PREDICTING LEADERSHIP AND PERFORMANCE IN UNIFORMED ORGANISATIONS USING THE FIVE FACTOR MODEL OF PERSONALITY

by

CHRISTOPHER JOHN JAMES ALLENDER

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Abstract

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Selection has been primarily focussed on the use of ability and aptitude measures as they have been shown to predict job performance in uniformed organisations. Personality assessment has largely been ignored as a possible contributor to improving predictions of performance. The emergence of the Five Factor Model as a framework for personality research, together with the development of the Trait Self Description Inventory (TSDI), has provided the opportunity to investigate how personality assessment might improve upon existing selection methods to predict performance in training. It was found that existing criterion measures did not fully reflect the core aims of the training organizations. This led to the use of a Leadership Trait Rating Scale as a criterion measure for subsequent investigation of the psychometric properties of the TSDI, and the development of a performance taxonomy. Five studies were carried out. Four of the studies involved soldiers and officers from the British Army as participants. These studies were undertaken to contrast the predictive validity of the Big Five factors against overall and specific areas of performance and to examine the incremental validity of the Big Five

factors and their sub factors over general ability measures. The fifth study examined the generalisability of the findings using similar data gathered from the Metropolitan Police Service. Contextual factors were found to have great influence on relationships between personality assessment and criterion measures. A novel, robust, two factor leadership model was identified. The first factor represented cognitively orientated leadership traits and the second, personality orientated leadership traits. These factors broadly equated to "can do" and "will do" attributes. Overall, the Big Five personality measures predicted no worse than, and, in some cases, as well as, some of the Army's Regular Commissions Board (RCB) dimensions. Big Five sub factors (facets) in certain situations were shown to predict performance better than the Big Five factors. The development potential of personality assessment for improving existing selection systems in uniformed organizations was confirmed by the findings.

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Chapter 1

Introduction to the Thesis

1.1 Introduction

This thesis is about the use of personality measures, in the form of self report inventories, to predict performance in uniformed organisations. It looks at how these measures might be used in the context of the Army and compares the use with another organisation, the Metropolitan Police, to assess the generalisability of the findings. The instrument used is the Trait Self Description Inventory developed by Tupes and Christal (1992). This thesis seeks to evaluate the utility of this instrument in the extant selection and training systems within these organisations.

1.2 Personality and Personality Measures

Burger (2004) defines Personality as consistent behaviour patterns and intrapersonal processes originating within the individual. However, Hough (1997) suggested that the discipline of psychology identifies with high levels of sophistication in methodology, and that less regard is placed in rigorous definition of terms. In a Defence context, Personality is seen as a combination of inherited characteristics shaped by environmental influences including values and learning from experience. The transmission of personality is shaped by our perception of a situation and a view of those with whom the subject wishes to interact. That perception or view is an interpretation of reality unique to that individual. Those on the receiving end of the message will interpret it in their own unique way based on

their perception of reality. (Leadership in Defence, Defence Leadership Centre Pamphlet, p. 3.13, 2003).

Hough's suggested indifference in the psychological paradigm to definition causes some difficulty in the realms of personality as there are consistently two interpretations of personality, which are fundamentally different. Salter (1996) contends that these two interpretations often lead to considerable confusion:

On the one hand, it [personality] refers to a person's social reputation and to the manner in which he or she is perceived by friends, family, co-workers and supervisors. This is personality from the observer's perspective and concerns the amount of esteem, regard or status that person has within his or her social groups....Alternatively, personality also refers to the structures, dynamics, processes and propensities inside a person that explain why he or she behaves in a characteristic way. (Salter, p.2, 1996)

In the first interpretation, personality is regarded in the context of someone's social "persona". This is derived from their own inherent processes that manifest themselves as internal drivers which, in turn, give rise to various behaviours. These behaviours are received by other people who then form a perception of the individual which becomes their social persona, though it is variously described as personality or character or even reputation. In this interpretation of personality, the meaning derives from the observer's domain and can be verified. In the second context, personality is not in the public domain and is hidden inside the person, and therefore must be inferred. Perhaps what is most critical to understanding of

any study involving the applied measurement of personality is that conceptually, the social persona is the thing that we wish to explain, but it is the hypothesised inner structures which are used to explain or account for it.

The "confusion" referred to above, and the interplay between these two concepts exists no less in the Armed Services than in any other part of society. For example, anecdotal evidence from those undertaking the selection of officers or soldiers suggests that they believe they are measuring objectively a candidates personality (often referred to as "Character"). Evidence for this arises in a number of ways, the most obvious being that the assessors, though untrained in psychometrics, score candidates on criteria such as "Personality and Character" using rating scales which have no underpinning theoretical basis in psychology. In fact, they are most frequently subjectively reinforcing their judgement of the candidate's social persona (Mileham, 2003) or judging how well it aligns to the norms of "personality" or "character" seen as "appropriate" to the role of their particular service, be it the Army, Navy or Air Force. The result is that whilst some such people in organisations often resist the use of personality assessment instruments, at the same time, the same people will often exhort the need to select people into their organisation on the basis of the individual's "personality" as they perceive it.

People are selected to join uniformed organisations on the basis of what they are able to do or their potential to be able to do something, predominantly by general ability (cognitive) or aptitude testing. Indeed Perry (1999) in his study into intelligence and personality at assessment centres, found intelligence had a major impact during selection of officers at the Admiralty Interview Board (AIB) as it was

"significantly and positively related to all assessment ratings and the final board result" (p.45). The selection processes tend to lay their emphasis on assessing ability and aptitude in individuals. The effect of this is to relegate the importance of objectively selecting individuals on *what they are like* or *what they have the "will" to do*. Thus those instruments which measure these less tangible, more complex aspects of an individual's make up, and which do not measure ability or aptitude directly, have consistently been excluded from the selection decision making processes. Personality assessment falls into this category.

Personality assessment, when undertaken by objective means, should rely upon instruments which are based on personality theories. Generally, personality theories are intended to explain what people are inherently like. Some, e.g. psychoanalysis, are designed to explain why people are neurotic or display disordered behaviour, however, they are not particularly useful for an understanding of a social competence such as leadership (Pervin,1996). Traditional clinical approaches are therefore not that useful in contributing to understanding normal people's behaviours in organisations. Not surprisingly therefore, many psychologists are of the opinion that personality measures have limited utility in selection contexts (Bernardin & Bownas 1985, Tett et al 1991, Hogan 1990 Barrick and Mount, 1991, and many others). Nevertheless, personality measures represent a source of information on individuals which might augment the information provided by cognitive ability instruments and aptitude tests which constitute the main source of psychometric data on potential recruits to the Armed Services and other uniformed organisations. However, Hogan (1990) also stated that validity coefficients rarely exceed .30 for personality measures and

explain only 9% of variance in social behaviour, and so the question of the extent of the utility of such tests in context remains to be answered.

In reviewing the validity of personality measures in personnel selection, Guion and Gottier (1965) concluded that it was difficult to advocate use of personality measures in most situations as a basis for making employment decisions. However, whilst there is continuing controversy regarding the use of personality measures in employment screening, they *are* widely used in employee selection, often despite a lack of evidence in support of their use. Guion and Gottier (1965) also advocate caution in the generalisability of their findings. Whilst personality assessments are not currently used for military selection in this country, historically, this has not always been the case. In the British Army During World War 2, personality assessment was undertaken, though not through the use of self reporting inventories. More clinically based practices on all recruits were undertaken in order to screen out those deemed unsuitable for military service, or identify those of "insufficient character" to undertake certain more demanding roles. This would imply that there was an inherent belief that personality *does* play a significant role in the explanation and prediction of behaviour. Research findings (e.g., O'Keefe, 2002) and test users perceptions therefore appear to be at odds. It is the extent to which personality tests underpin other measurable phenomena which might constitute the true extent of their applicability within the selection context. Standards laid down by the Society for Industrial and Organisational Psychology (Robertson,1987) emphasise the value of conceptual links between predictors and criteria. Where conceptual links are deficient between these elements, the potential value of personality measures in employee selection would

be obscured. Guion and Gottier (1965) found that personality measures developed for specific purposes were more predictive than traditional personality inventories scored with standardised algorithms. Thus links between job requirements and personality measurement are crucial in assessing any added value that personality assessment might bring to a selection process.

In keeping with their prescription for theory-driven validation Guion & Gottier (1965) called for careful consideration of the specific settings in which personality scales are validated. Situational specificity has been successfully challenged in the case of aptitude tests (Schmidt, Hunter, Pearlman and Shane 1979) supporting the view that general cognitive ability is an important factor in job performance regardless of the setting and the job in question. Personality, however, encompasses a more diverse array of traits that are less highly intercorrelated than are intellectual abilities. The desire to broaden the criteria for selection has thus led to a renewal of interest in personality assessment in general (Salter 1996) which has been sustained.

Schmidt, Hunter et al (1985) show that there is a lot of evidence that ability tests are valid predictors of job performance for most, if not all jobs. Their meta analysis shows that most of the variance in validity coefficients can be accounted for by statistical artefacts, principally sampling error. Thus, cognitive ability tests are likely to be the best predictors of job performance, but they are unlikely to be the only predictors of job performance. To delve into the as yet unexplained variance, complementary assessment tools are needed. Personality measures may be one such adjunct to ability testing (Day and Silverman, 1989, Guion, 1987; Hunter,

Schmidt and Judiesch 1990; Schippman and Prien, 1989,) in Hogan (1990) and thus remain worthy of further investigation.

1.3 Aims of the Thesis

In evaluating a self reporting inventory for personality assessment as a potential selection or assessment tool in uniformed organisations, the specific research aims were thus:

To test the predictive validity of the Big Five factors against broad and narrow criterion measures, i.e. against overall performance measures and specific areas of performance

To examine the incremental validity of the Big Five factors over mental ability and their interaction with ability

To examine the relative predictive validity of the sub factors which go to make the Big Five factors

To examine the results in terms of developing a future performance taxonomy

To examine the extent of the generalisability of any findings by looking at results of similar data gathered from another uniformed organisation, the Metropolitan Police Service.

1.4 Thesis Structure

The thesis begins with a chapter comprising a literature review on personality theory and the Five Factor Model. This sets out the developments and current status of the underlying theories and describes the instrument, the Trait Self Description Inventory, used in this research. This is followed by a chapter to help the reader understand the organisational context in which the studies have taken place. It describes how selection and training are undertaken within the organisations from which the samples were drawn. The fourth chapter covers two initial investigative studies. The first is based on data derived from Army recruits, and the second on data gathered from Officer Cadets on the Commissioning Course at the Royal Military Academy Sandhurst (RMAS). Chapter Five covers a third study using a sample from a personal development course, Rowallan Company, also at RMAS, which gave rise to examination of narrow criterion measures. Chapter 6 then examines the contextual element of personality assessment, focussing on the use of leadership performance criteria and providing the reader with a review of the relevant leadership research findings from the literature. Chapter 7 examines how individual instructors at RMAS and the Metropolitan Police Service Peel Training Centre at Hendon perceive personality and leadership. Chapter 8 covers the two main studies, the first investigating a further sample of Officer Cadets from the Royal Military Academy Sandhurst. This study examined the relationship between personality assessment and leadership performance. A second similar study aimed at assessing the generalisability of the findings was undertaken. This used a sample from another uniformed

organisation, the Metropolitan Police Service, made up of recruits from the Peel Training Centre, Hendon. The final chapter, Chapter 9, provides a summary and conclusions arising from this research thesis, and suggestions for future work.

Chapter 2

Background – Personality Theory and the Five Factor Model

2.1 Introduction

This chapter provides an overview of the development and current status of the Five Factor Model (FFM) and a review of research into its use as a predictor of job performance. It looks at the underpinning trait theory of personality and some alternative models to the FFM. It covers the nature of factors and sub factors (facets) and the limits and merits of the FFM, and discusses the reasons for the use of the FFM in this research. The use of the Big Five personality factors in occupational selection is reviewed, and the FFM's ability to predict performance is discussed. Finally, the chapter touches on some of the main instruments used to assess the factors constituting the FFM, and examines in detail the research and development of the Trait Self Description Inventory (TSDI) used in this thesis, reviewing its characteristics as a self reporting questionnaire and its psychometric properties.

2.2 Personality Trait Theory

Traits describe broad regularities and consistencies in individual functioning. They can be grouped into attainment, ability and personality traits (Cooper, 2002). In personality theory, traits are descriptors used to characterise and summarise a personality. Trait psychology, which emphasises quantitative assessment of personality, has become the dominant paradigm within personality psychology

(McCrae, 2000). Trait psychology is concerned with the study of enduring individual differences in overt styles of thinking, feeling and acting. Initially, many psychologists considered traits to be superficial, and distrusted self report questionnaires often used to assess personality traits. Some authors suggested behaviourists and other experimental psychologists (e.g. Skinner), were not impressed by the modest ability of trait measures to predict observed behaviours in the laboratory and by the 1970s, the existence of traits was being questioned (e.g. Mischel, 1968). Indeed, anthropologists such as D'Andrade (1965) and Shweder (1975) persuaded many that traits and trait dimensions were cognitive constructs of the perceiver, rather psychological characteristics of the perceived. However, subsequent research findings have resulted in trait psychology becoming viable in supporting personality studies. Self reports and observer ratings have become accepted as valid methods of measurement and evidence of the reality of traits has come from studies showing substantial agreement between the different methods of obtaining source data (Funder, Kolar and Blackman, 1995). Longitudinal studies have also demonstrated the stability of traits (Costa and McCrae, 1994; 1999) using test-retest evidence.

2.2.1 Development of a Personality Taxonomy

The process to develop a taxonomy was started by Allport and Odbert (1936) and was based on a lexical approach (De Raad, 2000). They began by identifying a pool of some 400,000 words from Webster's New International Dictionary (1925 edition). From this source, trait descriptive terms were identified which could be used to describe people for various personality traits. Allport (1937) suggested that traits were fundamental units of personality. He considered that traits were a

predisposition to respond in a particular way. This led to a consistency of response, bringing together adaptive and expressive behaviour. Allport believed these traits existed and were based on biological and physical differences within people, but it was the observable behaviours through which the traits were seen. These observable behaviours were categorised into traits which applied to all people (nomothetic) and traits which were unique to individuals (idiographic). Allport also argued that people possessed a range of different traits, some differing in significance and some differing in generality. Whilst Allport was critical of factor analysis, as he felt it emphasised the average and the individual became lost in the process, he developed a taxonomy of terms covering stable and enduring characteristics, mood states and activities, talents and physical abilities (Allport and Odbert, 1936). The use of this taxonomy of terms was designed to capture the uniqueness of the individual.

In the late forties, Cattell, drawing heavily on the work of Allport and Odbert, focussed on the use of adjectives to describe behaviours. This was predicated on and underpinned by the belief that there was a strong likelihood that every aspect of personality had a term describing it in the language. Cattell applied factor analysis to personality traits and assessment of personality to attempt to determine the basic dimensions of personality. Grouping personality traits using factor analytical techniques resulted in fifteen factors being found to account for most aspects of personality. He then attempted to determine if the same groups of terms (factors) could be identified. Cattell further refined Allport's adjectives down first to 180, and then subsequently to 42 - 46. A final set of 45 trait descriptors were then used, and the rating responses subsequently factor analysed by Cattell (1957). This yielded 12 to 15 factors. This investigation resulted in the production

of the Sixteen Personality Factor Questionnaire (16PF) (which included intelligence as a trait). Cattell also investigated how heredity and environmental factors influenced determinants and developments of traits, particularly in respect of the stability of traits over time.

Norman (1963) also worked towards producing bipolar adjective descriptors (e.g. talkative-silent) for the items. Norman, in attempting to redefine Cattell's "personality sphere", sorted terms into clusters. These were subjectively assigned to a pre-existing model rather than being derived through factor analysis. Norman selected 20 variables based on results from several analyses performed by Tupes and Christal in 1958. The four variables with the highest median factor loadings for each of the five factors identified in these earlier analyses were taken. Thus, Norman's five personality factors were not only determined by Catell's set of 35 variables, but also by further selection of statements, in the form of phrases, which described behaviours and attitudes. These were added to improve the instrument's predictive validity (De Raad, 2000). However, these phrases were clearly not derived from lexical hypothesis, and thus the result was that the purely theoretical basis for the Five Factor Model was compromised. However, the rationale for the refinement of the instrument was that it would render it more effective in measuring personality traits.

McCrae and Costa (1995, p. 248) summarise clearly the concept of personality traits as being dispositions rather than descriptive summaries of behaviour. These dispositions, they assert, can be inferred from and can predict and account for patterns of thoughts, feelings and actions. The scientific evidence for the existence of traits is provided in part by studies that show patterns of covariation that cannot

readily be explained by transient influences, learned responses, and cultural norms. These studies have examined personality traits across time (McCrae, Costa, De Lima, Simoes, Ostendorf, Angleitner, 1999; McCrae and Costa, 1994), twin pairs (e.g. Loehlin, 1992; Loehlin and Martin, 2001), and cultures (e.g.Eysenck, 1979; McCrae, Costa, Martin, Oryol, Rukavishnikov, Senin, Hrebickova, and Urbanek, 2004; Salgado, 1997). Psychological constructs give conceptual coherence to the covarying pattern of thoughts, feelings and actions. Indeed, good constructs have surplus meaning that points beyond known correlates of a trait. Whilst trait explanations are not themselves mechanistic, the mechanisms through which they operate may or may not be specified in a psychological theory. When trait status in an individual is assessed using a validated method, knowledge of the trait's manifestations can legitimately be invoked to explain the individual's behaviour. However, McCrae and Costa (1995) accept that over time, traits interact with the environment to produce culturally conditioned and meaning laden characteristic adaptations such as attitudes, motives and relationships.

In this conceptual framework, facts about personality traits, the comprehensiveness of the FFM, the stability and heritability of traits, and the utility of trait measures in predicting occupational performance can be understood. As is demonstrated below (see section 2.5), research has shown trait explanations to be legitimate, useful and powerful.

2.2.2 Limits of the Lexical Approach

Traits, which have been used to describe individual differences from an evolutionary viewpoint, have stood up to the "long test of the survival of the fittest".i.e. they represent those lingual units which have survived (Austin 1970 p 181, in De Raad, 2000, p.18.). Trait descriptors are universally used by people from a very early age (John, 1990). Critics (e.g. Eysenck, 1992; Loevinger, 1994; McCrae, 1994; Tellegen, 1993; Zuckerman, 1994) however, suggest that because trait theory is based on dictionary definitions, there is a tendency for it to emphasise ordinary language and lay peoples' judgement forming the basis for charting the domain of traits. Block (1995) felt that these factors might lead to a restricted understanding of personality and biased trimming of the field of individual differences. Block (1995) criticises the lexical derivation of personality traits on the grounds that lay usages should not be taken over to provide the basic concepts of the field of personality psychology. Such tendencies, it was thought, would contravene the purported scope of the lexical hypothesis, namely to have recourse to all realms of life where people may exhibit individual differences. Further criticism of this approach centred around biased usage of terms; for example, Hofstee (1990) suggested that personality terms were heavily saturated with social desireability. Graziano (1992) and others (e.g. Beck, McCauley, Segal and Hershey,1988; Goldberg and Kilkowski, 1985) also expressed concern over the variations of understanding of the adjectives used between different groups who were exposed to personality instruments.

Evaluative terms and state descriptors (e.g. very excitable) have as a rule been excluded from psycholexical studies. Some authors (e.g. Tellegen and

Waller,1987; Tellegen,1993; and Waller and Zavala,1993) have questioned this because these omissions detract from the comprehensiveness of the lexical approach. In this context, they suggest the use of samples of trait terms that are non-restrictive for a more comprehensive representation of traits.

Despite these concerns over the limitations of the lexical approach, it nevertheless provided the empirical foundation for the development of the FFM which will be considered in the next section.

2.3 The Five Factor Model (FFM)

The FFM, most often held up to account for differences in human behaviour, consists of Extroversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience (Hough & Oswald, 2000; Matthews, 1997). The development of a model with five factors was given initial impetus by Eysenck, working initially in parallel with Cattell in the late forties. Eysenck used factor analysis in his research into development of personality questionnaires, and the genetic and biological basis of personality (see section 2.5 below). The findings from his research, which were based on clinical and experimental findings, emphasised three basic dimensions of personality: Introversion-Extraversion, Neuroticism and Psychoticism, all three being essentially mutually orthogonal. These dimensions formed the basis of the Eysenck Personality Questionnaire (EPQ) (Eysenck and Eysenck, 1975). Extraversion and Neuroticism were similar to those found in Cattell's sixteen factors, and subsequently appear in virtually every factor-analytic trait study. Further research by Costa and McCrae (1978) found two clearly defined clusters which appeared to measure Extraversion (sociability, confidence, optimism and cheerfulness and Neuroticism (worrying,

guilt proneness, anxiety etc), plus a small third cluster. Items were added to expand the output of this latter cluster (Openness to Experience). It was then decided that each factor should be measured by 6 behavioural facets which, when accumulated, defined the factor. This led to the further decline in strength of support from the lexical model as items were designed to measure a particular set of facets. Two further factors were later added to facilitate measurement of Goldberg's two factors of Agreeableness and Conscientiousness (Goldberg, 1981). These developments thus finally resulted in the Five Factor Model (FFM), also referred to as the Big Five. The FFM became a widely accepted working hypothesis for the representation of the structure of personality traits (McCrae and John 1992).

2.3.1 The Big Five Factors Described

Extraversion (also spelt Extroversion) is the factor associated with the social domain. It is used as a measure of traits concerned with dealing with people. It is related to energy and enthusiasm. Extraversion is about quantity and intensity of interpersonal interaction, activity levels and stimulation needed (Pervin,1996). People described as outgoing, active, sociable, talkative and assertive score high on this factor. Low scorers are described as shy, timid, reserved or withdrawn (Costa and McCrae, 1985).

Conscientiousness is often referred to as the organisational domain of personality. In this domain, traits represent differences in motivation and persistence. High scorers show tendencies towards being well organised, neat, productive,

conscientious and responsible. Low scorers are described as easygoing, unreliable, and unlikely to plan ahead (Costa and McCrae 1985).

Agreeableness is the factor associated with the moral domain, and is concerned with the styles people employ in their interactions with other people. High scorers on this domain tend to be trusting, tolerant, good natured and cooperative. Low scorers tend to be cold-hearted, hard-headed, competitive or antagonistic (Costa and McCrae 1985).

Neuroticism encompasses the emotional domain of personality. It represents how people react to emotionally distressing experiences. High scorers tend to display insecurity, depression, anxiety and are worriers. Low scorers tend to be even-tempered, calm, resilient and relaxed (Costa and McCrae 1985). This factor is the least controversial of the FFM and is universally accepted by researchers (McCrae and John 1992).

The *Openness* factor (also variously referred to as Openness to Experience and Openness to Change) remains controversial even in its definition. It is understood to either reflect the cultural or artistic domains, or it is interpreted as encompassing creativity, intellectual interests and unconventional values. Openness is described as referring to the attributes of assessing, proactivity, seeking and appreciation of experience, and toleration of, and exploration of, the unfamiliar (Pervin, 1996). High scorers show tendency towards curiosity, creativity, originality, imagination and unconventionality. Low scorers tend to be conventional, down to earth, and not tending towards the artistic, or the analytical.

2.3.2 The Big Five facets or sub factors

Below the Big Five factors in the hierarchy, there exist a range of facets or sub factors (see section 2.3 above). These facets or sub factors, are subscales which are associated with each of the Big Five factors. They offer greater differentiation between behaviours within each of the five broader personality factors. For example, in the NEO-PI Five Factor Inventory (Costa and McCrae, 1992) there are 300 items, which, in addition to scores on the Big Five factors, provide individuals with scores on six sub scales within each of the five factors.

Some authors (e.g. Block, 1995), argue that it is more fruitful and necessary to operate at a more specific facet/ sub factor level, than at the Big Five level. This, however, might tend to render the FFM as largely irrelevant. Block argues that whatever can be achieved predictively using the five global domain measures will be no more than, and probably less than, the set of subordinate and more specific dimensions provided by the sub factors (see sections 2.2.1 and 2.2.2 above). Block goes on to suggest that the Big Five domains are nothing more than linear combinations of the more specific dimensions said to lie within them ((Block, 1995, p. 208). It therefore follows that the sub factors may have more to offer in being representative of an individual's personality than the Big Five factors. The next section thus looks at the limits and merits of the FFM.

2.4 Limits, Merits and Alternatives to the Five Factor Model

There are well publicised authors who advocate acceptance of the FFM (Costa and McCrae, 1986). Advocates view the five factors as both necessary and

sufficient for describing the major features of personality at a global level. Costa and McCrae (1989) contend that the FFM provides a "universal" descriptive framework for the comprehensive assessment of individuals. McCrae and John (1992) suggest that it is an empirical fact that there are five factors. These claims have prompted some expressions of concern around the FFM's methodological, empirical, semantic and theoretical basis (e.g. Ben-Porath and Waller 1992; Eysenck, 1992, Tellegen, 1993). The criticisms are wide ranging. They cover concems over the lack of an underpinning conceptual framework and comprehensiveness of the FFM; the heavy reliance on factor analysis for the derivation of the model and the factor structure itself. These concems, critics suggest, manifest themselves in lack of replicability across studies and lack of agreement over how many and which factors might constitute a universal model of personality. There is also criticism over the failure of the FFM to take into account behavioural, environmental, situational and social influences. These aspects are considered below.

2.4.1 Limits to the Conceptual Framework of the FFM

Potential limitations of the conceptual framework of the FFM centre on conceptual understanding of the factors, the comprehensiveness of the model and the terminology used. Firstly Block (1995) criticises Tupes and Christal for not elaborating conceptual understandings of their five factors on the basis that they gave them titles without any elaboration of their meaning. These labels have not only endured, but have subsequently shaped thinking and guided interpretation of research findings. Tupes and Christal had been guided by French (1953) who reviewed some 68 factor analyses, and proposed some 49 factors. There was

some question regarding the conceptual and methodological acceptability of the factor analysis undertaken to derive these factors, and as French acknowledged, the resulting factors were therefore rendered ambiguous. Indeed, his efforts to identify or summarise reproducible factors was severely limited. As an illustration of this, Block describes the subsequent term "Agreeableness", for example, as "a broad, bland, impressively unincisive umbrella of a label" (Block 1995, p194).

The comprehensiveness of the FFM has also been questioned. As an illustration of this concern, Saucier and Goldberg (1998) looked at clusters of adjectives potentially reflecting factors beyond the Big Five. These clusters included those reflecting positive and negative Valence; those referring to physical features (e.g. tall, athletic), to sexuality (chaste, sexy) to Attractiveness, and many others which had low communalities with the Big Five factors in earlier studies. Saucier and Goldberg found that these more exotic variables indeed supplemented the Big Five factors, but only when variable selection was extended outside conventionally defined personality traits.

The terminology used by those arguing for the viability of the FFM has also been questioned, e.g. use of the term "model" as applied to an atheoretical construct. Block (1995) suggested that the FFM does not represent a personality structure within the individual, nor does it offer a sense of what goes on within the structured motivation-processing, system maintaining individual.

2.4.2 Technical Limitations of the FFM

There are certain flaws and limitations concerning the evolution and development of the FFM. These surround the methodology used in its development, the replicability of the factor structure and the independence of sub factors and factors. Cattell's initial formative work has been questioned. In factor analysing peer ratings based on the 35 bipolar rating scale dimensions, Cattell concluded that 12 "primary" factors underlay personality. These factors do not closely match the factors subsequently known as the Big Five (Block 1995). More than 99% of the 4504 trait-name adjectives of Allport and Odbert and those first added by Cattell had been eliminated during Cattell's activities. Cattell admitted that his reductions to the list of trait-names could well have eliminated personality features of relevance (Cattell, 1945). There were also methodological limitations of Tupes and Christal's work. Tupes and Christal failed to meet Cattell's (1957) list of principles for adequate rating of personality; e.g., sampling of only young, fit men; small sample sizes; inconsistent training of raters, and the length of time over which the ratings were derived.

The ability of the factor structure to be replicated in studies led also to concern. Studies have not replicated Cattell's 12 to 16 Factors. However, some studies have found support for up to 10 factors (e.g. Browne, 1971) using 16PF data. Reanalysis of Cattell's data resulted in no more than 6 factors (Howarth 1976, cited in Block 1995, p.194). Matthews (1989) found evidence for a 12 factor solution, though none of these factors corresponded to Cattell's primary factors. This might suggest that whatever is based on the Cattell scales, including the NEO

PI (Costa and McCrae, 1985), is essentially a product of non - representative variable sampling.

Tupes and Christal, using the data they had gathered from air force officers and officer candidates (see also section 2.6.1), concluded that five fairly strong and recurrent factors emerged. However, six of the eight analyses gave rise to the extraction of eight orthogonal factors, whilst in another analysis five factors were extracted. In another re-analysis, this time on the female sample, twelve factors were extracted (Block,1995). Block suggests that the degree of recurrence of this five factor structure over the eight analyses may not be so striking as had been assumed. Whilst Goldberg (1992) and others, have described the Big Five factors as orthogonal, or nearly orthogonal to each other, it has been found that the five factors frequently correlate with each other to reflect an overriding evaluative component (e.g. Mroczek, 1992; Goldberg, 1993; Peabody and Goldberg, 1989).

It appears that the five factors are not truly independent. When the facets or sub factors are considered, the question of "which five factors?" often arises. For example, Costa and McCrae have positioned "Warmth" as a facet of Extraversion, whilst Goldberg places it under Agreeableness. "Impulsivity" is usually a facet of Neuroticism for Costa and McCrae, but it is sometimes considered to be an attribute of low Conscientiousness, yet Goldberg places Impulsivity with Extraversion. Trapnell and Wiggins (1990) retained their Dominance and Nurturance factors rather than accept Costa and McCrae's Extraversion and Agreeableness labels. Hogan and Hogan (1992) split Extraversion into Sociability and Ambition; Tellegen and Waller (1987) have added two factors; Zuckerman (1994) proposes an alternative five factor model with fundamental differences in

the broad dimensions. Zuckerman's five factorial model does not correspond one to one with the five factors of the FFM, though four of the five factors in this alternative model can be interpreted in the FFM framework. However, Zuckerman's model does not have the Openness factor represented. In its place, Zuckerman emphasises the activity and energy facets of the FFM Extraversion factor, including these together in a separate *Activity* factor. These variations on the FFM illustrate the weakness of the FFM in relation to its conceptual basis and the independence of its sub factors. However, alternative factor models often have close similarities to the FFM. It is perhaps noteworthy that researchers tend to clarify their own trait model in relation to the FFM. The alternatives tend to share features of the FFM. Other alternative trait models have been suggested, such as a "Big Three" (Peabody and Goldberg, 1989); a "Big Six" (Jackson, Ashton and Tomes,1996); and a "Big Seven" (Almagor, Tellegen and Waller,1995) incorporating two additional factors, Positive Valence and Negative Valence, representing positive and negative aspects of self evaluation. In the Six Factor Personality Questionnaire (SFPQ) Jackson and Tremblay (in De Raad, 2002), three of the six factors identify with Extraversion, Agreeableness and Openness to Experience, another with the Neuroticism Big Five factor, whilst two other of the six factors, Methodicalness and Industriousness, can be regarded as a split Conscientiousness factor. Even the 16PF in its fifth iteration gives five second order factors which can be easily interpreted as variants of the Big Five. The Hogan Personality Inventory (HPI), despite being originally based on the Five Factor Model for its construction, uses seven factors to describe the data. Alignment of these seven factors with the Big Five Factors, however, is straightforward; Neuroticism, Agreeableness and Conscientiousness align directly to Adjustment, Likeability and Prudence, whilst Extraversion equates to a

combination of Ambition and Sociability. Intellect/Openness to Change is related to Intellectance and School Success in the HPI.

2.4.3 Developments in Personality Theory – Biological and Social influences

The means to define personality have been based on observed behaviours. Biological determinants and environmental/social factors contribute to determine these behaviours, and therefore the extent to which each of these factors might influence personality definition, is now considered.

2.4.3.1 Biological Influences

The aspect of Eysenck's concept of underpinning biological factors (Eysenck 1990) was illustrated by a range of studies which indicated, for example, fundamental differences in the functioning of introverts and extraverts in terms of behaviour. Eysenck considered that these behaviours, such as, for example, levels of arousal, were underpinned by biological factors. Eysenck cited the presence of a strong genetic component with Extraversion, for example, relating to the regulation of sensory input. Thus Eysenck argued strongly for a biological basis for personality, and proposed that personality trait development is largely a genetic phenomenon. This claim has also been supported by McCrae and Costa (1995) who, whilst accepting that personality traits are hypothetical psychological constructs, also claim that they have a biological basis. Evidence of the relative independence of personality from the environment has been offered from twin, family and adoption studies (Reimann, Angleitner and Strelau, 1997). Studies

have also confirmed the importance of genetic influences on adult personality (McCrae 2000).

Indeed, Mathews and Gilliland (1999) in reviewing the personality theories of Eysenck and Gray suggests that the biological theories may be improved by better methodology or through discriminating multiple systems underpinning traits. They therefore suggest that the biological approach may not adequately explain behavioural correlates of traits, and thus, as more mental properties and processes are understood, then additional traits will be identified. If this is the case, then trait research should place more emphasis on cognitive or social bases for personality. Some traits which are identified during research but do not have a basis in psycholexical theory, may either have a basis in biological theory, or be a learned response to social influences (see section 2.4.3.2 below). Zuckerman (1994), for example, argues that the psycholexical approach does not give central place to what he considers to be key traits such as Impulsivity and Sensation Seeking, in terms of their biological basis. He thus argues that such traits should be included in any assessment of personality.

2.4.3.2 Social influences on Personality

The alternative influence of social factors may work in concert with the biological and psycholexical explanations of personality to produce a more broadly based theory of personality. That there is another source of influence on personality beyond biological and genetic factors has been evidenced by meta-analysis. For example, over a range of aggregated findings from studies investigating the influence of age on personality change, the heritability of personality traits has

been assessed as being only 50% at most (Plomin and Caspi, 1999). As the remaining 50% of influence is unlikely to be as a result of measurement error, then other influences must be at work. Indeed, other research (e.g. McCartney, Harris and Bernieri (1990) working on heritability estimates, have found that heritabilities for some personality (and, incidentally, intelligence) factors have been found to increase with age. Given that heritability reflects a fixed estimate of genetic influence, then why would heritability change with age? Presumably because environmental factors must assert some degree of influence on personality. However, given that heritability increases with age, this might imply that environmental influences decrease. There may be explanations for this: for example, it is likely that when adolescents escape the family they begin to shape their own environment more, and family influences decrease. Findings from clinical studies (e.g. Lambert and Supplee, 1997; Piedmont, 2001) also suggest that clinical interventions actually change personality traits. So, environmental factors and heritability of personality points towards to the importance of the environment, though it is accepted that heritability estimates may be misleading as they reflect both genetic and environmental factors, and therefore do not just purely represent biological factors which influence personality.

An alternative theory, Social Investment Theory, proposes that personality develops largely as a result of experiences in universal social roles in young adulthood. Roberts, Wood, and Smith (2005) found that having reviewed cross cultural, longitudinal and behaviour genetic studies reveals little support for the FFM position and provisional support for Social Investment Theory. This assertion was based on evidence that personality differences across age ranges were similar in different cultures (McCrae, 1999), and that if personality was a

genetically determined human imperative, there was striking consistency across individuals in the pattern of personality development with age (Roberts et al, 2001). These consistencies arise, it is suggested, due to such activities as social living, i.e. finding a marital partner, starting a family, establishing a career, as promoted by the culture in which individuals live, promotes the widespread shared pattern of personality traits found in adulthood (Helson, Kwan, John and Jones, 2002).

Alternative theories suggest that behaviour is situationally rather than dispositionally determined. For example, Mischel (1968) argued that situations determine behaviour rather than traits. However, this view is regarded as untenable in the light of research data: personality traits would not exist if behaviour were purely driven by situations, and the genetic make up of personality would not influence people's behaviour. However, specific behaviours occur when these characteristic adaptations interact with the immediate situation; traits are thus best construed as indirect or distal causes of behaviour (McCrae and Costa,1995). The many examples of at least moderate levels of performance prediction from the Big Five factors refute the suggestion that behaviour is entirely situationally determined (Robertson & Callinan, 1998).

Perhaps the approach that psychologists interested in abilities have used may provide a more useful conceptual framework. Thus an approach which seeks to draw together the biological, sociological, situational and environmental influences on personality and present the concept with the individual as the focus is likely to be of value. Hofstee (2001) offered a different approach to assessing relationships amongst Big Five factors. He suggested, in parallel with

conceptualisations of intelligence, consideration of a general personality factor, the *p*-factor. With this as the highest trait in a sophisticated hierarchy, he proposed that the meaning of the *p*-factor might be considered as *social desirability.* Even if this were to be adopted, the five factors, or variants there of, are still likely to provide a means by which personality may be assessed in an applied framework, nevertheless.

2.4.4 Summary – The FFM

There is nothing definite about the number "5" (Hofstee, Ostendorf & Boomsma, 1998). There is also more to personality (e.g. moods and processes) than is captured by the Five Factor Model. It appears that no single language is capable of providing an unequivocal five dimensional personality trait structure: decisions about the number of factors and about the meaning of factors are based on probabilities at best (De Raad, 2000, p.99).

There are a number of limitations to the FFM described in the literature. These centre around technical aspects of the development of the model, failure to take into account situational, social and environmental variables, and issues regarding bandwidth in applied settings. However, although there are differences between the models described above, the different models also have much in common. The next section examines the utility of the FFM in applied settings as a predictor of performance and how it provides a theoretical basis for the application of selection instruments.

2.5 The Effectiveness of the FFM in Predicting Performance

The emergence of the Five Factor Model (FFM) as an organising framework for personality research (Mount & Barrick, 1995) brought renewed interest in personality measures as predictors of job performance (Matthews, 1997; McManus & Kelly, 1999) including military training and overall job performance (Christal & Collis, 1997). Use of the Big Five in occupational selection has slowly grown over the last decade or so, though with varied results.

2.5.1 Predicting Job Performance

The use of personality measures to predict job performance remains controversial. Some authors support use of personality measures in selection (Gray 1991, Owens 1991), but some have derided their use: Blinkhorn and Johnson (1990) suggest that "there is precious little evidence that even the best personality tests predict job performance" (p.672). The main arguments in the literature against the use of personality measures for selection, and thereby against their usage to predict job performance, relate to poor validity coefficients. Where data exists, validity coefficients tend to be much lower for personality measures than for other psychometric predictors. Validity coefficients for personality tests are variously reported as between .01 and .23 (Hough et all, 1990); .28 (Ghisella,1973); and .149 on average (Schmitt et al, 1984). If these are compared with validity coefficients for cognitive ability tests from the literature; e.g., .53 to .65 (Campbell, McHenry and Wise, 1990); .47, for supervisor ratings of overall job performance (Hunter and Hunter, 1984); or when compared with work samples, .378 (Schmitt et al, 1984), personality validity coefficients show clearly lower orders of values.

Also, if a set of independent personality scales are being validated, such as a personality instrument which gives rise to scores on a number of factors or sub factors, only one, or at least a small number of scales, is likely to predict a discrete criterion (this issue will be revisited in section 2.5.4 below). For example, Conscientiousness predicting skill acquisition, shows a validity coefficient of .10 (Hurtz and Donovan,2000); Agreeableness predicting creativity, - .29 (Hough, 1992). Averaging the validity coefficients of all personality scales in the battery tends to seriously dilute the estimate of validity. The same argument holds when validities for a single personality scale are averaged across a number of discrete criterion measures. Jackson and Rothstein, (1993) and Robertson (1991) questioned whether or not the level of validity achieved for personality testing made this method useful in personnel selection decision making. These authors took this stance in the light of the fact that the best true correlations for various personality dimensions obtained in the studies cited had not been large (.26 at most), adding support to the assertion of Hough et al (1990) who stated that "validities were in the .20s" (p.590).

Tett et al (1991) noted that whilst there was an abundance of potential personality predictors, in the absence of prior information about their relevance to jobs, the chances of identifying significant validities were low, and that this provided a possible reason for the low validity coefficients cited above. It is also important to note that when multiple predictors are looked at, some larger correlations will be found purely by chance. Tett et al (1991) discovered that validities rose up to .38 when selection of personality traits was guided by conceptual hypotheses and by job analysis. However, it was also observed that the personal qualities chosen as criteria must be important in job performance and feature in objective job analysis,

otherwise there was a risk that irrelevant personal qualities might be introduced into the criterion measures. Conceptualizations of job performance have expanded (Campbell, 1990), and the studies of personality against more specific performance domains have shown differential prediction both for different personality factors and measures of ability (Borman & Mottowildo, 1993; Hough & Oswald, 2000). Thus overall job criteria may obscure relationships, therefore differential prediction may be only achieved through operationalising finer level criteria, e.g. Conscientiousness predicting Citizenship, .24 (Borman et al, 2001). Hough and colleagues (Hough, 1997; Hough & Schneider, 1996) provided evidence in military populations that the Big Five factors contain sub factors with both high and low criterion-related validity and these act to dilute the criterion-related validity of the five factors. Selection strategies may thus need to attend to maximising the use of the predictive sub factors. More specific and dynamic theories linking personality with components of job performance, such as leadership behaviour (Pratch & Jacobowitz, 1997), have yet to be adequately empirically tested with more narrow bandwidth personality and criterion measures (Schneider, Hough, & Dunnette, 1996).

McHenry et al (1990) suggested that personality may be a meaningful and useful predictor of training success when classified according to the Big Five factor structure. However, interest has overwhelmingly been in predicting *overall job performance* from the five factors (Ones & Viswesvaran, 1996) as opposed to predicting *various performance criteria* from the factors or sub factors (Schneider & Hough, 1995). In terms of predicting job performance, meta-analyses by Barrick and Mount (1991) and Tett, Jackson & Rothstein (1991) together with individual studies (e.g., Barrick and Mount, 1993; Hogan & Ones, 1997; Mount & Barrick,

1995; Salgado, 1997), have led many researchers to claim the Big Five factors *are* valid predictors of performance. The Barrick and Mount (1993) meta-analysis examined 117 validity studies which looked at the relationship between Big Five personality factors and training performance. Their study found *all* the Big Five factors to be valid predictors of training proficiency. The validity coefficients cited in the validity studies for the Big Five factors are shown at Table 2.1 as follows:

Factor	r	*p*
Conscientiousness	.13	.23
Agreeableness	.06	.10
Extraversion	.15	.26
Openness	.14	.25
Neuroticism	.04	.07

Table 2.1 Validity Coefficients for the Big Five Factors from Meta-analysis of 117 Studies (Barrick and Mount 1993)

Salgado (2003) examined the relationship between the Big Five factors and job criteria through a meta-analysis. His findings are shown at Table 2.2 as follows:

Factor	Number of Studies	r	*p*
Conscientiousness	90	.17	.28
Agreeableness	68	.08	.13
Extraversion	75	.04	.07
Openness	48	.05	.08
Emotional Stability(Neuroticism)	72	.09	.16

Table 2.2 Validity Coefficients for the Big Five Factors from Meta-analysis (Salgado 2003)

Salgado considered that these results showed that all the Big Five factors were valid predictors of training performance.

Efforts to improve selection models and better understand the nature of job performance have lead to specific models of job performance, highlighting its multi-facetted nature (Campbell, 1990). For example, two distinct aspects, *contextual* and *task* performance, have been identified (Borman & Mottowildo, 1993). It has been suggested that personality measures should predict contextual performance or organizational citizenship behaviour (behaviours that assist and support the organizational and social environment in which the tasks are performed). Ability measures, in contrast, may be more predictive of task performance (Borman & Motowildo, 1993; Motowildo & Van Scotter, 1994). Indeed, in the United States Army, McHenry, Hough, Toquam, Hanson and Ashworth (1990) found that personality variables were predictive of the contextual performance factor of Personal Discipline, and both personality and cognitive variables were predictive of Effort and Leadership.

Borman and Motowildo (1993) have been more specific in developing a taxonomy for management performance. They included 18 dimensions and four orthogonal factors (Interpersonal Dealings & Communication, Leadership & Supervision, Technical Activities & the Mechanics of Management, and Useful Personal Behaviour & Skills). Personality is implicated in all of the factors apart from the third cited, where mental ability is deemed most critical (Schneider & Hough, 1995). As military organisations move further away from work roles to more dynamic environments (Anderson & Ostroff, 1997), further understanding of predicting the organisational fit of personnel and military leaders would appear particularly critical. These models and data may provide a means by which organisational fit could be better predicted in the light of such functional changes.

2.5.2 Limitations of the FFM in Predicting Performance

There have also been suggestions that some factors need to be split or that narrower bandwidth measures are of more predictive value. One narrower bandwidth measure, namely, achievement (Hough, 1992), has been evidenced as more predictive of performance for a number of United States Army training courses (Hough & Oswald, 2000). Hough (1992) suggested Extraversion should be split into Potency and Affiliation, and extra dimensions of Rugged Individualism and Locus of Control should be considered essential constructs. More recent meta-analytic studies have given partial support to this. For instance, Hough (2000) points to the studies of managerial performance (Hough et al, 1998) and sales performance (Vinchur, et al.,1998) which have shown the importance of distinguishing Achievement from Conscientiousness and Affiliation from Extraversion. In addition, alternative trait theories have been put forward e.g. Tellegen (1982)(see section 2.4 above), though the FFM has dominated selection work. However, there remain few examples in the literature, or tests, of more refined personality taxonomies integrated with theoretically driven performance taxonomies.

Notwithstanding the foregoing criticisms of the FFM, further examination of the Big Five and its sub factors against a variety of criteria has been strongly recommended (Matthews, 1997; Schneider & Hough, 1995), and, despite the limited scepticism alluded to above, the Five Factor Model is regarded by most personality psychologists as fundamental to personality theory.

2.5.3 The Big Five Factors and Measures of Ability

The utility of the Big Five factors has been further demonstrated where Conscientiousness and Emotional Stability (High Neuroticism) have been found to contribute to the prediction of overall job performance over and above general mental ability (Hough & Oswald, 2000; Salgado, 1997 and 2003). The possibility that cognitive ability and personality might interact in predicting performance was suggested by Maier (1955) and evidence supporting this possibility was reported as early as 1958 (French,1958). Using other methods, the interaction between cognitive ability and self-esteem (Hollenbeck, Brief, Whitener & Pauli, 1988) and ability and Need for Achievement (Wright, Kacmar, McMaham & Deleeuw, 1995), have been found to contribute incrementally to job performance over individual measures. Ackerman and Heggestad (1997) in their review of the development of the modern paradigm for intelligence and assessment, provided an extensive meta-analysis of personality and intellectual ability correlations. Their key findings for the Big Five factors are shown at Table 2.3 overleaf:

Big Five	General Int. (G)	Crystalised Int. (Gc)	Knowledge and Achiev-ement	Learning and Memory	Fluid Int. (Gf)	Maths/ Num-erical
C	$\hat{\rho}$ =.02 CI= -.01 to .05	$\hat{\rho}$ =-.05 CI= -.10 to -.01	$\hat{\rho}$ =-.19* CI= -.33 to -.04	$\hat{\rho}$ =.07 CI= -.07 to -.20	$\hat{\rho}$ =-.08 CI= -.18 to -.02	$\hat{\rho}$ = -.15* CI= -.23 to -.08
A	$\hat{\rho}$ =.01 CI= -.06 to .07	$\hat{\rho}$ =.04 CI=.00 to.09	$\hat{\rho}$ =.17 CI=.-.19 to.12	$\hat{\rho}$ =.17 CI=.00 to.33	$\hat{\rho}$ =.03 CI= -.05 to .11	$\hat{\rho}$ =-.05 CI=-.15 to .04
E	$\hat{\rho}$ =.08* CI =.06 to.09	$\hat{\rho}$ = .11* CI=.10 to.12	$\hat{\rho}$ =.05 CI=.00 to.10	$\hat{\rho}$ =.05 CI=.00 to .10	$\hat{\rho}$ =.06* CI= .05 to .08	$\hat{\rho}$ =.09* CI = .07 to .11
O	$\hat{\rho}$ =.33* CI= -.01 to .05	$\hat{\rho}$ =.30* CI =.25 to .34	$\hat{\rho}$ =.28* CI=.16 to .40	$\hat{\rho}$ =-.11 CI= -.24 to .03	$\hat{\rho}$ =.08 CI= -.06 to .21	$\hat{\rho}$ =.01 CI = -.06 to .08
N	$\hat{\rho}$ =-.15* CI= -.17 to -.12	$\hat{\rho}$ =-.09 CI = -.11 to -.08	$\hat{\rho}$ =-.13* CI= -.16 to .09	$\hat{\rho}$ =-.06* CI= -.11 to -.01	$\hat{\rho}$ =-.08* CI= -.10 to -.06	$\hat{\rho}$ =-.17* CI = -.20 to -.14

Table 2.3 Estimated Correlations (ρ) and Confidence Intervals (CI) (Ackerman and Heggestad (1997))

Key

$\hat{\rho}$ = estimated population correlation based on effect size measure for each analysis

CI= Confidence intervals for $\hat{\rho}$

Examining these correlations from a qualitative perspective, it can be seen that Extraversion and Openness tend to be positively correlated across ability traits, and Neuroticism negatively correlated.

2.5.4 FFM Predicting Performance Using Narrower Bandwidth Measures

In section 2.5.1 above, the notion that sub factors or narrower bandwidth measures might be of greater value than factors for prediction was raised. Evidence in support of narrower bandwidth personality measurement to predict job performance has emerged in two ways. Some authors claim that the breadth of personality measurement should be matched to the bandwidth of the criterion so that in some instances a narrower bandwidth is needed and should be matched with greater specificity in terms of criterion (Hogan and Roberts, 1996). This could take on the form of a greater number of factors, or utilizing sub factor dimensions (Schmidt & Ryan, 1993; cited Matthews, 1997). Others suggest more emphatically that the Big Five factors are just too broad to most effectively account for work behaviour and that narrower bands, or a 7 to 9 factor model, should be considered for a taxonomy of personnel selection (Hough, 1992; Hough et al, 1990; Schneider and Hough, 1996). A taxonomy which is based on a construct-oriented approach is proposed. This specifies a personality taxonomy, and also a job performance taxonomy, with a nomonological net, or theory, that links them. This would likely improve the fidelity of the personality measures when outcome measures are also constrained to narrow bandwidth measures.

More recently, some research has been published which has addressed the utility of using sub factors for prediction of behaviour and comparing results with the prediction of the Big Five factors. Paunonen and Ashton (2001) compared the Big Five factors and the Big Five sub factors (or facets) on their ability to predict 40 behavioural criteria. These researchers took 141 students, and paired them into same sex pairs. They then administered the Jackson (1984) Personality Research

Form (PRE) 6, the Jackson Personality Inventory (JPI) and the McCrae and Costa NEO PI-R (1992). These were measured against behavioural criteria which included both self rated and peer rated items. A range of areas were covered including ratings of intelligence, popularity, femininity, smoking behaviour and alcohol consumption. The authors then carried out regression analysis on all 5 PRE – JPI factor scores to predict each of the 40 behavioural criteria. Addition of the Big Five data into the regression equation for example, to sex differences, which alone did not account for differences in tobacco consumption (r=00), increased prediction of that criteria by a substantial 21.3% (r=.46). Overall, these high level factor scales accounted for significant amounts of criterion variance in 17 of the 40 scales with a mean increment of 9.7%. When expert judges picked selected PRF-JPI trait scales for the top 5 choices for each criterion, the average amount of criterion variance for the narrow traits that could be accounted for, beyond participant sex as a predictor, was even greater than the amount for the big five factor predictor, being 10.2% over 20 criteria as compared with 9.7 % over 17 criteria for the Big Five factors. These findings are noteworthy given the behaviours to be predicted were much narrower than the factor scales and, as such, necessarily account for much less variation in behaviour overall. The criterion variance accounted for by the personality sub factors (or facets) often included large portions of behaviour not predicted by the main personality factors. This suggested that there may be utility in the sub factors (or facets) for more effective prediction of performance and that these were thus worthy of further investigation.

2.5.5 Sources of Distortion - Faking it, organisational stereotypes and the use of personality inventories for selection

It is recognised that people can fake personality inventories under laboratory conditions (Power and McCrae 1977), however, the extent to which they do attempt to "fake it" under real conditions remains open to question. This is because people providing responses in inventories may either be subject to other assessment processes which confirm their responses, or, have to be motivated to fake, to be able to create a "good" impression. Whilst there may be distortions as a result of faking, it is argued that such distortions are no greater than those found in job applications. From this it is concluded that the selection instruments used would therefore still possess predictive validity (Cunningham, Wong and Barbee 1994). With this in mind, there are implications for this study with regard to the timing of administering the personality inventory and consideration of the "organisational personality stereotype". The ideal would be to administer the test during the selection process, however, practicalities are not always conducive to this course of action. The compromise may have to be made, for example, to administer the inventory at a time when motivation to complete honestly would likely prevail, and the need to fake responses is least. These issues are referred to again in later chapters (see Chapter 4, section 4.2.6 and Chapter 8, section 8.2.4) which examine in detail aspects of context which appertain to this thesis.

However, it is worthy of note how personality stereotypes actually may have influence over responses made by those completing self report inventories, as this is a source of variation in their "true" predictive validity. Bartram (1995), who looked at the use of the Eysenck Personality Inventory and Cattell's 16 Personality Questionnaire to predict flying training outcome suggested that pilots, through self

selection, have a "pilot" personality. Applicants, he argues, tend to self select on the basis of these characteristics, and selection procedures tend to favour those with these characteristics.

2.5.6 Reasons for using the Five Factor Model for this research

Although the FFM is not universally supported, some of the alternative models to the FFM still have much in common with it. Previous investigations using the FFM have shown a degree of success in predicting overall job performance (see section 2.5.1) and the TSDI provides a vehicle through which the question of whether the factors or sub factors are of greater utility for predicting job performance could be further explored. The choice of the FFM for use in this research arose primarily because The Trait Self Description Inventory (TSDI), adopted for research in the Military for personality assessment (see section 2.6 below) has the FFM as its basis, and at the time this work commenced, there was a lot of interest being shown in it. This was because this personality model, based on traits, is appropriate to the personnel selection, training and development systems which currently exist in uniformed organisations (Mileham, 2003; Macfarlane,1998. See also Chapter 3, section 3.3). The next section reviews the TSDI and the research carried out to date in uniformed organisations using this instrument.

2.6 The Trait Self Description Inventory (TSDI)

There is a long history of using questionnaires for rating, and in particular, for selection into uniformed organisations. Indeed "Questionnaire ratings are the most frequently used form of rating, both for theoretical and applied purposes"(Van Der Maesen de Sombreff and Hofstee, 1989, p.356). Often, the purpose of their use has been for broad reduction of the number of candidates to sift out those who might be completely unsuitable (see also Chapter 1, section 1.2). In the First World War, administration of questionnaires was used as a quick and inexpensive device to keep extremely unstable individuals out of military service (Van Der Maesen de Sombreff and Hofstee 1989, p. 365). However, as practices involving personality questionnaires evolved, a range of instruments were developed for use. There are a number of commercially available measures of the Big Five including the Revised NEO Personality Inventory (NEO-PI-R) (Costa & McCrae, 1992) and the Hogan Personality Inventory (Hogan, 1986). However, at much reduced cost, the Air Force Self Description Inventory (AFSDI), developed by Tupes and Christal (1961) is available to military organisations under specific collaborative research agreements and is now known as the Trait Self Description Inventory (TSDI).

The TSDI, the instrument often referred to as the OCEAN (Collis, 1997), comprises 64 trait name items and 99 behavioural statement items. Participants must decide to what extent the trait or behavioural statement is representative of themselves. The McCrae & Johns (1992) labels of Extroversion, Agreeableness, Conscientiousness, Neuroticism and Openness to Experience described in section 2.3, explain the OCEAN/TSDI factors. These are broken down into sub factors or

facets (hereafter referred to as sub factors). The sub factors were derived by Tupes and Christal (1992) from further factor analysis of the groups of items which loaded onto each of the Big Five factors. These were then given descriptors and annotated as shown at table 2.4 below;

Agreeableness	**Conscientiousness**	**Extroversion**	**Openness**	**Neuroticism**
A1. Warm & Sympathetic	C1. Efficient & dependable	E1. Shy & Bashful	O1. Philosophical	N1. Nervous & stressed out
A2. Friendly	C2. Hard working	E2. Talkative	O2. Scientific Interest	N2. Worrying
A3. Considerate	C3. Organised	E3. Socially active	O3. Creative	N3. Irritable
A4. Cold & Insensitive		E4. Assertive	O4. Reflective	N4. Envious & Jealous
A5. Helpful		E5. Unsociable	O5. Cultured	

Table 2.4: Trait Self Description Inventory (TSDI) Factors and Sub-Factors

The instrument and associated documentation is shown at **Appendix A** for reference.

2.6.1 Research and Development of the Trait Self Description Inventory

2.6.1.1 Overview

The TSDI resulted from the collaborative efforts between the UK Defence Research Agency (now QinetiQ), the University of Plymouth and the Armstrong Laboratories of Texas. The TSDI is the paper and pencil version of the Air Force Self Description Inventory (AFSDI) and was tested on military personnel in the US and the UK. It was as a result of its use within the Royal Navy, that it also became known as the OCEAN. In the Armed Forces of the UK, the instrument was used in research into Voluntary Withdrawal From Training (VWFT) (attrition) for both RN officers (Collis, 1995) and Army officers (Elshaw and Abram, 1996 and 1999), and soldiers (Hampson, Vincent and Jacobs,1997). It was also used to link personality with leadership potential and motivation within naval officer selection (Collis,1995). In addition, the Canadian Forces (O'Keefe, 1998 and 1999a) and Australian Defence Forces (Watkins,1998) have used the instrument in research into its possible use as a selection tool. The Technical Cooperation Panel Technical Panel 3 (TTCP TP3) monitors and reviews the development of this instrument on behalf of the cooperating nations (Syed and Klammer, 2002).

2.6.1.2 Assessing the Psychometric Properties of the TSDI

The initial development of the AFSDI undertaken by Christal (1994) came about between 1993 and 1995. Christal was attempting to identify non-cognitive predictors of learning ability and job performance. He examined the potential relationship between personality factors, activity preferences, perceived abilities

and life experiences (Syed and Klammer, 2002). The result was a computer delivered instrument to be used in selection for the United States Air Force. This was duly administered to 3,000 enlisted men on the USAF Basic Military Training course. The items were administered in random order. The questionnaire was made up of 163 items out of the original 205 trait names and 220 behavioural statements, of which 64 were "traits" (adjectives), and 99 were behavioural statements. A sample of 573 officers or officer trainees was then used to verify the factor structure. This proved consistent with the original findings from the enlisted sample. Composite scores for each factor were derived from item loadings of .40 or above on Christal's original enlisted sample weightings. These composites were highly correlated with factor scores from the officer sample. Retests were carried out on 584 enlisted subjects 13 to 25 months after they had previously completed the questionnaire. This gave test - retest reliabilities for factor composite scores between .57 and .73 , and, when outliers were removed, .65 to .79. These results were comparable to other similar instruments such as Myers Briggs Type Indicator (MBTI). Collis (1995a) extended the work of Christal by looking at how these results compared when a similar exercise was undertaken using a sample of British servicemen and servicewomen as participants, but with paper and pencil test papers. Correlations between composites and factor scores of .89 to .97 were achieved suggesting that measurement of the five factors was consistent across delivery modes and UK/US cultures. Predictive validation studies carried out by the United States Air Force (Christal, 1994) reported significant correlations between Agreeableness and performance ratings of Leadership (r= .27), Following Rules & Regulations (r= .26), Integrity (r= .27), Self Development (r= .29), and Interpersonal Proficiency (r= .35). Some significant negative correlations were found between Neuroticism and performance ratings of

Initiative (r= - .24), Following Rules & Regulations (r= - .24), Leadership (r= - .34), Self Development (r= - .33) and Interpersonal Proficiency (r= - .24). Openness was significantly correlated with the following performance ratings: Following Rules & Regulations (r= .26), Integrity (r= .27), Leadership (r= .27), Self Development (r= .29) and Interpersonal Proficiency (r= .35).

In the UK, initial studies were undertaken on behalf of the Admiralty Interview Board (AIB) into Voluntary Withdrawal From Training (VWFT), leadership potential and motivation (Collis and Elshaw 1997). Schmit (1997) examined three motivational and personality measures being trialled for use with RN officer selection which included the TSDI, using 647 candidates as participants at the AIB between1994 and 1996. A further dataset was derived from 310 entrants to the Brittania Royal Naval College, Dartmouth which trains Naval Officer Cadets. According to Schmit's results, all three measures offered promise for predicting VWFT and improving prediction of performance at Brittania Royal Naval College, Dartmouth.

In 1999, Perry (1999) examined the role of intelligence and various personality dimensions (Extraversion, Conscientiousness and Emotional Stability (Neuroticism) in the performance of 647 RN and Royal Marine candidates attending AIB. The interaction of personality and intelligence with leadership ability was also explored. Perry concluded that the main contribution to leadership potential was provided by measures of intelligence and Extraversion. He found intelligence was significantly and positively related to all assessment ratings and the final AIB board result. Extraversion was found to be the only Big Five factor that had any significant major relationship to overall assessment and final AIB

result. However, Conscientiousness was found to be related to service commitment and final AIB marks. Typically, the lower scores on Agreeableness were related to higher ratings for leadership potential, effective intellect and service motivation. Overall, higher levels of Neuroticism negatively impacted on performance, though high levels of Neuroticism seemed to be advantageous to individuals with low levels of Extraversion. Perry concluded that the TSDI had potential and high reliability, even at the AIB, which was also shown to be a highly valid selection tool.

The potential shown by the TSDI for screening candidates, particularly for aspects such as low Agreeableness, may be useful and financially very attractive. Perkins and Corr (2000) examined the additive and interactive effects of personality and cognitive ability on military leadership potential for RN officer selection in 1997 and 1998. Predictor variables used were results from the TSDI and cognitive ability tests. The latter was derived from scores on verbal and non-verbal reasoning tests. Leadership potential data was derived from candidate led and leaderless command tasks. Results showed an interactive effect between cognitive ability and Neuroticism indicating that higher levels of Neuroticism were related to lower levels of leadership potential amongst the least cognitively able officer candidates. However, higher levels of cognitive ability ameliorated the negative effects of neuroticism. For Conscientiousness, high scores on cognitive ability were associated with more power for Conscientiousness in predicting leadership potential. The findings suggested that high cognitive ability only predicts leadership potential for those with a motivation to use their cognitive ability. This also strengthens the case for the use of personality measures in selection, not just as a standalone measure, but in conjunction with cognitive ability tests. Thus

cognitive ability and personality appear to interact, therefore early predictions (Catell,1947 and Maier, 1955) have been shown by these findings to be correct (see also section 2.5.3 above).

For the British Army, Elshaw and Abram (1996 and 1999) investigated the roles of personality and motivation in Voluntary Withdrawal From Training (VWFT) of potential officer candidates. They were interested in why suitable officers leave, how voluntary wastage can be predicted, and how the pattern of withdrawal can be influenced by interventions. It was hoped that investigating the motivation of potential officers would improve the selection and training system. In this study, reasons for officer cadets leaving training were collected from exit reports. In addition, questionnaires were administered to 605 officer cadets. These questionnaires were designed to assess candidates understanding and preparedness for training, their confidence in being able to cope with training, and how they dealt with them. Three personality measures, including the TSDI, Locus of Control and efficacy scales, were administered. Results indicated that personality, as well as realistic knowledge and expectations of training, were important in adapting to military life. A clear relationship was found between expectations of training being met and VWFT. This relationship indicated that those who lacked prior knowledge and experience of the military were more likely to VWFT. Also, cadets who scored low on Extraversion, Conscientiousness and Emotional Stability (High scores on Neuroticism) reported fewer realistic beliefs about training, decreased levels of coping behaviour, poorer social fit with other cadets, poorer understanding of personal performance and lower levels of commitment. Extraversion, Conscientiousness and Neuroticism were therefore found to predict VWFT. Elshaw and Abram concluded that the best predictors of

VWFT were personality measures, along with biodata, and a clear assessment of military compatibility. Elshaw and Abram's results tend to support Schmit's results from the Navy in relation to VWFT and applicability of the TSDI. The findings from Elshaw's study were tentative given the sample size. However, they raised the question of the linkage between RCB and RMAS in terms of what was being measured. These findings raised the issue of whether the dimensions measured at RCB were appropriate as the linkage with those assessed at RMAS appeared to be very weak. Given that selection and training are part of the same continuum, it might be reasonable to anticipate that RCB should assess the skills and competencies required to be successful at RMAS.

Hampson et al (1997) carried out a study into VWFT with 1090 participants in Phase 1 soldier recruit training using the TSDI. Training data was only available for 545 of the total sample. Results showed that there was no identifiable difference between those who withdrew from training and those who remained with regard to the dimensions of Agreeableness, Extraversion, Conscientiousness and Neuroticism. There was a difference on the Openness dimension between these two groups. For the Openness dimension, recruits who VWFT tended to score lower. Hampson found that the TSDI did not identify those who VWFT any better than existing measures, i.e. data from the British Army Recruit Battery (BARB) test of general ability (for details of BARB, see Chapter 3, section 3.2). Hampson's results therefore contrasted with those of Elshaw and Abram and Schmit. This may be an indication of differences between recruits and officers in terms of personality assessment. Hampson's study concluded with a recommendation to undertake further research using a larger sample.

For the Australian Defence Force (ADF), Sutherland and Watkins (1997) administered the NEO Five Factor Inventory, which has the same trait structure as the TSDI, to 183 graduates from technical and non-technical trade training courses at RAAF Base Wagga Wagga. Correlations, corrected for range restriction, with course marks (converted z scores) indicated a number of possible relationships. Conscientiousness (r= .20) correlated more highly with performance scores than scores on technical and mathematical ability, though low correlations were achieved for Neuroticism (r= - .05), Extraversion (r= - .03), Openness (r= .02) and Agreeableness (r= .09).

Subsequently, Watkins (1998) reported on TSDI trials using 478 general entry Royal Australian Navy recruits as participants. Watkins' study found good internal consistency for the TSDI for measuring the Big Five factors, but no significant relationships were found between course outcome (pass or fail) and the Big Five factors. However, significant differences were found for Neuroticism between those discharged (directed to resign) and those who passed or were recoursed (back-termed to repeat training). Conscientiousness positively correlated with overall course performance (r= .20) and was the most important personality variable in predicting overall training performance. Scores on cognitive ability tests were found to best predict course outcome (accounting for 16.2% of variance), but the Big Five factors (together with age) were significant contributors to the prediction of overall course performance, adding incremental validity of 4% after cognitive abilities were factored out. Bhat (1999) extended the Watkins study using the same dataset, by investigating the relationship between TSDI results and training success. Bhat found similarly to Watkins that the TSDI did not

contribute significantly to the prediction of training success over and above the ability measures and age (Bhat 1999 p.59).

The Canadian Forces (CF) have carried out extensive studies using the TSDI, focussing on selection of Military Police, and selection of general recruits to the CF. O'Keefe (1998) carried out two studies investigating the relationship between personality and job and training performance. The first study used the Canadian equivalent of the US Army's ABLE test, the Measure of Personal Attributes (MPA), and the second study, used five different personality measures; the TSDI, MPA, NEO PI, Assessment of Individual Motivation (AIM) and the 16 PF. The scores from the Personnel Evaluation Report (PER) produced on all individuals in the CF annually, were used as the dependent variable in both studies. Results indicated that for officers, performance was significantly correlated with both Dominance and Achievement, with Dominance predicting performance significantly. For Non Commissioned Officers (NCOs), performance was significantly correlated with Achievement, Dominance, Dependability, Adjustment and Internal Control. In summary, Dominance and Achievement accounted for a notable amount of variance in predicting job performance for officers and NCOs. In the second study, the five tests were administered to 1100 personnel including officers and NCOs O'Keefe (1999a) in Basic Officer Training and Basic Recruit Training. Results indicated that for officers, performance was significantly correlated with Neuroticism and Extraversion, and for NCOs, Neuroticism only. The TSDI accounted for the highest proportion of variance in performance in comparison to the other personality tests, and of the five tests, predicted training performance most successfully for both groups.

For the third CF study, 381 Military Police were administered the TSDI, and their PER scores used as the dependent variable. Based on the personality profile of high performers, O'Keefe (1999b) created a description of the optimal TSDI profile for MP applicants. MPs had lower scores than the general CF population on Agreeableness, Extraversion and Openness. Results were consistent with past research carried out in the CF (O'Keefe, 1999a; Noonan, 1999), as performance was significantly correlated with Conscientiousness, Extraversion and Neuroticism factors. Performance was also correlated with the following sub factors: Assertive (N3), Irritable (N1), Nervous and Stressed out (N1), Efficient and Dependable (C1), Hardworking (C2), Unsociable (E5) and Worrying (N2). Following on from these studies, Schwartz (1999) attempted to replicate and validate the TSDI on Basic Recruit Training (BRT) and Basic Officer Training Course (BOTC) results. The sample consisted of 367 participants, including 298 NCOs, and 69 Officer Cadets in training. Course scores for BRT and instructor ratings for BOTC were used as criterion data. Cronbach's Alpha coefficients for reliability were above .90 for all Big Five factors, higher than other populations researched. Sub factor alphas ranged from .75 to .91 except for : Assertive (E4) (.58), Hardworking (C2) (.70) and Cultured (O5) (.65). No significant relationships were found between BRT performance ratings and TSDI scales, but significant correlations were found between sub factor scales Organised (C3), Socially Active (E3). For BOTC ratings, Assertiveness (E4) and Creativity (O3) showed correlations. The values of these correlations were not reported, however.

Schwartz (1999) reported a significant correlation between Neuroticism and Basic Recruit Training (r= - .40), and between Neuroticism and Extraversion and Basic Officer Training (r= - .42, and r= .29; respectively). Regression analyses

suggested that the TSDI accounted 17% of the variance in performance in BRT and 5% of the variance performance in Basic Officer Training, over and above that accounted for by cognitive ability (O'Keefe, 1998). However, subsequent analyses failed to replicate these findings (Schwartz, 1999).

The inconsistencies in findings of the Canadian research prompted further investigation into the TSDI psychometric properties. The TSDI was administered to 1008 randomly selected CF members (Jones, Uggerslev, Paquet, Kline and Sulsky (2000a;2000b) . They also provided self evaluation of course performance and overall work performance data. The first report looked at Big Five TSDI sub factors Jones et al (2000a)(Study 1), and the second (Study 2), Jones et al (2000b) looked at the primary Big Five factors. Study 1 found that the psychometric properties of four of the five Extraversion sub factors, Shy and Bashful (E1), Talkative (E2), Socially Active (E3), and Unsociable (E5) were good, as were all of the Neuroticism sub factors; three of the five Openness sub factors, Philosophical (O1), Scientific Interest (O2) and Creative (O3). It was further recommended that sub factors should be kept separate, rather than being combined into a single factor. The strongest predictors of the criterion measures were Conscientiousness and Extraversion sub factors together, followed by Openness, Neuroticism and Agreeableness sub factors. The Efficient and Dependable (C1) and Hard Working (C2) sub factors (Conscientiousness), the Assertive (E4) (Extraversion) sub factor, the Creative (O3) (Openness) sub factor and the Nervous and Stressed Out (N1) (Neuroticism) sub factor were stronger incremental predictors of performance than any of the other sub factors (including the Agreeableness sub factors). Based on all the findings, removal of two of the Conscientiousness sub factors and revision of the Reflective (O4), Cultured (O5)

and Assertive (E4) sub factors was recommended. For study 2, Jones et al (2000b) found Neuroticism, Conscientiousness, and Openness were the most robust factors in analyses conducted, but results suggested that a single construct was underlying all the items. Though internal consistencies for Extraversion and Agreeableness were favourable, data did not fit the factors well in that there was no indication that clear sub factors comprised these scales, and there were concerns about reverse coding items for these scales. In terms of the ability of the TSDI factors to predict performance, they were found to account for 9.3% of variance in Overall Performance and 15% in Day to Day Performance, based on self report performance. Conscientiousness was found to be a meaningful predictor, Openness was not a useful predictor above and beyond other personality factors. Limited incremental predictive ability was found to be provided by Extraversion, Neuroticism, and Agreeableness. For this study, however, it is difficult to know whether personality assessment was predicting true performance, or just self-evaluation.

2.6.2 Summary - TSDI

The TSDI has been shown to be a good measure of the Big Five personality factors, with broadly sound psychometric properties. The instrument has been shown to predict performance using an array of performance measures in a variety of settings. Research conducted in the Armed Forces of Canada, Australia, the US, and the UK has produced evidence that the TSDI *can* predict performance, (reported as training and work performance, voluntary withdrawal, and leadership potential), though to varying degrees of significance. However, some of these findings could not be replicated (Syed and Klammer, 2002). The variations in

results between the studies cited above, and the varied organisational contexts within which they have been undertaken, may underpin the cause of the poor consistency between the findings. However, the fact that most of the relationships between the Big Five factors and sub factors and the performance criteria were weak (much weaker than those reported by Christal for instance) may explain the inconsistencies. Much of the research detailed in this section has been going on in parallel with the research for this thesis, though it has only recently been reported, yet there still remain some important questions to be answered.

2.7 Summary - Implications for this thesis

Trait theory has been shown to exist as an established cornerstone of psychological theory which, in giving rise to the Five Factor Model, offers a methodological structure for investigation of the expansion and refinement of selection systems in uniformed organisations. Application of the FFM has potential to broaden selection systems from largely ability and attainment based processes, to produce broader, contextually appropriate selection profiles for individuals, despite a degree of scepticism regarding the theoretical robustness of both psycholexical theory and the FFM. Nevertheless, the FFM has given rise to the development of a selection instrument, the TSDI, which has been in existence for only just over a decade, and is still being developed, but which has been shown as possessing broadly sound psychometric properties, though being in the bounds of the military may have constrained its development. Research undertaken since its inception, has shown it may have promise for application in the field of selection. Given also its low cost and military development, it would appear to be a promising instrument both for military selection and assessment.

With regard to this thesis, there are a number of factors arising from the research which need to be examined. Firstly, there may be possible benefits for selection provided for by the Big Five sub factors which need to be investigated. Where sub factors have been investigated to date, there are some findings which show potential utility. Secondly, interactions with ability need to be examined more thoroughly. This is because the research indicates that personality measures used *in conjunction* with ability measures, which are generally well developed in uniformed organizations, *may* improve their utility as predictors within existing systems. Positive findings in this area may ameliorate the problem highlighted by the literature of only moderate predictive validity being shown by personality measures when used independently of other measures. In addition, more specific and dynamic linkage of personality with components of job performance, such as leadership behaviour (see also Chapter 6, section 6.4) needs to be considered. This will facilitate maximising the use of sub factors which may be predictive. This thesis will address the aspect of matching bandwidth of personality measure with criterion measures to develop a taxonomy which will give stronger links between selection and training systems within uniformed organizations.

Chapter 3

Organisational Context

3.1 Introduction

This chapter is intended to help the reader understand the context in which the studies that follow took place. The chapter describes the selection and training of Army recruits, both officers and soldiers, and of recruits to the Metropolitan Police Service. It aims to provide sufficient detail concerning the selection processes, data gathered and training performance measures used by these organisations to enable the reader to understand the studies reported in subsequent chapters.

3.2 Soldier Selection and Training in the British Army

Soldier selection in the Army is a formidable task. Over 150 Career Employment Groups exist, and the number of posts to be filled in 1997 being in the order of 16,000 vacancies, and in 2005, 10,000 vacancies. For every recruit who enters and successfully completes training, about seven potential recruits are rejected for reasons ranging from medical unsuitability to being in possession of extant convictions.

Soldiers are selected through a series of processes from their first enquiry to joining and commencing basic training. A summary flow diagram of the process is shown at **Appendix B.**

Much of the onus is put upon individuals to choose which specialism they wish to go into. Career advice is provided by dedicated recruiting staff. The recruiting staff check each individual applicant's biodata to ensure they meet legal requirements (including checks for outstanding criminal convictions, rehabilitation of offenders act etc), that they meet the minimum Mandatory Academic Qualifications (MAQs) where they exist (i.e. some technical and non-technical trades require some GCSEs at grade C,), and undertake overarching checks on their medical and physical status. A key stage in this process is when the individual sits the British Army Recruit Battery of ability tests (BARB) at the Armed Forces Careers Offices. This provides the individual with a score, the General Trainability Index (GTI), which is cross referenced against each of the 150 or so specialisms. For example, someone who obtains a GTI score of 26 will have a limited number of specialisms into which they might go, such as Infantryman or Pioneer, whereas a score of 78, for example, together with the required MAQs, would allow someone to train as an Avionics Technician. Whilst the right of entry into these specialisms is governed by the vacancies available, higher individual GTI scores provide the individual with a broader choice of options. Applicants are also scored on the Personal Qualities Assessment Profile (PQAP) which, essentially, aims to record their motivation and organisational fit for Army service. This rudimentary instrument is not further referred to in this thesis.

At this stage, the applicant then attends a 24 hour assessment centre at one of the regional Recruit Selection Centres. Here, medical screening is undertaken, physical fitness and function is assessed, a technical selection test is sat by those wishing to enter technical branches of the Army, and the successful individual receives a formal confirmatory interview and job offer. Successful candidates are

then booked onto Phase 1 (Basic) Training Course for recruits. These courses are run at any one of Five Army Training Regiments (ATRs). Here they undergo training in drill, physical fitness, field craft, first aid and a variety of military oriented skills. On completion of this 12 week course, they move to Phase 2 training, where they are trained in their particular specialism. This may take anything between 10 weeks and 2 years, depending on the specialism. Thereafter, the individual joins a unit in the Field Army, receiving additional individual training as necessary (Phase 3 training), and generic training appropriate to their rank and experience. They also undertake collective training involving other units, and pre-deployment operational training appropriate to the theatre and role in which they will be deployed.

3.2.1 Training Performance Measures in Army Training Regiments (ATRs)

Training Objectives, with laid down standards of performance common to all the ATRs who deliver basic training, underpin all the training received by recruits. Whilst formal testing is undertaken using materials designed by each individual ATR, the overarching criterion is for recruits to meet these training standards "to the satisfaction of the Directing Staff". The emphasis is on team success, in order to generate mutual reliance and support. Individual recruits are therefore not ranked in terms of their performance, nor are final grades awarded at the end of basic training.

3.2.2 *Which Criteria can be used as Training Performance Measures ?*

The data that were available for use in this study were provided by rating of recruits. These data were gathered as part of a project to examine the reasons why so many recruits were withdrawing voluntarily from training. Instructors rated each recruit on a 1 to 5 scale for each of the criteria listed below:

a. Acceptability to others in the Squad.

b. Adjustment to Military Life.

c. Common Sense.

d. Motivation.

e. Overall performance.

3.3. Officer Selection and Training in the British Army

Much time and effort is expended by the Army to ensure that officers meet the standards required. A summary flowchart of the process is shown at **Appendix C.**

3.3.1 Officer Selection

Following application to join through the Armed Forces Careers Offices, medical screening is undertaken alongside attendance at a pre-screening assessment centre, Pre-Regular Commissions Board Briefing (Pre-RCB). Those who are successful, pass on to the full three day assessment centre at the Regular

Commissions Board held throughout the year at Westbury, Wiltshire. This generates a considerable volume of data, some of which purports to assess aspects of "personality", though without the aid of any accepted psychometric instruments designed or developed for such a purpose. Indeed, a recommendation arising from a comparison of selection boards (McFarlane, 1998) across the British Armed Forces aimed at making the selection systems more efficient recommended incorporation of a personality test into the selection process, though this has yet to be implemented.

The selection process has continued in much the same general form since it was conceived in the early 1940s. The pre RCB (Regular Commissions Board) Briefing lasts two days. Candidates are assessed on their performance in interviews, intelligence tests, group discussions, lecturettes, group tasks and command tasks. Each candidate is then classified into one of fourteen categories: These are shown at Table 3.1 below:

Pre- RCB Briefing Category	Description
Cat –1	To attend RCB immediately. Either satisfactory potential or candidate nearing 26 yrs (upper age limit for officer selection)
Cat - 2.6	To attend RCB after 6 months
Cat - 2.12	To attend RCB after 12 months
Cat - 2.18	To attend RCB after 18 months
Cat - 2.24	To attend RCB after 24 months
	(The above 4 categories relate to candidate's maturity assessment)
Cat 3	Not Recommended
Cat 4	Highly unlikely to be successful
Mc4	Failed not militarily compatible
Pi4	Failed, personality flaws
PiMc4	Failed not militarily compatible and personality flaws
PODC	Advised to attend Potential Officer Development Course
Ip4	Failed, lack of intellectual potential
IpMc4	Failed lack of intellectual potential not militarily compatible
IpPi4	Failed lack of intellectual potential and personality flaws

Table 3.1 Pre RCB Grading categories.

Candidates who perform adequately at the Pre-RCB Briefing then subsequently progress to the RCB. This process lasts 3 days. Candidates are assessed by 4

assessors on a number of different tasks, having been first assigned to a syndicate of about 8 members. These tasks are shown at Table 3.2 below:

Task	Description
Written tests	General assessment on science, general knowledge, mathematics, general intelligence, planning ability, dictation, essay writing.
Group discussions	45 minute debates on general topics.
Analysis and planning	Timed analysis of a problem, planned group solution and questions answered on solution.
Lecturettes	5 minute lectures on a topic of their choice are given by candidates
Leaderless group tasks.(Others Command Tasks)	Candidates are asked to solve complex group tasks containing physical and mental challenges under severe time constraints without appointed leaders. (This is to observe which candidates assume role of leader naturally)
Command Tasks	As above with appointed leaders. Assessors observe how candidates cope with pressure of leadership.
Individual Obstacle course	10 minutes are given to successfully negotiate as many obstacles as possible, in any order. Requires clear thinking under pressure to maximise scores.
Interviews	Covering educational attainment, achievements and motivational aspects and general topics.
Closing Race	Inter-syndicate competition over an obstacle course carrying burden (e.g. log). This is to let assessors finalise their views on candidates leadership potential, and provide a means by which borderline candidates may confirm their prowess.

Table 3.2 Assessment elements used at the Army's Regular Commissions Board (RCB)

Individuals are assessed on a scale of 0-9 (0 = very bad to 9 = very good) on 11 *Performance Dimensions* (See Table 3.3 below).These tasks give rise to scores which are then recorded on a database. Scores are then combined using formulae to give 4 *Final Dimensions*, each being scored 0-9.

Performance Dimension	Final Dimension
ES = Educational Standard CW = Communications Written CO = Communications Oral AP = Analysis and Planning CS = Communication Skills PS = Problem Solving PH = Physical PI = Personality Interaction IM = Impact DD = Drive and Determination RS = Reaction to Stress MC = Military Compatibility	IP = Intellectual Potential PPS = Potential for Problem Solving PP = Physical Potential PC = Personality and Character Potential

Table 3.3 RCB Performance and Final Dimensions

At the end of the process, during the final assessment meeting, an overall grade is then awarded based on these combined scores. Every detail known about a candidate is considered before a panel decision is made to award a pass or fail. Pass categories are subdivided to highlight particular strengths (e.g. merit pass M) or weaknesses (e.g. Risk Pass (R)) for future note by RMAS. Those who are regarded as borderline passes, but who might benefit positively from a course in personal development to bring them up to the start standard for the Commissioning Course, are recommended to attend a course run at RMAS called Rowallan Company (see also Chapter 5). Whilst candidates who have been allocated to Rowallan Company have effectively been accepted into the Army for training, they are in reality "on probation" as Cadets at RMAS. Here, their suitability as officers will be constantly under review until such time as they successfully complete the course. RMAS is designed to identify and deselect any remaining unsuitable candidates. In practice, many of these unsuitable candidates self-select out at early stages of this training. The majority of those who leave (Elshaw and Abram,1996) do so in the first 6 weeks of the course, with relatively few leaving during the remainder of the course. The studies undertaken using RMAS training performance data therefore did not include those early leavers for whom no training performance data remained in existence.

Cognitive Tests: At RCB, tests included those comprising the ARCOM, a paper and pencil and more complex derivative of the British Army Recruit Battery (BARB) (Irvine, Dann, & Anderson, 1990), and the RCB test battery. ARCOM comprises three tests taken from BARB, Alphabet Lag (AL), Number Distance (ND), Letter Checking (LC), and an additional Reasoning (RES) test. All were derived against item-generative principles (as described by Irvine et al., 1990) and

use elementary cognitive tasks (ECTs) to measure constructs including perceptual speed, working memory, and speed of information processing. Test-retest reliabilities of the tests are reported as satisfactory by Tapsfield (1993). T-scores for each of the tests, and a combined equally weighted composite, are used as predictors.

The RCB battery included a multiple-choice numerical reasoning test and a verbal reasoning test. The numerical reasoning test consists of interpreting data from tables and graphs and answering questions related to the data. The verbal test is a critical reasoning test that involves the subject reading a written passage and then answering a series of questions.

3.3.2 Training Performance Measures for Officer Training

There is a degree of obscurity surrounding training performance measures in officer training, and the definition and use of training performance measures at RMAS remains controversial. Whilst the management of training is increasingly becoming more rigorous at RMAS, consistent and internally standardised training performance measurement remains vulnerable to inconsistencies. These inconsistencies arise from turnover of instructors and the influence of subjective factors arising from the experiences of those individuals appointed (MacFarlane, 1998). Mileham (2003 p.18) suggests that this is compounded by an inconsistency of both defining what constitutes the personal profile and competences of instructors, and the numerous terms used to analyse and describe the individual in training and his or her actions. In the case of the organisational context of this research, in the Army, the term "character" is seldom

differentiated from "personality", (see Chapter 1, section 1.2). The hierarchy of terms in use are sometimes singular, or representative of generic groups of terms which are not cross checked with academic research or dictionary definitions. Examples of terms in use in the Army currently reported by Mileham (2003) are described below:

Character – the essential inner person or *anima* linked to philosophy of existence, identity and beliefs. At RMAS, this term implies "moral agency", the anticipation of discovering within self belief, honour, inner strength and resilience against external detrimental pressures. The externally observed "character of an officer" is the *persona,* there being an anticipated link to "integrity". Montmarquet stated that moral character – meaning roughly some disposition to take and act on appropriate moral judgements: is based on the idea that some have this disposition to a greater extent than others (Montmarquet, 2003, p.24). What is important is that a person can only infer the character of another person by observed behaviour. Whilst this may lead to reasonably accurate judgement, it may also lead to degrees of distorted perception by one person of another's character.

Personality – this tends to refer to the *persona*, the social behavioural interaction with others.

Qualities – usually a graded order of desirable traits or attributes.

Behaviour – patterns of actions.

Performance, Proficiency. Expertise and Skills – these cover abilities ranging from intellectual activities to physical dexterity.

Potential – describes developable qualities and skills.

Knowledge – learning from education and training enriched by experience.

Competence – refers to a framework or area of skills, knowledge, attitudes or attributes.

Disposition or pre disposition - expectation of a person to act in certain ways, and a term which often links many of the above working definitions.

In addition to the above, many others are used such as *dimension* and *tendency* in isolation and, often, haphazardly. Pertinent to this study, the Army, even now, has still been unable to provide greater consistency and coherence between the criteria for selection at RCB, performance at RMAS, Officers' Joint Appraisal Report (measuring on the job performance and potential for promotion) and Job Specifications (Mileham, 2003). As a result, any training performance measures used are likely to suffer from weaker relationships with other measures for this reason alone. Nevertheless, the issue may be primarily about terminology rather than variations in the understanding of the concepts involved. Legislation on commissioning, dating from 1960, implies that a commissioned officer is expected to fulfil a range of criteria covering dedication to a military career, competence of command, and adherence to the execution of laid down procedures and processes. What is of particular interest to this thesis is that Mileham (2003) cites

specifically within in his paper that a commissioned officer ..*was expected to be* "…. *Of confident character, and extrovert personality….*" (Mileham, 2003, p.11, para 30). However, measures of personality are not currently undertaken at any stage of either selection, training, on the job appraisal or generally at any subsequent internal selection for particular employment[1].

3.3.3 *Which criteria can be used for Training Performance Measures* ?

The Queen's Medal is awarded to the best performing cadet in training from each RMAS course. Data from assessments of 'Military' and 'Academic' training performance are used to assist adjudicators in the award of the Queen's Medal. The Military criterion includes course t-scores for Military Knowledge (MK), Signals (SIGS), Military Technical (MTECH) and Range Management Qualification (RMQ) components. The 'Academic' component covers Written Skills (WS), Defence International Affairs (DIA), and Communication Skills (CS). Individual component scores are used, and composite scores are also derived through equally weighting the individual components.

The Queen's Medal data was deemed useful in providing a range of training performance measures and has been used for other research purposes (Elshaw et al 1997; McFarlane 1999), however, it cannot be assumed to be a direct substitute or entirely representative of formal course outcomes. No other formally recorded outcome data was available for this study. Where the latter does exist, it is closely guarded by RMAS Staff. This is to ensure that graduate Cadet's later Army service

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[1] Some personality assessment is undertaken for certain internal selection for some highly specialised employments, though this is very restricted in its application.

is not influenced by any traceable shortcomings which might have been exposed during basic training at RMAS, thus ensuring that Officers commence their regimental service with a 'clean sheet'.

3.4. Selection and Training of Metropolitan Police Service Recruits

In order to assess the generalisability of the findings from the Army sample, a sample from the Metropolitan Police Service was also studied. A summary flowchart of the selection process for Metropolitan Police recruits is shown at **Appendix D.**

3.4.1 Police Recruit Selection

Recruits to the Metropolitan Police Service undergo a comparatively simple selection process. Firstly, candidates produce competency based responses on an application form which is followed up by a competency based interview. The competences for this process are as follows:

Resilience

Effective Communication

Community and Customer Focus

Respect for Diversity

Teamworking

Personal responsibility

Problem Solving

In addition, a cognitive ability test (the Police Initial Recruitment Test (PIRT)) is administered following the competency based interview. This is a paper and pencil test consisting of a short (12 minute) numerical reasoning test, followed by a longer (25 minute) Verbal and Logical reasoning test. Total scores only from this test were available for analysis. Only pass or fail data were available for the competency based assessment. The interview and the PIRT are administered on the first assessment centre day. This is followed by a Police National Computer check to identify any previous convictions and confirm nationality. A second assessment centre day for medical and physical screening is undertaken. If the candidate is successful, then this gives rise to an unconfirmed job offer. The final job offer comes when a place in training is allocated at the Metropolitan Police Training School, Peel Centre, Hendon. On entry to this course, the recruit is attested as a police officer, and undergoes a 26 week training course. This comprises scenario based training which covers all aspects of police duties, including application of the Law, procedures for arrest, and physical training. There is no selection based on leadership criteria. Those who are promoted (some 30 to 35% of Police Constables are promoted to Sergeant and above during their careers) undertake promotional examinations and internal assessment centres to compete for vacancies at higher rank.

3.4.2 Training Performance Measures for Metropolitan Police Recruits

A series of modular tests are administered throughout the course to allow directing staff and cadets to monitor their progress. These are based around skills, academic content of courses, and competencies required of police officers. Those who are unable to meet the competency requirements receive additional training

to bring them up to standard. If they consistently fail to meet the requirements, then they are back termed to repeat training (re-coursed) and start the training again, less the induction phase. These performance measures taken during training unfortunately do not generate useable individual performance data, they are pass/fail with only a tiny proportion of individuals failing any one test.

3.5 Summary

There exist varying levels of sophistication within the selection and training systems from which the research cohorts were drawn. The selection of Army officers and soldiers appears sophisticated, though training performance measurement may be less than efficient. Selection of Metropolitan Police recruits is more rudimentary, and training performance measures tend to be very task oriented and not very effective in discriminating performance levels. It was in this context that the utility of the Trait Self Description Inventory would be examined with a view to judging whether personality assessment might usefully contribute to the selection processes already in existence. In addition, the thesis will go on to evaluate the validity of the training performance measures in place and the extent to which personality assessment might enhance the existing selection and training systems.

Chapter 4

Initial Investigations into Personality Assessment and Predicting Training Performance

4.1 Introduction

In the review of the literature (see Chapter 2), the potential for using narrower bandwidth measures of personality, which make up the Big Five factors, for prediction purposes was cited. This was to facilitate more specific and dynamic linkage of personality with components of job performance to improve predictive validity of the TSDI. The studies reported in this chapter therefore aim firstly to examine the extent to which the Big Five factors themselves relate to performance task measures, and secondly to investigate the possible utility of the sub factors or facets in predicting the same. The two initial studies undertaken to explore the relationship between training performance measures and the results from the TSDI are described in this chapter. Study 1 involved 500 Phase 1 Recruits from the Army Training Regiments (ATRs), and Study 2, 180 Cadets from the Royal Military Academy Sandhurst (RMAS) as participants.

4.2 Study 1 - Analysis Of Data from 500 Phase 1 Army Training Regiment Recruits – *Does the Trait Self Description Inventory predict training performance* ?

4.2.1 Introduction

The initial administration of the Trait Self Description Inventory (TSDI) in the Army was made to 1007 recruits on entry to the Army Training Regiments (ATRs) during the pre-Common Military Syllabus (Recruits) (CMS (R)) Phase known as the Army Foundation Scheme. This study was undertaken as part of a larger research initiative aimed at improving the level of retention during basic training. This data gathering, undertaken by the Defence Evaluation and Research Agency Centre for Human Sciences (DERA CHS, now QinetiQ) was made available to this research project. The aim of the data collection was to identify personality traits which might underpin early withdrawal from training. It was envisaged that this information might contribute to more efficient assimilation of young recruits into the Army. A flexible period of training, usually from between two and six weeks or more, had been introduced to facilitate smoother passage of recruits into the organisation. This was known as The Army Foundation Scheme. During this period, recruits were prepared for the rigours of undertaking Basic Training. The scheme was predicated on the assumption that better preparing recruits would reduce voluntary withdrawal from training (VWFT) by taking into account the experience and physical fitness of those being recruited.

4.2.2 Sample

Recruits in the first week of training at four of the ATRs were asked to complete the TSDI. Sessions were supervised by Defence Evaluation and Research Agency Centre for Human Sciences (DERA CHS) psychologists who visited each ATR during the first week of recruit training. The majority of the participants were from one Army Training Regiment, Pirbright, with a small number from the three others. Towards the end of training, an assessment of performance was made. The details of the collection of these data are shown below. In addition, selection data, in the form of a measure of recruits' performance on the British Army Recruit Battery (BARB) which produces a General Trainability Index (GTI) score, was also collated. Background details of the GTI are shown in Chapter 3, section 3.2. No indication on gender was provided within the data. The sample produced 467 usable data sets, 533 cases were omitted due to the following reasons:

1) *Voluntary or enforced withdrawal from training.* Many recruits would have left training, either voluntarily or as a result of being held back to repeat training, or discharged as a result of being found to be unsuitable for a variety of reasons of which medical/physical conditions are a major cause.
2) *Poor Data Management in the Recruitment System.* The Army at that time had a separate, paper administered recruitment organisation which was vulnerable to poor data management.
3) *Lost forms and incomplete training data records.* This arose in ATRs.

4) *Army Foundation Scheme withdrawals.* Many of the missing data had arisen due to individuals exiting from the Army Foundation Scheme either prior to commencement of basic training or being retained in the Army Foundation Scheme for a period beyond that normally anticipated. This group would not therefore have been awarded ratings in training performance.

Although there were a number of missing data, the sample would seem adequate for a study of this nature, although this figure is clearly considerably less than the starting sample. Nevertheless, the sample size remained viable. Whilst this represented an element of sample attrition, it should also be noted that in addition, an element of range restriction was introduced into the data. This was brought about by the fact that those who had been rejected during the selection process were not sampled, those who were entering training as officers were not covered by the sample, and the remainder were as a result of the reasons cited above. The group whose data were unavailable as a result of those reasons (1) to 4) cited above with the exception of those who were selected for officer training, included an excess of unsuitable recruits.

4.2.3 Training Performance Measures

Before 1996, training performance was neither recorded quantitatively or on a standardised form. As a result, DERA CHS assisted in the introduction of a standardised form to be used across the ATRs to record individual training performance, together with the provision of training for those who carried out the assessment. This scheme was introduced in June 1996. Following a drive to

address wastage (attrition) in training which began in July 1997, amongst a range of initiatives, an induction training course was developed aimed at providing standardised training for all ATR platoon staff. The Objectives for this course included familiarisation for assessment of training performance. The data for Study 1 was collected between July 1997, and October 1998.

At the end of basic training courses, Instructors in Army Training Regiments (ATRs) rated recruits by using ratings between 1 and 4, on the following five criteria:

Acceptability to others in the squad.

Adjustment to military life.

Common Sense.

Motivation.

Overall Performance.

The descriptors for each rating score were defined as:

4 = Good

3 = Satisfactory

2 = Adequate

1 = Poor

These ratings were designed and introduced to inform the Army recruiting organisation that people were being recruited who were compatible with military life and capable of completing basic training. They were therefore not necessarily

representative measures of training performance on all the aspects of training covered on the courses. The rating was intended to be completed by a training officer although in practice, the recruits tended to be assessed by platoon instructors. These instructors comprised Senior and Junior Non Commissioned Officers (Sergeants and Corporals), with ratings quality controlled by platoon commanders, usually Commissioned Officers at the rank of Lieutenant or Captain, and occasionally Warrant Officers. Overall Quality Control of this process rested within Individual Training Group (ITG), part of the Army Training and Recruiting Agency (ATRA), the organisation responsible for recruiting and training recruits entering the Army.

4.2.4 Treatment of Data

All analyses were performed using SPSS for Windows Version 9 to 12. Bivariate and multivariate data screening were performed in accordance with Tabachnick and Fidell (1996). Outliers were removed if they constituted data entry errors; otherwise they were considered representative of the population. Descriptive statistics and Pearson correlations between variables were first computed. T-scores for the tests and training criterion were used whilst raw scores (Collis, 1997) for the TSDI factors and sub factors were used.

4.2.5 Standardisation Of Assessment Of Recruits At ATRs

Are there variations in the data relating to the different ATRs ?

Before undertaking the main analysis, it was necessary to see if there were any differences in the standards applied at different ATRs as this could weaken correlations with personality. To assess any possible variations arising between the ATRs, descriptive statistics for the data from each of the ATRs sampled were compiled. These are summarised below in Table 4.1:

ATR	Acceptance to others in the Squad	Adjustment to Military Life	Common Sense	Motivation	Overall Performance
1 Pirbright	N= 331 Mean = 2.69 SD = .850	n= 331 Mean = 2.63 SD = .900	n= 331 Mean = 2.51 SD = .916	n= 330 Mean = 2.74 SD = .889	n= 328 Mean = 2.6 SD = .847
2 Bassing bourne	N= 73 Mean = 2.89 SD = .781	n= 73 Mean = 2.73 SD =.902	n= 73 Mean = 2.63 SD =.936	n= 72 Mean = 2.86 SD = .909	n= 72 Mean = 2.79 SD = .846
3 Glen corse	N= 37 Mean = 3.14 SD = .673	n= 37 Mean = 2.84 SD = .764	n= 72 Mean = 2.94 SD = .687	n= 37 Mean = 2.92 SD =.640	n= 37 Mean = 2.92 SD = .640
4 Lichfield	N= 19 Mean = 2.37 SD = .761	n= 19 Mean = 2.63 SD = .582	n= 19 Mean = 2.68 SD = .582	n= 19 Mean =2.79 SD =.631	n= 19 Mean = 2.84 SD = .688
Whole Sample	N= 467 Mean = 2.74 SD =.835	n= 467 Mean = 2.66 SD = .878	n= 467 Mean = 2.58 SD = .899	n= 465 Mean = 2.73 SD = .866	n= 463 Mean = 2.66 SD =.834

(Note: No data available from Winchester and Ballymena ATRs)

Table 4.1 Descriptive Statistics of Training Performance Measures from ATRs

In order to compare ATRs statistically, one factor between participant ANOVAs were carried out on each measure. The results of these are shown in Table 4.2 below:

Trg Performance Rating Criteria	*F Ratio*	Df	sig	Eta^2
Overall Performance	2.48	Between Gps 3 Within Gps 452 Total 455	.061	0.02
Acceptability to others in the squad	5.17	Between Gps 3 Within Gps 456 Total 459	.002	0.03
Adjustment to military life	0.81	Between Gps 3 Within Gps 456 Total 459	0.49	0.01
Common sense	3.22	Between Gps 3 Within Gps 456 Total 459	0.02	0.02
Motivation	0.80	Between Gps 3 Within Gps 456 Total 459	0.5	0.01

Table 4.2 Training Performance Ratings recorded at ATR - Anova

It can be seen in Table 4.2 that even when the differences between ATRs reach statistical significance, the ATR accounts for only a minor component of the variance with Eta^2 never exceeding 0.03. Also, the vast majority of the sample data has arisen from ATR Pirbright (331 out of n=467) with other ATRs making a fairly minor contribution to the data. It is therefore unlikely that the personality effects are weakened by differences between the ATRs.

4.2.6 Results

4.2.6.1 Training Performance Ratings - Intercorrelations

There were high intercorrelations between the 5 training performance ratings :

	Acceptability to others in the Squad	Adjustment to Military Life	Common Sense	Motivation	Overall Performance
Acceptability to others in the Squad		0.720**	0.618**	0.709**	0.753**
Adjustment to Military Life			0.732**	0.760**	0.818**
Common Sense				0.697**	0.786**
Motivation					0.825**
Overall Performance					

*Note ** p<0.01*

Table 4.3 Intercorrelations Between Training Performance Ratings at ATRs

Given that the input of relatively "inexpert" assessors, and that assessment instructions may be prone to a degree of subjectivity (Cooper 1981), the findings might suggest that a less than rigorous discrimination between the factors being assessed prevailed. The discrimination reliability and validity of the individual training performance ratings may therefore be open to question. However, the Overall Performance Rating might not necessarily be affected by this, given that Instructors tend to judge performance on subjective assessment which may not fit precisely the criteria descriptions. This is thus a likely source of halo effect.

The literature distinguishes between *true halo* and *illusory halo*. True halo refers to the fact that part of the correlation between dimensions is real and reflects the fact that recruits who are performing well on one dimension, are also performing well on others. Illusory halo on the other hand, refers to the fact that correlations are inflated by lack of discrimination between dimensions or general impressions are

contaminating all dimensions. Indeed the original usage depicted the halo effect as a general impression that seeps into ratings (Cooper 1981). These factors are likely to be present, though not quantifiable. However, a meta-analysis of research in this area revealed that training of raters significantly reduced rater bias (Hoyt and Kerns,1999) and therefore as a result of the training the instructors receive, depending on the quality of the training (see 4.2.3 above), the effect on the data should thus be reduced as a result. (Halo effects are further discussed in Chapter 8, section 8.2.4 with respect to rating of measures for leadership performance).

4.2.6.2 Big Five Factors

Intercorrelations exist between the Big Five factors:

	A	C	E	N	O
Agreeableness (A)		.499** (.53)	.545** (.51)	-.243** (-.41)	.312** (.09)
Conscientiousness (C)			.399** (.29)	-.286** (-.38)	.532** (.12)
Extraversion (E)				-.477** (-.48)	.190** (-.03)
Neuroticism (N)					-.028 (-.13)
Openness (O)					

(Note: Administrators Guide and Test Manual intercorrelations (1997) for RN personnel (n=508) shown in brackets)

Table 4.4 Intercorrelations between the Big Five Factors

These results accord broadly with the literature relating to the TSDI (Collis 1997) (see also Chapter 2, section 2.6). However, most striking is the apparent independence of *Neuroticism* relative to the other factors; and the relationship of *Agreeableness* with *Extroversion* (.545**) and *Conscientiousness* with *Openness* (.532**). The high negative correlation of *Neuroticism* with *Extraversion* however, is in contrast to Eysenck (see Chapter 2, section 2.2) who cited the independence of these two factors. (Note, for subsequent studies, intercorrelations between the Big Five factors are shown at **Appendix E**).

4.2.6.3 Training Performance Ratings (ATR) and Pass/Failed/Recoursed (PFR)

There are two outcome measures which might potentially be predicted by personality, training instructor ratings of performance and designation of recruits as passed the course, failed the course or recoursed (PFR) (those who do not pass the course first time may be either failed and discharged from the Army, or, if they do not meet the training competence requirements at the first opportunity, or are injured in training, they are then put back on to later courses to re-visit the training with another platoon, and are designated "recoursed"). Before looking at the relationship of each outcome measure to personality we will first consider how closely these two indicators of training outcome are related.

An analysis of the descriptive statistics for pass/failed and recoursed (see Table 4.5 overleaf) indicated that there was some variation between each of the training performance rating scores awarded, with those who passed scoring higher on the ratings than those who were recoursed, and those who were recoursed scoring higher than those who failed. Analysis of variance shown in Table 4.6 overleaf, confirmed that these differences were statistically significant for all four rating dimensions. However, the values of Eta^2 , which ranged from 0.03 to 0.09, indicated a large amount of rating variance which is not related to PFR. This tells us that P/F/R and training performance ratings are not particularly closely related, and hence the ability of the TSDI to predict these two outcomes needs to be considered separately.

	Acceptability to others in the Squad	Adjustment to Military Life	Common Sense	Motivation	Overall Performance
Passed n(listwise) = 247	Mean = 2.79 SD = .783	Mean = 2.75 SD = .857	Mean = 2.55 SD = .908	Mean = 2.84 SD = .829	Mean = 2.69 SD = .778
Recoursed n(listwise) = 24	Mean = 2.25 SD = .897	Mean = 2.29 SD = .999	Mean = 2.25 SD = .989	Mean = 2.33 SD = 1.007	Mean = 2.13 SD = .900
Failed n(listwise) = 36	Mean = 2.08 SD = 1.010	Mean = 1.92 SD = .983	Mean = 2.05 SD = .911	Mean = 2.06 SD = 1.013	Mean = 1.95 SD = .998
Overall n(listwise) = 307	Mean = 2.74 SD = .835	Mean = 2.66 SD = .878	Mean = 2.58 SD = .898	Mean = 2.77 SD = .866	Mean = 2.66 SD = .834

Table 4.5 Means and SDs for ATR ratings shown for Passed/ Failed /Recoursed Recruit Numbers

Trg Perf Rating Criteria	*F Ratio*	Df	Sig	Eta^2
Overall Performance	16.90	Between Gps 2 Within Gps 305 Total 307	<0.001	0.10
Acceptability to others in the squad	15.45	Between Gps 2 Within Gps 309 Total 311	<0.001	0.09
Adjustment to military life	15.80	Between Gps 2 Within Gps 309 Total 311	<0.001	0.09
Common sense	5.47	Between Gps 2 Within Gps 309 Total 311	0.005	0.03
Motivation	15.42	Between Gps 2 Within Gps 308 Total 310	<0.001	0.09

Table 4.6 Results for PFR and ATR Ratings – Anova

Table 4.6 shows that at the p=0.05 level there are significant differences between ATRs in ratings on Acceptance and Common Sense but not in other dimensions or overall performance.

4.2.6.4 Big Five Factors and Passed/Failed/Recoursed

Descriptive statistics for each of the TSDI factors broken down according to training outcome are shown in Table 4.7 overleaf:

	Agreeableness	Conscientiousness	Extroversion	Neuroticism	Openness
Passed n (listwise) = 204	Mean = 89.80 SD = 16.20	Mean = 151.1 SD = 18.80	Mean = 46.25 SD = 17.96	Mean = 125.28 SD = 25.57	Mean = 121.66 SD = 21.04
Recoursed n (listwise) = 40	Mean = 94.73 SD = 18.11	Mean = 155.97 SD = 18.11	Mean = 50.02 SD = 19.36	Mean = 126.67 SD = 29.50	Mean = 122.48 SD = 20.78
Failed n (listwise) = 38	Mean = 93.11 SD = 19.77	Mean = 146.00 SD = 19.45	Mean = 44.25 SD = 19.97	Mean = 130.95 SD = 29.07	Mean = 116.35 SD = 20.37
Overall n (listwise) = 282	Mean = 90.91 SD = 17.04	Mean = 151.2 SD = 18.93	Mean = 46.54 SD = 18.45	Mean = 126.24 SD = 26.62	Mean = 121.03 SD = 20.93

Table 4.7 Means and SDs for Big Five Factors and Passed/ Failed /Recoursed Numbers

Big Five Factors	F Ratio	Df	Sig	Eta2
Agreeableness	1.87	Between Gps 2 Within Gps 301 Total 303	0.16	0.01
Conscientiousness	2.88	Between Gps 2 Within Gps 304 Total 306	0.06	0.09
Extroversion	1.14	Between Gps 2 Within Gps 302 Total 304	0.32	0.01
Neuroticism	0.79	Between Gps 2 Within Gps 301 Total 303	0.46	0.01
Openness	1.25	Between Gps 2 Within Gps 293 Total 295	0.29	0.01

Table 4.8 Results for PFR and Big Five Factors - Anova

PFR was not significantly related to any of the five personality dimensions at the 0.05 significance level, although Conscientiousness comes close ($p = 0.06$). This may be due to the fact that there are many reasons for discharge, few of which relate to training performance. Most reasons for leaving relate more to unsatisfactory "organisational fit", resulting often in the recruit choosing to leave. A second common source of back terming (being recoursed) is physical injury. The relatively weak relationships between PFR and performance ratings (see Table 4.5 above) are consonant with this. With regard to those recoursed, it may well be that the factors which tend to govern recoursing are usually related to injuries sustained, although poor performance in training or poor fit into their training sub unit also results in recruits being held back. It appears that the ratings for performance in training do not reflect these decisions.

Table 4.9 shows there are generally low correlations between the Big Five personality factors and the training performance scores. Significant correlations only are reported below:

	Acceptability to others in the Squad	Adjustment to Military Life	Common Sense	Motivation	Overall Performance
Conscientiousness		0.107*	0.119*	0.133**	0.128**
Neuroticism	-.101*	-0.108*	-0.111*	-0.121*	-0.131**
Openness				0.116*	

*Note: * p <0.05, **p <0.01. Correlations which are not significant at p = 0.05 are omitted*

Table 4.9 Significant Correlations of the Big Five Factors and Training Performance Ratings

There appear to be some tentative relationships between these sets of variables; Neuroticism correlates negatively except with Common Sense (it may be that those who are more emotionally unstable, i.e. more neurotic, are more cautious about their behaviour) and Conscientiousness correlates particularly with Motivation and Overall Performance. Openness correlates weakly with Motivation. These low correlations suggest that the personality factors are not predicting performance as measured by these ratings to any great extent. However, Driskell et al (1994) in their study of military personnel suggest that personality assessment predicts attitudinal and motivational factors that affect training success, and this is reflected in the correlations, albeit in a limited way. Sutherland and Watkins (1997) in their study into technical and non technical training performance (see also Chapter 2, section 2.6) using scores on tests as criterion measures found that the relationship of Conscientiousness to training performance was weak compared with other predictors, of which cognitive ability was the most significant and thus could be too weak to be important in selection. The Neuroticism factor in their study also had a "small, but noteworthy correlation with

overall training performance " (Sutherland and Watkins 1997 page 12.). Similarly, these authors found that Openness did not appear to be related to training performance, though these findings are both contrary to previously reported findings (Barrick and Mount 1991;Hough et al 1990; and Salgado 1997). However, Sutherland and Watkins found that Agreeableness added a small amount of variance to other criteria.

Correlations of the Big Five factors with training performance ratings thus appear to be too weak to be useful in selection. However, the relationships could be weakened as a result of poor criterion reliability and validity. If the criterion reliability and validity were sound, then reasonably strong correlations with GTI could be expected.

4.2.6.5 GTI Scores

GTI and Overall Performance correlate at 0.19** (see Table 4.10 below), which is lower than the 0.25** Holroyd (1995) observed in previously researched validation studies of Phase 1 training. This indicates that the cognitive factor remains a significant element in the selection process.

	Acceptability to others in the Squad	Adjustment to Military Life	Common Sense	Motivation	Overall Performance
GTI	0.115*	0.153**	0.160**	0.148**	0.190**

** p<0.05, **p <0.01.*

Table 4.10 Correlations between GTI Scores and Training Performance Ratings

However, the correlations in table 4.10 are weaker than those often seen with cognitive measures (see Chapter 2, section 2.5.3). This could suggest that

criterion measures are not that good or that cognitive ability is not relevant to these criteria.

4.2.6.6 *Do Big Five personality factors add to the predictive ability of GTI scores?*

Personality correlations were found to be not hugely less than those with GTIs. A regression analysis was carried out using Overall Performance as the constant to see how much variance is added to by the Big Five (OCEAN) factors. The findings are shown in Table 4.11 below:

Army	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1(GTI)	.037	.035	.037	14.372	1,370	>.001
Model 2 (Model 1 +OCEAN)	.057	.042	.020	1.519	5,365	.183
Model 3 (Model 2 + GTI by OCEAN interactions)	.090	.062	.033	2.604	5,360	.025

(Note: for models other than the Model 1 the reported F ratios test whether there is a significant gain in variance accounted for in comparison to the preceding model).

Table 4.11. Results from hierarchical regression with Overall Performance as the Dependent Variable and GTI scores, scores on the Big Five, and interactions between scores on the Big Five and GTI scores as predictors.

This indicates that personality is adding significantly to GTI prediction, but only by a small amount (from 3.6% to 4.2%). Where this is coming from is shown at Table 4.12:

Model 2	Beta (Standardised Coefficient)	t	Significance
Constant		4.082	>.001
GTI	.172	3.288	.001
Agreeableness	-.032	-.496	.621
Conscientiousness	.071	1.019	.309
Extraversion	-.075	-1.151	.250
Neuroticism	-.131	**-2.237**	.026
Openness	.018	.282	.778

n = 371

Table 4.12 Source of added variance over GTI by Big Five Factors

Table 4.12 shows that what little incremental value is added, is arising from the *Neuroticism* factor (shown in bold).

Table 4.13 shows correlations with GTI scores:

	Agreeableness	Conscientiousness	Extroversion	Neuroticism	Openness
GTI	0.138**	0.206**	0.130**	-0.161*	0.155**

** p<0.05, **p<0.01.*

Table 4.13 Correlations between GTI scores and Big Five Factors

The correlation of GTI with *Conscientiousness* (see Chapter 2.6) fits with the literature as reported previously.

4.2.6.7 Big Five Sub Factors

The Big Five factors are sometimes regarded as too broadly based to have utility in predicting performance in training (see Chapter 2, section 2.3.2). More utility may be provided by considering the sub factors which make up the Big Five factors. In this analysis, there are 21 sub factors and 4 performance dimensions, giving a possible 84 correlations. It would be expected that there would be 0.05 x 84 = 4.2 significant correlations. There are 11 significant correlations, thus there is some predictive power being shown here. However, there is not much evidence of value in the predictive abilities of the sub factors shown in this analysis, though poor criteria may make it difficult to judge. If we now look at the sub factors, correlations with training performance measures are shown at table 4.14 overleaf:

	Acceptability to others in the Squad	Adjustment to Military Life	Common Sense	Motivation	Overall Performance
C1, Efficient and Dependable	.095*	.09*	.097*	.113*	.121*
C2, Hard Working			.109*	.125*	.108*
N1, Nervous and Stressed Out	-.125*	-.137**	-.133**	-.166**	-.174**
O1, Philosophical				.102*	
O5, Cultured			.110*	.105*	

*p =<0.05, **p = <0.01.

(Note: only significant correlations shown)

Table 4.14 Correlations between Big Five Sub Factors and Training Performance Measures

All Correlations for Study 1 Big Five factors and sub factors with Training Performance Measure Overall Performance are shown at **Appendix F.**

4.2.6.8 *Do the Big Five sub factors predict differentially ?*

It appears some sub-factors are more predictive of performance than the Big Five factors (See Chapter 2, sections 2.5.4 and 2.6). In particular, N1, Nervous and Stressed Out, gives correlations against all of the ratings which are better than those from those of the Big Five Neuroticism factor. This reflects the evidence cited in the literature that the sub-factors may have more utility in the selection context than the Big Five factors themselves (see Chapter 2, sections 2.3.2 and 2.5). However, the apparent differences between correlations deriving from different sub factors may be no more than chance variation and should, therefore, be treated with some degree of caution. In order to further explore this, tests of pattern hypotheses in correlation matrices were used. More specifically, for each of the Big Five factors a null hypothesis was tested that specified that all of the sub factors correlated equally with the criterion variable of overall performance. The null hypothesis made no stipulations about the inter-correlations between the different sub factors. Hence rejection of the null hypothesis implies that some sub factors have stronger correlations with the criterion variable than others.

The general method used for testing these null hypotheses is that illustrated by Steiger (1999). This approach was implemented in EQS 6.1 using the options for the correct analysis of correlation matrices. Maximum Likelihood estimation was used with the Satorra-Bentler correction to reduce the impact of departures from normality. The adjusted chi square from these analyses provided the required test of the pattern hypothesis, with a significant chi square suggesting that the sub factors do not have equal correlations with performance. However Steiger has argued this test may be sensitive to relatively minor departures from the pattern hypothesis and recommends consideration of the Root Mean Square Error of Approximation (RMSEA) and its confidence interval. The RMSEA is a goodness of fit measure, such that smaller values of the RMSEA indicate that the data conform well to the hypothesised pattern whilst larger values indicate a departure from the predicted pattern. An RMSEA value of 0.06, deriving from the work of Hu and Bentler (1999), is widely used as a threshold of acceptable fit. On this basis, RMSEA values above 0.06 should lead to the conclusion that the different sub factors of a factor are differentially predictive. RMSEA obviously shows sampling variation and thus might occasionally exceed 0.06 as a product of this. The 90% confidence interval for RMSEA helps in considering this possibility. If the 90% confidence interval does not include 0.06, then the apparent misfit is not likely to be due to sampling variation.

Results for this analysis are shown overleaf at Table 4.15:

Soldiers vs Overall Grade (Cohort 1)	Satorra-Bentler type Chi Sq	Df	Probability	RMSEA	90% Confidence Interval of RMSEA	
A	1.173 *	4	.45353	.000	.000	.032
C	1.204	2	.54800	.000	.000	.076
E	1.3824	4	.84724	.000	.000	.037
N	19.54	3	.00021	**.104**	.063	.151
O	0.9780	4	.91312	.000	.000	.025

Table 4.15 Big Five Sub Factors showing differential prediction

** Satorra-Bentler adjusted statistics not available. For this factor the standard Maximum Likelihood statistics are given.*

There is some evidence from table 4.15 that accords with the findings shown at table 4.12, that *Neuroticism sub factors predict differentially* (shown in bold). There is no evidence of differential prediction from sub factors of any of the other Big Five factors. The results for Neuroticism raise the question of whether any of the scales of the TSDI measuring sub-factors of Neuroticism could have greater predictive value than the factor as a whole. This was assessed through a series of hierarchical regressions in which Neuroticism was entered first and then the sub-factors of Neuroticism were added. The results are shown in Table 4.16 a-e overleaf:

ATR Recruits – *Openness* Factor	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1(Openness)	.003	.000	.003	1.029	1,397	.311
Model 2 (Model 1, (Openness) + O1, Philosophical)	.003	.002	.000	.160	1,396	.690
Model 3 (Model 1, (Openness) + O2, Scientific Interest)	.003	.002	.000	.036	1,396	.850
Model 4 (Model 1, (Openness) + O3, Creative)	.003	.002	.000	.001	1,396	.980
Model 5 (Model 1, (Openness) + O4, Reflective)	.003	.002	.000	.011	1,396	.915
Model 6 (Model 1, (Openness) + O5, Cultured)	.005	.000	.002	.911	1,396	.340

(Note: Other than for Model 1 the reported F ratios test whether there is a significant gain in variance accounted for in comparison to Model 1).

Table 4.16a. Results from hierarchical regression using Overall Performance as the Dependent Variable and scores on the Big Five Openness Factor and on the Openness sub factors as predictors.

ATR Recruits - *Conscientiousness* Factor	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1(Conscientiousness)	.016	.014	.016	6.837	1,411	.009
Model 2 (Model 1, (Conscientiousness) + C1, Efficient and dependable)	.020	.015	.003	1.347	1,410	.246
Model 3 (Model 1, (Conscientiousness) + C2, Hard working)	.017	.012	.000	.182	1,410	.670
Model 4 (Model 1, (Conscientiousness) + C3, Organised)	.023	.018	.007	2.873	1,410	.091

(Note: Other than for Model 1 the reported F ratios test whether there is a significant gain in variance accounted for in comparison to Model 1).

Table 4.16b. Results from hierarchical regression using Overall Performance as the Dependent Variable scores on the Big Five Conscientiousness Factor and on the Conscientiousness sub factors as predictors.

ATR Recruits - *Extraversion* Factor	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1(Extraversion)	.000	.002	.000	.127	1,403	.722
Model 2 (Model 1, (Extraversion) + E1, Shy and Bashful)	.000	.005	.000	.016	1,402	.899
Model 3 (Model 1, (Extraversion) + E2, Talkative)	.003	.002	.002	.970	1,402	.325
Model 4 (Model 1, (Extraversion) + E3, Socially active)	.000	.005	.000	.008	1,402	.930
Model 5 (Model 1, (Extraversion) + E4, Assertive)	.001	.004	.000	.085	1,402	.770
Model 6 (Model 1, (Extraversion) + E5, Unsociable)	.001	.004	.000	.144	1,402	.704

(Note: Other than for Model 1 the reported F ratios test whether there is a significant gain in variance accounted for in comparison to Model 1).

Table 4.16c. Results from hierarchical regression using Overall Performance as the Dependent Variable and scores on the Big Five Extraversion Factor and on the Extraversion sub factors as predictors.

ATR Recruits – *Agreeableness* Factor	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1(Agreeableness)	.000	.002	.000	.013	1,406	.911
Model 2 (Model 1, (Agreeableness) + A1, Warm and Sympathetic)	.001	.004	.001	.237	1,405	.627
Model 3 (Model 1, (Agreeableness) + A2, Friendly)	.001	.004	.001	.271	1,405	.603
Model 4 (Model 1, (Agreeableness) + A3, Considerate)	.000	.005	.000	.108	1,405	.742
Model 5 (Model 1, (Agreeableness) + A4, Cold and Insensitive)	.000	.005	.000	.154	1,405	.695
Model 6 (Model 1, (Agreeableness) + A5, Helpful)	.000	.005	.000	.071	1,405	.789

(Note: Other than for Model 1 the reported F ratios test whether there is a significant gain in variance accounted for in comparison to Model 1).

Table 4.16d. Results from hierarchical regression using Overall Performance as the Dependent Variable scores on the Big Five Agreeableness Factor and on the Agreeableness sub factors as predictors.

ATR Recruits – *Neuroticism* Factor	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1(Neuroticism)	.017	.015	.017	7.057	1,405	.008
Model 2 (Model 1, (Neuroticism) + N1, Nervous and Stressed out)	.032	.027	.015	6.192	1,404	.013
Model 3 (Model 1, (Neuroticism) + N2, Worrying)	.020	.015	.003	1.253	1,404	.264
Model 4 (Model 1, (Neuroticism) + N3, Irritable)	.017	.012	.000	.009	1,404	.923
Model 5 (Model 1, (Neuroticism) + N4, Envious and Jealous)	.029	.025	.012	5.100	1,404	.024

(Note: Other than for Model 1 the reported F ratios test whether there is a significant gain in variance accounted for in comparison to Model 1).

Table 4.16e. Results from hierarchical regression using Overall Performance as the Dependent Variable and scores on the Big Five Neuroticism Factor and on the Neuroticism sub factors as predictors.

It is apparent from Table 4.16, that scores on N1, Nervous and Stressed Out, add to the predictive ability of scores on the Neuroticism (N) factor overall. As N1 scores are included in the N factor scores and there are fewer items measuring N1 than N, this is a stringent test of the potential predictive value of the construct measured by N1.

4.2.7 Discussion

From this initial analysis, it can be concluded that there appears to be *some* relationship between the personality factors being assessed and quantified by the TSDI, and the training performance measures used to assess the level of training achieved. However, these relationships appear to be tenuous in this sample of recruits. The only clearly defined relationships appear to be with Conscientiousness (0.128**) which is positive, and a negative correlation is shown with Neuroticism (-0.131**). There are indications that Nervous and stressed out (N1) may be more predictive than other sub factors of Neuroticism. This might be explained by considering three elements which might account for the weakness of the observed correlations;

1) Situational Specificity. Different settings call for different personalities. Previous studies have indicated (Schmidt, Hunter, Pearlman and Shane 1979) that general cognitive ability is an important factor in Job Performance, regardless of job or setting, but situational variables must account for much of the remaining conduct. Indeed Holroyd (1995) and Jacob (1997) suggested a similar thesis in their validation studies into the Army selection system, specifically in the performance of BARB within the selection of Army recruits. Bern and Funder (1978) provided a method to construct a template of organisational personality which the personalities of applicants have to fit. Such a template does not formally exist amongst Army personnel, but there are organisational drivers which result in an informal template, which, if individuals are to progress in the organisation, they have to comply with. This cultural adaptation Sternberg (1985) refers

to in his triarchic theory of human intelligence. He states that successful adaptation to the culture of the organisation is regarded as an important aspect of intelligent behaviour. Given the emphasis on the use of cognitive ability as a selection criteria, and the use of academic performance as a training performance measure, it is a reasonable assumption that in uniformed organisations, people tend to display intelligent behaviour, given the emphasis on assessment of cognitive ability in their selection processes. It thus follows that soldiers would seek to adopt the mantle of the informal personality template that the Army extol. The question then arises, *are the personality factors assessed by the TSDI relevant to the personality template?* If they *are* relevant, then the validity of the TSDI to predict outcomes in training is weak, if they are *less* relevant, then the instrument, and what it purports to measure, has little utility and it would be expected to produce low correlations with training performance measures.

2) *Criterion Validity and Reliability*. Training performance ratings may be suffering from "noise" or they are simply not appropriate, and thus neither valid nor reliable as everything correlates weakly with them. This is supported by the fact that GTI shows only weak correlations. However, Schmidt and Hunter et al (1985) showed evidence that ability tests *are* valid predictors of job performance for most, if not all jobs and for most applicants, and therefore these findings are at variance with the literature. From this it might be implied that whilst cognitive ability tests may be the best predictors of job performance, they are unlikely to be the *only* predictors, even though other predictors may be weak. If the application of this in the context of selection is considered, even weaker predictors must

nevertheless be exploited to increase the efficiency of the selection and training systems to ultimately reduce unnecessary wastage of recruits. Elshaw and Abram (1996), following their study into cadet expectations at RMAS (see Chapter 2, section 2.6) suggested that personality assessment *may* predict attitudinal and motivational factors that are important to job and training success. These factors are equally valid in the context of selection for soldiers. The strongest overall relationship is displayed between Conscientiousness and the training performance measures (with the exception of Acceptability to others in the Squad) which reflects this hypothesis, albeit tenuously. In a similar way, Neuroticism might be a factor, as those who are stressed out or nervous or who "take it in their stride" are also likely to be easily identified. This might suggest that the only discernible relationship between the Big Five factors and the training performance measures centre on Conscientiousness and Neuroticism. These two factors point to the contextual elements which in a military situation, where people are completely immersed in a culture during training, must inevitably influence rater perceptions and attitudes. So whilst the criteria may be reliable, they may not encompass those things predicted by the TSDI. It is on these latter dimensions where "fit" between occupation or organisation and particular personality traits, may show a significant relationship with aspects of job performance.

3) Are the Big Five factors as measures too broadly based? It is also possible that the Big Five factors are too broad for applicability in the context of selection for the military training environment. An alternative to using the Big Five factors was examined here to see if there were any

relationships with the Big Five sub factors. For this sample, i.e. recruits in training, there appears to be no additional value to exploit in a military selection context given the few weak relationships with sub factors (a moderate correlation with Nervous and Stressed Out (N1), and a weak correlation with Efficient and Dependable (C1)).

The findings of this study highlighted the following:

General ability tests are valid predictors in accordance with previous research but weaker than is typical. This would serve to reinforce the use of cognitive testing in selection processes when compared with personality tests. As predicted, only weak correlations of personality assessment with training performance measures were obtained, in accordance with the literature (see Chapter 2).

Contextual or situational specificity may have a much greater influence on relationships between personality assessment results and the measures used as predictors. The extent to which personality factors, as measured by the TSDI, are a variable related to performance of recruits in training remains questionable, given the nature of the activities undertaken.

The reliability and validity of the criteria used may be suspect. There are various aspects to this; the criteria may not be valid and reliable, as they may not be appropriate measures of performance for those phenomena that the TSDI may predict. Also, the way the criteria are applied may result in a degree of noise affecting the data which has significant impact on the

correlations. This may be as a result of the fact that the rating is done by only recently trained raters, which must impact on standardisation and reliability to some extent. The criteria themselves also appear to be centred more around attitudes or appropriate behaviours. Therefore, they may not provide comprehensive coverage of performance per se, but a *perception of performance* which may reflect the impact of the halo effect.

The question of the Big Five factors being too broad in their applicability, given the above contextual variables, remains to be answered. The fact that there is some suggestion of variation between the predictive ability of the sub factors, suggests that greater utility may be available for selection purposes from the sub factors.

The findings from Study 1 suggested that future research must address the possibility that personality assessment may only have utility if it is undertaken in an appropriate context and it is specifically linked to appropriate criteria for measurement of performance. Identifying an appropriate context for personality assessment was relatively simple. The area where personality has always been regarded as a key element in the Army, indeed in many uniformed organisations, is in the area of leadership, and, more specifically, officer selection and training. Study 2, thus examined the relationship between personality assessment and training performance, with the participation of Officer Cadets from the Royal Military Academy Sandhurst (RMAS).

4.3 Study 2 - Analysis Of 180 RMAS Cadets Data – *Does personality assessment using the TSDI predict training performance in a more appropriate context ?*

4.3.1 Introduction

The main focus of leadership training in the Army, the Royal Military Academy Sandhurst (RMAS) was accessed to see to what extent personality assessment might add to the existing selection system in predicting training performance. On initial investigation, (see Chapter 3, section 3.3) it was found that the criterion-referenced training performance measures at RMAS were seen as rather less relevant in assessing competence as "officers" or "leaders" than one might expect. Permission was gained to gather data from one Cadet Commissioning Course, and access was granted to a set of training performance measures to assist in identifying those Cadets who might be in the running for excellence awards. Findings from this study were also reported in a paper shown at **Appendix G.**

4.3.2 Sample

This study was originally planned with a sample of 400 cadets, but due to a final hour rearrangement of the training programme, this was reduced to 280, and finally 220, of which 178 of those were actually administered the TSDI. Of the 220, 25 were excluded due to sickness and injury, and 17 were also excluded as they were overseas students, for whom no selection and training data existed. The question of the viability of a sample of just 178 participants immediately became an issue as to whether or not this could be regarded as representative, and whether this sample size might give rise to sampling error. However, the 178

came from three different cadet training companies, the remaining companies being extended on an exercise deployment. It was therefore decided that, whilst it would have been desirable to have a larger sample, it was considered that the sample was representative of the group being studied. There was also some concern that selection data derived from the Regular Commissions Board (RCB) also presented a degree of range restriction, given that the sample studied excluded those who were not selected to go on to officer training. However, Queens Medal data (see also Chapter 3, section 3.3) was available for all 178 who completed the TSDI.

In December 1998, this group of Officer Cadet participants from RMAS were thus invited to complete the TSDI in a group setting and in their own time, shortly before the end of their course. The Cadets were noticeably relaxed, as a result of having almost successfully completed their rigorous one year course. Access to RMAS Cadets and the associated data is not easy to obtain, nevertheless, the TSDI data was subsequently matched to the two sets of other data.

4.3.3 Training Performance Measures

The absence of pre-existing leadership-specific training performance measures at RMAS gave some cause for comment in the study undertaken by Elshaw and Abram (1997) (see Chapter 2, section 2.6.1). Satisfactory performance in basic military skills does not necessarily mean success on the commissioning course at RMAS, nevertheless, this was where the effort to measure performance in training was directed. Success, as measured and recorded on the Queens Medal database, appeared to be invariably related to these basic military skills. These

measures cover a range of Military skills; e.g. Signals, Range Management, Military Knowledge; Academic skills, such as Defence and International Affairs, Military Technical Knowledge; and contextual elements such as Communications Skills, both Oral and Written. The measures were derived from training content of the Common Commissioning Courses where Cadets were graded, marked or otherwise assessed, during their training. This data appeared to be predominantly measuring military competencies, academic attainment and communications skills.

Despite their centrality to the training objectives at RMAS, measures of other individual qualities, talents or broad order leadership capabilities did not appear in the Queens Medal data. These aspects, though undefined, allude to "character" and "leadership skills". Both of these aspects, whilst being made up of variously articulated "personal qualities", were not assessed or recorded in any objective or quantitatively defined manner. Nevertheless, it was possible that any assessment of personality derived from a self reporting inventory might relate to some extent with these "character" and "Leadership skills" criteria. In the absence of "character" and "leadership skills" assessment per se, the relationship between the existing training performance measures, i.e. the Queens Medal data and results from personality assessment, in the form of results from the administration of the TSDI to the group of Officer cadet participants at RMAS, was examined.

The reason why assessments of cadets personality/ character and leadership skills were not available for scrutiny arose from a policy which required that individual performance at RMAS was closely guarded (see Chapter 3). This was based on the premise that later Army service should not be influenced by any traceable shortcomings which might have been exposed during cadets' basic

training. This was designed to ensure that all cadets who graduated from RMAS should begin their Army career with a "clean sheet". Whilst the morals and ethics of this stance are commendable and well-intentioned; they have their origins in the past when there might have been good reason for this course to be adopted; such a posture may shroud deficiencies in accountability, fairness and objectivity in assessment of individual cadets' performance during RMAS training. This highlights the fact that the reliability and validity of RMAS assessments had not been scrutinised by internal audit systems. However, recent changes in practice might give rise to significant improvements in this area, for example, the implementation of open reporting and the designation of Commandant RMAS as the proponent for leadership throughout the Army. Both these changes will require greater accountability for performance in delivery of training at RMAS. However, the products of these changes have yet to be evaluated. This situation arose partly due to the difficulty in separating the "training" function of RMAS and its "extended assessment centre" function. Whilst there are issues regarding the validity of the measures used, which are discussed later, the database of training performance (see Chapter 3, section 3.3.3) on each individual was used to assist (but only assist) adjudicators in the award of the Queens Medal. This award is given to the best cadet of the intake, but there are a number of other influences independent of the training performance measures cited, which also contributes to the decision over who is nominated for the award. Nevertheless, the data is very useful in providing a range of training performance measures and has been used recently for other research purposes (Elshaw et al 1996; Elshaw and Abram, 1997; and others).

4.3.4 Results

Data was examined by looking initially at the significant correlations between Big Five personality factors and Training Performance Measures; RCB Selection Data and Training Performance Measures; and finally Big Five personality factors and RCB Selection Data.

4.3.4.1 Intercorrelations between Big Five factors

Intercorrelations between Big Five factors for this sample are shown at **Appendix E.** Of the 10 intercorrelations, 6 are broadly similar to those derived from the administration to RN personnel, however, some of the variations mirror the larger soldier sample (see Study 1 above).

4.3.4.2 Relationships between Personality Factors and Training Performance Measures

In this investigation, the TSDI sub factors and Big Five factors and sub factors were matched against the data from the Queens Medal database from RMAS (see Chapter 3, section 3.3.3). The factor and overall criterion correlations are presented at Table 4.17 overleaf. Only significant correlations are shown (All correlations for Study 2 Big Five factors and sub factors with Training Performance Measure Overall Military/ Academic Total are shown at **Appendix F**):

	MK	Signals	RMQ	Tech-nical	Total Score Mil/Trg	WS	DIA	CS	Overall Acad	Overall Mil Trg/ Acad
A1	.224**	.244**	.298**					.262**	.171*	.268**
A4			-.199*							
C1		.160*						.155*		.169*
C3	.153*			-.151*				.161*		
C	**.198****				**.157***			**.150***		**.160***
E2									.157*	
E5		-.216**						-.151*		-.161*
E		**.179***						**.148***		**.169***
N1	-.159**	-.252**		-.208*			-.163*	-.234**	-.206**	-.241**
N		**-.191***						**-.166***		**-.167***
O1				.186*		.228**	.224**		.262**	
O3								.157*		
O						**.182***	**.164***		**.194****	

***p <0.01;*p<0.05 n=178*

Table 4.17 Significant Correlations between the Big Five Personality Factors and Sub Factors and Training Performance Measures at RMAS

Explanatory Note

Key
Shaded rows indicate Big Five factors.
MK = Military Knowledge. Factual recall of information to be committed to memory for operations.
Signals = Operation of radio equipment and voice procedure.
Range Management Qualification (RMQ) = Formal instruction in running a practical range period under realistic conditions for small arms only and tested by practical assessment.
Technical = Formal instruction in Military technology theory and applications assessed by factual recall.
Total Score Military Training = A summed score for all assessments of Military training.
WS = War Studies = Military history assessed by essay and presentation.
DIA = Defence and International Affairs = essay assessed formal lectures on current defence issues.
Communications Skills (CS) = media ops (practical dealings with media) giving presentations, interview techniques, service writing.
Overall Academic Scores= summed scores for WS, DIA and CS.
Overall Mil Trg/Academic = summed scores for all assessments covering military and academic training and studies.

Agreeableness (A)	***Conscientiousness (C)***	***Extroversion (E)***	***Neuroticism (N)***	***Openness (O)***
A1. Warm & Sympathetic	*C1. Efficient & dependable*	*E1. Shy & Bashful*	*N1. Nervous & stressed out*	*O1. Philosophical*
A2. Friendly	*C2. Hard working*	*E2. Talkative*	*N2. Worrying*	*O2. Scientific Interest*
A3. Considerate	*C3. Organised*	*E3. Socially active*	*N3. Irritable*	*O3. Creative*
A4. Cold & Insensitive		*E4. Assertive*	*N4. Envious & Jealous*	*O4. Reflective*
A5. Helpful		*E5. Unsociable*		*O5. Cultured*

Trait Self Description Inventory (TSDI) Factors and Sub-Factors for Reference to Table 4.17

From the above 270 correlations, it would be expected that 2.7 could be spurious at the 0.01 level out of the 16 recorded. Similarly, it would be expected that 13.5 out of the 24 recorded at the 0.05 level are spurious. From this it can be concluded that whilst some of the 40 significant correlations recorded may be spurious, the majority are unlikely to have arisen through chance. However, the correlations are still quite weak.

Nevertheless, the sub factor, Efficient and Dependable (C1), shows higher value correlations and therefore predicts overall more highly than the Conscientiousness factor; Nervous and Stressed Out (N1) predicts overall more highly than the Neuroticism factor: Philosophical (O1), and Creative (O3), predicts overall more highly than Openness (to Change) factor ; and Warm and Sympathetic (O1), predicts overall more highly than Agreeableness factor. This provides further evidence that the sub factors may have greater utility in predicting outcomes. It may be interesting to note that C1, N1 and O1 also showed a similar relationship with the respective Big Five Factors in Study 1 (See this chapter, section 4.2).

These results indicate that there are a greater number of relationships between the Big Five sub factors and training performance measures, than between the Big Five factors and the training performance measures, even though the relationships are weak. This raises the possibility that the sub factors may be of greater utility than the Big Five factors as predictors of performance, though some of the differences in correlation values may be due to chance. It should be considered, however, that the greater number of possible correlations provided for by the sub factors, of which there are 22 compared to 5 Big Five factors, would be expected as this provides more scope for some sub factor correlations to be inflated by chance.

Extracting the top level representative components for analysis, table 4.18 below presents correlations between the Big Five (OCEAN) factors and Military, Academic, and Overall Military/Academic criteria for Officer Training Performance. All correlations are shown:

	Military	Academic	Military/Academic
Openness	.052	.194**	.146
Conscientiousness	.157*	.114	.160*
Extroversion	.179*	.130	.175*
Agreeableness	-.106	.011	-.068
Neuroticism	-.152*	-.133	-.157*

n=178 * p<0.05, **p<0.01

Table 4.18: Correlations Between Big Five (OCEAN) Factors & Military, Academic and Military/Academic Performance Measures at RMAS

Four of the five factors, *Openness, Conscientiousness, Extroversion* and *Neuroticism* correlate significantly with one of the two or the combined training performance criteria, or show small effects. In each case the significant correlation is for either military or academic criteria, rather than for both.

4.3.4.3 *Do the Big Five Sub factors predict differentially ?*

The test of the null hypothesis, that different sub factors of the same Big Five factor were equally predictive, was carried out in relation to the Total Score arising from the Military and Academic scores combined. The process is described at Chapter 4, section 4.2.6.8. For each sub factor, an overall military/academic total score was used. Results from this analysis are shown at Table 4.19 below:

RMAS Queens Medal Dbase data vs Academic/Military total scores	Satorra-Bentler type Chi Sq	Df	Probability	RMSEA	90% Confidence Interval of RMSEA	
A	40.3541	4	.000	.227	.166	.292
C	24.5641	2	.000	.252	.169	.345
E	47.1824	4	.000	.247	.186	.312
N	44.5657	3	.000	.280	.210	.354
O	16.444	4	.002	.133	.070	.202

Table 4.19. Big Five sub factors showing differential prediction

The above table indicates that within each of the Big Five factors, sub factors are differentially predicting total performance. This conclusion is predicated on the

presence for each factor of a significant chi squared value and a value for the RMSEA >0.06. *This provides reassurance that the differences between sub factors discussed above are meaningful and raises the possibility that sub factors may have more potential in selection than Big five factors overall.*

To evaluate whether the sub factor scales on the TSDI have greater potential than the factor to which they relate in predicting the Academic and Military total a series of hierarchical regressions were conducted in which the factor score was entered as the first predictor and then the various sub factors were added. The results of these are shown in Tables 4.20a to 4.20e:

RMAS Cadets – *Openness* Factor	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1(Openness)	.006	.001	.006	1.089	1,176	.298
Model 2 (Model 1, (Openness) + O1, Philosophical)	.031	.020	.025	4.431	1,175	.037
Model 3 (Model 1, (Openness) + O2, Scientific Interest)	.015	.003	.008	1.503	1,175	.222
Model 4 (Model 1, (Openness) + O3, Creative)	.012	.000	.006	.998	1,175	.319
Model 5 (Model 1, (Openness) + O4, Reflective)	.010	-.001	.004	.764	1,175	.383
Model 6 (Model 1, (Openness) + O5, Cultured)	.024	.013	.018	3.277	1,175	.072

(Note: Other than for Model 1 the reported F ratios test whether there is a significant gain in variance accounted for in comparison to Model 1).

Table 4.20a. Results from hierarchical regression using Academic and Military Total Score as the Dependent Variable and scores on the Big Five Openness Factor and on the Openness sub factors as predictors.

RMAS Cadets – *Conscientiousness* Factor	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1(Conscientiousness)	.029	.023	.029	5.199	1,176	.024
Model 2 (Model 1, (Conscientiousness) + C1, Efficient and dependable)	.036	.025	.007	1.244	1,175	.266
Model 3 (Model 1, (Conscientiousness) + C2, Hard working)	.029	.018	.000	.004	1,175	.948
Model 4 (Model 1, (Conscientiousness) + C3, Organised)	.036	.025	.007	1.339	1,175	.249

(Note: Other than for Model 1 the reported F ratios test whether there is a significant gain in variance accounted for in comparison to Model 1).

Table 4.20b. Results from hierarchical regression using Academic and Military Total Score as the Dependent Variable scores on the Big Five Conscientiousness Factor and on the Conscientiousness sub factors as predictors.

RMAS Cadets – *Extraversion* Factor	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1(Extraversion)	.029	.023	.029	5.164	1,176	.024
Model 2 (Model 1, (Extraversion) + E1, Shy and Bashful)	.041	-.030	.012	2.278	1,175	.133
Model 3 (Model 1, (Extraversion) + E2, Talkative)	.031	.020	.002	.383	1,175	.537
Model 4 (Model 1, (Extraversion) + E3, Socially active)	.066	.049	.032	5.886	1,175	.016
Model 5 (Model 1, (Extraversion) + E4, Assertive)	.029	.017	.000	.006	1,175	.937
Model 6 (Model 1, (Extraversion) + E5, Unsociable)	.029	.017	.000	.006	1,175	.937

(Note: Other than for Model 1 the reported F ratios test whether there is a significant gain in variance accounted for in comparison to Model 1).

Table 4.20c. Results from hierarchical regression using Academic and Military Total Score as the Dependent Variable and scores on the Big Five Extraversion Factor and on the Extraversion sub factors as predictors.

RMAS Cadets – *Agreeableness* Factor	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1(Agreeableness)	.002	-.003	.002	.391	1,176	.532
Model 2 (Model 1, (Agreeableness) + A1, Warm and Sympathetic)	.072	.062	.070	13.241	1,175	.000
Model 3 (Model 1, (Agreeableness) + A2, Friendly)	.041	.003	.012	2.117	1,175	.147
Model 4 (Model 1, (Agreeableness) + A3, Considerate)	.009	-.002	.007	1.279	1,175	.260
Model 5 (Model 1, (Agreeableness) + A4, Cold and Insensitive)	.013	.002	.011	1.888	1,175	.171
Model 6 (Model 1, (Agreeableness) + A5, Helpful)	.013	.002	.011	1.888	1,175	.171

(Note: Other than for Model 1 the reported F ratios test whether there is a significant gain in variance accounted for in comparison to Model 1).

Table 4.20d. Results from hierarchical regression using Academic and Military Total Score as the Dependent Variable scores on the Big Five Agreeableness Factor and on the Agreeableness sub factors as predictors.

RMAS Cadets – *Neuroticism* Factor	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1(Neuroticism)	.028	.023	.028	5.076	1,176	.025
Model 2 (Model 1, (Neuroticism) + N1, Nervous and Stressed out)	.076	.065	.048	9.024	1,175	.003
Model 3 (Model 1, (Neuroticism) + N2, Worrying)	.046	.035	.018	3.353	1,175	.069
Model 4 (Model 1, (Neuroticism) + N3, Irritable)	.042	.031	.014	2.584	1,175	.110
Model 5 (Model 1, (Neuroticism) + N4, Envious and Jealous)	.032	.021	.004	.690	1,175	.407

(Note: Other than for Model 1 the reported F ratios test whether there is a significant gain in variance accounted for in comparison to Model 1).

Table 4.20e. Results from hierarchical regression using Academic and Military Total Score as the Dependent Variable and scores on the Big Five Neuroticism Factor and on the Neuroticism sub factors as predictors.

It is apparent from Tables 4.20a – 4.20e that for all Factors except Conscientiousness the best predicting sub factor adds significant incremental validity to the Factor as a whole. As noted previously, from a perspective which views sub factors as distinct constructs and factors as amalgams of correlated constructs, these hierarchical regressions provide a stringent test of the value of sub factors since (i) the sub-factors are measured by fewer items than the factors and are therefore measured less reliably and (ii) the scores on the factors are based in part on the most predictive sub factor.

4.3.5 Summary Findings, Big Five Personality Factors and Training Performance Measures

The data shows that for each Big Five factor, one or two of the sub factors correlated significantly with the various training criteria. It also shows that, apart from the *Neuroticism* factor, the sub factors correlate with different training components (i.e., Military or Academic). Broadly, where the sub factors correlate significantly with training components, they are at a higher level than the

correlations of the Big Five factors. Apart from *Extroversion*, the sub factors also correlated more highly, but weakly. The results can be summarised as follows:

Conscientiousness: sub factors unexpectedly did not relate to all training criteria. *Efficient & Dependable (C1)* correlated overall with the military criterion, and correlated significantly with military knowledge. *Organised (C3)* was shown to be related to written and communication skills.

Neuroticism: only the *Nervous & Stressed Out (N1)* sub factor correlated with training outcomes, and this was the case for nearly all components.

Openness: *Philosophical (O1)* correlated with all academic criteria and with the Technical component of the military criteria. *Creative (O1)* correlated with Communication Skills and *Reflective (O4)* with Defence International Affairs.

Extraversion: *Talkative (E2)* correlated with the academic criteria, whilst the *Unsociable (E5)* sub factor correlated with the military criteria. *Unsociable (E5)* was also significantly negatively correlated with Signals and Communication Skills.

Agreeableness: *Warm & Sympathetic (A1)* was correlated with both academic and military criteria and with most course components. Also, the *Warm and Sympathetic* (*A1)* and *Cold and Insensitive (A4)* sub factors were the only ones of all OCEAN sub factors to correlate with RMQ.

4.3.6 The Relationship between RCB Selection Data and Training Performance Measures

Turning now to an examination of the relationship between the existing selection data from RCB and the Training Performance Measures. There are a number of correlations found amongst the individual selection tests and formulated RCB dimensions, and the individual training performance measures (see also Chapter 3). RCB predictors which show significant correlations with the Military, Academic and Military/Academic composites from the Queens Medal data are shown at table 4.21 below:

	Military	Academic	Military/Academic
ARCOM Tests			
RES	.263*		.256*
Total	.195*	.178*	.212*
OFFICER Tests			
Numerical		.185*	
Verbal		.227*	.230*
Total		.257**	.241**
ALL Tests	.211*	.268**	.275**
Intellectual Rating	.186*	.248**	.248**
Educational Standard		.256**	.218*
Communications Written	.181*	.304**	.288**
Communications Oral		.350**	.260**
Physical	-.185*		
Personality and Interaction	.230*		.239**
Intellectual Potential	.212*	.324**	.294**
Personality and Character		.222*	.233**
Overall Grade	.229*		.257**

n= 124 **p<0.01, *p<0.05

Table 4.21: Significant Correlations Between RCB Predictors and Military and Academic Performance Measures at RMAS

The sample size (n = 124) for this cohort has again been reduced as a result of either incomplete data from RCB which was excluded from the analysis, or inability to locate individuals on the RCB database. The latter can be explained by erroneously input data. It should be noted that the database had been managed by untrained, unqualified staff (this was rectified in 2000) and quality checks on data were rarely if ever carried out, thus screening of the data was clearly important under these circumstances. Also, data for certain groups, such as those

in receipt of Army Bursaries and scholarships did not necessarily have data recorded at RCB. The 54 cases with missing data thus could be accounted for.

The ARCOM test battery, is more related to the military criterion than to the academic criterion, whilst the RCB tests show the reverse pattern with the academic criteria. The main relationship of the RCB dimensions is with the academic and military/academic component. This is not surprising given the focus on cognitive and academic ability at RCB. However, Personality and Interaction and Personality and Character show similar moderate correlations as the more cognitively oriented assessments. This suggests that ability measures are not the only aspect relevant to RCB selection, and that personality *does* form a constituent part of the selection criteria.

4.3.7 Summary Findings – RCB Selection Data compared with Training Performance Measures

The RCB data shows a number of significant, though moderate predictions against the Academic and combined Academic and Military Queens Medal database training performance measures. Indeed, the majority of the RCB measures have assessments which are strongly cognitively oriented. It is therefore necessary to compare the size of the RCB correlations with those coming from the TSDI. *There is the possibility that the TSDI, (an inexpensive self report assessment), when compared with RCB (an expensive assessment centre), may be providing the same information.*

To what extent might personality assessment compare with the RCB measures ability to predict against the Queens Medal criteria ?

The next stage was thus to examine the relationship between the Big Five personality factors and the RCB selection data.

4.3.8 Big Five Personality Factors vs RCB Selection Data

Table 4.22 below summarises the significant correlations between the Big Five sub factors and the dimensions recorded at RCB:

RCB Ratings	C1	C2	C3	C
Physical Potential		.191*		

RCB Ratings	N1	N2	N3	N4	N
Reaction to Stress	-.207*				
Educational Standard			-.198*		

RCB Ratings	O1	O2	O3	O4	O5	O
Reasoning (ARCOM)	.179*		.186*			
Personality and Interaction		-.239**		-.207*		**-.184***

RCB Ratings	E1	E2	E3	E4	E5	E
Military Compatability (MC)	.215*	.233**			-.256**	**.195***
Physical Potential			-.198*			
Reaction to Stress	.215*					
Communications Written		.212*			-.278**	**.292****
Personality and Interaction					-.191*	

(Note: this is based on E1 and E5 being reverse scored)

RCB Ratings	A1	A2	A3	A4	A5	A
Personality and Interaction	.184*					
Physical Potential		-.227*	-.247**	.239**	-.178*	
Educational Standard					.234**	
Reaction to Stress		-.207*				

(Note. This is based on A1 being reverse scored).

*Correlations that are significant at the 5% level are shown. n= 124 **p = <0.01, *p=<0.05*

Table 4.22: Significant Correlations between Personality Factors and RCB Selection Data

Explanatory Note

See table 4.16 above for descriptors of Big Five sub factors and Ch 3, Section 3.3.1 for description of RCB Ratings

The findings above show that the significant correlations are predominantly with the Big Five sub factors (22 in total; highest value being .239**), with only 3 significant correlations with Big Five factors, predominantly with *Extraversion* and *Openness*. Nevertheless, there are no correlations >.292** for the Big Five factors. It is perhaps surprising that Personality and Interaction ratings do not correlate with *Extraversion*, though they correlate with some of the sub factors from each of the Big Five factors.

4.3.10 *Do the Big Five factors add incrementally to the performance of the existing RCB predictors?*

In order to answer this question a hierarchical regression was carried out. The Queens Medal Academic/Military criterion was used to measure the relative effects of the RCB ratings, and the Big Five factors. The RCB dimensions were compared with a composite of cognitive ability derived from the RCB test data (see Chapter 3, section 3.3). The results are shown in table 4.23:

Step	IV	R^2	ΔR^2	Sig F Change	Beta
1.	Cognitive Ability	.076			
2.	RCB Ratings	.194	.118*	.006	
	Pi				.191
	Pps				.013
	Pp				-.127
	Pc				.252*
3.	OCEAN	.221	.027	.628	
	O				.016
	C				.137
	E				.030
	A				-.008
	N				-.027

Table 4.23: Hierarchical Regression Results for Ability, RCB Ratings & Big Five Factors (OCEAN) for Overall RMAS Training Performance Criterion

Explanatory Key

RCB Ratings:

Pi = Personality Interaction
Pps = Potential for Problem Solving
Pp = Physical Potential
Pc = Personality and Character

The results show that specifically the Personal and Character rating provides significant incremental prediction over and above cognitive ability, but that the Big Five (OCEAN) factors together do not add incrementally to the existing RCB measures.

Results for individual hierarchical regression analysis for predicting overall military /academic performance, with the cognitive ability composite entered first, followed by the OCEAN factor and the interaction variable, are presented in Table 4.24 below. Of all the Big Five factors, only *Extroversion* accounted for additional variance (3%) over cognitive ability (7.6 %).

	Beta	R^2	Adjusted R	ΔR^2
1. Cognitive	.275*	.076	.067	
2. Conscientiousness	.150	.098	.082	.023
3. Cognitive X C	-.044	.100	.075	.002
1. Cognitive	.275*	.076	.067	
2. Neuroticism	-.090	.084	.067	.008
3. Cognitive X N	.061	.084	.061	.000
1. Cognitive	.275**	.076	.067	
2. Extroversion	.173*	.106	.089	.030*
3. Cognitive X E	.109	.115	.091	.009
1. Cognitive	.275**	.076	.067	
2. Openness	.054	.079	.062	.003
3. Cognitive X O	.062	.082	.057	.003
1. Cognitive	.275**	.076	.067	
2. Agreeableness	-.040	.077	.060	.001
3. Cognitive X A	.131	.094	.069	.017

Table 4.24: Hierarchical Regression Results for Cognitive Ability, Big Five (OCEAN) Factors and Military/Academic Criterion

It can be seen that there is no significant interactions with ability. However, from the data at Table 4.23, Conscientiousness has the largest beta, but at table 4.24, only Extraversion adds significantly. It is therefore possible that Extraversion may be picking up the same information as Personality and Character.

4.3.11 Discussion

The Big Five factors do not add incrementally to existing RCB predictors. Contrary to the Barrick and Mount (1991) meta-analysis, Conscientiousness was not shown to correlate with all performance criteria (see Chapter 2, section 2.5). This study did reinforce the utility of the RCB ratings, specifically those assessing Personality

and Character (see later, Chapter 8, Study 4), which accounted for significant incremental validity over cognitive ability. The findings suggest, however, that assessment of personality *does* contribute to the effectiveness of RCB. *Of all the RCB ratings, Personality and Character is most predictive.* However, the fact that the Big Five factors do not add incrementally (though Extraversion added to the predictive validity of cognitive ability measures, see below) might suggest either that the Big Five factors do not represent relevant aspects of personality with regard to the criteria, or that the criteria are not appropriate for personality to predict. In terms of incremental validity, the fact that Extroversion contributed to prediction over cognitive ability, suggests that there must be a degree of relevance of the Big Five factors to selection. This confirms the early tentative predictions of Maier (1955) and French (1958), (See Chapter 2, section 2.3), refutes the arguments against the use of personality assessment in selection (see Chapter 2, section 2.5.1) (Blinkhorn and Johnson,1990) and contributes positively to the thorough examination of the Big Five taxonomy asked for by Perkins & Corr (2000). It might also be pondered that, given the similar order correlations between these sub factors and the criterion measures, and the comparable correlations of the RCB dimensions and the criterion measures, that which is provided by an expensive 3 day assessment centre might be achieved by the use of a cheaper self report inventory. This would be dependent on the findings from consideration of the sub factors were found to be reproducible. However, there are broader issues of assessment that are served by observation of command tasks such as face validity requirement, fairness and equality of opportunity. These exercises also provide a medium for more assessable aspects of skills and competencies. With regard to the training measures, the absence of a measure of *effective leadership* in the Queens Medal training performance criteria suggests

that the training performance data that does exist, may not be truly representative of the RMAS core output criteria. This is because the data only covers those elements which *can* be measured quantitatively and objectively; i.e., elements of professional knowledge and skills, However these criteria only *contribute* to successful leadership. It might be considered that some of these criteria are either peripheral or contribute only by qualification in professional skills; for example, *we might wish to contemplate to what extent a leader's ability is measured by the ability to write a good essay on Wellington's Peninsular Campaign that is then marked by an academic instructor?* The answer is probably not to a great extent, but nevertheless, an analysis of the literature on this subject might *contribute* to the overall ability of the leader by assisting in developing his analytical skills. The question therefore remains, *how can the effectiveness of the predictive validity of the TSDI be assessed without a training performance measure which measures contextually appropriate output criteria (i.e. leadership)?*

With regard to comparison of these two studies findings and the findings from the literature using the TSDI (see Chapter 2, section 2.6), the prominence of *Extraversion* as a Big Five factor is confirmed. Further interactions of personality factors with ability were also evidenced (see Chapter 2, section 2.6) previously reported by Perkins and Corr (2000). Correlations of the Big Five factors with performance measures were of broadly the same order as previously reported findings (See Chapter 2, section 2.6). Where they are shown to have higher value correlations is where the performance criterion measures are narrower bandwidth.

4.4 Summary

There is general agreement that predictor and criterion measures should be matched in terms of specificity (Campbell, McHenry and Wise 1990). There is also a belief that the Five Factor Model might represent constructs which are too broadly based for accurate prediction (See Chapter 2, section 2.5). Whilst these studies did not find conclusively that Big Five sub factors produced stronger correlations than the Big Five factors themselves, there were a greater number of significant correlations arising from the sub factors than the Big Five factors. This supports the suggestion in the literature that narrower bandwidth predictors and performance criteria *should* be considered for a taxonomy of personnel selection (Hough, 1992; Hough et al, 1990; Schnieder and Hough, 1996) (See Chapter 2, section 2.5). More importantly, there is evidence that the sub factors are differentially predictive. In both the studies reported here, Nervous and Stressed Out (N1) seems to predict more strongly than the other Neuroticism sub factors. These findings were not arising due to chance; there was clear evidence in Study 2 that different sub factors of the same factor varied in their ability to predict the military/cademic total. Most of the TSDI/criteria correlations would suggest that personality measures are better predictors of the more *contextual* elements of performance (Borman & Mottowildo, 1993). Also, these findings support those of other authors cited (e.g. Paunonen and Ashton, 2001) (See Chapter 2, section 2.5). For example, nearly all the sub factors correlated with the Communication Skills performance measure, but comparatively few with academic criteria, and particularly few with technical criteria. This accords with the literature in that differential prediction may be only achieved through operationalising finer level criteria (See Chapter 2, section 2.5). Consistent with other findings (Schneider &

Hough, 1995), ability was shown to be more important for predicting the Queens Medal data. In attempting to inform any such future strategy to further investigate personality factors, design for further studies will require development and application of more appropriate training performance measures. The next studies therefore focussed on investigations of more contextual outcomes in uniformed organisations, more particularly, on leadership performance-specific measures in training. In the leadership domain, personality is deemed to play a significant part in individual performance and individual differences. Study 2, by its findings, suggests that there may be utility of personality measures in predicting more *contextual* (see Chapter 2, section 2.5 and Chapter 6), as opposed to *task*, criterion (Borman & Mottowildo, 1993; Campbell, McHenry and Wise 1990), and it is to these factors that this thesis now looks.

Chapter 5

In Search of Contextually Appropriate Performance Measures -

A Pilot Study using RMAS Rowallan Company Cadets as Participants

Would a measure of leadership performance provide a better predictor of training performance for assessing the utility of personality assessment using the TSDI ?

5.1 Introduction

Following findings from Studies 1 and 2, using instructor ratings and Queens Medal data as training performance measures respectively, Study 3, aimed to investigate the use of more appropriate performance measures. A possible explanation of the results from Study 2 is that whilst the training measures were objective assessment of training *content* or *tasks* undertaken at RMAS, they did not relate to any significant extent to the *core purpose* of RMAS, that is, to develop leadership skills within young officer cadets to equip them to lead their soldiers (see Chapter 4, section 4.4).

Extracting existing training performance measures that could be identified as contextual still failed to provide appropriate predictors where personality assessment might have most utility. The use of performance measures in the areas where personality is regarded as a significant contributory factor to outcomes, i.e. within leadership, would, it was considered, provide guidance on future research design.

A small number of cadets at RMAS, those in Rowallan Company (ROWCO), are allocated to a course which is designed to develop those who represent "risk passes" at RCB and prepare them for mainstream officer cadet training. These cadets have their performance measured in such a way that they are continually assessed throughout the course on aspects which relate, in a far more focussed fashion, to core aspects of leadership. These skills or traits, which are deemed essential pre-requisites for successful completion of officer cadet training, are used as the foundation for their assessment throughout the course. The ensuing data is used to filter out those unlikely to successfully complete the Common Commissioning Course at RMAS. It was therefore decided to gather personality data on this cohort to assess whether or not there might be a stronger relationship between personality factors and leadership assessment ratings. This research would therefore be a pilot study to explore the appropriateness of a methodology. Two intakes were subsequently administered the TSDI.

5.2 Sample

41 RMAS Rowallan Company (ROWCO) cadet participants in January 1999 and 26 Cadets on a second course in May 1999 completed the TSDI, giving a total of 67 datasets. Training performance data was also collected on the latter date. A total of 48 data were then analysed. The 19 cases lost arose as a result of individuals being de-selected from the training course.

5.3 Rowallan Company

The Rowallan Company (ROWCO) cadets represent risk candidates from RCB

(see Chapter 3, section 3.3). These individuals have shown an element of potential, but are considered to have scored too low on Physical Potential and Personality and Character Potential at RCB. The ROWCO course is designed to develop candidates for further training or assess them as unsuitable for further training. If found unsuitable for further training, cadets are released from the Army, or occasionally, recommended to serve in the ranks for a period and retry for commissioning at a later date. As a consequence, the wastage rate of ROWCO candidates is in the order of 25%. The 10 week course is pressurised, and is heavily oriented towards outdoor and adventurous pursuits. The physical content is therefore highly significant. Few amongst those who have been through this regime would regard Rowallan Company as a pleasurable experience. However, the course has shown itself to be an effective way of bringing out potential in individuals. It also sifts out those who, for whatever reason, would be unlikely to be successful in completing officer training and presumably would be less than satisfactory in subsequent employment as a junior officer. However, the cadets on this course are very closely supervised at all times, and Instructors constantly provide cadets with feedback on their performance. The feedback takes the form of interviews, self and peer assessment, and a comprehensive record of their performance is maintained.

5.4. Training Performance Measures

The training performance measures used to match against the predictors consisted of ratings recorded against a range of identifiable leadership traits. These had been introduced to RMAS following work undertaken by DERA CHS and reported by Elshaw (1996)(See Chapter 2, Section 2.6). The mainstream

commissioning course at RMAS had ceased using these criteria for rating due to problems of training management. The perception had developed amongst the staff at RMAS that the rating scale was too onerous for use by Instructors. Additionally, a lack of resources made it difficult to ensure a workable degree of standardisation across the courses run in the Academy. These two factors were the catalysts for the removal of the only objective means of assessing leadership performance at RMAS. However, leadership ratings had been retained for use within Rowallan Company.

The criteria are shown below:

Leadership Traits
Planning Ability
Initiative
Intelligence
Analysis and Judgement
Powers of Expression
Controlling Ability
Zeal and Energy
Composure
Impact
Self Confidence
Physical Ability
Determination and Commitment
Adaptability
Military Compatibility
Personal Relations and Team Spirit
Integrity
Order of Merit (Lship)
Overall Rating

Table 5.1: Leadership Criteria

The criteria are rated on a 9 point scale as follows:

1 = Very weak
2 = Weak
3 = Less than adequate
4 = Adequate
5 = Satisfactory
6 = More than Satisfactory
7 = Good
8 = Very Good
9 = Exceptional

5.5 Results

The data were screened to remove any incorrectly completed ratings. The analysis of the data was undertaken focusing on the relationship between the Big Five Factors and sub factors of the TSDI and the leadership trait rating data (leadership training performance data).

5.5.1 Leadership Ratings – Intercorrelations

There were a high number of significant and strong correlations between the individual leadership traits. Exceptionally, Physical Ability and Integrity show some variation from this, in particular with Powers of Expression, and in the case of Integrity, and with Intelligence. One possible explanation for this might be that people with a particular type of personality end up going through ROWCO training, and this factor may account for weaker correlations.

5.5.2 The Relationship of Personality Factors and Sub Factors with Leadership Traits Ratings

Tests to determine whether the different subfactors of each factor were equally correlated with the overall leadership rating were carried out using the method described in Chapter 4, section 4.2. The results are shown in the following subsections below.

5.5.2.1 Intercorrelations between Big Five Factors

Intercorrelations between Big Five Factors for this sample are shown at **Appendix E**. Except for the correlation between Neuroticism and Agreeableness and Neuroticism and Conscientiousness, the intercorelations are much lower than would be expected on the basis of the findings in Study 1 and Study 2. However, the sample size is very small and this may account for the variation. Table 5.2 summarises the significant correlations of Big Five factors and sub factors with individual leadership traits;

Leadership Trait	C1	C2	C3	C
Planning Ability				
Initiative				
Intelligence				
Analysis and Judgement				
Powers of Expression				
Controlling Ability				
Zeal and Energy				
Composure				
Impact				
Self Confidence				
Physical Ability				
Determination and Commitment				
Adaptability				
Organisational Compatibility				
Personal Relations and Team Spirit				
Integrity				
Overall Rating				
Order of Merit (Leadership)				

Leadership Trait	N1	N2	N3	N4	N
Planning Ability		-.291*		-.285*	
Initiative		-.471**			-.374*
Intelligence					
Analysis and Judgement					
Powers of Expression					
Controlling Ability					
Zeal and Energy					
Composure					
Impact					
Self Confidence					
Physical Ability					
Determination and Commitment					
Adaptability					
Organisational Compatibility					
Personal Relations and Team Spirit					
Integrity					
Overall Rating					
Order of Merit (Leadership)					

Leadership Trait	O1	O2	O3	O4	O5	O
Planning Ability						
Initiative						
Intelligence						
Analysis and Judgement						
Powers of Expression						
Controlling Ability						
Zeal and Energy						-.316*
Composure						
Impact						
Self Confidence						
Physical Ability						
Determination and Commitment						
Adaptability						-.295*
Organisational Compatibility	-.337*	-.358*		-.324*		-.409**
Personal Relations and Team Spirit			-.308*			-.301*
Integrity						
Overall Rating						
Order of Merit (Leadership)						

Leadership Trait	E1	E2	E3	E4	E5	E
Planning Ability						
Initiative					-.422*	.377*
Intelligence						
Analysis and Judgement						
Powers of Expression	-.388*	.345*	.306*	.535**	-.363*	.422**
Controlling Ability				.288*	-.374*	.411*
Zeal and Energy						
Composure						
Impact						
Self Confidence		.294*		.296*	-.422*	.444*
Physical Ability	.295*					.305*
Determination and Commitment						
Adaptability						
Organisational Compatibility		.298*		.406*		.370*
Personal Relations and Team Spirit						
Integrity						
Overall Rating						
Order of Merit (Leadership)						

Leadership Trait	A1	A2	A3	A4	A5	A
Planning Ability						
Initiative						
Intelligence						
Analysis and Judgement						
Powers of Expression		.365*				.344*
Controlling Ability						
Zeal and Energy						
Composure						
Impact						
Self Confidence						
Physical Ability						
Determination and Commitment						
Adaptability						
Organisational Compatibility						
Personal Relations and Team Spirit						
Integrity						
Overall Rating						
Order of Merit (Leadership)		-.288*				-.308*

(n=48)

Note: The following sub factors are reverse scored N1, N2, N3, N4, A4, E1, E5

Table 5.2. Correlations between Leadership trait ratings and Big Five Factors and Sub factors in the Rowallan Company sample. Only correlations significant at 5% or higher are shown.(Note all ratings are provided by instructors)

It is first noteworthy that evidence for the relevance of Nervous and Stressed Out (N1) as a sub factor predicting more than the Neuroticism factor is absent from this data in contrast to Studies 1 and 2, and there were no significant correlations for Conscientiousness. It will be immediately apparent that the sample size was small and on the margins of accepted viability (n=48). However, the correlations of Big Five sub factors and factors with some of the Leadership traits are strong. In this analysis, there are 21 sub factors and 16 performance dimensions which give a possible 336 correlations. It would be expected that there would be 0.05 x 336 = 16.8 significant correlations at the 5% level of confidence. However, there are 36 significant correlations, thus there *may* be some predictive power being shown here, but the evidence is not convincing. However, the strength of the correlations might suggest that some prediction is in evidence. However, 13 predictions out of

a possible 35 for the Big Five factors may suggest more convincing evidence of relationships between personality and performance in this instance.

Controlling Ability, Powers of Expression, Initiative and Self Confidence almost always anecdotally, in the context of uniformed organisations, act as indicators of leadership capability likely to be expounded by an individual in most predicted or routine situations. Those scoring low on the Unsociability (E5) scale are the more outgoing, and more likely to be extrovert, thus the negative correlations of the Unsociability (E5) sub factor with 4 of the traits measured may serve to confirm the extent to which this personality factor may represent the inherent abilities required for achieving high scores against leadership performance criteria. Instructional staff at RMAS hold teamwork in high regard. They also perceive the ability to get on with their peers as an essential element for those who will make successful team members and for the necessary bonds of the team to be made. This, in turn, is seen to rely on the individual's personality in that those who are able to interact best with their peers tend to be the better leaders within the context of RMAS.

There was a .471** correlation shown by the Worrying (N2) sub factor with Initiative and this sub factor also seemed to relate to Planning Ability – at this stage in developing leadership skills, this might be crucial to satisfactory performance.

The importance of the "Communications factor" (see Chapter 4 section 4.4) is also brought to the fore from these findings, and as RMAS is about induction of the individual into the uniformed organisation (though this is not always an aim stated in these terms) Military Compatibility (or organisational fit) relates closely with

Assertiveness (E4), perhaps the most easily identified of leadership behaviours in uniformed organisations, correlates highly with Powers of Expression (.592**).

5.5.2.2 *Do the Big Five sub factors predict differentially ?*

In response to this question, the analysis described in Chapter 4, section 4.2.6.8 was undertaken. Results are shown at Table 5.3 below:

Rowallan Company vs Instructor Overall Leadership Rating	Satorra-Bentler type Chi Sq	Df	Probability	RMSEA	90% Confidence Interval of RMSEA	
A	5.88	4	.208	.100	.000	.256
C	0.46	2	.792	.000	.000	.182
E	3.94	4	.414	.000	.000	.217
N	5.03	3	.169	.120	.000	.294
O	2.35	4	.671	.000	.000	.170

n=48

Table 5.3 Summary of results of tests of the pattern hypothesis that all subfactors correlate equally with overall leadership rating.

There is no evidence that the sub factors within a factor differ in their ability to predict outcomes. In the absence of a significant chi squared value, the two RMSEA values >0.06 cannot be taken as evidence of differential prediction. However, the lack of evidence for differential prediction is not surprising given the small sample size.

5.6 Discussion

These findings suggest the TSDI may be useful in a selection context. However, the literature suggests a degree of caution surrounding these findings, as the view that measured personality traits do not predict much of the variance in work

performance, including leadership performance (Norvik and Brovold,1999) remains an important consideration. This implies the necessity to design carefully future research with this in mind. Nevertheless, prediction may not be the only application of any such findings; for example, cadets are given the opportunity to objectively identify their personality traits through personality assessment. This may show for example, that they might benefit from concentrating on or improving their interpersonal skills such as powers of expression. Such testing might justify development of coping strategies to improve their performance to offset low ratings on Personality and Character which they may have acquired at RCB and which are perceived as critical and which might be rectifiable. However, though based on a small sample size, this sample indicated that higher order correlations could be obtained when using more contextually based and appropriate performance measures. The correlations are much stronger, though fewer in number than those recorded in Studies 1 and 2.

5.7 Summary Findings

The findings from the Rowallan cohort in Study 3 suggests that the rating leadership as a performance measure might be a more appropriate and satisfactory criterion to use for future studies. With this measure, there may be stronger relationships with TSDI results to be identified. The personality measures appear from this study, to be better predictors of the more *contextual* elements of performance, in this case, leadership traits. However, the importance in leadership of Communications Skills, Powers of Expression, Self Confidence, Initiative, Controlling Ability and Military Compatibility (organisational fit) and the links to the Big Five factors Extraversion and Neuroticism suggest that these

correlations may represent the strongest relationships to date in this research, between the outcomes of self assessed personality traits and training performance as measured by instructor leadership rating.

The findings from this study provided the foundation for the subsequent studies reported in Chapter 8 (Studies 4 and 5). They serve to identify and focus on the critical elements central to any potentially conclusive investigation into the way in which personality assessment might contribute to predicting training performance in uniformed organisations. The next chapter, Chapter 6, therefore looks at how leadership performance criteria might provide a better context for the use and application of personality assessment.

Chapter 6

Contextualising Personality Assessment – The Use of Leadership Performance Criteria

6.1 Introduction

The aim of this chapter is to provide a background to the investigation of the relationship between leadership and personality within the organisational contexts of the Army and, for comparative purposes, the Metropolitan Police Service. It reviews leadership theory and looks at the relationship between personality and leadership, finally examining how leadership and leadership development is viewed from the organisational perspectives of the participating organisations.

"As is always the case in predictor-criterion relationships, the criterion (i.e. where you want to go) is of far greater significance than the predictor (i.e. how you get there)" (Nagle 1953. p.272)

Studies 1 and 2 (see Chapter 4) identified the need to contextualise personality assessment. This could be achieved by the use of a more appropriate criterion that might better represent the core outputs with regard to personality i.e. training in leadership, together with measurable outcomes in the form of leadership performance. This was essential if a reasonably confident judgement were to be made as to whether or not personality assessment might be judged to be of use in selection. At that time, the only area where any appropriate quantitative data could be extracted was in Rowallan Company at RMAS where a pilot study (Study

3, see Chapter 5) was undertaken. This, together with the findings from Study 2 (see Chapter 4, section 4.3) which specifically identified the importance of the context in which personality assessment might be used, gave rise to the need to locate personality assessment in the organisational context. Whilst the Queens Medal data had demonstrated only moderate relationships with the Big Five factors and sub factors, the need arose to examine criteria which were justifiable, paying heed to Muchinsky's observation that *"the inability of a given predictor to predict could be resolved by selection of a new predictor"* (Muchinsky, 1986,Chapter 2 p.37), thus a more appropriate criterion measure needed to be identified.

6.2 Leadership Performance as a Criterion Measure

It was decided to focus throughout the remainder of this thesis on the relationship between personality and leadership; firstly, because leadership is regarded as a crucial aspect of performance in all uniformed organisations, and secondly, because there is reason to believe that leadership potential relates to personality (Kets De Vries and Forent-Treacy, 2002), and therefore is likely to provide a more appropriate predictor/criterion relationship for the use of personality assessment.

For almost 100 years researchers have made numerous attempts to explain leadership on the basis of personality traits (Yukl and Van Fleet 1992). The main focus for research was on either "great person theory" or on the identification of traits that characterised successful as opposed to unsuccessful leaders.

A recent PsycINFO search undertaken by Bono and Judge (2004) found that some 12% of the 15,000 articles on leadership published since 1990 included the keywords personality and leadership. The Military, and the Army in particular, has always had a strong culture of leadership which underpins the organisation. Indeed, military organisations have institutions, such as military academies, which are dedicated entirely to producing leaders. A military academy is an institution with a mission of producing leaders. For military organisations, leadership is not a by-product of training; it is one of the organisation's primary purposes. (Attwater and Yammarino 1993, p.653). The above suggests that the importance afforded to personality in leadership research justifies using leadership as a criterion measure for examining the utility of personality assessment in uniformed organisations. The next section therefore reviews leadership theory as the background to using leadership as a criterion measure.

6.3 Leadership Theory

The concept of leadership has long been an area of controversy in academic research and the development of leadership theories has led to the production of a range of theoretical models. These models are variously based on personal attributes, traits, behaviours, and attitudes, or centre around responses to situations and the external environment (contingency theories, see below). Others focus on path-goal strategies.

The trait theory of leadership (also known as the "*Great Man*" theory) has been a focus of scientific study for at least a century (e.g. see Terman, 1904; in Smith and Canger, 2004, p.446) . However, studies have suggested that the relationships

between traits and leadership performance have been inconsistent and disappointing. Few universal traits associated with effective leadership have been identified. Variations on trait theories exist, and include those which have been based upon studies into charismatic leaders. These represent a hybrid approach to leadership in so far as they include elements of many other theoretical approaches to leadership such as traits, behaviours, attributions, and situations (Yukl and Van Fleet ,1992).

As an alternative to theories which promote the importance of universal traits and behaviours of leaders, some authors (see section 6.3.2 below) have proposed that leadership performance is dependant upon the environment. These (contingency theories) contend that leadership behaviours may be either helpful or harmful, depending on the characteristics of those subordinate to the leader and the situation. Path - Goal theory also require a consideration of the subordinates needs before deciding a leadership strategy (House, 1996). These theories provide clear alternatives to trait theories of leadership and give rise to the view that there may be leadership styles which are effective in some situations, and ineffective in others. Often, however, perceptions of the construct of leadership have led to a range of interpretations of the meaning of leadership. The next section therefore considers how leadership might be defined.

6.3.1 Defining Leadership

Defining leadership has always proved to be problematic. "*Of all the hazy and confounding areas in social psychology, leadership theory undoubtedly contends for top nomination. And, ironically, probably more has been written and less is*

known about leadership than about any other topic in behavioural sciences". (Bennis 1959, p.78) Leadership has been studied more extensively than almost any other aspect of human behaviour (Kets de Vries, 1993: Goffee and Jones, 2000; Higgs and Rowland, 2001). As Stodghill (1974, p.259) points out "*there are almost as many definitions of leadership as there are persons who have attempted to define the concept*". Whilst the research on leadership is vast and diverse it has, to date, been inconclusive in defining what *effective leadership* is, and the reasons why some people are *effective leaders*. Indeed, conclusions are often contradictory (Kets de Vries, 1995; Clemens and Mayer, 1999); what may be seen as effective in one organisations such as, for example, an authoritarian style, might be counterproductive in another. Many authorities therefore conclude that there remains little real knowledge of what is required for effective leadership (Kets de Vries, 1994; Higgs and Rowland, 2001; Hogan and Hogan, 2001). Two common factors emerge from the studies on the nature of effective leadership, however. The first is that there appears to be a focus on top-level leaders; and the second, is that successful leadership is judged by the financial performance of the business being led. It is, perhaps, noteworthy that neither of these factors are applicable to selection and assessment of leadership for the vast majority of the leaders required in uniformed organisations.

One issue of definition that is frequently encountered in the literature concerns the concepts of "leadership" and "management". There are oft cited conceptual differences between "leadership" and "management" and between "leaders" and "managers". In the context of this thesis, it is an important factor for consideration because how members of uniformed organisations understand these concepts will influence how they assess individual performance in leadership. To illustrate this

point, research by Khaleelee and Wolf (1996), into emotional development, and capacity to exercise leadership was presented under a heading of "*the Nature of Leadership and Management*". Khaleelee and Wolf suggest, rather confusingly, that "leadership needs to be demonstrated at all levels of management and is not a separate activity" (Khaleelee and Wolf,1996,p.5) yet just three paragraphs later they state.... "The work of leading is significantly different from the work of managing" (op cit, p.5). The extent to which the concepts of leadership and management are considered as separate or related, or interchangeable constructs, is clearly dependent upon different perceptions. In uniformed organisations, this perception is often at variance to the general business community view, and this has implications for assessment of leadership performance. This is illustrated by Havaleschka (1999) in his study of personality and leadership which examined the impact on success and failure of businesses. Havaleschka refers early in his paper to "leaders", then "top leaders" and "other leaders" and migrates towards use of the term "managers" and "senior" and "top" managers" as the paper progresses. The reader might conclude that it is the latter definition which is more appropriate. However, the paper's title suggests it is about leadership, and this, in a general context, appears to be misleading in the light of the content of the paper which looks towards phenomena that can be more easily measured, i.e. systems and task management, which, arguably, are more tangible. Indeed, Havaleschka is not alone in this respect, there are many definitions of leadership and management within the Army and other uniformed organisations.

For the purposes of this thesis, leadership defined within the context of the Army, and which is regarded as a central feature of organisational performance, is

adopted. The Army, and the other Armed Services, use doctrine to guide corporate perceptions on many issues, including leadership. British Defence Doctrine (2001) is concerned with the effect of leadership on those being led. It defines the purpose of leadership as *getting subordinates to do what is required of them and to engender within them the confidence that breeds initiative and the acceptance of risk and responsibility.* Management, on the other hand, is seen as being primarily concerned with organising resources, rather than inspiring people (Soldier Management Handbook, 2004). What is important is what those members of the organisation understand to be leadership and how universal that understanding is. The concept of Leadership is therefore subject to ambiguity and differing interpretation. The next section reviews the development of leadership theories, with particular reference to the relationship of personality with leadership.

6.3.2 The Development of Leadership Theory

It is important to understand that leadership theory when viewed as whole, would indicate that no single perspective tends to be entirely accurate nor entirely irrelevant, and that the skills of leaders are always an element in the equation (Dulewicz and Higgs 1990). With this in mind, the main elements of the theories which go to make up leadership theory are summarised below.

6.3.2.1 Trait Theory

Firstly, the more "modern" leadership research is regarded as having begun with *Trait Theory* in the late 1920s (Alimo-Metcalfe, 1995; Goffee and Jones 2000; Higgs and Rowland, 2001) and was influenced by the work of Freud, Jung and

Skinner (Collingwood, 2001). This research tended towards a personality-based approach, but it led to generally inconclusive findings with regard to the identification of common leadership and personality traits (Fiedler, 1964). This research did not take into account other major influential factors; i.e. *the environment, the situation, those being led and the circumstances in which the leader had to operate.* The traits identified therefore tended not to generalise across different settings.

6.3.2.2 Behavioural and Situational Theories

The response to *Trait Theory* resulted in the development of *behavioural and situational theories* of leadership derived from examination of the "styles" adopted by leaders (Alimo-Metcalfe, 1995). A classic example of this approach is provided by the Blake and Moulton Model (1964). This approach was underpinned by a point of view, or belief, that there was a "best" style of leadership (Alimo-Metcalfe, 1995). However, the weakness of this approach was that, in reality, there were numerous examples of success employing "less desirable" styles (Higgs and Rowland, 2001). A further example comes from the work of Vroom and Yetton (1973) who proposed a model of supervisory decision making which suggests the need for a careful consideration of situational factors before determining the most effective decision making strategy.

6.3.2.3 Contingency Theory

The limitations of the *style theories* were the catalyst for the development and application of the *contingency theory* of leadership. A classic example of the

contingency leadership model was that developed by Hershey and Blanchard (1969, 1993) who maintained that it was not the leaders' style which necessarily led to effectiveness, but rather the ability of the leader to adapt their leadership style to the needs of the followers. This approach drew on the relatively under-explored work on understanding leadership from the "follower" perspective, originally developed from research carried out by Fiedler (1964). Taking into account the leadership situation and taking into account those being led were not features of trait theory, and so this contributed to the development of leadership theory, because, previously, trait theory had not taken into account these critical factors in applied settings.

6.3.2.4 Charismatic Theories

While trait theory tended to imply that effective leadership was a matter of selection, i.e. that the leader was born rather than developed, the *behavioural and situational theories* focused more on the development of leadership *capabilities* in individuals. Once again research, using both style and contingency theories, failed to provide consistent and compelling evidence for their validity across a wide range of contexts (Alimo-Metcalfe, 1995). There then followed development of so-called *Charismatic theories*. In focusing on top-level leadership performance, i.e. the performance of Chief Executive Officers (CEOs), Shamir (1992) returned to analysing *qualities of leaders* and identified, through studying cases of successful leaders, the common thread of *charisma*. Charisma was defined as being "the ability to inspire others to act in a way which is required to realise the leader's vision" (Shamir, 1992). This led to a period (which continued into the 1990s – Collingwood, 2001a,b) in which the focus of much of the leadership research was

on the qualities of the heroic CEO (Collingwood, 2001a,b; Alimo-Metcalfe, 1995). However, this approach failed to produce compelling results in terms of understanding the mechanisms by which effective leadership is an outcome in any general scenario. It also tended to be very restricted in its focus (Alimo-Metcalfe, 1995) which was towards the corporate performance of businesses, and particularly of businesses in the USA specifically (in 2001, a search on the Library of Congress database revealed in excess of 8,000 books on the topic of leadership (Aitken, 2002)). It was also evident that the drivers of interest in leadership were clearly associated with change and complexity in the business and organisational environment. This is a view that has much support in the literature (Goffee & Jones, 2000; Collingwood, 2001; Hogan & Hogan, 2001; Higgs & Rowlands, 2001).

6.3.2.5 Transformational and Transactional Leadership

In the late 1970s leadership research led to methodological and terminological debates which caused further confusion and less enlightenment (Higgs 2003). In this research environment, Bass (1985) developed a leadership model identifying sets of behaviours and characteristics required for situational and organisational transformation and situations of stability. Bass (1997) labelled these *transformational and transactional leadership*. Bass and Avolio (1996) carried out further work with this model in mind. They identified the main characteristics and behaviours associated with each context. These are described as follows:

Transformational leadership. The context is characterised by charismatic and inspirational behaviours, inspiring and aligning others by providing a

common purpose, allied with optimism, about the "mission" and its attainability; employing intellectual stimulation by encouraging individuals to challenge the status quo, to consider problems from new and unique perspectives, and to be innovative and creative. These were accompanied by individualised consideration in the form of a genuine concern for individuals' feelings, aspirations and development. Leaders paid special attention to each individual's needs for achievement and growth, and coaching and mentoring, with followers treated differentially and equitably.

Transactional leadership. The context here is characterised by contingent reward, encouraging specific performance and behaviours by making rewards (in the broadest sense) contingent on delivery; and management by exception, and only intervening actively when a delegated task or function is failing to conform to expectations.

This view of leadership provided a theory of greater utility in applied settings, and especially in the business community, but did little to consolidate generalised leadership theory universally.

6.3.2.6 Contemporary Approaches to the Conceptualisation of Leadership

Dulevicz and Higgs (2002) suggested that the frustration with the inability of leadership research to clarify and generalise findings appeared to give rise to a belief that there was a fundamental truth which had yet to be discovered. Weick (1996), however, considered that an alternative way forward might be found, encapsulating a new way of viewing leadership research. He suggested that as

"social and organisational sciences, as opposed to physics and biology, do not discover anything new" then research effort should be directed at comprehending that which is already known in a much better way, *"opening up new, unforeseen, possibilities of reshaping, re-engineering and restructuring our original social environment" (Weick, 1995).*

Building on this "emerging theory" school of thought put forward by Weick (1995), a more pragmatic strategy for leadership research was suggested that would reduce the complexity and confusion and provide for clarity. Grint (2002) identified four approaches. These involved addressing the *Process of leadership, the position of the leader, the philosophy of leadership and the purity of leadership.* The *Process of Leadership* embodies two definitional sub-streams that are trait and characteristic focused (leadership in-person) and behavioural/activity focussed (leadership in-practice). The *Position of the Leader* gave rise to two sub-streams which are concerned with hierarchical position (leader in-charge) and hierarchical positions (leader in-front). The *Philosophy of Leadership* focuses on issues such as *freedom to lead, agency and causality of leadership.* It is an approach which highlights the significance of *contextual* issues. In the *Purity of Leadership* approach, the discourse is concerned with the extent to which leadership is *embodied within individuals, groups, networks* or even inanimate objects. These factors point to the need to examine more broadly perspectives of leadership to make sense of findings of data derived from narrower parameters of investigation.

6.3.3 Leadership Theory – Summary

In summary, the concept of leadership is surrounded by ambiguity, and there is much research which is highly context specific. There appears to be a tendency to deal with the tangible and measurable as indicators of leadership performance when in practice, these are often reflections of more organisational or management orientated outputs. The theories therefore tend to lack generalisability. The implications for this thesis are that in order to identify which aspects of personality are relevant to leadership, there is a need to draw out the identifiable traits which go to make up context specific organisational perceptions of leadership. Secondly, there is a need to incorporate appropriate identifiable attributes and behaviours within the leadership domain of the organisation, and not restrict the measurement of outcome criteria to the management domain. A purely pragmatic approach to assessing leadership performance is therefore required on the grounds that those within an organisation have a common understanding of the criteria and concepts that they are assessing in individuals, with particular references to aspects of personality. The next section therefore looks at the relationship between personality and leadership.

6.4 Personality and Leadership

A core issue, for some time, has been whether or not leadership depends on *personality* or *particular behaviours* or *both* (e.g. Hogan and Hogan, 2001; Macall et al., 1988). However, it is likely that the tasks and responsibilities for leadership positions would be related to personality traits (Smith and Canger, 2004). This is because leadership responsibilities tend to be highly interpersonal in nature.

Leadership roles tend to be carried out with a high degree of autonomy, thus it seems logical that personality assessment would predict leader performance. Bass (1990) considered fifty potential important traits for leadership, but concluded that very few personality traits predicted *leadership effectiveness*, though cognitive ability did do so. This, in turn, has organisational implications in terms of strategies for developing leadership capabilities. A personality-based paradigm would argue for selection as being the main focus, whereas a behaviour-based paradigm would argue for leadership development. In essence this is the debate around whether leaders are born or made. The "emerging school" (Weick, 1997; Grint, 2002; see section 6.3 above) perceives leadership as being a combination of *personal characteristics* and *areas of competence*. The re-emergence of personality as a component of effective leadership is therefore evident in some of the more recent studies of leadership where the focus is on building capability. (Kets De Vries and Forent-Treacy, 2002).

More recent research has provided evidence to support personality-performance relationship in leadership positions. Judge and Bono (2000) demonstrated that transformational leadership is predicted by several of the Big Five personality traits. They showed that Extraversion (r = .22**), Openness (.22**) and Agreeableness (.27**)predicted subordinate ratings of transformational leadership, and personality factors were predictive of supervisor ratings of leader effectiveness. In a meta-analysis of 73 samples examining the relationship between personality and leadership (Judge, Bono, Ilies and Gerhart, 2002), personality variables were sorted into the Big Five dimensions and studies were coded into "leader emergence" and "leader effectiveness", both measured by ratings provided by supervisors, peers and subordinates. "Leader emergence"

refers to whether or to what degree an individual is viewed as a leader by others. In contrast, "leadership effectiveness" refers to a leader's performance in influencing and guiding the activities of his or her team towards achievement of its goals. Hogan (1994) suggests that leadership effectiveness should be measured in terms of team, group or organisational effectiveness. All of the Big Five personality factors, less Agreeableness, predicted both leader effectiveness and leader emergence. When the results for leader emergence and leader effectiveness were combined, the correlations with the Big Five factors were: Extraversion, p=.31; Conscientiousness, p= .28; Neuroticism, p = -.24 and Openness, p = .24; Agreeableness, p= .08. Based on a regression, of overall leadership on the Big Five, Judge et al estimated that personality accounted for almost 25% of the variance in leadership performance, and the Big Five factors had an overall multiple correlation of .48 with leadership. This, Judge et al suggests, also gives strong support for a leadership trait perspective when traits are organised according to a Five Factor Model of personality.

Pursuing further the argument the personality of the leader is an important determinant of the leader's effectiveness (e.g. Hogan & Hogan, 2001; Collins, 2001), effective leaders are differentiated from other leaders through the exercise of a relatively small range of skill or competence areas (Kouzes and Posner, 1998; Goffee and Jones, 2000; Higgs and Rowland, 2001; Hogan and Hogan, 2001). The way in which these skills and competencies are exercised is not prescribed, but is a function of the underlying *personality of the leader* (Hogan, 2002; Hogan and Hogan, 2001). As an example of this kind of research, Higgs (2002) tried to link personality and leadership employing the concept of Emotional Intelligence. Higgs used overall assessment rating of performance to compare with scores

derived from the Emotional Intelligence Measure, EIQ-M, (Higgs and Dulewicz, 1999) which had been used to compare emotional intelligence competences of CEOs, executive directors and managers. In Higgs' study, which was reported initially in the public domain as based on a sample size of only 20, 29% of the variance in the overall assessment rating was accounted for by Emotional Intelligence. Further review of the central competencies indicated that three (strategic leadership, intellectual leadership and political leadership) were more related to cognitive abilities and knowledge. Removing these three competences from the analysis, 37% of the variance was accounted for by the Emotional Intelligence elements. Higgs acknowledged that the relatively small numbers in the study limited the generalisability of the findings.

When personality research is undertaken and reference to leadership theory is made, it is often the definition of the outcome criterion which leads to the difficulties associated with generalisability. Work which looked at leadership styles, rather than leadership performance (see above, Judge et al) gives further evidence for the relationship between personality and leadership. Kornør and Nordvik (2004) looked at the relationship between personality traits as measured by the NEO Personality Inventory (NEO PI-R; Costa and McCrae 1992) and leadership styles in the form of Change, Production and Employee (CPE) measured by Ekvalland and Arvonen's 1991 CPE questionnaire. This study examined data from 106 participants, all leaders. Three common factors comprising leadership styles and personality domains - "looking for new possibilities", "hard working" and "dealing with people" - were identified. The study considered personality traits as behavioural tendencies in unspecified situational contexts, and leadership styles as behavioural tendencies in three leadership

contexts. The findings indicated that the strongest predictors of CPE scores were Conscientiousness and Extraversion, though Openness and Agreeableness were specific predictors of Change and Employee criteria respectively. One finding of significance for this thesis was that all data was derived from self-report, showing consistencies in self perceptions, independent of context. Also, the sample was one consisting entirely of people in leadership roles, mainly at middle management levels, and therefore, whilst the output from the data analysis must have suffered considerably from range restriction effects, the target population is arguably similar to the sample of participants being used in this thesis.

Judge, Bono, Ilies, and Gerhart (2002) argued that the results from their review of personality and leadership suggested that stronger and more consistent personality-leadership relations existed than had previously been recognised because they used the FFM as an organising framework. However, they also cautioned that their results may simply indicate a close correspondence between the way we see people's personalities and our stereotypical conceptions of the characteristics of leaders. Whilst studies using the FFM have provided evidence that personality consistently predicts job performance and other work related criteria, the small magnitude of the relationships has resulted in some researchers questioning the utility of personality measures (Hurtz and Donovan, 2000). Barrick and Mount (1993) found that personality predicted performance better in jobs with high levels of autonomy which would incorporate roles which include within their specifications, leadership. However, measuring and assessing leadership performance as a criterion measure is not necessarily straightforward. The next section thus looks at the measurement and assessment of leadership performance.

6.5 Measurement and Assessment of Leadership Performance

In the research by Kornør and Nordvik (2004), (see above, section 6.4.1), the issue of leadership effectiveness was found to be a variable difficult to assess. Bias arising from the data attributed to the nature of self-report assessment and the variation of report from subordinates and supervisors was not investigated in their study. However, Kim and Yukl (1995) who studied this issue in comparable settings, suggested that subordinate ratings of supervisors behaviours were more closely related to leadership effectiveness than self-reports. In contrast, Kornør and Nordvik (2004) concluded that people tended to be consistent in their self-reports regardless of context, and that leadership styles were related to personality traits. This latter finding was based on data that showed that those who viewed themselves, for example, as rated highly on Agreeableness, tended to report themselves as concerned about employees; those who rated themselves as high on Extraversion and Open to Experience, tended to report themselves as enthusiastic for change.

In the general literature (e.g. Kornør and Nordvik (2004); Ekvalland and Arvonen (1991); Havaleschka (1999); Higgs (2002); Hogan & Hogan, (2001); Collins, (2001)) much of the leadership assessment is context specific and restricted to corporate or business needs, based on specific task or output performance, or based on named individuals or heroic CEOs , e.g. performance of Chief Executive Officers (CEOs), Shamir (1992) (see section 6.3 above). Studies to assess *leadership* as opposed to *management* performance and behaviours have been previously cited (Elshaw (1997) within the Army context (see Chapter 2, section 2.6, and see also Chapter 8, section 8.3.1). It is therefore towards more

constrained contextual data sources to which this thesis must turn for comparison of leadership assessment. In the light of these theoretical considerations, the perspective of leadership in the organisational contexts of the participants, i.e. the Army and the Police, is next reviewed.

6.6 Leadership and Personality in the Context of Uniformed Organisations

That there is a relationship between personality and leadership in military settings has been taken as an implicit assumption by the military for a long time (Bradley, Adelheid, Charbonneau and Meyer, 2002). This probably began to be recognised objectively when the first inventory measuring neurotic tendencies within the military was first used. This came about with Woodworth's (1917) Personal Data Sheet developed during the first world war to assess the ability of soldiers to cope with military stresses. With regard to the Five Factor Model (for related research findings centring on the FFM see also Chapter 2, section 2.5 and 2.6 and Chapter 3 section 3.3), Extraversion has been shown to be linked to situations in general contexts where power and energy play an important role (Ten Berge and De Raad, 1999). Clearly, these would include those situations in which leaders operate. Evidence has also been put forward to indicate that neurotic individuals are less likely to be perceived as leaders (Hogan, R., et al 1994) and that creativity, which is strongly linked to Openness, is also linked to effective leadership (Sosik, Kahai and Avolio, 1998). Thus people scoring highly on Openness, may be more likely to emerge as effective leaders. The Need for Affiliation, which, it is suggested, may be an indicator of Agreeableness, has been found to be negatively related to leadership (Yukl, 1998). This is explained by Cooperativeness tending to be related to leadership (Bass, 1990) and altruism,

tact and sensitivity, characteristic of an agreeable personality, suggesting that leaders tend to be more agreeable. However, agreeable individuals tend to be modest (Goldberg, 1990), but leaders tend not to be excessively modest (Bass,1990). Also, modesty tends to be a part of Extraversion, though many scholars consider Need for Affiliation to be an indicator of Agreeableness, suggesting this is negatively related to leadership. The possible link between Agreeableness, and leadership may thus be ambiguous (Judge, Bono, Ilies, and Gerhart 2002).

Research undertaken on potential US Navy Midshipman using the Hogan Personality Inventory (Johnson, Lall, Holmes, Kimberley, Brinkmeyer, and Yatko,1999) found significant differences between those who subsequently undertook Naval training and their non-military counterparts. The Midshipman group displayed higher levels of ambition (initiative, competitiveness, leadership potential), sociability (extraversion, gregariousness, and need for social interaction), intellectance (imagination, creativity, and curiosity) and school success (interest and commitment to learning and education). They scored generally lower in adjustment (confidence, self esteem, and composure) likeability (warmth, charm, and relationship maintenance), and prudence (responsibility, self-control, and conscientiousness).

In a study to examine cognitive and personality predictors using a sample (1143 participants) who were to become West Point Cadets, Bartone, Snook and Tremble (2002) found that both these variables predicted leadership performance 3 to 4 years later when the participants became West Point Cadets. Results for the NEO –PI which was used to measure the Big Five Personality factors found that

Neuroticism and Openness did not correlate with leadership performance, though Conscientiousness and Agreeableness did. Extraversion did not predict leadership performance, but this, Bartone et al argued, might be a result of a function of substantial multicollinearity between Extraversion and Conscientiousness ($r = .47$, $p < .001$). Vickers (1995) further noted that the apparent association between Extraversion and leadership effectiveness in the literature probably stemmed from the assertiveness and activity sub factors since the sociability aspects of Extraversion had been found to be negatively related to leadership effectiveness in previous studies undertaken within the military.

6.6.1 Leadership - The Army Perspective

There are characteristics of military organisations, such as a rigid chain of command, which do not exist in many other organisational settings (Attwater and Yammarino 1993, p.664). The Army is a highly structured, systems-oriented organisation, heavily dependent upon interlocking, mutually dependent elements working together in an orchestrated fashion. Few of those recruited into the organisation, if any, have the practical skills required of either Army officers or soldiers on entry. The Army thus aims to develop these skills amongst those undergoing officer training at RMAS, and recruit training at ATRs, with a highly prescriptive common direction, outcome and philosophy. Indeed, Army Defence Publication "Soldiering" (MOD, 2000 p 3-13) states that: *"all British soldiers have the capacity for leadership*" and thus even at the early stage of recruit training, the culture of leadership is being instilled, though it is very much "self-leadership" and "followership" that are the priority at this formative stage of a soldier's career.

However, if personality is a significant determinant of effective leadership then a

purely developmental focus will not on its own contribute sufficiently to building an organisation's leadership capability (Hogan and Hogan, 2001). This implies that any approach to building leadership capability needs to be underpinned by rigorous and effective selection procedures. Nevertheless, whilst formal leadership training is provided for JNCOs and above, the soldier sample in Study 1 (see Chapter 4, Section 4.2) was also subject to the first seeds of leadership training in ATRs, forming a platform upon which those selected for promotion to JNCO would build. The emphasis on this aspect of training requires universal organisational provision to support the development of individuals, however. The next section summarises these provisions.

6.6.2 Systems and Procedures in Support of Leadership Development

Those being specifically trained in leadership, i.e. officer cadets at RMAS, are provided with prescriptive frameworks and regulations to guide the development of their leadership skills and performance output. For example, the Tactical Aide Memoire (TAM) provides a step by step guide for field commanders on Operations which a cadet will use at RMAS and continue to use in initial and subsequent command appointments. For more non-operational management-oriented leadership skills,(e.g. Personnel Management, Problem Solving, Self-Development etc) the Leadership and Management Pamphlet developed and maintained at RMAS (Soldier Management Handbook, 2004) provides prescriptive procedures to guide cadets and young commanders with detailed strategies in the application of these activities. Cadets may refer to well tried, constantly updated methodologies and use as reference "those who have gone before" for guidance. This is facilitated at RMAS by qualified and experienced instructors. Leadership

development therefore operates in a highly systemised context. Likewise within the RMAS training context, systems and procedures dominate; a rehearsed, formulaic approach is used to produce the required outcomes. In the job scenario, this is essential; the personality of the leader and how that impacts, whilst critical to success on Operations, remains subordinate at most levels to the "corporate" plan of how the battle will be fought, how the troops will be prepared and how, therefore, the organisation is run.

6.6.3 Leadership Development in the Army

The systems and procedures described at 6.6.2 above might be interpreted as the Army officer's "management" part of leadership performance, though they are often inextricably linked in the overall assessment of "leadership" (see Chapter 4, section 4.3.11). Discerning what constitutes "real" "leadership" attributes and what is a faithful regurgitation of well practised procedures (i.e. "management", see section 6.3.1), can be often difficult. To illustrate this point, a scenario, familiar to many Army officers under training or recently trained, might be considered. In order to undertake a Section[1] attack, the most basic formation based attack, a template for every aspect of procedure, from reconnaissance through delivery of orders to reorganisation after completing the attack, is documented in the Tactical Aide Memoire. This forms the basis of many other aspects of training, and is deeply familiar to all platoon commanders, platoon second in commands (platoon sergeants) and section commanders. Adherence to the procedures laid down in theory provide the section commander with the means to execute a successful

attack on an enemy position. However, not all section attacks are successfully executed; some simply result in high casualties, others do not achieve their objective, and some simply falter in mid stream, often with chaotic implications. Failures like this are usually attributed to the platoon leader. The platoon leader, however, may have diligently and accurately followed the procedures; the plan may be immaculately conceived and comprehensively understood by those undertaking it. There may be no obvious mitigating circumstances. Even when the platoon leader has responded appropriately, perhaps to seeing previously unidentified enemy positions adjacent to the defined objective, which may have tipped the balance towards the defender's advantage, and has changed his plan accordingly - and yet the attack still fails. So why do attacks like this fail and why does the responsibility lie with the platoon leader ? Why in such an instance is this regarded as a failure of leadership ? In reality the cause of failure is usually attributed to the leader who has been unable to bring his or her will to bear on all those under command to execute the attack successfully. The platoon leader has been unable to get the team to perform beyond what they might normally be capable of; he or she has failed to instil complete and utter belief in those under command *in themselves*, so that they will simply not fail, regardless of changing circumstances. This is regarded as a personal failure of leadership, because the procedures can be learnt, taught, assessed, practiced, and repeated until they are instinctively executed. What cannot be taught - except perhaps the behaviours which reflect them - are the attitudes, motivational factors, need for achievement, ruthlessness, personal impact, use of unique interpersonal skills, use of internalised psychological characteristics and combinations of them, that bring the

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[1] Normally, a section consists of about 8 men, 3 sections make up a platoon, and usually 3 platoons make up a company. A section is usually regarded as the smallest formation for

will of the leader to bear on the "followers". These phenomena are products of the personality of the leader in the Army context.

Thus the classic tale of individual officers and NCOs being awarded medals for leading "textbook" operations always begs the question: *to what extent was this a manifestation of leadership attributes or "obedience" to a set of learnt and well executed systems and procedures (management)?* Whatever the answer, it is likely that both aspects contribute to produce the outcome, it is a question of, *in what proportion*? The "learnt and well executed systems and procedures" underpinned many of the outcome criteria examined in Study 2 (see Chapter 4 section 4.3) such as for example, the Range Management Qualification, Signals, and other assessed military training. However, as previously stated, (see Chapter 4, section 4.3) if it is accepted that personality is likely to have more influence over leadership attributes, then an independent variable based on defined "leadership attributes", it is hypothesised, would likely have a stronger relationship with any outcome from personality assessment, hence the need to use outcome criteria which mirror accurately these appropriate attributes. In addition, when personal leadership attributes rise to the top of the "essential" ingredients list in an Operational scenario such as the one described above in the section attack, i.e. when the leader is required to exhort the follower beyond their usual expected limits of performance, then these attributes, be they skills, traits, attitudes or propensities, tend to blend indistinctly with those that might be demonstrated by leaders from many other organisations; professional "expertise" in a given area, together with "personal attributes" are broadly common to leaders, regardless of their vocation or job (see section 6.4 above).

This two aspect model has been acknowledged in the latest attempt to bring broad coherence and compliance within the Defence community on what constitutes leadership. Identified are.... "Two themes, one developed from practitioner-philosophers, which has a military base and which looked at *what makes a good leader*, and the second, pioneered by psychologists, sociologists, management and political scientists, and historians, sought to address not just *what a leader does*, but *why it is done* and *how it works*." (Leadership in Defence, MOD, 2003) Thus at one level the training at RMAS seeks to identify and develop the aspects which can be recognised as *common to good leaders* (attributes) from the first theme, and, at another level, address *what a leader does*, and the *why and the how*. The second level is well developed at RMAS in terms of the training content and, to an extent, moderately well assessed via the Queens Medal data (see Chapter 3, section 3.3), together with some subjective judgements on performance from instructors, though these are based on their own individual experiences and are provided for cadets to improve their performance. Unfortunately, this data does not form into a universal, composite, single score for leadership performance. So, if the question were asked *what is the score for a cadet on his or her leadership performance ?*, then the answer would be, perhaps, he or she is a good/average/poor character and will make a good/average/poor Army officer, with the possible addition that he or she is an good/average/poor marksman, and has passed certain military tests, or gained certain qualifications such as the Range Management Qualification (RMQ). Consideration of these responses suggests that they only go part way to answer the question, and the most important aspect, i.e. that of their ability or suitability to lead, is perhaps not answered.

6.6.4 Summary Leadership – The Army Perspective

The Army has strongly embedded systems and procedures upon which leaders may draw and which are universally well understood within the organisation. Assessing performance against these criteria is straightforward and well developed, though systematically measuring non-managerial aspects, or "real" leadership may be less so. Whilst there is no school of leadership which provides a modem philosophical tradition for assessing standards of leadership, RMAS might be regarded as a place where one should be highly developed, and indeed may exist, though it is either undocumented or unrecorded. For comparison, the perceptions of leadership within the Metropolitan Police Service is now considered.

6.6.5 Leadership – A Metropolitan Police Service Perspective

The focus of the remainder of this thesis is on leadership in the Army and the Metropolitan Police Service, and in particular, relationships with the leadership criterion and personality traits. The findings from Study 2 (see Chapter 4, section 4.3) illustrated the importance of context dependence on any assessment of both leadership and personality. To examine the extent to which any findings might be generalisable, there is a need to replicate the research with a further set of participants from another uniformed organisation. The recruits of the Metropolitan Police Service as participants provided the data for this comparison.

6.6.6 Leadership Development in the Metropolitan Police Service

The training of police recruits at the Police College Hendon in leadership follows an underpinning philosophy which might be described as a "reactive strategy". As a result, the emphasis is on practising policing tasks in a realistic scenario (currently based on a "virtual community scenario"). These policing tasks are assessed throughout the course (See also Chapter 3, section 3.4). Organisation of the training classes means that whilst 24 hour connectivity with instructors does not take place as it does at RMAS, the relatively less formal and less detached relationship between instructors and recruits, together with smaller class sizes than those at RMAS, means that police instructors are likely to have a greater awareness of their students' abilities than their opposite numbers at RMAS. At RMAS, a greater degree of detachment by instructors from the officer cadets means that they would probably be less aware of the abilities of those under instruction. If they are less detached, then it is open to question whether they are less objective or not. However, for officer cadets at RMAS, formal procedures, a 24 hr 7 day a week regime, and a highly structured environment might well compensate for any shortfalls in this connectivity between Army instructors of their cadets. The background to these aspects in the Metropolitan Police Service context is examined below.

6.6.7 Leadership Culture in the Metropolitan Police Service

In the Metropolitan Police, leadership tends to be much more independent of the systems that seek to structure police officer's activities than in the Armed Forces. In the police, leadership tends to be regarded as characterised by being heavily "personality" dependent and highly "reactive" to events (HMIC Report: Modernising the Service, 2004). This has given rise to expressions of concern over effectiveness of leadership within the Police (indeed "..there has been considerable debate regarding the quality of leadership in the service.." HMIC Report 2004, p.124). This may be deeply rooted within the police organisational configuration; Police officers are recruited without any selection for leadership capability or potential (See Chapter 3, section 3.4); they tend to operate autonomously and often independently; a Police officer on street duties cannot "plan" in fine detail for an unforeseen event or incident; Police officers operate in a highly unpredictable environment. Only when an incident or event has developed is a more formal "leadership/management procedure" required of the Police officer. Given the unique nature of each event there is little possibility of the execution of pre-planned, learned leadership or management procedures. However, learnt procedures may be applied in support of post incident management. This is at variance to the leadership scenario in a Military context. Once an incident happens, the Police officer on street duties is the leader on the scene. Imagine an accident in the street, the first on the scene from the emergency services is almost always a Police officer. At this point, he or she takes command of all other emergency services, people in the immediate vicinity, and the area within which the incident occurs. The Police officer remains the leader well after an incident has occurred – even to the extent of not handing over command to senior Police officers until well after post incident management procedures have been activated. The Police officer will be responsible for leading

members of the public, fire service, ambulance service - usually people he or she has never met or seen before. When compared to the Military scenario, where men and women will have trained together on common, mutually understood systems and procedures from the outset, the Police officer exercises his or her leadership in a highly unstructured environment, relying heavily on experience gained and instinct, without the benefit of previously learnt procedures. The Military officer operates in a much more structured framework. There are some interesting ramifications of these differences in an organisational context. The systematic, procedural leadership characterised by that seen in the Army lends itself to functioning at successively higher levels within an organisation. However, the leadership style developed as a Police officer on the streets does not have the same applicability or functionality at higher levels in the Police organisational structure. Once that Police officer reaches higher levels within the organisational hierarchy, there is a demand for more systematic and "organisationally mindful" strategies for successful leadership and management. The Police may therefore operate in an environment with reduced adherence to laid down and highly prescriptive procedure when compared to the Military. These issues are explored in more detail in Chapter 7.

6.6.8 Summary - The Metropolitan Police Service Perspective

The Metropolitan Police Service differs significantly in its view of leadership from the Army but both organisations perceive the role that personality plays in leadership as being important in defining individual performance. However, leadership is seen as less organisationally focussed in the Police than in the Army. It is viewed as being located within the domain of the individual who is expected to

react to situations by leading. In the absence of selection for leadership ability, leadership development provides the only means to produce the organisation's leaders, though formal assessment of leadership is not undertaken in training.

6.7 Summary - Contextualising Leadership and Personality

In summary, firstly, the construct of leadership is ambiguous, research appears to be heavily context specific and there are many views about what constitutes leadership and what constitutes management. Research into the relationship of personality and leadership tends to be biased towards business and corporate needs, where almost exclusively, leadership assessment is focussed on success, or otherwise, as measured against corporate or business criteria. However, links between leadership and personality have been shown to exist, particularly by research undertaken with military personnel (See section 6.6 above) though there is a general lack of consistency of relationships between the personality factors and leadership performance criteria. There are differences in interpretation of the leadership and management constructs between organisations; the Army has strongly embedded systems and procedures upon which leaders may draw and which are universally well understood. Leadership in the Metropolitan Police Service is seen as less organisationally focussed, with less emphasis on systems and procedures; leadership in this organisation is vested heavily within the domain of the individual Police officer.

Having examined leadership theory, the relationship of leadership and personality in the broader context, and the perspectives of leadership and personality in the contexts of the two organisations, the next stage is to examine the perspectives of

those instructors responsible for training the two organisations' future leaders to see what informs their real evaluations of individual leadership potential and personality factors. Chapter 7 goes on to examine the views of two groups of instructors from the Army and the Police.

Chapter 7

The Instructors' Perspective of Leadership

7.1 Introduction

Chapter 6 examined leadership theories and looked at how leadership is inculcated, perceived and practiced at an organisational level in the Army and the Metropolitan Police. This chapter aims to examine leadership from the perspective of those individuals within the organisations who are concerned with training and developing the next generation of leaders. Members of this cohort will provide the rating of individuals against the leadership traits for Studies 4 and 5. The purpose of this investigation, therefore was to examine the views and perceptions of the instructors responsible for the assessment of those undergoing leadership training in the uniformed organisations from which the quantative data will be drawn.

Interviews were undertaken to gain insight into instructors' perspectives of leadership to establish how those embedded in the organisation interpret the meaning, position and priority of leadership as part of the organisational culture, and also see how the construct of personality was viewed in this context. This investigation also aimed to assess the subjective factors which guide the raters, to see how objectively the raters would rate individuals on the traits, and to identify possible sources of variation which might go to explain quantitative variations between the ratings produced by the instructor and recruit raters in the later

studies. From this, it was aimed to gain some qualitative pointers that might indicate the level of consistency that might be achieved in terms of showing how organisational perspectives affect the data gathered.

7.2 Sample

Two groups, totalling twelve participants, six from each of RMAS and the Peel Centre, Hendon were interviewed. From the Army, six RMAS instructors, three platoon commanders (at the rank of Captain) and three platoon second in commands (at the rank of Colour Sergeant, and Senior Non Commissioned Officers) were interviewed. The Platoon Commanders' length of service was on average 7 years, and the Colour Sergeants', between 10 and 14 years. From the Metropolitan Police, six class instructors, who ranged in rank from Police Constable to Police Sergeant were interviewed. From the second group, all were experienced police officers with lengths of service between 12 and 23 years.

Firstly, an unstructured interview was undertaken to identify topics and themes that were likely to arise. This was carried out on the first of the interviews with an instructor at RMAS. The participant was asked to express personal views, thoughts and ideas on leadership, personality, training of leaders, the represented organisational views as they were perceived by the participant, and any experiences upon which the expressed views thoughts and ideas were based. This information was then used to construct a structured interview schedule shown at Table 7.1 overleaf:

	Question	Supplementary Question
1	How is the concept of leadership perceived by the organisation within which you work?	What is the organisations view of leadership?
2	How do you as a trainer perceive leadership and personality ?	Do you think leadership performance is dependent on the personality of the individual ?
3	How is leadership training delivered in your organisation ?	Are trainees provided specifically with leadership training ?
4	How is leadership performance assessed in your organisation?	Do you formally assess leadership performance ?
5	Are you confident that you can assess leadership performance efficiently and effectively ?	How do you assess leadership performance in training ? Who are best equipped to assess leadership traits, peers or supervisors?

Table 7.1 Training Instructors Interview Schedule

The schedule thus used was preceded by a short exposition on the purpose of the research and confidentiality, followed by a question designed to elicit the background and experience of the interviewee. The interviews were brought to a close by asking for any further relevant information the interviewee felt they wished to raise, and then they were thanked and complimented on their input.

Having collected the data by audiotape recorder, the interviews were then transcribed in full, and emerging themes identified. The themes were based on the responses from the interviewees, and categorised under the themes referred to in Chapter 6, sections 6.6 and 6.7. The themes and supporting evidence were then coded.

7.3 Findings and Discussion

Five themes emerged from the data with the first and main theme focussing on organisational culture. The other themes that emerged covered inherent versus developmental aspects of leadership; interpretation and application of leadership in an organisational context; assessing leadership performance, and the contribution of personality to leadership performance.

A summary of themes giving examples of data gathered is shown at table 7.2.(see overleaf p. 169. Codings are shown in the text in brackets and refer to table 7.2).

TEXT BOUND INTO THE SPINE

Table 7.2 Themes Arising From Interviews with Instructors

Theme	Army	Evidence	Police	Evidence
Organisational Culture	A.1.a.Perceived as highly vocational, different than leadership seen in other organisations. Strong leadership culture, systematic/dynamic leadership procedures and practices.	A.1.1 "....for us in a military environment that's different from, perhaps, what you might find in other civilian organisations, because it's very easy for them to step at 5 o clock in the afternoon and say, " that's it. There's no longer a requirement for you to lead anymore".. but true leadership , I think, it doesn't stop – it has to flow into all aspects of life not just what you do from 9 to 5.." (Platoon Colour Sergeant, RMAS)	P.1.a. Leadership seen as an emerging understanding	P.1.1 "Just in a PC rank, it has not affected me a great deal, I am a leader here due to the role that I am carrying out, but in relation to the OSPRE (national selection exams to Sergeant), obviously leadership is seen as one of the leading criteria in promotion terms and generally. *(PC Class Instructor, Hendon)*
			P.1.b. Leadership associated with roles, at each level a different understanding of what it means	P.1.2 "I don't think people naturally think of themselves (as leaders), I'm a PC, I'll just be led, I don't think they realise that .....especially with the job that we do, that as they act as police officers, then they are leading because they are having to make decisions and obviously the powers being what they are, you know, I think they are leaders but I think people think 'Oh it's the next rank telling me what to do'. (PC Class Instructor, Hendon)
	A.1.b Leadership a primary function	A.1.2 "..the ultimate thing at Sandhurst is for me to be happy that these cadets can walk up those steps [1] and they understand what their job is, and what the role of a leader is, and how they can develop themselves.." (Platoon Colour Sergeant, RMAS)	P.1.c. Leadership is seen as a group process, and not an individual responsibility	P.1.3 " Leadership, I think that the quality of your leadership ultimately is also going to be very dependent on the people that you are leading, so whether you are good, bad or indifferent it is the people you are leading who will play a major part in your effectiveness as a leader as well." (Police Sergeant Class Instructor, Hendon)
	A.1.c. Everyone's responsibility regardless of position in organisation	A.1.3 "Leadership is such a vital thing..... what you don't realise is, I think, as a cadet, sometimes, is, actually, leadership is [exists] at all levels. And it is not just the officers who are leaders... and the majority of the time, you are not doing much leading at all.... it is your Sergeant who is doing it, or your Corporal is doing it, or your Lance Corporal ....and so leadership is vital and you realise it when you are [become] a junior officer" (Platoon Colour Sergeant, RMAS)	P.1.d. Core function driven by reaction of organisation to events	P.1.4 I think, because we are learning from Stephen Lawrence and there was a lack of leadership from senior managers - I think that has basically come down the chain now - and leadership is prioritised because there were some poor leaders and I don't think there was enough emphasis on it at the time. But that has changed because of that nightmare situation back then, and I sort of think now the organisation has learnt from that and feel that there was poor leadership and, therefore, we will prioritise that asap and that brought out, and it really is highlighted in qualities needed to make good supervisors and leaders. So there was a massive change after the Stephen Lawrence enquiry, and that is why the Met then reviewed leadership, I mean, it probably was there, but I do feel that there was a big drive around leadership after that. *(PC Class Instructor, Hendon)*
	A.1.d Belief and Confidence in leadership	A.1.4 [In comparing his experience of serving with the French Foreign Legion and a secondment to the US Military Academy, Westpoint] "...So, I don't know if we are necessarily the envy of the world, we all probably like to think we are, but I certainly think we have got "leadership". (Platoon Commander, RMAS)	P.1.e High priority, no robust systems and infrastructure to implement leadership	P.1.5 " I think at this moment in time we really are struggling with the leadership principles but I think we have changed, and this again is my opinion, but we have turned into a two tier corporation with big board members and different people in different roles..., and I agree, in the Service, that this a concern to lots of people." *(PC Class Instructor, Hendon)*
				P.1.6 "They have been banging on a lot about leadership lately, they have sent out forms with what each leader is expected to be competent in ...leadership, ... there was one for each rank so every particular rank got one of those..". *(Police Sergeant Instructor, Hendon)*
			P.1.f. Leadership perceived as different from that within other organisations	P.1.7 "this guy in particular... he was re-coursed through welfare, and when I did eventually read his profile, we found that he was an ex-Army Captain and had been through Sandhurst, and suddenly everything he was doing made more sense, he was just so used to leadership..!" (Police Sergeant Class Instructor, Hendon) (PC Class Instructor, Hendon)
			P.1.g Police Officers do not have an implicit requirement for leadership	P.1.8 "... our main aim is to make people effective police officers, learn the Criminal Law procedures, so they can go out and do the job and obviously, with that within 18 weeks, it is quite tough to get through, so it's a case of individual priorities, it would be great if we could put it [leadership]in the course, but that would mean extending the course and that is not possible. (PC Class Instructor, Hendon)
			P.1.h. Leadership not formally taught	P.1.9 ....we do a few [exercises], mainly we have one exercise at the beginning of the course, and we play treasure seeking games, and that is very interesting ..... I mean, I have done it four times now,...oh, and that's a leadership team building game. I have done it once where we put predominantly who we perceive as the weaker candidates in one group, and put the strongest characters in the other group ..So then we mix the groups then [do it] again ....that is the only leadership assessment that we do. (PC Class Instructor, Hendon)
			P.1.i. Leadership not formally assessed	P.1.10 I would like to see, perhaps, even in a Test Area[3], that there was something, like leadership-wise, to get out of it, so that we can turn people out [who don't meet leadership standards]. (PC Class Instructor, Hendon)

[1] This refers to the final part of the Passing Out Parade on the Old College Parade Square at the end of each course where cadets "rite of passage" from Cadet to Commissioned Officer is recognised at the point at which they march off the square up the steps of Old College.

[3] Modular progressive test delivered throughout the course

Leadership: innate vs developmental	A.2.a. Leaders are selected on innate characteristics, then personal qualities developed	A.2.1. Most people come here with a foundation of leadership, because if they didn't have it, they wouldn't be here...they wouldn't be selected by the Regular Commissions Board, and be judged to be suitable for further training. And I think if they haven't got that, we can t really re-programme them, they have to come here with something – which is innate, which we can build on, and build a framework and give them a foundation of leadership which they can then build upon with their personality... " (Platoon Commander, RMAS)	P.2.a.Leaders have innate characteristics, then personal qualities developed	P.2.1".....you get some people, where others might be quite shy and strained, there are people who naturally just come to the fore". (PC Class Instructor, Hendon)
	A.2.b. Training facilitates development of leadership styles	A.2.2."Unless they have the practical chance to try out their leadership [abilities] then they won't be successful" (Colour Sergeant Instructor, RMAS)	P.2.b.Training needed for development of leadership when in role	P.2.2. "..... I think as PCs you are not really given much training in leadership because it is only when you want to go up to the next stage the rank of Sergeant and above, that is when you are predominantly tested in leadership. As a PC you would not get that training." (PC Class Instructor, Hendon)
The interpretation and application of leadership in an organisational context	A.3.a. Moral vs Physical Leadership	A.3.1 "I think you have to separate leadership into moral leadership and physical leadership. I think the two are quite distinct, but intertwined .I think that part of the emphasis which we teach here, perhaps weighs more towards the physical aspects of leadership...in terms of getting people to do something..". (Platoon Commander, RMAS) A.3.2 "..because we have a focus on physical leadership, because this is what we do, and with that, you know, being able to impress your personality on an individual, getting him to do something that he, perhaps might not want to do. I think really, that's the emphasis here, but it's much more difficult here to put the emphasis on the moral leadership because there no real way of teaching it ..." (Platoon Colour Sergeant, RMAS) (Platoon Commander, RMAS)		
	A.3.b. Moral Leadership a personality (Integrity) issue	A.3.3"..Aspects of it [moral leadership] you can pull out from the list of the qualities of a leader .integrity is a big one, compassion I suppose, and possibly more important, selflessness... giving you rime to your subordinates.... It requires you to take the reins and lead from perhaps a pastoral and moral aspect""		
	A.3.c. Leadership vs Management: differentiation	A.3.4."What they did quite recently on a new [cadet].. course was... .they have taken out all their arms drill [3] and they have replaced it with management training.. what they are doing is saying "What we need to do is give them a base understanding of management ".. because it is different than leadership ..but it is something they need to do, and it often interacts and overlaps.... we are therefore teaching basic management skills... " (Platoon Colour Sergeant, RMAS)	P.3.a. Leadership vs Management	P.3.1" I do have quite definite ideas on leadership, I see that there are two versions, there is management and there is leadership, and they are not necessarily one and the same thing." (Police Sergeant Class Instructor, Hendon)
Assessing leadership performance	A.4.a. Strong and weak leaders can be identified, middle ranking performers are difficult to rate	A.4.1" I could probably put the ones at the top third, middle third and bottom third but I wouldn't say I could put them one to 28 or 1 to 27 because it would be unfair on a few who are about the same, ..." (Platoon Commander, RMAS)	P.4.a. Strong and weak leaders can be identified, middle ranking performers cannot	P4.1. "... I don't think we get to know them that well... we get to know the very very good and the very very bad but the ones in the middle, we don't because of the size of classes, there are a lot of places to hide, and as long as they don't show out in terms of failing .....because most of your attention is directed at those having difficulty." (PC Class Instructor, Hendon)
	A.4.b. System for training of leadership which is standardised and understood	A.4.2"On a particular job [platoon appointment on a platoon task] ...Platoon Commander in defence operations, or on a platoon attack...there is some element of assessment that will measure how well they have completed the task in terms of leadership. Off the top of my head, they are assessed on the ability to plan, keep their unit formed, their ability to take in information, and, aside from the welfare aspect, whether they are keeping their eye not only on the task, but on the team... (Platoon Commander, RMAS)		P.4.2. " No, probably I could pick 5 or 6 or 7 of the good ones. Bad ones? Yes 5 or 6 at the bottom. There is a gap in every class we call the "grey people" and you get to know the "nightmares" ..... because they always come to your notice, and you get to know the ones that shine, because again they come to notice for the right reasons... but there is a huge swathe there, bearing in mind they're here 18 weeks, and the grey people - you won't even know their name by the end of 18 weeks, which is a bit embarrassing, bearing in mind that we have got two classes both with 36 people. 20 of those, probably, if you bumped into them in the corridor, you probably wouldn't realise - crumbs - they are in my class!" (PC Class Instructor, Hendon).
	A.4.c. System for assessment of leadership which is understood	A.4.3 "They are graded A to D with A being with the guy who is absolutely outstanding, the middle grade being a B pretty much average, C being "we are going to have to watch this person he may need some extra help, or perhaps a little more time to enhance his leadership ability, and D being this guy is a bit worrying and he needs a lot more time or he needs to be elsewhere. The majority will come in within B, and at this stage there will be the odd B+".		P.4.3 "... in my class there was about three of us, I'd say, two of us went on to be class captain, and the other one was ahead of the game....everyone else was willing to sit there and not do anything.." (PC Class Instructor, Hendon)

[3] A considerable amount of time on the Cadet Course was spent practising rifle drill which, after passing out from RMAS, an officer would never use again. More robust management of training content has now begun to rectify this and similar training irrelevancies.

			(Colour Sergeant Instructor, RMAS)		
Contribution of personality to leadership performance	A.5.a. Personality – Extraversion, Impact, and Command Presence	A.5.1."I suppose much of the first impression is a lot about personality ...and if someone has got quite a large character, then they are going to stick in you mind.....and there may just be as an exceptional leader as the guy who has got a great buoyant personality and character, but just has a different way of doing it. " (Platoon Commander, RMAS) A.5.2. "One of the great "cries" that comes up quite a lot in a leadership assessment form "Officer Cadet X lacks impact when in command",.. and you can put it down to a number of things: he "lacks confidence in his ability to lead" or "in his ability to do the job he has been asked to do.." (Platoon Commander, RMAS) A.5.3. "It is difficult to force someone to change their personality and I think, and we do get people coming through who are just quiet by nature, but that doesn't make them necessarily a bad leader. ... I don't think you can physically change someone's personality." (Platoon Commander, RMAS) A.5.4. "Some of them have got a command presence and people will do things for them straightaway because of the way they go about things". (Platoon Colour Sergeant, RMAS) A.5.5. "To be honest, I am not too sure, but with him, he is quite quiet in himself as well. And so, okay he'll talk - but he is quiet with it- when he is being spoken to. Okay you can have a presence if you are quiet, but, to be honest, I couldn't put my finger on it because he doesn't project any personality". (Platoon Colour Sergeant, RMAS)	P.5.a. Personality contributes a significant part of leadership P.5.b Leadership Style derived from personality P.5.c Extraversion/Introversion	P.5.1. "I think they [personality and leadership] are interwoven without doubt ... personality is important and the leaders haven't had to be one specific personality." P.5.2 "... someone's personality is going to be a very integral part of how they actually choose to lead. Without a doubt" P.5.3 "There are different styles of leadership which are equally effective I would suggest, and it is about how you get to motivate your team if you aim to work most effectively. " (Sergeant Class Instructor, Hendon) P.5.4 ".. they don't have to be the brash outspoken person, they don't have to be someone that is always pushing themselves forward.
	A.5.b. Leadership style derived from Personality	A.5.6. "I don't want to change their characters and personalities, I just want to develop them because everyone is different, everyone has their own style of leadership..." (Platoon Commander, RMAS) A.5.7. "You identify the fact that everybody is different and everyone has a different personality and background, and everyone has the same values.... and yet everyone has a version of those values as well. You have your own Army values which you stand by, there is no point in being here if you don't .." (Platoon Commander, RMAS) ."So it is important firstly for the cadets to understand what their own personality is like....[we say to the cadets] it is really now up to you to try to develop the link through your personality as to how you are going to make a leader" (Platoon Commander, RMAS) "I don't think you can have a "best" personality. I think you have got to go with your own. It is pointless coming here and trying to act the way that somebody sees an officer to be. If you do that, then you can't keep it up, you can't keep the job up, you can't keep the acting up for the rest of your Army career; you have got come here and be yourself". (Platoon Commander, RMAS)		

ble 7.2 Interview Results, themes and evidence

7.3.1 Organisational Culture

The most striking and universal view from the RMAS interviews was that being a leader in the Army, either as a Non Commissioned Officer or an Officer, was perceived as a "vocation" (A.1.a) which went well beyond what such people *do*, but much more reflected what they *are*. It was seen as a primary function (A.1.b) and overriding priority and as a functional activity in itself (A.1.b) (A.1.2). This was exemplified in the expression of "dedication" and "commitment" to their output of well developed leaders (graduating RMAS Cadets) ready to take up their posts in the Field Army (A.1.b). The RMAS instructors expressed the idea that they were prepared to make any amount of personal sacrifice to achieve these ends (A.1.c) (A.1.1). There was a strong common understanding of what leadership meant, and the emphasis on leadership as a "service" (serving those who are under command) tended to be a commonly articulated view. This concept of *service* also emphasised the privileged position those in authority within the organisation hold and the moral responsibility (integrity, trustworthiness etc) was regarded as a very important aspect. There was the suggestion of a strong leadership culture in this training regime, and, indeed, the organisation as a whole. The perceptions of both officer instructors and colour sergeant instructors was similar; that leadership was everyone's responsibility in the organisation (A.1.b)(A.1.3). They also expressed the belief that leadership was something the Army was very good at. Leadership above all else, was something that, when other things might be less than efficient or effective, was regarded as one area where those in the Army could be confident of efficiency and effectiveness A.1.d) (A.1.4).

The organisational perspective expounded by the Metropolitan Police instructors interviewed differed from that of the Army. The range of views expressed was greater and more varied then those expressed by the Army interviewees (9 sub themes from the Metropolitan Police as opposed to 4 from the Army instructors). Whilst the Metropolitan Police instructors saw leadership as a priority, they tended to view it conceptually as the preserve of rank, or role (P.1.e) (P.1.1, P.1.2) and that leadership was an issue because of variously reported and documented criticisms in the media (P.1.a, P.1.d) (P.1.4) [1]. The Police interviewees were all familiar with these issues, though the connection between identified leadership challenges and how they might be addressed was not expressed. The Police interviewees viewed leadership as very important. Those interviewed indicated that they were well aware that the organisation was making efforts to rectify it's shortcomings in this area (P.1.e) (P.1.6), though they were unsure what their role, or indeed the role of the training regime, was supposed to play (P.1.h;P.1.i).

Indeed, the "culture" of leadership appears to receive less emphasis in the Police than in the Army (P.1.f) (P.1.7). The issue seemed to be that whereas the culture of leadership starts at selection in the Army (A.2.1), at the base of the hierarchy, there is no infrastructure to support a similar core function in the Police[2]. Police

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[1] It should be borne in mind that Police recruits are not selected on any leadership criteria per se, and, indeed, it is anachronistic that, unlike most police forces in the world (though no different from any other in the UK) the Metropolitan Police operate a "single entry" system. Indeed, this has been recently identified as a possible source of organisational failing. It is felt that this organisational artefact may have contributed to the concern over leadership in the organisation highlighted by the criticisms laid on the Metropolitan Police following the death of Stephen Lawrence and the subsequent MacPherson Report (1993). A recent Home Officer Report (2004) advocated.." a fundamental review of concepts such as the single point of entry into the service, the thirty year police career and the non-transferability of training, skills and qualifications" (page 18).

[2] The British Army recruits soldiers and officers, i.e. recruiting at non-management and management level. This is reflected in most police forces throughout the world. Some Armies (e.g. the French Army) and many police forces recruit at 3 levels, which equates to police officer, supervisory grades (Sergeant equivalent) and Senior management (Inspector and above). See also Chapter 3, section 3.5.

instructors clearly recognised their organisation's efforts to improve leadership (P.1.e) (P.1.5). They were aware that their organisation requires to change to fulfil leadership aspirations. However, their perception of the effectiveness of these efforts appeared ambivalent (P.1.i) (P.1.6).

The aspect of leadership responsibility existing at all levels of rank was shown to be strong in the Army leadership culture (A.1.c) (A.1.3). This was illustrated by the concept which prevails that whatever goes wrong, it is the leader who takes full responsibility. This does not appear to be reflected in the Metropolitan Police culture. Here, the perceived capabilities of those under command are sometimes seen as the cause of "failures in leadership" as leadership is viewed more as a group process, rather than an individual responsibility (P.1.c) (P.1.3). This, the Police instructors consider, reflects the much less pronounced emphasis on moral leadership standards and practices in their organisation when compared with that in the Army (P.1.f) (P.1.7).

The leadership culture in the Army is certainly not restricted to those who have rank, position or authority over others; everyone in the organisation has a leadership responsibility, it is just that the extent of that responsibility which is defined by rank or appointment (A.1.3). In the Police, leadership only becomes a factor at the point at which it appears as a responsibility of rank or role, and somehow a personal responsibility not dictated by the organisation, but driven by need (P.1.b) (P.1.1, P.2.2).

7.3.2 Innate vs Developmental Aspects of Leadership

The Army interviewees regarded those selected as a result of the Regular Commissions Board (RCB) to be people who had the necessary innate qualities in terms of leadership to become officers (A.2.a) (A.2.1). However, there was also a perceived need that traits displayed by individual cadets required development (A.2.b). It was felt that the cadets needed help to develop their practical leadership abilities, and leadership style (A.2.2) which was appropriate to each individual cadet's personality (A.5.5, A.5.6.), and also appropriate to the role of the officer as the Army defines it. It was recognised that an individual would require more development in the necessary Operational[3] Skills (referred to as "physical" leadership, (A.3.1, A.3.2), also see below) indicating the view that RMAS has a critical and exclusive role in the Army in producing the organisation's leaders.

7.3.3 The Interpretation and Application of Leadership in an Organisational Context

Reflecting the common understanding of what is meant by leadership in the Army, the Army interviewees described leadership as consisting of two components, the first, "moral" leadership and the second, "physical" leadership (A.3.a) (A.3.1, A.3.2). Moral leadership was seen as tending towards the behaviours associated with aspects which cannot be taught (A.3.2). This construct is also viewed as and more the preserve of officers. The "physical" leadership component (A.3.a) was derived from the type of training done in the field, operating on exercises in command appointments; e.g. commanding a platoon attack (see Ch 3).

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[3] Practical leadership skills required to command soldiers in various warfighting situations

Interestingly, no mention was made of the third element, the Intellectual component. This component, though strongly reflected in the RCB selection process (see Chapter 3, section 3.3) which is based on assessment of academic ability, exists independently at RMAS within dedicated academic course modules[4].

There have been a number of changes to RMAS cadet training recently to bring to the fore aspects of management training which have previously been either non-existent, or of low priority (A.3.c) (A.3.4). This may have generated some of the instructors' responses. Leadership training is perceived to work well because there are systematic processes for auditing and modifying training. Within RMAS Leadership and management training *can* be prioritised more highly than other training. This suggests the training delivered is highly accountable to the end user, even in an environment of constrained resources. These systems of review either do not operate efficiently, or do not exist in the Metropolitan Police, though both organisations are heavily constrained by resource provision. The perception of the Police instructors was rather contradictory. They appeared to recognise that leadership was important (P.1.e) (P.1.5), that it was a high priority (P.1.e) and it needed to be integral within the training (P.1.i). However, it was seen as a "subject" (P.1.8) which stood alone and did not form a part, or necessarily impinge upon, what they regarded as "professional" training, in the form of Criminal Law procedures etc. However, the concept of management being a different function to leadership was expressed by Police interviewees (P.3.a) (P.3.1), and whilst the

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[4] These modules tend to support more long term strategic aspects in leadership skills. This area is not the preserve of the instructors interviewed, as the instructors responsible for this training are predominantly academic, civilian lecturers, but who are subject matter experts. This group of instructors at RMAS do not have any overall direct responsibility for the development of individual cadets other than within the delivery of their subject matter.

specific differences were not articulated in detail, the idea that leadership was seen as a separate competence was made by some of the instructors (P.3.1).

7.3.4 Assessing Leadership Performance

Assessing leadership is seen as a difficult area in both the Army (A.4.a) (A.4.1) and the Metropolitan Police (P.4.a)(P.4.1). Assessing leadership skills in training is clearly problematic especially since frenetic, packed courses with poor student to instructor ratios prevail in many uniformed organisations, and the Police (P.4.1, P.4.2) and the Army (A.4.1,A.4.3) are not exceptional in this respect. Spotting good leaders and bad leaders appears to depend on identifying the exceptions (A.4.1,A.4.3). In the Army, the identification of leaders has already begun within the selection process at RCB (A.2.1). In the Metropolitan Police, the instructors saw it as their role not only to assess leadership capability, but identify leaders too, (P.4.3) though there is no formal requirement as selection on leadership criteria is not undertaken as part of their recruit selection process. The resource constraints which operate on both organisations result in a similar strategy employed by instructors of identifying "groups" in terms of leadership capability (A.4.1., P.4.2) All instructors expressed the ability to be able to broadly identify the top group of the cadets in terms of leadership performance, and be able to identify the bottom group of weaker candidates. All were unanimous in expressing some concern that those who were in the middle group (referred to as the "grey" people (P.4.2)), were extremely difficult to get to know much about (P.4.1), and rating them was difficult to do with a degree of accuracy. The grading employed at RMAS (but not available for scrutiny for this or any other study) suggested that breaking down the leadership skills into their more specific components was subjective (A.4.3). Those

interviewed were not able to list the criteria in full (A.4.3) and the observation that "the majority will come within B [grade]" suggests that this grading may not be a particularly reliable measure anyway.

The interviewees were asked which group, instructors or recruits/peers or both, might best assess the leadership traits that were likely to be used in the leadership trait rating scale then under development. Amongst the RMAS interviewees, traits were perceived as being more accurately and objectively assessed by instructors, though with some exceptions. For example, Personal Relations and Team Spirit was seen as being better rated by cadets (peers) than instructors. This was mirrored by the Police interviewees' responses, although the RMAS instructors showed a greater degree of consistency overall on this question than the Police instructors. The RMAS instructors interviewed tended to believe that, overall, not surprisingly, instructors would be better able to rate individuals on the leadership traits.

7.3.5 The Contribution of Personality to Leadership Performance

There was an acknowledgement that personality contributed to leadership performance from all interviewees (A.5.a, P.5.a) (A.5.1,P.5.1). From the Army, this tended to focus on one aspect, variously described as "command presence" (A.5.4), this is a defined "Leadership Quality" in a list of such items which exist in the Army Leadership and Management doctrine, ethos and training materials. This "command presence" tends to be regarded in many instances as "impact" (A.5.2). There was also reference to the perception that personality influenced the adoption of leadership style (A.5.6, P.5.2, P.5.3) appropriate to the individual's

personality (A.5.8). However, these seemed to be orientated specifically around the issue of individual's degree of displayed extraversion or introversion (A.5.a) (A.5.1, P.5.4).

7.4 Summary

This chapter has examined how instructors view leadership, and personality. The factors which may influence the perspective from which instructors will rate their subordinates on leadership performance has also been evidenced. The findings may also give indications of how accurately and consistently they would complete a trait based rating instrument. The interviews identified differences between the leadership cultures and practices in the two organisations. It can be concluded that the emphasis on leadership differs between the two organisations. The more systematic and focussed selection and training of Army officers and soldiers appears to facilitate a strong organisational culture which influences leadership culture, and vice versa. This shapes a conceptual framework which provides mutual understanding of what is expected of individuals with regard to leadership in the organisation. In the Metropolitan Police Service, leadership is more emergent in its nature, and reactive. This might be expected in a high profile, highly accountable Public Service.

There exist differences in the extent to which the two organisations support selection of those with a leadership propensity and the way they subsequently develop those with leadership potential within the two organisations. Both sets of interviewees broadly had a common understanding of the differences between management and leadership. They also expressed similar difficulties in identifying

and assessing leadership performance across the range of abilities within their students. However, the perception that personality was closely related to leadership performance was common to both sets of interviewees, though responses beyond broad reference to extraversion/introversion and individual's "presence" and "impact" was the extent to which the nature of personality was articulated.

The next chapter looks at how a rating scale for leadership was developed and how it was used as a criterion measure in conjunction with predictor data from the TSDI and existing selection processes. Army officer cadets and Police recruit participants provided the data sample. The strength of the predictor/criterion relationship was examined to see how it might be enhanced using a more appropriate and standardised criterion measure.

Chapter 8

Personality Assessment in Context - Using Leadership Ratings as Performance Criteria

8.1 Introduction

Following on from Study 3 using Rowallan Company cadets as participants (see Chapter 5) to examine the utility of the leadership criteria, a qualitative analysis of leadership in the organisational context (see Chapter 6) with examination of instructors perceptions (see Chapter 7), two further studies were then undertaken. These were designed to test whether or not there were any identifiable relationships between existing selection data, leadership trait ratings and personality assessment data derived from the participants using the TSDI. Firstly, a Leadership Trait Rating Scale which could be used to gather criterion data was identified for use and refined. Two further groups participated. The first, another group of Army Officer Cadets at RMAS (Study 4), and a second group, Police Officer Recruits from the Metropolitan Police Service (Study 5).

The cohorts for Studies 4 and 5 were subject to a modified methodology designed to address the findings from the previous studies. This involved the use of a Leadership Trait Rating Scale similar to that used in Study 3 as the criterion measure. This was needed as a result of the findings from Studies 1 and 2 (see Chapter 4) where it was seen that training performance measures were found to be less than adequate in reflecting the core aims of the training organisations. This arose because correlations of personality measures with predictors tended to

match findings from previous research and were generally weak (see Chapter 2). Selection tests and assessments were more likely to demonstrate the strongest relationship with predictors (see Chapter 3) when the instruments used were context specific. The aim of RMAS as a core function is to train Officer cadets in leadership, and it has been suggested that personality plays a significant part as a contributory factor to good leadership performance (see Chapter 7). To this end, the next stage of the research was to examine, using standardised training performance measures, the relationship of the Big Five and their sub factors with leadership performance. These training performance measures, ratings on leadership traits (see section 8.2 below for details of the Leadership Trait Rating Scale and its administration) were designed to better reflect the core aims of the training outcomes, in the context within which personality assessment might have utility, i.e. in predicting leadership training performance in an appropriate organisational context.

8.2 Training Performance Measures – The Development of a Leadership Trait Rating Scale

The leadership trait rating proforma and instructions for use are at **Appendix H.** This was the same as that used for Study 3 (see Chapter 5). A modified set of instructions to reflect instructor and cadet nomenclature for the Metropolitan Police sample was used. This merely involved changing the title of "Platoon Commander" or "Officer Cadet", to "Class Instructor" and "Recruit" respectively on the proforma used by the Army. Otherwise the Leadership Trait Rating Scale was made up of the same content, with no items changed. The leadership trait rating

scale was subsequently used to gather predictor data for Studies 4 and 5 described in this chapter.

8.2.1 A Leadership Trait Rating Scale

Build your character, not just your image - to lead properly a person must have certain character traits and virtues.

(*Sun Tzu – the Art of War, translated 1988)*

The use of a Leadership Trait Rating Scale, which had previously been acceptable to RMAS and was understood by those who would be asked to carry out the rating of individuals, first appeared in Study 3 (see Chapter 5). The rating criteria used by Rowallan Company had previously been developed for use as a research tool by the Defence Evaluation and Research Agency (DERA) Centre for Human Sciences (CHS) in 1997 (Elshaw et al 1997). Following a study, behaviourally anchored rating scales (BARS) - a standardised procedure for the assessment of exercise performance - were introduced to RMAS training. Elshaw et al examined the measures available for assessing officer qualities at RMAS. The study looked at how useful these were as criteria measures for validating officer selection, how successful RCB was at predicting officer potential and how effective the then current combination of information derived at RCB was for predicting performance. Elshaw's sample consisted of participants from RMAS; 92 from the Commissioning Course and 97 from Rowallan Company. The leadership attributes for rating were taken from the assessments used on the two courses, which are shown at Table 8.1 overleaf:

Commissioning Course	Rowallan Company
1. Physical and Moral Courage	1. Planning
2. Physical Fitness and Stamina	2. Briefing
3. Confidence	3. Controlling
4. Logic and Common-sense	3. Practical
5. Initiative and Common Sense	4. Physical
6. Determination and Commitment	5. Coolness
7. Maintain Standards	6. Sense of Urgency
8. Withstand Setbacks	7. Dominance
9. Exploit the Unexpected	8. Initiative
10. Loyalty and Selflessness	9. Determination
11. Accept Responsibility and Criticism	10. Military Compatibility
12. Ability to Decide and Act	11. Responsibility
	12. Personal relations
	13. Maturity
	14. Self confidence
	15. Final Grade

Table 8.1 The Two sets of Leadership Attributes used in RMAS

Elshaw's study used a leadership trait rating scale as a criterion measure to validate RCB selection data against the training outcomes for the Commissioning Course at RMAS. Elshaw's findings informed minor modifications of the rating scale which was subsequently used in studies 4 and 5 of this thesis. A draft version had been used in Study 3, but the main items remained common. Elshaw et al in their study found that for Rowallan Company, in the cognitive domain ("Intellectual"), moderate negative correlations with the traits predominated. The study commented on the "Criterion Problem" often cited as one of the major reasons for poor outcomes in validity research. This has been discussed previously (see Chapter 4, section 4.3). The data for Elshaw's study was derived from supervisors' ratings, rather than measures of achievement. Previous research (Schmit et al 1984) would suggest that validities against this type of outcome measure would tend to be low. However, in the absence of any other type of measure, then these outcome measures had to suffice. Study 4 and 5 faced the same situation, hence the high likelihood of lower validities being reported.

8.2.2 *Which traits should be included in the Leadership Trait Rating Scale ?*

In order to use the scale appropriately, raters needed to have a clear understanding of the traits to be used. This was deemed important since today's environment requires a greater emphasis on interpersonal competence in leaders (e.g. Savery, Mazzarol & Dawkins, 1996; Cooper & Argyris 1998; Zacarro, 2001). The traits selected for the Leadership Trait Rating Scale required to be applicable in a practical context by those applying the scale. Previous attempts to define "qualities" have been less than successful (see Chapter 3, section 3.3 and Chapter 6, sections 6.4 and 6.6). Some trends were identified, but no definitive list of qualities was produced. Jenkins (1947), who examined results of research on the leadership criteria for officer selection of the US, German and British armies, concluded that " *..no single trait or group of characteristics has been isolated which sets off the leader from the members of his group*". However, the most frequently used criterion of job success tends to be by subjective evaluation, and the most common source of the evaluation is the employee's supervisor, although in other instances, other indices have been used (Muchinsky 1986). The literature also documents the use of additional objective performance criteria as well as subjective evaluations from the supervisor from peer, subordinate and self rating sources (Seashore et al 1960). However, experience gained from Study 3 (see Chapter 5) suggested that providing traits commonly understood by the instructors, participants and the organisation as a whole appeared to be the most pragmatic basis on which to select traits.

8.2.3 *Who should carry out the rating and when ?*

Instructors are responsible for reporting on the performance of cadets at RMAS. There was a degree of consistency evidenced from the interviews with instructors which suggested that instructors were best placed to carry out these ratings within certain constraints, such as how aware they would be of the cadets real performance (see Chapter 7, section 7.3). However, it was considered that peer raters (i.e. cadets/recruits) might contribute to the study given that at RMAS, cadets are routinely both representative of colleagues and subordinates in leadership training scenarios[1]. It has been hypothesised that one basis for the validity of peer assessments is that such assessments are based upon more untarnished perceptions which other subjective evaluations do not provide (Muchinksy 1986). Peer assessments might be predictive dealing with supervisors, though subordinates may attempt to conduct themselves in a way that enhances their image, thus supervisors assessment of subordinates may be tainted by the somewhat misleading picture of the subordinate. This may contribute to lower validities of supervisor evaluations. However, peers tend to be more candid with each other. Reilly and Chao (1982) summarised the literature on the validity of peer assessments and reported 0.31 correlations with success in training. It was therefore decided to use both instructor and recruit (peer) raters for leadership performance rating.

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[1] In training at RMAS, Cadets routinely are given appointments to test their leadership abilities. On these occasions, those Cadets who have not been appointed in leadership roles act as subordinates. Cadets therefore have a dual perspective of their colleagues; firstly, as their peers, and secondly, as their subordinates.

Justifying the degree of validity of leadership rating as representative not only of training performance but also job performance, Hollander (1965) reported that peer ratings made in the third week of military officer training correlated 0.40 with ratings of success as an officer three years later. There was thus some justification of rating during training, as this would have a reasonable degree of validity. It was therefore decided to task the instructors and cadets to carry out the rating after the third week of the training courses.

8.2.4 Considerations for Research Design - Halo effects

Halo error (see also Chapter 4, section 4.2.6) results from raters general impressions of a person influencing their evaluations of the same person on other conceptually similar or dissimilar attributes. The situation and the characteristics of the ratee can influence Halo effects (Murphy and Anhalt, 1992), though such effects are typically a direct function of the cognitive processes of the rater (Feeley, 2002). Fisicaro and Lance (1990) suggested three conceptual models of halo error. The first, the *general impression model* is in accord with most authors' description where a general expression affects observed scores but not true scores and may be based on a completely different dimension or attribute. The second, the *salient dimension model*, is where one trait influences evaluation of other traits which may be related or unrelated. The third model, the *inadequate discrimination model*, refers to a raters failure to discriminate amongst conceptually distinct aspects of a behaviour of the individual being rated.

To accommodate and minimise Halo effects, during research design, it is suggested, the experience and training of the raters should be carefully

considered and provided for. For rater experience and training, observers should have experience of those being rated (Cooper, 1981), and training in familiarity with attributes should be provided as this has been found to significantly reduce rater bias (Hoyt and Kerns, 1999). To minimise halo effects in data gathering, this can be achieved by use of aggregate ratings for single individuals or mean ratings from multiple raters (Kenny and Berman, 1980). These methods reduce the effects typically encountered in practical situations when assessors are asked to rate subordinates or others. These are: *Opportunity bias*, which occurs when the assessor has not had the opportunity to observe the relevant behaviours; *Central tendency*, i.e. the tendency of assessors to avoid extreme ratings and *Leniency error*, the reluctance of raters to assign unfavourable ratings. The last two, reduce the effective width of the rating scale (e.g. a 5 point scale may become a 3 point scale) and so the ratings are less likely to discriminate effectively between levels of performance (Elshaw et al,1997). Elshaw et al (1997) found evidence of Halo effect operating in the RMAS leadership assessments which suggest such ratings are based on an overall general impression of "officerness" possibly, he argued, arising from some form of stereotype common to both RCB and RMAS.

8.3 Sample

Sample data was gathered from two sources; the Army at RMAS, and the Metropolitan Police Service at Hendon.

8.3.1 Army Sample

TSDI data from 378 RMAS cadets was gathered in August 1999. Leadership trait rating was carried out by cadets (2 per platoon) and 1 instructor per platoon. This produced 298 datasets. The instructions for the administration of the Leadership Trait Rating Scale were distributed through a single officer who provided the focal point at RMAS. He was given a detailed briefing in early May 1999. This officer then briefed the company commanders, who further briefed the platoon commanders (instructors) who were to carry out the ratings. They in turn instructed the cadets (recruits) who were to rate their colleagues. The ratings were then completed and collected on the day the TSDI was administered. The personality (TSDI) data was centrally collected from the participants during a single administration of the inventory carried out by this author and a small team of research assistants. This facilitated ease of collection of the completed inventories, and standardised administration to all participants. This took place shortly before the end of their training course. Ideally, the TSDI would have been administered earlier in the course, but access to cadets for research purposes is restricted until the week leading up to the end of their course.

For the TSDI, data screening for outliers reduced the number of useable data to 180. This reduction was accounted for by the rejection of cases with data missing or inventories completed incorrectly. The addition of the RCB data further reduced the workable sample size to n=109. This occurred as a result of the state of the RCB database in 1999 (see Chapter 4, section 4.3.6 and section 8.6.2 below), which rendered some candidates who went through RCB prior to that date without accessible data records. Introduction of a new database resulted in a further small

number of datasets being rendered incomplete when data transfer to the new database was undertaken, and these data were subsequently rejected as their reliability was questionable.

8.3.2 Police Sample

TSDI and leadership data was gathered from the Metropolitan Police Recruit Training School at the Peel Centre, Hendon between March 2000 and July 2002. This exercise was problematic as reliance had to be placed on training staff at the training centre to remotely gather data. This was due to two factors; restricted regular access to recruits and the nature of the way training courses were managed. The instructions for the administration (see below) of the Leadership Trait Rating Scale were passed out through a single focus in the form of a Police officer instructor stationed at Hendon. He was given a detailed briefing on the administration of the Leadership Trait Rating Scale in early January 2000. This officer was responsible to brief class training instructors who were to carry out the ratings, and who were also required to instruct the recruits who were to rate their colleagues. A number of the class training instructors failed to complete the leadership rating forms over the period. It was not possible to closely manage this data gathering, and the result was that relatively few leadership rating data were collected.

The TSDI data was collected on the day each group of recruits formed up for their training course at Hendon. This was carried out by a briefed and BPS Level B Intermediate qualified research assistant. Classes formed up every few weeks, though as a result of the sharp rise in the number of recruits over the period the

data was collected, the capacity of the college to administer tests was sorely challenged, and resulted in reduced volume of data than was originally envisaged.

863 subjects provided TSDI data and 679 leadership rating data. The remaining data having been either lost or not completed (436), did not match against TSDI data (74); 90 did not have Police Initial Recruitment Test (PIRT) selection data matching and 263 had data missing or outliers and were thus rejected. 1500 datasets of the Police Initial Recruitment Test, the only objective selection test data available, were also collected. Once screened for incorrectly entered data, the PIRT data was reduced to 1171 datasets. Briefing of those gathering the TSDI data was undertaken by the author and spot checks were made on these processes. Leadership data, once screened and matched to the TSDI and PIRT data, further reduced the useable number of cases to 677 datasets. Briefing of the training staff undertaking the leadership trait rating was undertaken one to one with the class training instructors by one Police officer responsible for data management. Again, quality control was undertaken by random checks.

8.4 Results

The data gathered from the Army sample and the Police sample have been analysed concurrently to provide comparison between the two samples.

8.4.1 Intercorrelations between the Big Five Factors

Intercorrelations between the Big Five factors for these two samples are shown at **Appendix E.** The overall pattern of correlations is broadly the same as for the RN sample (See Chapter 2) and as shown in Study 1 and Study 2. Differences are probably attributable to different entrant populations for the different organisations.

8.4.2 Correlations between Big Five Factors and Sub Factors and Leadership Trait Ratings

The next analysis examined the relationship between the leadership traits and the personality measures for both Army and Police cohorts.

8.4.2.1 **Army** Sample

Table 8.2 shows the significant correlations, using mean instructor ratings and mean recruit ratings, for the individual leadership trait ratings against the Big Five factors and their sub factors from the Army RMAS sample:

Leadership Trait	C1	C2	C3	C
Planning Ability	.197* (.200*)	.245*	.219*	.277** (.206*)
Initiative				.197*
Intelligence				
Analysis and Judgement				
Powers of Expression	.216*			
Controlling Ability				
Zeal and Energy	.235*	.262**	.215*	.302**
Composure				
Impact				
Self Confidence				
Physical Ability		.229*		
Determination and Commitment	.209*	.269**		.271**
Adaptability				
Organisational Compatibility		.212*		
Personal Relations and Team Spirit				
Integrity	.210*			.225*
Overall Rating		.212*		
Order of Merit (Leadership)				-.206* (-.201*)

Leadership Trait	N1	N2	N3	N4	N
Planning Ability	-.204*			-.280**	-.212*
Initiative	-.232*			-.257**	-.214*
Intelligence				-.242*	
Analysis and Judgement				-.227*	
Powers of Expression	-.198*			-.278**	
Controlling Ability	-.211*				
Zeal and Energy	-.218*			-.236*	
Composure					
Impact	-.141*				
Self Confidence	-.200*				
Physical Ability	-.219*			-.253*	
Determination and Commitment	-.238*			-.273**	-.234*
Adaptability	-.198*			-.232*	-.223*
Organisational Compatibility	-.218*				
Personal Relations and Team Spirit	-.229*			-.200*	
Integrity	-.285**		-.285**	-.229*	-.302**
Overall Rating	-.211* (.206*)			-.248*	
Order of Merit (Leadership)	(.240*)			.281**	

Leadership Trait	O1	O2	O3	O4	O5	O
Planning Ability			.223*		.257**	
Initiative						
Intelligence	.208* (.301**)		.259**		.209*	.222* (.253*)
Analysis and Judgement			.202*		.209*	
Powers of Expression						
Controlling Ability						
Zeal and Energy			.223*		.222*	
Composure						
Impact						
Self Confidence						
Physical Ability						
Determination and Commitment			.208*		.230*	
Adaptability		-.203*				
Organisational Compatibility						
Personal Relations and Team Spirit						
Integrity						
Overall Rating						
Order of Merit (Leadership)						

Leadership Trait	E1	E2	E3	E4	E5	E
Planning Ability	(-.197*)	(.283**)				(.245*)
Initiative	-.262** (-.250*)	.197* (.280**)	.209*		-.259** (-.199*)	.268** (.264**)
Intelligence						
Analysis and Judgement		(.205*)				
Powers of Expression	-.211* (-.222*)				-.228*	.203* (.253*)
Controlling Ability	(-.235*)	(-.232*)	(.203*)			.203* (.253*)
Zeal and Energy	-.202*	.334** (.208*)	.263** (.203*)		-.242*	.322** (.246*)
Composure	(-.206*)					
Impact	-.233** (.324**)	.202* (.249*)	.232* (.225*)		-.246* (-.269**)	.266** (.334**)
Self Confidence	-.299** (-.287**)	(.265**)			-.212* (-.243*)	.236* (.309**)
Physical Ability						
Determination and Commitment		.199* (.232*)	.207*		-.198*	.219* (.237*)
Adaptability						
Organisational Compatibility	(-.206**)	.222* (.207*)	.246*			.220* (.217*)
Personal Relations and Team Spirit	-.282** (-.252**)	.230* (.197*)	.225* (.204*)		-.214*	.279** (.271**)
Integrity			.209*			
Overall Rating	(-.279**)				-.251*	(.278**)
Order of Merit (Leadership)	-.206* (-.279**)	-.265**	(.241*)		.217* (.251*)	-.220*

Leadership Trait	A1	A2	A3	A4	A5	A
Planning Ability	-.171*		.205*			
Initiative	-.201**					
Intelligence						
Analysis and Judgement						
Powers of Expression						
Controlling Ability						
Zeal and Energy			.221*			
Composure						
Impact						
Self Confidence						
Physical Ability						
Determination and Commitment						
Adaptability	-.169*					
Organisational Compatibility	-.176*		.256*			
Personal Relations and Team Spirit			.285**			
Integrity			.231*			
Overall Rating						
Order of Merit (Leadership)						

(n=100)

Note: The following subfactors are reverse scored N1, N2, N3, N4, A4, E1, E5

Table 8.2. Correlations between Leadership trait ratings and Big Five Factors and Sub factors in the Army sample. Only correlations significant at 5% or higher are shown. Correlations based on instructor ratings are unbracketed, those based on recruit ratings are shown bracketed

From table 8.2, it can be seen that in this analysis, there are 27 factors and sub factors and 18 performance dimensions for both instructor and recruit ratings. This gives a possible 486 correlations. It would be expected that there would be 0.05 x 486 = 24.3 significant correlations by chance at the 5% significance level for each of the instructor and recruit raters. However, there are 111 significant correlations for instructor ratings, and 48 for recruit ratings. There is thus some evidence that predictive power is being demonstrated here, though the highest proportion of significant correlations are arising from the instructor ratings rather than the recruit ratings (111 compared with 48). In interpreting Table 8.2 it needs to be borne in mind that a number of the correlations shown may be spurious. With this in mind, correlations should be regarded as generally modest. There are few that are significant with both instructor and recruit rating. Neuroticism and its sub factors

are more frequently significant with instructor ratings and Extraversion and its sub factors are more frequently significant with both instructor and recruit ratings than the other Big Five factors.

In every Big Five factor, the correlations of the sub factors are more numerous than the correlations with the Big Five factors but there are more sub factors available to correlate with leadership trait ratings. However, for the Neuroticism factor and sub factors, there are a much higher proportion of significant correlations arising from the Neuroticism sub factors than the Neuroticism factor (41.6% compared with 27.8%) though this is not mirrored in the remaining factors. This is illustrated in Table 8.3 below:

Big Five Factor	Number of Significant Factor Correlations (Max No. possible in Brackets)	Percentage of Factor Correlations that are significant at 5%	Number of Significant Sub Factor Correlations - (Max No. Possible in Brackets)	Percentage of Sub Factor Correlations that are significant at 5%
C	7 (18)	38.8	13 (3 x 18 = 54)	24.7
N	5 (18)	27.8	30 (4 x 18 = 72)	41.6
O	2 (18)	11.1	11(5 x 18 = 90)	12.2
E	13 (18)	72.2	38 (5 x 18 = 90)	42.2
A	0 (18)	0	4 (5 x 18 = 90)	4.4

Table 8.3. Army Sample: Relative number and proportion (%) of Correlations of Big Five Factors and Sub Factors with Leadership Trait Ratings that are significant at the 5% level.

8.4.2.2 **Police** Sample

Table 8.4 overleaf shows the significant correlations, using mean instructor ratings and mean recruit ratings, for the individual leadership trait ratings against the Big Five factors and their sub factors from the Police sample:

Leadership Trait	C1	C2	C3	C
Planning Ability				
Initiative				
Intelligence				
Analysis and Judgement		.166*		
Powers of Expression		.189*		
Controlling Ability				
Zeal and Energy				
Composure				
Impact				
Self Confidence				
Physical Ability				
Determination and Commitment		.195*		.171*
Adaptability				
Organisational Compatibility				
Personal Relations and Team Spirit				
Integrity				
Overall Rating				
Order of Merit (Leadership)				

Leadership Trait	N1	N2	N3	N4	N
Planning Ability					
Initiative					
Intelligence					
Analysis and Judgement					
Powers of Expression					
Controlling Ability					
Zeal and Energy					
Composure					
Impact					
Self Confidence					
Physical Ability					
Determination and Commitment	-.175*				-.161*
Adaptability					
Organisational Compatibility					
Personal Relations and Team Spirit					
Integrity					
Overall Rating					
Order of Merit (Leadership)				*(-.167*)*	

Leadership Trait	O1	O2	O3	O4	O5	O
Planning Ability						
Initiative						
Intelligence						
Analysis and Judgement						
Powers of Expression						
Controlling Ability						
Zeal and Energy						
Composure						
Impact						
Self Confidence						
Physical Ability						
Determination and Commitment						
Adaptability					.164*	
Organisational Compatibility						
Personal Relations and Team Spirit						
Integrity					.174* *(.164*)*	
Overall Rating						
Order of Merit (Leadership)						

Leadership Trait	E1	E2	E3	E4	E5	E
Planning Ability						
Initiative						
Intelligence						
Analysis and Judgement						
Powers of Expression						
Controlling Ability						
Zeal and Energy						
Composure						
Impact			*(.159*)*			
Self Confidence			*(.164*)*			
Physical Ability						
Determination and Commitment						
Adaptability						
Organisational Compatibility			.235**			
Personal Relations and Team Spirit						
Integrity		.174*				
Overall Rating						
Order of Merit (Leadership)						

Leadership Trait	A1	A2	A3	A4	A5	A
Planning Ability						
Initiative						
Intelligence						
Analysis and Judgement			.183*			
Powers of Expression						
Controlling Ability	*(-.183*)*					
Zeal and Energy				-.173*		
Composure						
Impact						
Self Confidence						
Physical Ability						
Determination and Commitment						
Adaptability						
Organisational Compatibility						
Personal Relations and Team Spirit						
Integrity			.160*			
Overall Rating						
Order of Merit (Leadership)						

(n=152)

(Note: Reverse scored N1, N2, N3, N4, A4, E1, E5. See Appendix F-3 for key to Big Five factors and sub factors)

Table 8.4. Correlations between Leadership trait ratings and Big Five Factors and Sub factors in the Police sample. Only correlations significant at 5% or higher are shown. Correlations based on instructor ratings are unbracketed, those based on recruit ratings are shown bracketed.

From the above tables for the Police sample, it can be seen that in this analysis, there are 27 factors and sub factors and 18 performance dimensions for both instructor and recruit ratings. This gives a possible 486 correlations. It would be expected that there would be 0.05 x 486 = 24.3 significant correlations at the 5% or higher significance by chance for each of the instructor and recruit raters. However, there are only 13 significant correlations for instructor ratings, and only 5 for recruit ratings. There is thus some evidence that these will have occurred by chance, though again, the highest proportion of significant correlations are arising from the instructor ratings rather than the recruit ratings(13 compared with 5). The highest correlation seen in this analysis is that for instructor rated Organisational Compatibility with Socially Active (E3), .235**.

In every Big Five factor, however, the correlations of the sub factors are more numerous than the correlations with the Big Five factors as shown in Table 8.5:

Big Five Factor	Number of Significant Factor Correlations (Max No. possible in Brackets)	Percentage of Factor Correlations that are significant at 5%	Number of Significant Sub Factor Correlations - (Max No. Possible in Brackets)	Percentage of Sub Factor Correlations that are significant at 5%
C	1 (18)	5.5	3 (3 x 18 = 54)	5.5
N	1 (18)	5.5	2 (4 x 18 = 72)	2.7
O	0 (18)	0	3 (5 x 18 = 90)	3.3
E	0 (18)	0	4 (5 x 18 = 90)	4.4
A	0 (18)	0	4 (5 x 18 = 90)	4.4

*Table 8.5. **Police** Sample; Relative number and proportion (%) Correlations of Big Five Factors and Sub Factors with Leadership Trait Ratings that are significant at the 5% level*

The above results are likely to have been due to chance, and do not mirror the findings from the Army sample. This will be returned to at section 8.5.4.3 later.

8.4.3 Leadership Data - Factor Analysis

8.4.3.1 Factor Analysis of **Army** Leadership Traits Ratings

From the tables, 8.2 and 8.4 above, it can be seen that there are a high number of possible correlations (486) for each of the Army and Police samples. In order to simplify the analysis of this data, a Factor Analysis of leadership traits was undertaken to achieve two purposes. Firstly, to identify perceived dimensions of leadership, and secondly to produce a smaller number of factor scores to facilitate further investigation of the relationship of leadership with personality.

The extraction of this sample of data was undertaken using maximum likelihood with Promax rotation and Kaiser normalisation. Two separate factor analyses were

carried out, the first examining the data covering instructor leadership ratings, and the second recruit rater leadership ratings. Consideration of the scree plot and of the interpretability of the resultant solution led to a decision to extract two factors. For the factor score coefficient, Bartlett's method was selected.

Treating the instructor ratings and recruit ratings separately, (see table 8.6 overleaf) suggested a defined factor structure emerging, broadly comparable across both Army instructor and Army recruit raters. For both groups of data, the first factor tended to indicate characteristics related to cognitive ability, i.e. Intelligence, Analysis and Judgement, Planning Ability etc. This first factor was thus deemed to comprise of Cognitively Orientated Leadership Traits (COLT). The second factor was considered to be more associated with personality, e.g. Zeal and Energy, Personal Relations, Impact, Determination and Commitment etc, and referred to as a factor comprised of Personality Orientated Leadership Traits (POLT).

Army	Instructor Rated Leadership Traits	Recruit Rated Leadership Traits
Factor 1 (Tendency towards more cognitively orientated leadership traits)	**Intelligence 1.147** **Analysis and Judgement 0.734** **Planning Ability 0.512** **Initiative 0.488** Integrity 0.453	**Analysis and Judgement 0.986** **Intelligence 0.865** Powers of Expression 0.862 **Planning Ability 0.855** Adaptability 0.778 **Initiative 0.765** Controlling Ability 0.558 Self Confidence 0.518 Composure 0.356
Factor 2 (Tendency towards more personality orientated leadership Traits)	**Personal Relations 0.860** **Impact 0.838** Controlling Ability 0.826 **Compatibility 0.773** **Zeal and Energy 0.755** Composure 0.738 **Physical Ability 0.771** **Determination and Commitment 0.662** **Self Confidence 0.652** Adaptability 0.593 Powers of Expression 0.441	**Physical Ability 0.915** **Zeal and Energy 0.892** **Determination and Commitment 0.890** **Personal Relations 0.670** **Impact 0.612** **Compatibility 0.546** Integrity 0.415

(Note: Factor Loadings from Pattern Matrix, ML Promax with Kaiser Normalisation) Only loadings >.3 listed

*Table 8.6. **Army** Sample. Common Traits: Instructor and Recruit Ratings (Traits common to both recruits and Instructors in the factor structure are shown annotated in bold)*

The intercorrelations between the two factors for the Army instructor rated traits is .722** and for the Army Recruit rated traits, .782**. Thus the two factors are quite strongly correlated. It is likely that the halo effect (see Chapter 4, section 4.2.6, and Chapter 8, section 8.2.4) in the ratings may be tending to exaggerate the correlation.

Amongst instructors, 61.5% of the variance is accounted for by Factor 1 and amongst recruit raters 69.82%. This might be expected given the strong relationship between results of measurement of cognitive abilities tests with performance in training indicated in the literature (see Chapter 2, section 2.6) although these studies, studies 4 and 5, are looking specifically at *leadership* and not *overall performance*. Such traits as Intelligence, Analysis and Judgement, and Integrity, are more likely to be perceived more readily by instructors exposed in a

training environment such as that which exists at RMAS (see Chapter 3, section 3.3, and Chapter 7, section 7.3). However, the apparent equal loading of Powers of Expression and Self Confidence might be subject to a particular interpretation; that whatever is rated in terms of leadership traits is underpinned by these two, both of which are behaviours which are most easily observed by those carrying out the rating (see Chapter 7, section 7.3). Indeed, Lance, Noble and Scullen (2002) suggest one model in which rater sources converge only in the assessment of ratee general performance, not in the assessment of ratee performance along specific dimensions, and this may contribute to explaining this tendency amongst raters.

For comparison, the data from the RMAS (Study 4) sample instructors and the data from the Rowallan Company (Study 3) sample instructors was examined. This is shown at Table 8.7 overleaf. It should be noted that the sample size for Rowallan Company was small (n=48):

Army	RMAS Instructor (Study 4 sample) Rated Leadership Traits	Rowallan Company Instructor (Study 3 sample) Rated Leadership Traits
Factor 1 (Tendency towards more cognitively orientated leadership traits)	**Intelligence 1.147** **Analysis and Judgement 0.734** **Planning Ability 0.512** **Initiative 0.488** Integrity 0.453	**Planning Ability 1.025** **Analysis and Judgement 0.912** **Initiative 0.851** Controlling Ability 0.705 Self Confidence 0.696 **Intelligence 0.680** Compatibility 0.668 Powers of Expression 0.653 Impact 0.621
Factor 2 (Tendency towards more personality orientated leadership Traits)	**Personal Relations 0.860** Impact 0.838 Controlling Ability 0.826 Compatibility 0.773 **Zeal and Energy 0.755** **Composure 0.738** **Physical Ability 0.771** **Determination and Commitment 0.662** Self Confidence 0.652 **Adaptability 0.593** Powers of Expression 0.441	**Physical Ability 0.951** **Determination and Commitment 0.910** **Zeal and Energy 0.901** **Personal Relations 0.482** **Composure 0.689** Integrity 0.656 **Adaptability 0.497**

(Note. Numbers shown are Factor loadings from the Pattern matrix. Only those traits with loadings >0.3 are shown. Those shown in bold indicate traits common to both groups of raters)

Table 8.7. A Comparison between RMAS Instructors rated Leadership Factors and Rowallan Company Instructors Leadership Factors

The two factors match to a high degree between the two data samples. The interpretation of the two factors into labels differentiating between more cognitively oriented traits and more personality oriented traits was based primarily on the selection criteria at RCB (See Chapter 3, section 3.3), findings from Study 2 (Chapter 4, section 4.3), and the information derived from the interviews with instructors (see Chapter 7, section 7.3). Perceptions here were that those traits which had a relationship with academic or cognitive ability, instructors felt, were more readily assessable, and related to the concept of "Can do". Conversely the abilities which were not assessed by either of the selection processes, but which anecdotally were regarded as being in the realm of personality (see Chapter 3, section 3.3 and Chapter 7, section 7.3), appeared to form the second factor, and were considered to be more related to more inherent elements which were not

restricted to ability exclusively, but more to do with the desire or motivation or will to do something, i.e. "will do".

8.4.3.2 Leadership Data - Factor Analysis of **Police** Leadership Traits Ratings

Again, in order to simplify the analysis of this data, a Factor Analysis was undertaken similar to that undertaken on the Army sample, i.e. to achieve two purposes; firstly to find perceived dimensions of leadership and secondly to produce a smaller number of factor scores to facilitate further investigation of the relationship of leadership with personality.

The extraction of this sample of data was undertaken using maximum likelihood (ML) Promax rotation and Kaiser normalisation. The initial treatment of the data consisted of consideration of the scree plot and the interpretability of the resultant solution led to a decision to extract two factors. The data was first reduced to produce one set of instructor ratings together with the means of the 2 x recruit raters (peer group/subordinates group) which produced a single set of recruit ratings. The results are shown at Table 8.8 overleaf:

Police	Instructor Rated Leadership Traits	Recruit Rated Leadership Traits
Factor 1 (Tendency towards more cognitively orientated leadership traits)	**Planning Ability 0.964** Initiative 0.879 **Analysis and Judgement 0.764** **Intelligence 0.683** Controlling Ability 0.462	Determination and Commitment 0.734 Adaptability 0.702 **Planning Ability 0.528** **Intelligence 0.526** Composure 0.491 **Analysis and Judgement 0.481** Physical Ability 0.374
Factor 2 (Tendency towards more personality orientated leadership traits)	**Compatibility 0.912** **Personal Relations 0.766** Determination and Commitment 0.738 Adaptability 0.738 **Impact 0.718** Physical Ability 0.656 **Zeal and Energy 0.648** **Integrity 0.513** **Self Confidence 0.509** **Powers of Expression 0.414** Composure 0.412	**Powers of Expression 0.919** **Impact 0.915** **Self Confidence 0.874** Controlling Ability 0.828 **Integrity 0. 797** **Compatibility 0.782** **Zeal and Energy 0.541** **Personal Relations 0.537** Initiative 0.489

(Note: Factor Loadings from the Pattern Matrix, ML Promax with Kaiser Normalisation) Only loadings >.3 listed

*Table 8.8. **Police** Sample. Common Traits: Instructor and Recruit Ratings (Traits common to both recruits and Instructors in the factor structure are shown annotated in bold)*

The intercorrelation between the two factors for the Police instructor rated traits was .611** and for the Police recruit rated traits, .658**. The first factor appears to focus around features of individuals based on perceptions of intelligence or general mental ability. The second factor may be arising from the interrelationships/team factors which predominate in both Army and Police officer training and may be therefore more outward "presentational" elements.

8.4.3.3 Similarities and Differences in the Factor Analyses between the Army and Police Samples

Broadly, the same two factors have emerged from *five* different factor analyses; Instructor and recruit ratings at RMAS; instructor and recruit ratings at Hendon; and Rowallan instructor ratings at RMAS. *The existence of these two factors is therefore a robust finding.* It has been hypothesised (Day and Silverman, 1989;

Driskell et al, 1994; McHenry et al, 1990) that personality measures might contribute an important component to the selection device by assessing the "will do" factor (Salter, 1996) (see also Chapter 8, section 8.4.6.1). This, it has been thought would thus add to the incremental validity not accounted for by cognitive factors (See Chapter 6, section 6.4) which tend to be the focus of existing selection processes (See Chapter 3, sections 3.3, 3.4 and 3.5) and which measure the "can do" factor. This relationship has been alluded to by Weick (1997) and Grint (2002) who perceive leadership as being a combination of personal characteristics and areas of competence. Kets de Vries & Florent-Treacy (2002), also proposed that effective leadership required a combination of behavioural, cognitive and personality factors. However, the absence of a contribution of cognitive ability data to the two leadership factors which emerge from these analyses suggests that personality may subordinate cognitive ability when leadership performance is being assessed both in the "can do" and "will do" domains. *It is the manifestation of ability which is most important aspect to consider.*

The structures of the factors are similar between both instructors and recruit raters within each sample and between the Army and the Police samples. Both samples show fairly distinctive groups of traits. Evidence of similar factor analysis of leadership traits has not been found in the literature. *This may be a novel finding. It is therefore possible that this approach has not been used previously, and may therefore have potential for development as a generalizeable criterion measure for leadership performance.*

8.4.4 Leadership Factors and the Big Five Personality Factors and Sub Factors

The next stage was to look at the relationship between the leadership factors and the personality data. The data was processed to give a factor score for each of the factors identified at table 8.6 and 8.8 above. Factor scores were calculated using Bartlett's method. In order to examine the relationship between personality measures, correlations between the leadership factors and Big Five factors and sub factors were calculated.

8.4.4.1 **Army** Sample: Leadership Factors vs Big Five Personality Factors and Sub Factors

he table below (Table 8.9) show correlations between the two leadership factors and the factors and sub factor scores from the TSDI.

Army Leadership Factors	C1	C2	C3	C
Instructor factor 1 – COLT Can do	.166	.180	.097	.188
Instructor factor 2 – POLT Will do	.173	.173	.120	**.200***
Recruit (peer) factor 1 – COLT Can do	.126	.080	.020	.103
Recruit (peer) factor 2 – POLT Will do	.031	-075	-027	.028

Army Leadership Factors	N1	N2	N3	N4	N
Instructor factor 1 – COLT Can do	**-.246***	-.061	-.061	**-.223***	-.185
Instructor factor 2 – POLT Will do	-.194	-.099	-.107	**-.269****	-.210
Recruit (peer) factor 1 – COLT Can do	-.099	-.004	.045	-.107	-.061
Recruit (peer) factor 2 – POLT Will do	-.072	.012	.141	-.043	-.003

Army Leadership Factors	O1	O2	O3	O4	O5	O
Instructor factor 1 – COLT Can do	.057	-120	.155	-037	.170	.037
Instructor factor 2 – POLT Will do	.190	.026	**.261****	.085	**.223***	**.200***
Recruit (peer) factor 1 – COLT Can do	.110	.004	.127	.077	.070	.106
Recruit (peer) factor 2 – POLT Will do	-041	-086	.003	.038	.029	-.028

Army Leadership Factors	E1	E2	E3	E4	E5	E
Instructor factor 1 – COLT Can do	**-.236***	**.215***	**.229***	-.013	**-.226***	**.268****
Instructor factor 2 – POLT Will do	-.048	.074	.131	-.016	**-.203***	.126
Recruit (peer) factor 1 – COLT Can do	**-.218***	**.231***	.112	.034	-.171	**.229***
Recruit (peer) factor 2 – POLT Will do	**-.218***	**.221***	.193	.125	-.183	**.261****

Army Leadership Factors	A1	A2	A3	A4	A5	A
Instructor factor 1 – COLT Can do	.004	.113	**.211***	-074	.088	.132
Instructor factor 2 – POLT Will do	.037	.071	.086	-119	.074	.062
Recruit (peer) factor 1 – COLT Can do	.088	.102	-069	.004	-011	-080
Recruit (peer) factor 2 – POLT Will do	.080	.048	-064	.020	.050	.086

(Note. Correlations that are significant at the 5% level are shown in bold).

Table 8.9. ***Army*** *Sample. Correlations between the Big Five Factors and Sub Factors and scores on the two leadership factors derived from factor analyses of instructor ratings and of recruit ratings.*

(For comparison, all correlations between the Big Five factors and sub factors for Instructor Factor 1 and Instructor Factor 2 for the Rowallan Company sample are shown at ***Appendix F****).*

Firstly, it can be seen from table 8.9 that sub factors show a greater number of significant correlations than Big Five factors with the Leadership factors, and in particular the Extraversion sub factors. However, it would have been anticipated that personality would have correlated more strongly with Leadership Factor 2 which was not the case. That the Extraversion and Extraversion sub factors feature so prominently is consistent with Study 3 (see Chapter 5, sections 5.5 and 5.6). Extraverts tend to be more outgoing and by implication self confident, and impress themselves more on the situation where they are being rated. Nevertheless, this finding is consistent with previous research (see Chapter 2, section 2.6). In most situations those who are tending towards nervous and stressed out (N1) and socially less acceptable in a group, i.e. envious and jealous (N4), are also likely to be more easily identified and therefore rated accordingly. The findings regarding towards Nervous and Stressed Out (N1) is consistent with studies 1 and 2 (See Chapter 4, section 4.2 and 4.3).

8.4.4.2 *Do the Big Five sub factors predict differentially for the RMAS Sample ?*

If the Big Five sub factors are more useful for predicting performance than the Big Five factors, this has to be because some sub factors predict better than others. There are examples of this (see Chapters 4 and 5), e.g. Nervous & stressed out (N1) and Envious & Jealous (N4) have been shown to predict better than Worrying (N2) and Irritable (N3). The method described in Chapter 4 section 4.2, was used to see whether sub factors were equally predictive. In Studies 4 and 5, the factors, Leadership Factor 1 and Leadership Factor 2, as rated by both instructors and recruits, were used as the performance criteria. Results of the analyses are shown below at Tables 8.10 and 8.11 respectively. Table 8.10 relates to instructor ratings and Table 8.11 relates to recruit ratings;

RMAS RCB data vs Leadership Factor 1 Scores (Cohort 4)	Satorra-Bentler type Chi Sq	Df	Probability	RMSEA	Confidence Interval of RMSEA	
A	4.7226	4	.31697	.040	.000	.151
C	1.4593	2	.48208	.000	.000	.168
E	24.4843	4	.00006	.212	.136	.295
N	16.8575	3	.00076	.201	.114	.298
O	20.6322	4	.00037	.191	.114	.275

RMAS RCB data vs Leadership Factor 2 Scores (Cohort 4)	Satorra-Bentler type Chi Sq	Df	Probability	RMSEA	90% Confidence Interval of RMSEA	
A	0.8447	4	.93236	.000	.000	.039
C	0.7207	2	.69743	.000	.000	.137
E	10.6904	4	.03027	.121	.034	.211
N	7.2974	3	.06300	.112	.000	.218
O	6.8607	4	.14343	.079	.000	.176

Table 8.10 Results from tests of the pattern hypothesis that all sub factors of a given factor correlate equally with leadership factor scores derived from factor analysis of Army instructor ratings

RMAS RCB data vs Leadership Factor 1 Scores (Recruit) (Cohort 4)	Satorra-Bentler type Chi Sq	Df	Probability	RMSEA	90% Confidence Interval of RMSEA	
A	4.83	4	.305	.043	.000	.153
C	1.81	2	.404	.000	.000	.179
E	14.13	4	.007	.149	.070	.236
N	4.95	3	.175	.076	.000	.189
O	2.37	4	.667	.000	.000	.110

RMAS RCB data vs Leadership Factor 2 Scores (Recruit) (Cohort 4)	Satorra-Bentler type Chi Sq	Df	Probability	RMSEA	90% Confidence Interval of RMSEA	
A	2.67	4	.614	.000	.000	.117
C	3.09	2	.213	.069	.000	.210
E	16.64	4	.002	.166	.089	.252
N	9.32	3	.025	.136	.042	.238
O	2.89	4	.576	.000	.000	.122

Table 8.11 Results from tests of the pattern hypothesis that all sub factors of a given factor correlate equally with leadership factor scores derived from factor analysis of army recruit ratings

The above tables, Tables 8.10 and 8.11, provide evidence that the Extraversion sub factors are differentially predictive for both factors and both groups of raters. The sub factors Shy and Bashful (E1) and Talkative (E2) predict Leadership Factor 1 for both recruit and instructor rated factors but the sub factor Assertive (E4) does not. Additionally, Neuroticism sub factors are differentially predictive for Instructor Leadership Factor 1 and Recruit Leadership Factor 2, and Openness sub factors for Instructor Leadership Factor 1. Table 8.9 shows a number of sub factors which have both stronger and weaker relationships with the leadership factors than the Big Five Factors to which they contribute. For example, Nervous and Stressed Out (N1) predicts Instructor Leadership Factor 1 only. Worrying (N4) predicts Leadership Factors 1 and 2, but only for instructor rated factors. For Creative (O3) with Instructor Leadership Factor 2 shows a correlation of - .261 at p <0.01 level of confidence, though this is likely due to chance, whereas Big Five

factor Openness (O), shows a correlation of .200 at the <0.05 level of confidence. This provides reassurance that the differences between sub factors discussed above as examples, and others also found at Table 8.9, are meaningful. This raises the possibility that the Big Five sub factors may have more potential in selection than the Big Five factors overall.

In order to further explore the potential of the current sub factor scales in the TSDI a series of hierarchical regressions were conducted for those cases where the analyses reported above demonstrated that the sub factors were differentially predictive and where there were sub factor scales which showed significant correlations with the relevant leadership factor score. For each sub factor with significant correlations with the leadership factor score these regressions examined whether the sub factor explained additional variance beyond that explained by the factor. The results of these regressions are shown in Tables 8.12a to 8.12d overleaf:

RMAS Cadets: Instructor Leadership Factor 1	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1(Extraversion)	.072	.063	.072	7.606	98	.007
Model 2 (Model 1, (Extraversion) + E1 *Shy and Bashful*)	.073	.054	.001	.127	97	.722
Model 3 (Model 1, (Extraversion) + E2 *Talkative*)	.072	.053	.000	.005	97	.945
Model 4 (Model 1, (Extraversion) + E3 *Socially active*)	.073	.054	.001	.149	97	.700
Model 5 (Model 1, (Extraversion) + E5 *Unsociable*)	.072	.053	.000	.035	97	.846

RMAS Cadets: Instructor Leadership Factor 1	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1(Neuroticism)	.034	.024	.034	3.467	98	.066
Model 2 (Model 1, (Neuroticism) + N1 *Nervous and stressed out*)	.066	.047	.032	3.321	97	.071
Model 3 (Model 1, (Neuroticism) + N4 *Envious and Jealous*)	.050	.031	.016	1.648	97	.202

(Note: The reported F ratios test whether there is a significant gain in variance accounted for in comparison to Model 1).

Table 8.12a. Results from hierarchical regression with Instructor Leadership Factor 1 as the Dependent Variable and scores on the Big Five Factors and the differentially predicting sub factors as predictors.

RMAS Cadets: Instructor Leadership Factor 2	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1 (Extraversion)	.016	.006	.016	1.576	98	.212
Model 2 (Model 1, (Extraversion) + E5 *Unsociable*)	.019	-.001	.003	.297	97	.587

(Note: The reported F ratios test whether there is a significant gain in variance accounted for in comparison to Model 1).

Table 8.12b. Results from hierarchical regression with Instructor Leadership Factor 2 as the Dependent Variable and scores on the Big Five Factors and the differentially predicting sub factors as predictors.

RMAS Cadets: Recruit Leadership Factor 1	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1 (Extraversion)	.052	.043	.052	5.430	98	.022
Model 2 (Model 1, (Extraversion) + E1 *Shy and Bashful*)	.056	.036	.003	.341	97	.560
Model 3 (Model 1, (Extraversion) + E2 *Talkative*)	.059	.040	.007	.695	97	.407

(Note: The reported F ratios test whether there is a significant gain in variance accounted for in comparison to Model 1).

Table 8.12c. Results from hierarchical regression with Recruit Leadership Factor 1 as the Dependent Variable and scores on the Big Five Factors and the differentially predicting sub factors as predictors.

RMAS Cadets: Recruit Leadership Factor 2	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1(Extraversion)	.068	.059	.068	7.257	98	.009
Model 2 (Model 1, (Extraversion) + E1 *Shy and Bashful*)	.068	.049	.000	.021	97	.884
Model 3 (Model 1, (Extraversion) + E2 *Talkative*)	.069	.050	.001	.070	97	.792

(Note: The reported F ratios test whether there is a significant gain in variance accounted for in comparison to Model 1).

Table 8.12d. Results from hierarchical regression with Recruit Leadership Factor 2 as the Dependent Variable and scores on the Big Five Factors and the differentially predicting sub factors as predictors.

In no case do the results reported in Tables 8.12a to 8.12d provide any evidence of a sub factor adding to the predictive value of a factor. However, it would be premature to dismiss the possibilities of sub factors as predictors on the basis of this finding. As a consequence of limited sample size the power for detecting improvements in prediction from sub factors is limited. Moreover in some cases the value of considering the sub factor level may lie not in one sub factor of a factor being more predictive than the remainder but rather in one sub factor being distinctly less predictive. The prediction of Instructor factor 1 from Extraversion, where all sub factors except E4 (Assertive) appear to be equally related to the leadership factor score provides a possible example of this. Finally for reasons discussed in Chapter 4 looking at whether existing sub factor scales can predict additional variance beyond that predicted by the corresponding factors, provides a very stringent test of the potential of sub factor constructs.

8.4.4.3 *Do the Big Five personality factors add to the predictive ability of RCB?*

The Big Five personality factors show modest correlations with scores on the Leadership factors. This raises the question of whether the Big Five factors can add to the evidence already available from RCB in predicting leadership

performance. This was investigated through hierarchical regression. The sample size was not sufficient to allow all the component RCB scores to be entered into this regression. The Final Rank Order data from RCB was thus used as a measure which should reflect an accumulation of all the evidence from RCB. The Final Rank Order data from RCB has the further advantage of having a stable interpretation despite changes in RCB procedure during the period in which members of the sample where assessed at RCB (see Chapter 4, section 4.3.6).

Thus the regression analysis was carried out by entering Final Rank Order in the first block and adding scores on the five personality dimensions in the second block. This would show how much additional variance in leadership performance is explained by the Big Five (OCEAN) factors. The findings using the instructor-rated Leadership Factor 1 as the dependent variable are shown in Table 8.13:

Army	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1(Final Rank Order)	.119	.110	.119	13.285	1,98	>.001
Model 2 (Model 1 +OCEAN)	.210	.159	.090	2.126	5,93	.069

*Table 8.13. Results from hierarchical regression with **Army Instructor Rated Leadership Factor 1** as the Dependant Variable and RCB Final Rank Order and scores on the Big Five as predictors.*

(Note- For Model 2 the reported F ratio tests whether there is a significant gain in variance accounted for in comparison to the preceding model.)

This indicates that personality is adding to the Final Rank Order in predicting scores on Instructor Leadership Factor 1, albeit slightly below accepted levels of significance. The increase in variance explained is a modest 6%. However, *an alternative perspective would see this as more than a 50% improvement on the 11% variance provided by RCB assessment alone*. Standardised regression coefficients for individual predictors in Model 2 are shown at Table 8.14 overleaf:

Model 2	Beta (Standardised Coefficient)	t	Significance
Constant		.074	.941
Final Rank Order	-.333	-3.562	.001
Agreeableness	-.258	-.258	.797
Conscientiousness	.146	1.375	.173
Extraversion	.215	2.078	.040
Neuroticism	-.065	-.581	.563
Openness	.006	.058	.954

n = 109

Table 8.14. Standardised regression coefficients and associated significance tests from a model predicting scores on Leadership Factor 1 derived from army instructor ratings from RCB Final Rank Order and the Big Five.

Of the personality factors, only Extraversion makes a unique contribution to the prediction of scores on Instructor Leadership Factor 1.

The hierarchical regression was repeated for the other leadership factors. As can be seen in Table 8.15 in the case of Instructor Leadership Factor 2 the Final Rank Order accounts for only 2.6% of the variance. This falls short of significance at standard levels (p=0.058). However the OCEAN factors do add significantly to this and raised the variance explained to 9.8%. The corresponding standardised regression coefficients are shown in Table 8.16.

Army	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1(Final Rank Order)	.036	.026	.036	3.694	1,98	.058
Model 2 (Model 1 +OCEAN)	.153	.098	.116	2.550	5,93	.033

*Table 8.15. Results from hierarchical regression with Army **Instructor Rated Leadership Factor 2** as the Dependent Variable and Final Rank Order and scores on the Big Five and Final Rank Order as predictors.*

(Note- For Model 2 the reported F ratio tests whether there is a significant gain in variance accounted for in comparison to the preceding model.)

Model 2 (Army)	Beta (Standardised Coefficient)	T	Significance
Constant		.331	.742
Final Rank Order	-.196	-2.028	.045
Agreeableness	-.096	-.907	.367
Conscientiousness	.089	.805	.423
Extraversion	.032	.302	.764
Neuroticism	-.240	-2.064	.042
Openness	.244	2.323	.022

Table 8.16. Standardised regression coefficients and associated significance tests for a model predicting scores on Leadership Factor 2 derived from Army Instructor ratings from RCB Final Rank Order and the Big Five.

It should be noted from Table 8.14 and 8.16 that Extraversion predicts Leadership Factor 1, but Neuroticism and Openness predict Leadership Factor 2.

For the recruit rated Leadership Factors, the findings are shown at Tables 8.17 and 8.18:

Army	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1(Final Rank Order)	.035	.026	.035	3.591	1,98	.061
Model 2 (Model 1 +OCEAN)	.098	.040	.062	1.287	5,93	.276

Table 8.17. Results from hierarchical regression with Army Recruit Rated Leadership Factor 1 as the Dependent Variable and Final Rank Order, and scores on the Big Five and Final Rank Order as predictors.

(Note- For models other than the Model 1 the reported F ratios test whether there is a significant gain in variance accounted for in comparison to the preceding model.)

Army	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1(Final Rank Order)	.032	.022	.032	3.214	1,98	.076
Model 2 (Model 1 +OCEAN)	.112	.055	.080	1.683	5,93	.146

Table 8.18. Results from hierarchical regression with Army Recruit Rated Leadership Factor 2 as the Dependent Variable and Final Rank Order, and scores on the Big Five and Final Rank Order as predictors.

(Note- For models other than the Model 1 the reported F ratios test whether there is a significant gain in variance accounted for in comparison to the preceding model.)

From tables 8.17 and 8.18, it can be seen that neither the Final Rank Order at RCB nor scores on the Big Five are contributing significantly to the recruit-rated leadership factors in the Army sample.

8.4.4.4 Findings

The most important overall findings from these analyses are; that RCB predicts Leadership Factor 1, but does not predict Leadership Factor 2, whereas the TSDI *does* predict Factor 2. Therefore, based on this data, *only ability(Can do) in leadership is predicted by the current selection process at RCB, but the personality aspect (Will do) which individuals require to lead are not measured. This would be rectified by inclusion of personality assessment at RCB.*

However, the issue to explain, is *why* do personality variables relate to Leadership Factor 1 (COLT) ? Whilst Leadership Factor 1 might be heavily related to cognitive ability, it may be that Leadership Factor 1 relates to *manifest* cognitive ability, i.e. *cognitive ability and the willingness or aptitude to display it.*

8.4.4.5 **Police** Data - Leadership Factors vs Big Five Personality Factors and Sub Factors

Turning now to the police data, the correlations are shown at Table 8.19 and are much lower in value than those shown in the RMAS sample :

Metropolitan Police Leadership Factors	C1	C2	C3	C
Instructor factor 1 – COLT Can do	**.114****	**.136****	.064	**.117***
Instructor factor 2 – POLT Will do	.066	.002	.114	**.089***
Recruit (peer) factor 1 – COLT Can do	.037	.030	-.001	.025
Recruit (peer) factor 2 – POLT Will do	.003	.032	-.029	-.001

Metropolitan Police Leadership Factors	N1	N2	N3	N4	N
Instructor factor 1 – COLT Can do	**-.086***	-.054	**-.076***	**-.099****	**-.093***
Instructor factor 2 – POLT Will do	-.046	-.056	-.041	-.033	-.053
Recruit (peer) factor 1 – COLT Can do	-.042	**-.078***	**-.086***	.001	-.061
Recruit (peer) factor 2 – POLT Will do	-.054	**-.101****	-.045	-.002	-.063

Metropolitan Police Leadership Factors	O1	O2	O3	O4	O5	O
Instructor factor 1 – COLT Can do	.019	.003	-.026	-.019	-.018	-.016
Instructor factor 2 – POLT Will do	.016	.022	.011	.006	.040	.028
Recruit (peer) factor 1 – COLT Can do	.025	-.030	-.045	-.028	-.044	-.048
Recruit (peer) factor 2 – POLT Will do	.046	-.018	-.034	-.046	-.013	-.035

Metropolitan Police Leadership Factors	E1	E2	E3	E4	E5	E
Instructor factor 1 – COLT Can do	.043	**.077***	-003	-025	-036	-012
Instructor factor 2 – POLT Will do	.061	**.100****	.053	-016	.016	.013
Recruit (peer) factor 1 – COLT Can do	-015	-.009	-.046	-034	.026	-028
Recruit (peer) factor 2 – POLT Will do	**.078***	**.110****	.025	-013	.074	-021

Metropolitan Police Leadership Factors	A1	A2	A3	A4	A5	A
Instructor factor 1 – COLT Can do	.035	.021	**.080***	-005	-052	.024
Instructor factor 2 – POLT Will do	.058	.028	.059	-007	-001	.041
Recruit (peer) factor 1 – COLT Can do	.018	-010	.016	-060	-.021	.023
Recruit (peer) factor 2 – POLT Will do	-.030	.017	.004	-.052	-.027	.006

n= 677

(Note. Correlation significant at the 5% level are shown in bold).

Table 8.19. Correlations between the Big Five Factors and Sub Factors and scores on the two Leadership Factors derived from factor analyses of instructor ratings and of recruit ratings in the police sample.

With regard to the sub factor correlations, again, the greatest number of significant correlations are with Leadership Factor 1 from the Instructor raters. In addition, the sub factors provide a greater number of correlations than the Big Five factors. There is also a greater spread of correlations across the two leadership factors.

The negative correlations with Neuroticism would be expected, given that higher levels of Neuroticism tend to be broadly associated with lower levels of performance (see Chapter 2, sections 2.5.3 and 2.4). The recruit raters may be basing their assessment of leadership traits which lead to relationships with Conscientiousness and Neuroticism to which they may be more sensitive, as a result of their closer interactions when operating with their colleagues in leadership situations (see Chapter 3 for an overview of Metropolitan Police Training at Hendon). It is quite feasible that, for example, a peer's assessment of the traits which give rise to the relationship with efficient and dependable (C1) and hardworking (C2) sub factors, when they live and work together 5 days a week for 25 weeks, may be more informed in terms of rating peers. This might be a result of more closely observed behaviour in an informal setting rather than in the more formal, arguably less interactional situation, that the recruit and the instructor might enjoy, and upon which the instructor might base his or her judgements.

The main point of interpretation of Table 8.19, however, is that there are a very low number of weak correlations, a very small number of which are significant, and these are likely to have occurred due to chance.

8.4.4.6 *For the Police sample, do the Big Five sub factors predict differentially ?*

The method described in Chapter 4 section 4.2.6.8 was used to see whether sub factors were equally predictive. The factors, Leadership Factor 1 and Leadership Factor 2, as rated by both instructors and recruits, were used as the criteria.

Results of the analyses are shown below at Tables 8.20 for instructor ratings and at Table 8.21 for recruit ratings:

Police vs Instructor Leadership Factor 1 Scores (Cohort 5)	Satorra-Bentler type Chi Sq	Df	Probability	RMSEA	90% Confidence Interval of RMSEA	
A	28.46	4	0.00001	0.095	0.064	0.129
C	17.86	2	0.00013	0.108	0.066	0.157
E	16.03	4	0.0029	0.067	0.035	0.102
N	3.73	3	0.292	0.019	0.000	0.070
O	1.51	4	0.823	0.000	0.000	0.035

Police vs Instructor Leadership Factor 2 Scores (Cohort 5)	Satorra-Bentler type Chi Sq	Df	Probability	RMSEA	90% Confidence Interval of RMSEA	
A	4.81	4	0.307	0.017	0.000	0.063
C	9.87	2	0.007	0.076	0.034	0.126
E	10.72	4	0.030	0.050	0.014	0.087
N	0.897	3	0.826	0.000	0.000	0.038
O	0.8358	4	0.934	0.000	0.000	0.016

Table 8.20. Results from tests of the pattern hypothesis that all sub factors of a given factor correlate equally with leadership factor scores derived from factor analysis of police instructor ratings.

Police vs Recruit Leadership Factor 1 Scores (Cohort 5)	Satorra-Bentler type Chi Sq	Df	Probability	RMSEA	90% Confidence Interval of RMSEA	
A	8.19	4	0.085	0.039	0.000	0.078
C	4.48	2	0.107	0.043	0.000	0.097
E	2.06	4	0.725	0.000	0.000	0.042
N	16.71	3	0.0008	0.082	0.047	0.122
O	2.08	4	0.720	0.000	0.000	0.042

Police vs Recruit Leadership Factor 2 Scores (Cohort 5)	Satorra-Bentler type Chi Sq	Df	Probability	RMSEA	90% Confidence Interval of RMSEA	
A	12.34	4	0.015	0.055	0.022	0.092
C	8.89	2	0.012	0.071	0.029	0.122
E	17.76	4	0.0014	0.071	0.040	0.106
N	14.29	3	0.0025	0.074	0.039	0.115
O	3.39	4	0.494	0.000	0.000	0.054

Table 8.21. Results from tests of the pattern hypothesis that all sub factors of a given factor correlate equally with leadership factor scores derived from factor analysis of police recruit ratings.

The increased size of this sample (n=677) makes the above statistical tests more sensitive, hence it is more important to take account of the RMSEA values. Some of the RMSEA values shown are greater than 0.06. This provides an indication of differential prediction, however, the values are not much greater than 0.06 and the lower bound of confidence intervals is always below 0.06. Thus there was only limited evidence that the sub factors were differentially predictive. For those cases where RMSEA was greater than 0.06 and there were sub factors which showed significant correlations with leadership factor scores an analysis was also carried out to see whether any sub factors could predict additional outcome variance beyond that explained by the personality factor. The results of these analyses are presented in Tables 8.22a to 8.22d.

Metropolitan Police Service Recruits: **Instructor Leadership Factor 1**	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1 (Extraversion)	.000	-.001	.000	.091	675	.783
Model 2 (Model 1, (Extraversion) + E2)	.007	.004	.007	4.823	674	.028
Model 1 (Agreeableness)	.001	-.001	.001	.405	675	.525
Model 2 (Model 1, (Agreeableness) + A3 *Considerate*)	.009	.006	.008	5.375	674	.021
Model 1 (Conscientiousness)	.014	.012	.014	9.431	675	.002
Model 2 (Model 1, (Conscientiousness) + C1 *Efficient and Dependable*)	.014	.011	.000	.312	674	.577
Model 3 (Model 1, (Conscientiousness) + C2 *Hard working*)	.019	.016	.005	3.350	674	.068

(Note: The reported F ratios test whether there is a significant gain in variance accounted for in comparison to Model 1).

Table 8.22a. Results from hierarchical regression with Instructor Leadership Factor 1 as the Dependent Variable and interactions between scores on the Big Five Factor Conscientiousness and sub factors which show differential prediction, as predictors

Metropolitan Police Service Recruits: Instructor Leadership Factor 2	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1(Extraversion)	.000	-.001	.000	.106	675	.744
Model 2 (Model 1, (Extraversion) + E2 *Talkative*)	.010	.007	.010	6.905	674	.009

(Note:The reported F ratios test whether there is a significant gain in variance accounted for in comparison to Model 1).

Table 8.22b. Results from hierarchical regression with Instructor Leadership Factor 2 as the Dependent Variable and interactions between scores on the Big Five Big Five Extraversion Factor and sub factors which show differential prediction, as predictors.

Metropolitan Police Service Recruits: Recruit Leadership Factor 1	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1 (Neuroticism)	.004	.002	.004	2.537	674	.112
Model 2 (Model 1, (Neuroticism) + N2 *Worrying*)	.006	.003	.002	1.603	673	.206
Model 3 (Model 1, (Neuroticism) + N3 *Irritable*)	.008	.005	.004	2.613	673	.106

(Note: The reported F ratios test whether there is a significant gain in variance accounted for in comparison to Model 1).

Table 8.22c. Results from hierarchical regression with Recruit Leadership Factor 1 as the Dependent Variable and interactions between scores on the Big Five Neuroticism Factor and sub factors which show differential prediction as predictors.

Metropolitan Police Service Recruits: Recruit Leadership Factor 2	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1 (Extraversion)	.000	-.001	.000	.310	674	.578
Model 2 (Model 1, (Extraversion) + E2 *Talkative*)	.015	.012	.015	10.157	673	.002
Model 1 (Neuroticism)	.004	.002	.004	2.685	674	.102
Model 2 (Model 1, (Neuroticism) + N2 *Worrying*)	.011	.009	.008	5.108	673	.024

(Note: The reported F ratios test whether there is a significant gain in variance accounted for in comparison to model 1).

Table 8.22d. Results from hierarchical regression with Recruit Leadership Factor 2 as the Dependent Variable and interactions between scores on the Big Five Extraversion and Neuroticism Factors and sub factors which show differential prediction as predictors.

Although there are cases where sub factors explain significant additional leadership variance beyond that explained by the factors this is largely a product of the large sample size. In most cases the additional variance explained is less than 1% with the largest increment in variance explained being 1.5% in the case of E2 (Talkative) if the prediction of recruit rated factor 2. Effects of this size provided

little support for the predictive utility of sub factors. However the relationships between leadership factors and personality are generally so weak in this sample that these data probably have little to offer in adjudicating the relative value of factors and sub factors.

Overall, the weak relationships between the Leadership factors and the personality factors and sub factors mean that it would be unlikely that any value might be obtained from use of personality assessment in selection in this organisation.

8.4.4.7 *Do the Big Five factors and sub factors enhance predictive ability of the Police Initial Recruitment Test (PIRT)?*

Parallel questions with those posed of the Army relating to the ability of the Big Five factors collectively to predict leadership performance arise for the Police sample. In this case, the only other potential predictor available is the PIRT (see Chapter 3, section 3.4 for details of the PIRT) scores. These scores correlate with Leadership Factor 1 (.236**). Hierarchical regression was carried out to see if the Big Five Personality factors added value to the predictive ability of PIRT scores. A regression analysis was carried out using PIRT score in block 1 and adding the the Big Five (OCEAN) factors to see how much additional outcome variance is explained by the Big Five (OCEAN) factors. The findings are shown in Table 8.23 overleaf:

Police	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1(PIRT)	.037	.035	.037	18.985	1,496	<.001
Model 2 (Model 1 +OCEAN)	.070	.059	.033	3.494	5,491	.004
Model 3 (Model 2 + PIRT by OCEAN interactions)	.072	.051	.002	0.226	5,486	.951

*Table 8.23. Results from hierarchical regression with **Police Instructor Rated Leadership Factor 1** as the Dependent Variable and PIRT scores, scores on the Big Five, and interactions between scores on the Big Five and PIRT scores as predictors.*

Note- For models other than the Model 1 the reported F ratios test whether there is a significant gain in variance accounted for in comparison to the preceding model.

PIRT is a poor predictor of Leadership Factor 1 as it explains only 3.5% of the variance. Personality adds a small amount to PIRT prediction, with the adjusted R square increasing from 3.5% to 5.9%. Although small, this increase is statistically significant. Standardised regression coefficients and associated significance tests are shown in Table 8.24:

Model 2	Beta (Standardised Coefficient)	t	Significance
Constant		-3.116	.002
PIRT	.170	3.877	.000
Agreeableness	-.070	-1.237	.217
Conscientiousness	.177	3.142	.002
Extraversion	.027	.542	.588
Neuroticism	-.073	-1.357	.176
Openness	-.069	-1.483	.139

Table 8.24. Standardised regression coefficients and associated significance tests from a model predicting scores on Leadership Factor 1 derived from instructor ratings from PIRT scores and the Big Five.

It can be seen that the Conscientiousness factor makes a unique contribution to predicting scores on Instructor Leadership Factor 1.

The analysis was repeated for Leadership Factor 2 shown overleaf at Table 8.25;

Police	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1(PIRT)	.034	.032	.034	17.586	1,496	<.001
Model 2 (Model 1 +OCEAN)	.049	.038	.015	1.568	5,491	.167
Model 3 (Model 2 + PIRT by OCEAN interactions)	.051	.029	.001	0.135	5,486	.984

*Table 8.25. Results from hierarchical regression with **Police Instructor Rated Leadership Factor 2** as the Dependant Variable and PIRT scores, scores on the Big Five, and interactions between scores on the Big Five and PIRT scores as predictors.*

Note- For models other than the Model 1 the reported F ratios test whether there is a significant gain in variance accounted for in comparison to the preceding model.

The results for the Police sample, Instructor leadership Factor 2 are shown in Table 8.26. The addition of the Big Five factors adds to the prediction of the PIRT to this factor as well by a small, but statistically significant amount (3.2% to 3.8%);

Model 2	Beta (Standardised Coefficient)	t	Significance
Constant		-3.400	.002
PIRT	.172	3.879	.000
Agreeableness	-.037	-.641	.217
Conscientiousness	.135	2.370	.002
Extraversion	.017	.342	.588
Neuroticism	-.019	-.359	.176
Openness	-.021	-.458	.139

Table 8.26. Standardised regression coefficients and associated significance tests from a model predicting scores on Leadership Factor 2 derived from instructor ratings from PIRT scores and the Big Five.

From Table 8.26, it can be seen that again only the Conscientiousness factor makes a unique contribution to predicting Instructor Factor 2.

For recruit rated Leadership Factors, results of this analysis are shown at Tables 8.27 and 8.28 overleaf:

Police	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1(PIRT)	.037	.035	.037	18.985	1,496	<.001
Model 2 (Model 1 +OCEAN)	.070	.059	.033	3.494	5,491	.004
Model 3 (Model 2 + PIRT by OCEAN interactions)	.072	.051	.002	0.226	5,486	.951

*Table 8.27. Results from hierarchical regression with **Police Recruit Rated Leadership Factor 1** as the Dependent Variable and PIRT scores, scores on the Big Five, and interactions between scores on the Big Five and PIRT scores as predictors.*

Note- For models other than the Model 1 the reported F ratios test whether there is a significant gain in variance accounted for in comparison to the preceding model.

Police	R^2	Adjusted R^2	R^2 change	F for change	df	Significance
Model 1(PIRT)	.017	.015	.017	8.804	1,496	.003
Model 2 (Model 1 +OCEAN)	.029	.017	.011	1.136	5,491	.340
Model 3 (Model 2 + PIRT by OCEAN interactions)	.034	.012	.005	0.523	5,486	.759

*Table 8.28. Results from hierarchical regression with **Police Recruit Rated Leadership Factor 2** as the Dependent Variable and PIRT scores, scores on the Big Five, and interactions between scores on the Big Five and PIRT scores as predictors.*

Note- For models other than the Model 1 the reported F ratios test whether there is a significant gain in variance accounted for in comparison to the preceding model.

For the recruit rated leadership factors, both PIRT and personality are poor predictors of leadership performance. Although PIRT does predict significantly in relation to both factors, very little variance is explained. The variance explained is only minimally increased when personality is brought in, although the very small increment does reach significance for Factor 1 (1.5% to 1.7%).

However, it should be noted that *Leadership Factor 1 is predicted by PIRT, a cognitive test, albeit weakly.*

8.5 Leadership Performance Measures, Army and Police Data Compared

8.5.1 Army/Police Instructors

Comparing the separate products of the factor analyses for the Army instructors and Police instructors, we find that common elements exist which give rise to two loosely formed clusters within the raters, as previously reported. To reiterate, the first encompasses the "ability to do", i.e, "*can do*", characterised by performances being more operationally and cognitively based, with a requirement for individuals to follow defined procedures and demonstrate competence within specifically defined areas. The second cluster of leadership traits regarded as focussing on more personality oriented, interactional and motivational traits defined as "*will do*". Looking first at the instructor ratings across the Army and Police instructors (common traits are shown in bold) at Table 8.29 below:

Army/Police Instructors	Army Instructor Rated Leadership Traits	Police Instructor Rated Traits
Factor 1 (Cognitively Orientated Leadership Traits)	**Intelligence 1.147** **Analysis and Judgement 0.734** **Planning Ability 0.512** **Initiative 0.488** *Integrity 0.453*	**Planning Ability 0.964** **Initiative 0.879** **Analysis and Judgement 0.764** **Intelligence 0.683** *Controlling Ability 0.462*
Factor 2 (Personality Orientated Leadership Traits)	**Personal Relations 0.860** **Impact 0.838** **Controlling Ability 0.826** **Compatibility 0.773** **Zeal and Energy 0.755** **Composure 0.738** **Physical Ability 0.771** **Determination and Commitment 0.662** **Self Confidence 0.652** **Adaptability 0.593** **Powers of Expression 0.441**	**Compatibility 0.912** **Personal Relations 0.766** **Determination and Commitment 0.738** **Adaptability 0.738** **Impact 0.718** **Physical Ability 0.656** **Zeal and Energy 0.648** **Integrity 0.513** **Self Confidence 0.509** **Powers of Expression 0.414** **Composure 0.412**

(Note. All loadings of >0.3 shown)

Table 8.29. Comparison of loadings (factor pattern coefficients) from the Factor Analysis of Leadership Trait ratings given by Army and Police Instructors

From this there can be seen a very high level of correspondence between the constituent traits in the factors within which they appear. Interestingly, *there is the same separation of leadership dimensions in both groups.*

8.5.2 Leadership Performance Measures, Army/Police Recruit Raters (Peers)

Comparing the separate products of the factor analyses for the Army recruit leadership raters and the Police recruit leadership raters, it is found find that common elements exist as follows in Table 8.30 (common traits shown in bold) below:

Army/Police Recruit Raters	Army Recruit Rated Leadership Traits	Police Recruit Rated Leadership Traits
Factor 1 ("Can do" Cognitively Orientated Leadership Traits)	**Analysis and Judgement 0.986** **Intelligence 0.865** Powers of Expression 0.862 **Planning Ability 0.855** **Adaptability 0.778** Initiative 0.765 Controlling Ability 0.558 Self Confidence 0.518 **Composure 0.356**	Determination and Commitment 0.734 **Adaptability 0.702** **Planning Ability 0.528** **Intelligence 0.526** **Composure 0.491** **Analysis and Judgement 0.481** Physical Ability 0.374
Factor 2 ("Will do" Personality Orientated Leadership Traits)	Physical Ability 0.915 **Zeal and Energy 0.892** Determination and Commitment 0.890 **Personal Relations 0.670** **Impact 0.612** **Compatibility 0.546** **Integrity 0.415**	Powers of Expression 0.919 **Impact 0.915** Self Confidence 0.874 Controlling Ability 0.828 **Integrity 0. 797** **Compatibility 0.782** **Zeal and Energy 0.541** **Personal Relations 0.537** Initiative 0.489

(Note. All loadings of >0.3 shown, common traits shown in bold)

Table 8.30. Comparison of loadings (factor pattern coefficients) from the Factor Analysis of Leadership Trait ratings given by Army and Police Recruits

This table, table 8.30, for recruit raters contrasts with the results from the instructor leadership raters and factor table (Table 8.29). Here, the number of common traits to be found within the 2 factors is more limited. This might suggest that the recruit's view of what constitutes good leadership matches between Army and Police, though not as much as the match between the view of the instructors from

the two organisations. Perhaps these common traits which are less contextually dependent, are therefore more generalisable, and simply *very obvious* to the raters who are likely to know the individuals they are rating relatively well when compared to how well their instructors know them.

The factor scores were correlated between instructor and recruit raters with the following results shown at Table 8.31 and 8.32 respectively overleaf:

Army n=115	Leadership Factor 1 instructor rater	Leadership Factor 2 instructor rater	Leadership Factor 1 recruit rater	Leadership Factor 2 recruit rater
Leadership Factor 1 instructor rater	1	.631**	.393**	.371**
Leadership Factor 2 instructor rater		1	.419**	.157
Leadership Factor 1 recruit rater			1	.744**
Leadership Factor 2 recruit rater				1

Table 8.31. Intercorrelations between Army Leadership Factor Scores

Police n=677	Leadership Factor 1 instructor rater	Leadership Factor 2 instructor rater	Leadership Factor 1 recruit rater	Leadership Factor 2 recruit rater
Leadership Factor 1 instructor rater	1	.695**	.413**	.398**
Leadership Factor 2 instructor rater		1	.303**	.309**
Leadership Factor 1 recruit rater			1	.709**
Leadership Factor 2 recruit rater				1

Table 8.32 Intercorrelations between Police Leadership Factor Scores

There are two main points to note from the analyses in tables 8.31 and 8.32.

Firstly, there is a degree of overall agreement between recruits and instructors on rating of leadership, but this is not factor specific.

The correlations of .695** for the Army sample and .631** for the Police sample between Instructor Leadership Factor 1 and Instructor Leadership Factor 2 suggest that there is "within" person agreement. This relationship is replicated between Recruit Leadership Factor 1 and Recruit Leadership Factor 2 (.744** and .709** for the Army and Police samples respectively). This is probably reflective of fairly strong halo effects (see Chapter 4, section 4.2.6 and Chapter 8, section 8.2.4).

In both samples, agreement between instructors and recruits is no greater within a factor than across factors. For the Army, the two within factor correlations between instructors and recruits are .393 and .157, whilst the two across factor correlations are .491 and .371. Similarly for the police sample, the within factor correlations are .413 and .309, whilst the across factor correlations are .303 and .398.

This suggests that there is general agreement overall on leadership, but not at factor level. This finding further adds weight to the argument that Halo effects (see Chapter 4, section 4.2.6 and Chapter 8, section 8.2.4 above) operate powerfully in the rating of leadership performance. General performance drives the activity of rating, rather than performance on specific dimensions as previously argued (Lance, Noble and Scullen, 2002), hence the ratings of all raters contain a substantial element which is idiosyncratic to the rater. This may contribute to the poor agreement at the factor specific level between instructors and recruits.

A second possible element in the lack of agreement between recruit and instructor at factor level is that they observe from different perspectives, and may draw on different evidence for their ratings. Consideration of agreement between raters

and the individual rater level may provide further insight into this. This is examined in the next section.

8.5.3 Individual Differences Between Raters

How much or how little do individual instructors and individual recruits disagree in their ratings ?

To answer this question, the separate individual instructor and peer ratings for each of the leadership traits for both the Police and the Army samples is considered.

8.5.3.1 **Army** Sample: The Relationship between Instructor and Recruit Raters for Leadership traits

Correlations between the raters for each of the leadership traits rated are shown overleaf at Table 8.33:

Leadership Traits	Rec1/ Instr	Rec2/ Instr	Rec3/ Instr	Mean Rec/ Instr	Rec1/ Rec2	Rec1/ Rec3	Rec2/ Rec3	Mean Rec/ Rec	-CI (95%)	+CI (95%)	Sig
Planning Ability	.348**	.434**	.503**	**.428**	.576**	.313**	.569**	**.486**	-0.04	0.15	
Initiative	.341**	.335**	.331**	**.335**	.599**	.321**	.551**	**.490**	0.04	0.27	*
Intelligence	.200**	.164*	.447**	**.270**	.526**	.267**	.501**	**.431**	0.03	0.31	*
Analysis and Judgement	.197**	.234**	.426**	**.285**	.625**	.255**	.448**	**.442**	0.05	0.27	*
Powers of Expression	.306**	.350**	.301**	**.319**	.486**	.478**	.588**	**.517**	0.10	0.33	*
Controlling Ability	*.024*	*.057*	*.055*	***.045***	.526**	.490**	.596**	**.537**	0.09	0.70	*
Zeal and Energy	.346**	.329**	.403**	**.359**	.609**	.450**	.618**	**.559**	0.08	0.33	*
Composure	.218**	.354**	.224**	**.265**	.523**	.176*	.252**	**.317**	-0.03	0.15	
Impact	.381**	.465**	.462**	**.436**	.486**	.446**	.596**	**.509**	-0.01	0.17	
Self Confidence	.320**	.479**	.429**	**.409**	.485**	.278**	.481**	**.414**	-0.08	0.09	
Physical Ability	.575**	.517**	.579**	**.557**	.680**	.530**	.625**	**.616**	-0.01	0.13	
Determination and Commitment	.259**	.276**	.334**	**.289**	.481**	.312**	.542**	**.445**	0.07	0.26	*
Adaptability	*.079*	.240**	.389**	**.236**	.309**	*.105*	.446**	**.286**	-0.02	0.21	
Organisational Compatibility	.154*	.359**	.328**	**.280**	.503**	.271**	.373**	**.382**	0.01	0.20	
Personal Relations and Team Spirit	.169*	.420**	.341**	**.310**	.507**	.275**	.403**	**.395**	-0.01	0.19	
Integrity	*-.235***	*-.003*	*.094*	***.048***	.447**	.498**	.481**	**.475**	0.39	0.68	*
Overall Rating	.535**	.718**	.495**	**.582**	.643**	.763**	.586**	**.664**	0.01	0.15	
Order of Merit (Leadership)	.940**	.641**	.546**	**.709**	.678**	.543**	.556**	**.592**	-0.08	+0.16	

(Note: - CI = Lower Bound of 95% Confidence Interval for Difference between Mean Recruit/Recruit and Mean Recruit/Instructor. +CI = Upper Bound of 95% Confidence Interval for Difference between Mean Recruit/Recruit and Mean Recruit/Instructor. Final column indicates significance of the difference between mean recruit/recruit and mean recruit instructor.)

Table 8.33. ***Army*** *Sample. Correlations between ratings of leadership traits given by individual recruits and instructors and by different pairs of individual recruits. Figures shown in bold are averages of the correlations given in the three preceding columns.*

From table 8.33, it can be seen that in all cases, agreement on leadership trait rating between pairs of recruits is higher than between a recruit and an instructor. Testing the significance of the difference between mean recruit/recruit correlations and mean recruit/instructor correlations is not entirely straightforward as there is a complex pattern of partial non-independence between the correlations contributing to the two means. This was dealt with by using bootstrapping (Efron and Tibrishani, 1993) to generate a 95% confidence interval for the difference between the two mean correlations. The bootstrapped confidence intervals are shown in

Table 8.33. The mean correlations are significantly different at the 5% level when this confidence interval does not include zero. Significant differences are indicated in the final column of Table 8.33. It can be seen that eight of the rating dimensions show significantly greater agreement between recruits than between recruits and instructors with a number of other dimensions only marginally missing significance.

This suggests that recruits and instructors may be drawing on somewhat different evidence in making their ratings. There are two exceptional cases, *Controlling Ability* and *Integrity*. For *Controlling Ability*, there are no significant correlations with recruit rater and instructor rater (.024 to .057) yet good correlations for recruit to recruit raters (.490** to .596**). It is worth considering again (see Chapter 8, section 8.2.3) that in the training regime at RMAS, peers also become subordinates as a matter of practice during training exercises and are thus constantly exposed to the abilities of their colleagues to lead. All recruit raters are thus likely to be highly sensitive to each other's Controlling Ability. Instructors however, see much less of this aspect of their students except when their skills are exposed in command appointments during training. For Integrity, the aspects which are used to inform the rating of an individual are clearly different between recruits and instructors. Recruits appear to be in agreement between themselves, but this is not the case between recruits and instructors.

The findings in Table 8.33 could help to explain why *instructor* rated leadership performance is better predicted by both RCB and OCEAN than by *recruit* rated leadership performance.

8.5.3.2 Police Sample. Correlations between Police Instructors and Recruit Raters for Leadership traits

Correlations between the raters for each of the leadership traits rated are shown below at Table 8.34:

Leadership Trait		Rec1 / Instr	Rec2/ Instr	Mean Rec/ Instr	Rec1/ Rec 2	-CI (95%)	+CI (95%)
Planning Ability		.500**	.557**	**.528**	.494**	-0.20	0.09
Initiative		.367**	.534**	**.450**	.356**	-0.28	0.10
Intelligence		.554**	.664**	**.609**	.659**	-0.03	0.14
Analysis and Judgement		.348**	.496**	**.422**	.375**	-0.20	0.09
Powers of Expression		*.062*	.444**	***.253***	*.176*	-0.24	0.11
Controlling Ability		.260**	.220*	**.240**	.291**	-0.14	0.23
Zeal and Energy		.210*	.314**	**.262**	.405**	-0.04	0.35
Composure		.310**	*.094*	**.202**	.384**	0.01	0.35
Impact		.323**	*.093*	**.208**	.378**	-0.03	0.33
Self Confidence		.305**	.423**	**.364**	.411**	-0.16	0.23
Physical Ability		*.173*	*.139*	**.156**	.601**	0.25	0.64
Determination and Commitment		.232*	.198*	**.215**	.385**	-0.01	0.38
Adaptability		.357**	.270**	**.313**	.204*	-0.27	0.07
Organisational Compatibility		.162	.292**	**.227**	.414**	-0.01	0.37
Personal Relations and Team Spirit		*.055*	*.143*	***.071***	*.202*	-0.08	0.31
Integrity		*.179*	*.071*	***.099***	*.144*	-0.17	0.23
Overall Rating		.327**	.455**	**.391**	.222*	-0.32	0.01
Order of Merit (Leadership)		.237*	.339**	**.288**	.287**	-0.24	0.21

(Note: - CI = Lower Bound of 95% Confidence Interval for Difference between Recruit/Recruit and Mean Recruit/Instructor. +CI = Upper Bound of 95% Confidence Interval for Difference between Recruit/Recruit and Mean Recruit/Instructor)

*Table 8.34. **Police** Sample. Correlations of leadership trait ratings between each of the two recruit raters and the instructor and between the two recruit raters. The figures shown in bold are the average of the two recruit/instructor correlations in the preceding columns.*

The significance of the difference between the recruit/recruit correlation and the mean recruit/instructor correlation was again assessed by constructing a bootstrapped confidence interval for the difference. For most dimensions the confidence interval included zero so in contrast to the army data there was no evidence of recruits agreeing better amongst themselves than with instructors. The two exceptions were there was significant evidence of recruits showing greater agreement were composure and physical ability.

From Table 8.34, it can be seen that generally recruit and instructor raters for the Police agree more closely on the Leadership Factor 1 (COLT) traits, in particular, Planning Ability, Initiative, Intelligence and Analysis and Judgement traits. For Leadership Factor 2 (POLT) traits, recruits tend to agree between themselves better than they do with instructors. Some ratings e.g. Powers of Expression, Controlling Ability, Zeal and Energy, Composure and Impact, are far less consistent between these two groups, though similar correlations for Self Confidence shows that this trait might be assessed consistently across the groups. It is striking that the variation in correlation value and significance for Physical Ability (.173 and .139 for correlation of recruit to instructor and .601** between recruits) should be so great. However, this is consistent with the fact that it is likely that peers are more aware of their colleagues physical ability as a result of the organisation of training – the instructors delegate physical training to specialist instructors and may not be aware of their students prowess, or otherwise, in this area. Consistency between the remaining traits tends to be low, particularly with regard to Personal Relations and Team Spirit, and Integrity. Comparing Army and Police consistency, the correlations between instructors and recruit raters from the

Police data are markedly lower than the Army raters for Overall Rating and Order of Merit. This further adds weight to the argument that understanding and awareness of leadership and the strength of leadership culture might be significant in explaining the differences between these data (see Chapter 7, section 7.3).

8.5.3.3 Summary, Army and Police Data Compared

There is a greater level of agreement on overall leadership performance in the Army than in the Police. This applies both to agreement amongst recruits and to agreement between instructors and recruits. For overall leadership rating, recruit/recruit correlations range from .586 to .763 in the Army, but were only .222 in the Police. Similarly, instructor/recruit correlations range from .495 to .718 in the Army, whilst the Police correlations were .327 and .455. Larger correlations for the Army were found to be even more evident, e.g. with the Order of Merit rating (.94**). There were also particular dimensions where Army correlations were found to be notably higher including Personal Relations and Team Spirit where none of the Police correlations were significant. This would indicate that both instructors and recruit raters in the Army are more consistent in their agreement over rating. This might suggest that the interpretation and common understanding of what constitutes a good, bad or indifferent leader in respect of performance against the traits, is more fully and universally understood by those in this organisation. Nevertheless, when compared with the literature, these inter- rater reliabilities are particularly high both for the Army and Police. Conway and Huffcut (1997) in their meta-analysis of subordinate, peer and self ratings on job performance found a range of reliabilities for subordinates rating supervisors (equivalent to cadet/recruits rating peers undertaking a leadership role). The

average correlation coefficient was found to be .22. For peer performance rating (equivalent to cadets/recruits rating cadets/recruits in non-leadership situations) the correlation coefficient was found to be .34 on interpersonal dimensions. For overall rating, subordinates showed the lowest interrater reliability; with peers .37, and with subordinates .22.

From this it can be concluded that the impact of the relative strength of organisational/ leadership culture (see Chapter 7, section 7.3) within the organisation on the raters ability to rate may be an influential factor affecting measurement of leadership performance.

For both Army and Police samples, the recruit raters agree better on Leadership Factor 1 traits (COLT, "Can do") than Leadership Factor 2 traits (POLT, "Will do"). The implication of this is that *there must be potential use for these ratings for measurement of leadership performance, and for further development of this method of rating leadership performance.*

In summary, the extent to which individuals rate differently might be explained by a combination of the following factors:

Individual Differences - Differences between recruit and instructor ratings on an individual basis; subjectivity and individual differences in interpretations and perceptions of the constructs being assessed are shown in the variations in the scores;

Differences according to role - i.e. Instructors and recruits looking for different things or using different evidence to arrive at the ratings which arise as a product of the values, mores and standards imposed on individuals by the organisation and the roles of those in it (see Chapter 7).

8.6 Summary – Studies 4 and 5

In terms of predicting leadership performance, both the Army's RCB and the Metropolitan Police existing selection measures do not predict leadership performance very well. Though the Final Rank Order from RCB produced the best correlation with leadership performance measures of the two samples, this would be expected because *RCB is designed to select leaders*. It would have been anticipated that RCB would predict leadership performance much better than the Police selection process, of which PIRT is a significant part, *but which is not designed to select leaders* (see Chapter 3 section 3.4, and Chapter 7 section 7.3). It should be of concern that RCB appears to be weak in predicting leadership performance. However, the reliability of the leadership rating measure remains a further variable that may not be reflecting the true value of the RCB selection process, although there are respectable levels of inter rater agreement.

8.7 A Review of the Use of Leadership Ratings as Performance Criteria

At the beginning of this chapter it was suggested that personality might play a significant part in contributing to leadership performance. Studies 4 and 5 aimed to examine the relationship of the Big Five factors and sub factors with a standardised training performance measure for leadership. Analyses of Army and

Police samples were undertaken to test whether or not there were any identifiable relationships between existing selection data, leadership trait ratings and personality assessment data derived using the TSDI. It was shown that there was a degree of consistency between instructor and peer raters in the Army sample over a range of traits, whilst in the Police sample this was less pronounced. It is possible that there may be organisational/contextual influences at work, however (see Chapter 3, section 3.4 and Chapter 7, section 7. 3 and 7.4). However, this degree of consistency was higher than is typical in rating data (Conway and Huffcutt, 1997).

With regard to the two leadership factors identified, the findings indicate that there is considerable potential for the development of a performance taxonomy for leadership based on ratings. It has been shown that there is a reasonable level of agreement across the raters for both instructors and recruits, especially for Army recruits. For the Army, averaging over three recruit raters also reduced the noise in the data. There is, therefore, a high degree of generalisability in these findings, but not surprisingly perhaps, there is also evidence that there is a high degree of Halo effect present in leadership rating.

For the Army sample, any conclusions should be prefaced by the fact that the sample size was relatively small, and therefore before these findings are acted upon, there is a need for a study based on a larger sample. Nevertheless, based on the data presented, there is evidence that RCB does not predict leadership performance, though Final Rank Order may do to some extent. With regard to personality assessment, there is some evidence that for the Army sample at least, the TSDI predicts leadership ratings, and adds to the ability of RCB to predict

performance in training, though the relationships are quite weak. The question remains to be answered as to whether this is entirely due to poor reliability in leadership rating as an outcome measure. Correlations from recruit raters probably provide the best indication of this. These are much better in the Army sample than the Police sample, but these findings still suggest there is a lot of noise present in the ratings. Nevertheless, the correlations fall well short of those reported by Hollander (1965). Personality measures *do* add to the ability of RCB to predict performance, *but to a limited extent only*. With regard to the Police sample, the addition to the existing selection system that personality assessment contributes is negligible, though the limitations of the Police selection system as it stands, in terms of generating objective test data, may be an influential underpinning factor in this outcome. However, it is possible that *leadership may not be the right criterion to use to measure performance in police recruit training* (See Chapter 7, section 7.3). In the case of both the Army and the Police samples, sub factors predict differentially e.g. Neuroticism sub factors. This suggests that there may be greater utility offered by the sub factors for exploitation for selection.

The next chapter will draw together the main findings from the studies undertaken, and conclude by making suggestions for future work.

Chapter 9

Summary and Conclusions

9.1 Introduction

This chapter summarises the research undertaken in this thesis and its findings, examining and evaluating the themes that have emerged from the studies. It draws together conclusions based on the findings and offers recommendations for future work.

9.2 Summary of Research

9.2.1 Research Aims

To reiterate the aims of the thesis, these were:

To contrast the predictive validity of the Big Five factors against broad and narrow criterion measures, i.e. against overall performance measures and specific areas of performance;

To examine the incremental validity of the Big Five factors over general ability measures and their interaction with ability;

To examine the relative predictive validity of the sub factors which go to make the Big Five factors;

To examine the results in terms of developing a future performance taxonomy;

To examine the extent of the generalisability of any findings by looking at results of similar data gathered from another uniformed organisation, the Metropolitan Police Service.

9.2.2 Research Design

To achieve these aims, the research design was based on initial studies to establish the effectiveness of existing predictors and extant performance criteria, examining the effect of adding the personality measures to these. There followed two further studies incorporating more contextually appropriate outcome measures (using the Leadership Trait Rating Scale results) and assessing the generalisability of the findings with a sample from another uniformed organisation.

The initial studies first investigated the extent to which the TSDI predicted performance in training using existing performance measures, including instructor ratings at ATRs and the Queens Medal database at RMAS (Study 1- soldier recruits in training at ATRs and Study 2 - Officer Cadets in training at RMAS, see Chapter 4). A study then examined the use of more appropriate criterion measures (Study 3 - Officer Cadet development training in Rowallan Company, see Chapter 5). This provided a foundation for more focussed investigations into the relationship between the predictive validity of the TSDI and leadership performance in training, bringing into account the contextual element (Study 4 - Officer Cadets at RMAS using a Leadership Trait Rating Scale as the criterion measure, see Chapter 8). The final study, a replication of Study 4, was undertaken

using a larger sample of participants from another uniformed organisation (Study 5 - Metropolitan Police Recruits in training at Hendon, see Chapter 8) to evaluate the extent to which the findings from the Army sample might be generalizeable across other uniformed organisations.

9.3 Summary Findings from the Research

This research produced findings summarised below.

9.3.1 Predictive Validity of Big Five Factors and Sub Factors

Overall, when Big Five personality measures were used to predict leadership performance, they predicted no worse than some existing RCB selection measures. The TSDI was found to predict in some cases as well as some RCB dimensions. However, RCB was found to be a poor predictor of leadership performance. It is possible that the validity of RCB is not at issue, but to *improve* its validity there may be some value in assessing personality as the Big Five (OCEAN) factors together add incrementally to the existing RCB measures (See Chapter 8, section 8.4.3 and 8.7). The TSDI has therefore utility in the context of RCB, *particularly since it adds to the ability of RCB to predict leadership performance* (see Chapter 8, sections 8.4.3 and 8.7). Final Rank Order predicts scores on Instructor Leadership Factor 1, albeit slightly below accepted levels of significance. The increase in variance explained by addition of the Big Five factors is a modest 6%. However, *an alternative perspective would see this as more than a 50% improvement on the 11% variance provided by RCB assessment alone* (see chapter 8, section 8.4.3).

Big Five Sub factors in certain situations predict better than Big Five factors, however, the sub factors predict differentially but inconsistently across samples (see Chapter 8, sections 8.4 and particularly section 8.4.4.2). This may be because of inconsistent application of criterion measures ratings, or the application of the selection instrument is so context specific that the use of the TSDI may not be generalisable across different organisations (See Chapter 8, section 8.7). The only clearly defined relationships with training performance shown by soldiers in training was found to be with Conscientiousness and Neuroticism. A positive correlation was shown with Conscientiousness, and a negative correlation shown with Neuroticism, but these were both weak (see Chapter 4, section 4.2.6). Analysis showed that the Big Five sub factors predict differentially in Study 2 (see Chapter 4, section 4.3.4.3) and Study 4 and 5 (see Chapter 8, section 8.4.4.2 and section 8.4.4.6). Broadly, where the sub factors correlate significantly with training component measures, they were at a higher level than the correlations of the Big Five factors (Chapter 4, sections 4.3.4.2 and 4.3.5). There were a number of sub factors which related to Leadership Instructor Factor 1 (COLT)(see Chapter 8, section 8.4.4.2). However, this was not reflected in Instructor Leadership Factor 2 (POLT) (but it would not necessarily be expected that the same aspects of personality would predict COLT and POLT; this is part of the value of separating them as performance criteria). It is important to note that the largest correlation is only of the order of .26, however (See Chapter 8, section 8.4.4.1). There was a much higher proportion of significant correlations arising from the Neuroticism sub factors than the Neuroticism factor (41.6% compared with 27.8%) (See Chapter 8, section 8.4.2.1 and section 8.5). With regard to Neuroticism and Extraversion and individual leadership traits, Neuroticism and its sub factors were more frequently

significant with instructor ratings, and Extraversion and its sub factors were more frequently significant with recruit ratings (See Chapter 8, section 8.4.4.2).

The fact that differential prediction from sub factors was found might encourage pursuit of more narrow band measures which would likely improve both selection and assessment of performance. The Big Five sub factors are likely to have more potential in selection than the Big Five factors overall.

9.3.2 Big Five Factors and Ability Measures

General ability tests were shown to be valid predictors in accordance with previous research (see Chapter 2, section 2.5; Chapter 4, sections 4.2, 4.2.6.5, and 4.3, and Chapter 8, sections 8.4.4.3. and 8.4.4.7) but weaker than is typically reported. This would serve to reinforce the use of cognitive testing in selection processes when compared with personality tests. As predicted, only weak correlations of personality assessment with training performance measures were obtained, in accordance with the literature (Study 2 - see Chapter 4, section 4.3.4.2; Study 4 and 5, Chapter 8, section 8.4.4.7). It was found that correlations of personality assessment with performance measures were not hugely less than GTI correlations with performance measures (Study 1 - see Chapter 4, section 4.2.6.5). Personality adds significantly to GTI prediction, but only by a small amount (from 3.6% to 4.2% of variance) (see Chapter 4, section 4.2.6.6). This was found to be provided by the Neuroticism factor. For the Soldier sample, 4 out of 5 GTI to supervisor ratings were significant at <0.01 level of confidence, though they showed weak correlations. GTI correlated with each of the Big Five factors, albeit weakly, with 4 or the 5 correlations at the <0.01 level of confidence (see Chapter

4, section 4.2.6.6). The PIRT scores for the Police sample showed weak correlations with the Big Five factors when compared with the GTI measure (see Chapter 8, section 8.4.4.7).

9.3.3 Personality Predictors Predicting Broad And Narrow Bandwidth Performance Criteria

The range of the correlation values, with the majority about .2 to .3 with a few outliers, suggest that the concerns expressed in the literature over personality assessment in predicting performance on broad criteria are borne out (see Chapter 2, section 2.5.4). Whilst strong evidence supports the relationship between personality and performance, the small magnitude of the relationship has caused some researchers to question the actual utility of personality for predicting work performance (Hurtz & Donovan, 2000) and this concern is upheld by these results. The opportunity to identify relationships between narrow bandwidth (or low bandwidth - Paunonen, 1998; Schneider, Hough and Dunnette, 1996)) phenomena within the Big Five factors in the form of the Big Five sub factors (predictors) and narrow bandwidth criteria (individual leadership traits) was clearly provided by this research (see Chapter 8, sections 8.4.2.1, 8.4.4.1, and 8.4.4.5) . The fact that few of the correlations of the narrow bandwidth predictors and narrow bandwidth criterion measures occurred, provides some evidence to suggest that the utility of the Big Five sub factors may still be open to debate.

9.3.4 Lessons For The Selection, Training Performance and Assessment Continuum

Personality assessment added significantly to the best predictor arising from RCB, Final Rank Order, when measured against Instructor Leadership Factor 1, Cognitively Orientated Leadership Traits (COLT) (Study 4 - see Chapter 8, section 8.4.4.3). However, the increase in variance explained was a modest 6%. Of the personality factors, only Extraversion made a unique contribution to the prediction of scores on Instructor Leadership Factor 1 (COLT). In the case of Instructor Leadership Factor 2 Personality Orientated Leadership Traits (POLT), RCB Final Rank Order accounted for only 2.6% of the variance. This falls short of significance at standard levels (p=0.058). However the Big Five factors do add significantly to this, raising the variance explained to 9.8% (see Chapter 8, section 8.4.4.3). Neither the Final Rank Order at RCB, nor scores on the Big Five factors contribute significantly to the two recruit-rated Leadership factors in the Army sample (see Chapter 8, section 8.4.4.3). However, *it is mainly the ability aspects of leadership that are predicted by the current selection process at RCB, but the more personality orientated aspects which individuals require to lead are not measured. This might be rectified by inclusion of personality assessment at RCB* (see Chapter 8, section 8.4.4.4).

In the Police sample, personality was found to add a small amount to the prediction provided by the PIRT scores, with the adjusted R square increasing from 3.5% to 5.9%. Although small, this increase is statistically significant (see Chapter 8, section 8.4.4.7). The Conscientiousness factor was found to make a

unique contribution to predicting scores on Instructor Leadership Factor 1 (COLT). For Instructor leadership Factor 2 (POLT) The addition of the Big Five factors was found to add to the prediction of the PIRT as well by a small, but statistically significant amount (3.2% to 3.8%) (see Chapter 8, section 8.4.4.7). *In the Police sample, recruit rated Leadership Factors, PIRT and the Big Five factors were found to be very poor predictors of leadership performance.* There is a mismatch between selection and training systems demonstrated in both the Army and the Metropolitan Police. At RCB much of the selection system is oriented towards the cognitive domain and demonstration of leadership in practical scenarios (see Chapter 3, section 3.3) . Much of what is assessed at RMAS has an academic flavour, and therefore relates to the cognitive domain tested at RCB (see Chapter 4, section 4.3.4.2). *However, measurement of leadership performance at RCB is not reflected in measurement of leadership performance at RMAS.* The selection system for the Metropolitan Police does not attempt to measure any aspect of propensity for leadership (see Chapter 3, section 3.4)). This is appropriate with respect to the subsequent training of recruits as leadership is not formally taught or assessed on the recruit training course (see Chapter 7, section 7.3). *However, all of those who enter the Metropolitan Police will be promoted into roles demanding leadership abilities, thus the training and selection system do not reflect the organisational needs.*

The RMAS data only covers those elements which *can* be measured quantitatively and objectively i.e. elements of professional knowledge and skills, but which only *contribute* to successful leadership (see Chapter 4, section 4.3 and particularly 4.3.3). *The leadership trait rating system might be a more appropriate and*

satisfactory criterion measure to use (see Chapter 8, section 8.7) to influence what is used at RCB as predictors.

9.3.5 Generalisability of the Findings

In the context of predicting overall performance, it is unlikely that the findings from the use of the TSDI are generalisable given the influence of the contextual factor on performance. However, in the case of leadership, the studies have shown that the instruments *may* have utility across different organisations (see Chapter 8, section 8.5.2) providing they are adapted to take into account the contextual and situational variations. "The key to predicting situationally embedded criteria is the isolation of the latent situational factors that affect the criteria and the assessment of relevant situational variance with the predictor" (Murtha, Kanfer and Ackerman,1996, p. 204). The implications of this are that *organisationally or occupationally bespoke versions of the TSDI may be the way forward to achieve higher levels of validity as a predictor* (see Chapter 2, section 2.6 and Chapter 8, section 8.7).

Jackson and Corr (1998) concluded that weak correlations were found between personality and performance at the individual levels of analysis, but strong correlations were found at the aggregate, organisational level of analysis. Whilst the leadership factors do not load consistently between the Big Five factors or sub factors, the data suggests that there may be a relationship between personality assessment and the leadership performance measures despite the variation between organisational or leadership culture (see Chapter 8, section 8.7). Within the RMAS (Study 4) sample a strong situation exists (see above for an explanation

of strong and weak situations and their relevance to situational forces), in the context of a strong leadership culture. In the Metropolitan Police, a weak leadership culture exists (see Chapter 7, section 7.3). It may therefore be reasonable to speculate that these organisational differences may explain the differences in the predictor/criteria relationships independently of the personality assessment/training performance criterion (see Chapter 8, section 8.7).

9.3.6 Personality Assessment and Context

The initial research confirmed findings in the literature that correlations of the Big Five factors with training performance ratings appeared too weak to be useful in selection (see Chapter 4, sections 4.2.7 and 4.3). However, the relationships could have been weakened by poor criterion reliability and validity. Big Five personality assessment using the TSDI has been shown to be context critical (see Chapter 2, section 2.5 and 2.6). Contextual aspects were found to have considerable influence on relationships between personality assessment results and criterion. The extent to which personality factors, as measured by the TSDI, were related to performance of recruits or cadets in training remains questionable, given the nature of the activities undertaken (see Chapter 4, section 4.2.7 and 4.3). Personality measures appear from this study to be better predictors than existing measures of the more contextual elements of leadership performance (see Chapter 8, section 8.4.4.4.).

A robust two factor leadership model was identified based on factor analysis (see Chapter 8, sections 8.4.3, 8.5.1 and 8.5.2). This is a novel finding. These were designated as Leadership Factor 1 (Cognitively Orientated Leadership Traits

(COLT) and Leadership Factor 2 (Personality Orientated Leadership Traits) (POLT). These factors broadly equate to "can do" and "will do" attributes (see Chapter 8, section 8.4.3.3). Whilst Leadership Factor 1 might be related to cognitive ability, it may relate more particularly to manifest cognitive ability, i.e. cognitive ability and the willingness or aptitude to display it (See Chapter 8, sections 8.4.3.3). These factors draw together both cognitive and personality aspects of leadership performance. From this it is suggested that personality measures might contribute an important component to the selection device by assessing the "will do" factor, in accordance with the assertion put forward by Salter (1996) (See Chapter 8, section 8.4.3.3). *A reasonable level of agreement on what constitutes leadership performance has been shown on ratings across the raters for both instructors and recruits, especially for Army recruits, in fact, from five different factor analyses* (see Chapter 8, section 8.4.3.3). *This is an important finding because it shows there is a degree of consistency featuring across rater groups and organisations.* The implication is that there *must* be potential use for the leadership ratings and factors for leadership performance measurement and therefore the development of a taxonomy for leadership performance. The absence of a contribution of cognitive ability data to the two leadership factors which emerge suggests that personality may subordinate cognitive ability when leadership performance is being assessed both in the "can do" and "will do" domains. *It is the manifestation of ability which is the most important aspect to consider in an applied setting.*

9.3.7 Training Performance Measures As A Reflection Of The Core Aims Of The Training Organisations

The absence of a measure of *effective leadership* in the Queens Medal training performance criteria from RMAS suggested that the training performance data that did exist, may not have been truly representative of the core output criteria (see Chapter 3.3.3). Indeed, most jobs are composed of task requirements and people requirements (Cascio, 1982), but the Queens Medal data has been shown to be orientated too much towards the former, and too little towards the latter (see Chapter 4, sections 4.3, 4.3.3 and 4.4). This culminated in the use of the Leadership Trait Rating Scale (see Chapter 8, section 8.2). Training performance measures need to reflect core outcomes in the first instance, and subsidiary or supporting outcomes should take lower priority. Whilst there may have been a degree of subjectivity introduced by the use of instructor/supervisor rating of performance, the most frequently used criterion for judging success tends to be a subjective evaluation, and the most common source of the evaluation is the employee's supervisor (Monahan and Muchinsky, 1983) and so this element of research design was in line with standard practice (see Chapter 8, section 8.2.3).

9.3.8 Relationships Between Peers And Supervisor Leadership Trait Ratings

A very high level of correspondence was seen between the constituent traits in the factors from both Police Instructors and Army instructors (see Chapter 8, section 8.5.3.1 and section 8.5.3.2). The relationships between peers (cadets/recruits) and supervisor (instructors) ratings on leadership traits have given rise to a number of insights into the leadership construct and a new perspective regarding the impact

of leadership culture on organisational performance (See Chapter 8, section 8.7). Peer/subordinate data was found to be in agreement with each other but did not always correlate with instructor assessment (See Chapter 8, section 8.5.3).

9.3.9 Leadership Culture

With respect to the construct of leadership, the research found that it is important that a culture of leadership is established in an organisation if personality assessment is to be used effectively to predict leadership performance (see Chapter 7, section 7.3). Members of the organisation need to have a universal understanding of what leadership means in that organisation and how it manifests itself. Leadership culture was found to be strongly and institutionally inculcated in the Army, but less so in the Metropolitan Police Service. The Police service is constrained in developing a strong leadership culture by a number of factors; recruits are not selected on leadership criteria, leadership is not formally taught or assessed in training, and the organisation does not provide a structure or systematic framework upon which a leadership culture could be built (see Chapter 3, section 3.4 and Chapter 7, section 7.3 and 7.4).

9.3.10 Individual Perceptions of Leadership

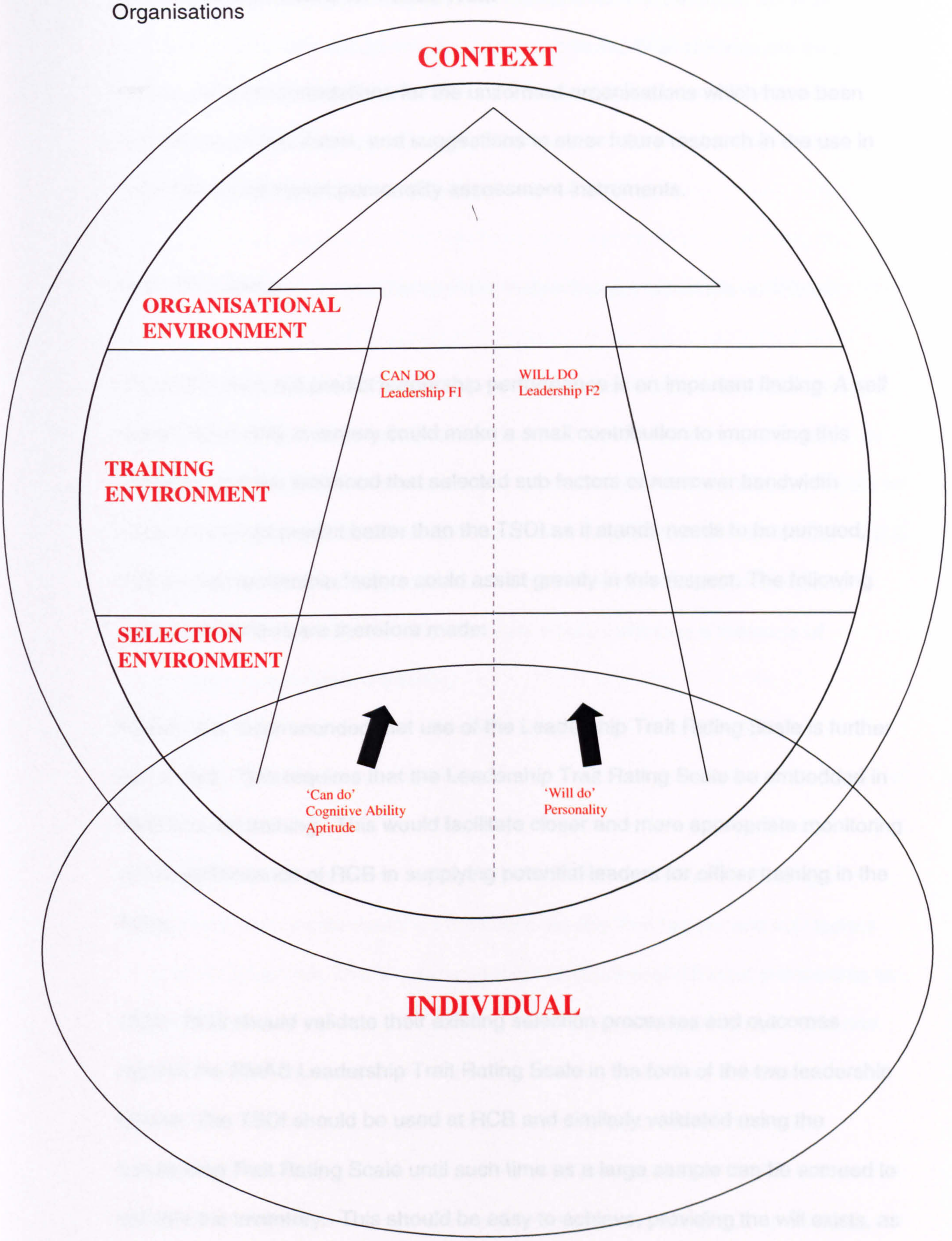
In terms of individuals within the organisation, the perception of leadership reported and demonstrated by the instructors from the two organisations closely matched between the Army and the Police (see Chapter 7, section 7.3). This was also true of the recruits, but to a less marked extent (see Chapter 8, section 8.5.3). Given the factor structures for the two leadership factors are similar, it is therefore

likely that the leadership traits are commonly understood by the raters, are appropriate and therefore more likely to be generalizeable (see Chapter 8, section 8.5.3 and 8.7).

9.3.11 A Framework For Predicting Leadership Performance In Organisations

Finally, the research findings have produced a framework that might be used for future research in applied settings, covering selection, training, and leadership in uniformed, or indeed, other organisations. The model is shown at Figure 9.1 overleaf (see page 257). It highlights the aspects which require assessment, both qualitative and quantitative, in any research investigation. It shows the environments which exist (Selection, Training and Organisational) and the relationship of the individual within the organisation which influences each constituent part of the processes which go on within the environments. The small black arrows indicate the contribution and interaction of selection data, and how they should relate to assessment of leadership performance (Can do and Will do factors) in training in order to provide leaders to take up their role in the organisation. The large arrow, divided by the dotted line, indicates that the relationships between the Can do and Will do elements remain to be defined, as these are likely to be typically unique to the organisation in which the framework might be applied.

Figure 9.1 A Framework for Selection, Training and Leadership in Uniformed Organisations



9.4 Recommendations for Future Work

Below are recommendations for the uniformed organisations which have been reported on in this thesis, and suggestions to steer future research in the use in selection of self report personality assessment instruments.

9.4.1 The Army

That RCB does not predict leadership performance is an important finding. A self report personality inventory could make a small contribution to improving this situation, and the likelihood that selected sub factors or narrower bandwidth measures might predict better than the TSDI as it stands needs to be pursued, and the two leadership factors could assist greatly in this respect. The following recommendations are therefore made:

RMAS. It is recommended that use of the Leadership Trait Rating Scale is further developed. This requires that the Leadership Trait Rating Scale be embedded in RMAS cadet training. This would facilitate closer and more appropriate monitoring of the performance of RCB in supplying potential leaders for officer training in the Army.

RCB. RCB should validate their existing selection processes and outcomes against the RMAS Leadership Trait Rating Scale in the form of the two leadership factors. The TSDI should be used at RCB and similarly validated using the Leadership Trait Rating Scale until such time as a large sample can be accrued to validate the inventory. This should be easy to achieve, providing the will exists, as the test is simple to administer, takes a short time to complete, completed

questionnaires can be marked automatically and no test purchase costs would be incurred. Potential savings and improvements to the RCB process are likely to accrue.

9.4.2 The Metropolitan Police Service

Recommendations for the Metropolitan Police Service are made as follows:

Leadership Assessment. For the Metropolitan Police Service, there are strong grounds to introduce leadership assessment as part of the selection process. In training, formal assessment of leadership performance in recruit training should be introduced. This, in addition to organisational changes, might initiate selection of a leader stream which would greatly assist in developing a stronger leadership culture. The Leadership Trait Rating Scale would suffice as a measure of leadership performance in training.

9.4.3 Future Research into the TSDI

Comparison of psychometric properties of the TSDI and other personality inventories. Inventories designed to assess the Big Five factors and sub factors should be compared. This would require administration of different instruments to the same group of participants using the same leadership performance criterion measures, over the same time, and in the same context. This could be undertaken, for example, as part of the selection process at RCB and the Leadership Trait Rating Scale used as the criterion measure at RMAS. As a longitudinal study, this could also be used to evaluate existing RCB predictors.

Research into utilizing the Big Five sub factors. Profiling good performers in particular jobs, and matching against TSDI sub factor data to those profiled, would inform the contribution of personality assessment to selection. Profiling all occupations would be expensive, but this may be reduced in the first instance by profiling, say, successful leaders, and using the findings to examine to what extent the Big Five sub factors predict their leadership performance. However, the multiplicity of sub factors creates problems with respect to the possibility of chance findings. This needs to be countered by using large samples or by replicating studies.

Meta Analysis to define the predictive validity of the Big Five factors and sub factors. A rolling meta-analysis should be compiled within the participating nations for the TSDI. This would greatly assist any future research.

Stability of Leadership Ratings over time. This study took a snapshot of individual's leadership performance and was not able to examine how stable the ratings were over time. It would be valuable to rate individuals at various stages of their training at RMAS and after graduation to see what variations could be identified.

9.5 Conclusions

There are a number of areas where any findings arising from this research should be treated with a degree of caution due to sample size, range restriction and the quality of performance measures. The quality of performance measures has been shown again, as in other research undertaken with British Army participants (Elshaw 1999), to impact significantly on the findings of selection research. From a more positive perspective, indeed, addressing the issue of contextual appropriateness of the criteria which makes up the performance measures, resulted in findings about the measurement of leadership performance which would otherwise have remained unidentified or at least obscured. It is therefore reasonable to suggest that in studying predictors, such as personality assessment that require outcome measures with high fidelity, the opportunity to address the broader issue of improving performance measures is an important contribution to future research. This applies both within the field of personality and other areas of psychological research which depend on trainees as participants. However, it is also accepted that the weakness of relationships between personality and leadership performance may always be found depending on the nature of the organisation within which it is being studied.

In terms of conclusive findings concerning the Big Five factors as measured by the TSDI, then this research thesis has added to the body of knowledge of how such theories and applications operate in real environments. It has established conclusively that any future research in personality assessment should ensure outcome measures are appropriate and robust before gathering data. It has shown that the organisational influence on individual behaviours and what underpins them is an important factor. Even if sample size is large and instruments used are

sound, then good predictive validity may still be difficult to obtain. Personality measures can be beneficial for prediction, but a careful match between the relevant performance scales and the outcome measures remains an essential requirement as the findings from this research indicate.

With regard to theoretical considerations, the strength of Eysenck's original hypotheses remains, with Extraversion and Neuroticism factors and sub factors showing the most correlations and accounting for the most variance in the 5 studies. There remain questions around the utility of Costa and McCrae's (1978) Openness factor and Goldberg (1981) Agreeableness and Conscientiousness when applied to selection.

Research should be continued to develop a personality and performance taxonomy as it remains a potentially productive activity, though not without challenge.

Appendix A

The Trait Self Description Inventory (TSDI) Administration Instructions and Questionnaire

Appendix A

Paper and pencil OCEAN reusable question booklet

THE T-SD INVENTORY

Version UK1.0

INSTRUCTIONS FOR COMPLETION

On the following pages you will find a number of adjectives and statements which might be used to describe oneself. You should read through and decide how well each adjective describes you and how well each statement describes you. Then indicate your answer on the separate answer sheet. There will be some more instructions on the next pages for the way you should give your answer.

In this booklet the adjectives are all together on one page and the statements are all together on several pages. Whichever part of the test you complete first - ADJECTIVES or STATEMENTS - do all of that part before you begin the next part of the test. Before you start, carefully fill in the boxes marked **name, sex, date of birth** and **today's date.**

Now you are ready to begin the test. Check that you are using the correct side of the answer sheet. If you start with adjectives, turn your answer sheet to the side that is labelled **'adjectives'.** When you start the statements, turn your answer sheet to the side that is labelled **'statements'.** When you mark your answers on the answer sheet, make sure that the number of the adjective or statement you have just read is the same as the number on the answer sheet. Please give an answer for every adjective and every statement.

Please do not write anything in this booklet

ADJECTIVES

On the following page you will find a number of words which are adjectives. You should read through the list and decide how well each one of them describes you.

Here is an example:

'cautious'

Decide if 'cautious' is characteristic of you. Give each adjective a number which represents how characteristic it is. Below you will see how to answer using the numbers ① to ⑨.

①	②	③	④	⑤	⑥	⑦	⑧	⑨
extremely uncharacteristic	very uncharacteristic	quite uncharacteristic	slightly uncharacteristic	neutral	slightly characteristic	quite characteristic	very characteristic	extremely characteristic

If you decide 'cautious' is '*very uncharacteristic*' of you, then your answer to 'cautious' will be ②, because the '*very uncharacteristic*' rating is represented by the number ②. You would answer this question by completely filling in the ② on your answer sheet.

You should reply to all adjectives, comparing yourself with people of the same sex and age group. Give your first impression of whether each adjective describes you. Don't spend too long on deciding what your answer should be. Answer all questions, even if you're not entirely sure of your answer. Please try to avoid using the extremes of the scale ① and ⑨ and the centre of the scale ⑤ unless you really have to. If you understand what you have to do, turn over the page and begin. If you do not understand, please contact the administrator now.

Please do not write anything in this booklet

ADJECTIVES

1. fearful	23. defensive	45. unsympathetic
2. withdrawn (quiet, does not enter into things)	24. careful	46. introspective (reflects on inner thought and feelings)
3. considerate	25. quiet	47. shy
4. prompt	26. innovative (creative, thinks up new ideas)	48. irritable
5. sociable	27. consistent	49. energetic
6. complex	28. warm	50. understanding
7. bold	29. timid	51. contemplative (intense thinker, given to careful study)
8. thorough	30. generous	52. insensitive
9. meditative	31. dependable	53. neat
10. precise (exact, accurate, correct, careful)	32. self-pitying (feels sorry for oneself)	54. affectionate
11. cold	33. efficient	55. inventive
12. unsociable	34. reserved	56. touchy
13. moody	35. cheerful	57. selfish
14. philosophical (learned, meditative, likes to theorise)	36. envious (jealous of what others have)	58. disorganised
15. nervous	37. perfectionistic	59. bashful
16. steady	38. deep	60. assured
17. pleasant	39. sympathetic (kindly, caring)	61. verbal
18. talkative	40. temperamental	62. jealous
19. sloppy	41. kind	63. helpful
20. friendly	42. responsible	64. unkind
21. orderly	43. silent	**GO ON TO THE NEXT PAGE**
22. creative	44. organised	

STATEMENTS

On the following page you will find a number of statements. You should read through the list and decide how well each one of them describes you.

Here is an example:

'I often try to find new and more efficient ways of doing things'

Decide if this statement is characteristic of you. Give each statement a number which represents how characteristic it is. Below you will see how to answer using the numbers ① to ⑦.

①	②	③	④	⑤	⑥	⑦
very strongly disagree	strongly disagree	moderately disagree	neutral	moderately agree	strongly agree	very strongly agree

If you decide that you '*strongly agree*', then your answer will be ⑥ because the '*strongly agree*' rating is represented by the number ⑥ You would answer this question by completely filling in the ⑥ on your answer sheet.

You should reply to all statements, comparing yourself with people of the same sex and age group. Give your first impression of whether each statement describes you. Don't spend too long on deciding what your answer should be. Answer all questions, even if you're not entirely sure of your answer. Please try to avoid using the extremes of the scale ① and ⑨ and the centre of the scale ⑤ unless you really have to. If you understand what you have to do, turn over the page and begin.

Please do not write anything in this booklet

STATEMENTS

1. I spend a lot of time analysing my internal feelings
2. I don't accept criticism very well
3. I like to help others when they are down on their luck
4. If I commit myself to do something, I always carry it through
5. I like parties, where there are a lot of people
6. I would enjoy being a theoretical scientist
7. I resent it when I don't get my own way
8. I avoid meetings and social gatherings when possible
9. I am better than most in seeing what the future holds
10. I always try to do more than is expected of me
11. Some people consider me to be unfriendly
12. I get rattled when I am under pressure
13. I get a lot of pleasure in helping others with their problems
14. I tend to take charge in group meetings
15. I prefer listening to classical music rather than popular music
16. I tend to get upset easily
17. I try to respect others' point of view, even if I don't agree with them
18. If things get too boring at a party, I try to get things going
19. I like to work with people who are highly organised
20. Sometimes I get so upset, I feel sick inside

GO ON TO THE NEXT PAGE

21. I like to help others, even if there is nothing in it for me
22. I like to keep all my belongings neat and organised
23. I find intellectual things more interesting than sport
24. When I am under great stress I often feel like I am about to break down
25. I like to be where there is a lot of action
26. My feelings are easily hurt
27. I am fascinated with the theory of evolution
28. If I start something I work until it is finished to my satisfaction
29. I have a lot of influence over others
30. I have a lot of sympathy for those who are having problems
31. Sometimes I feel weak and shaky at the knees
32. I am considered to be easy to get along with
33. I have a lot of intellectual curiosity
34. I laugh a lot
35. I am a timid person and am easily embarrassed
36. When things are not going right, I sometimes feel like crying
37. I try to do a good job in the first place, so it doesn't have to be done again
38. I am uneasy when I am the centre of attention
39. I get very upset when I am criticised
40. I spend a lot of time in meditation and deep thought

GO ON TO THE NEXT PAGE

41. I am good at cheering people up
42. I love to find innovative solutions to difficult problems
43. There are times when I feel sorry for myself
44. I am always considerate of the feelings of others
45. In meetings, I tend to let others do most of the talking
46. I would rate myself as being a very persistent worker
47. I feel that I am more intellectual than most of my friends
48. I hardly ever feel lonely or blue
49. My friends consider me to be bashful
50. I am always worried about how things might go wrong
51. I try to be kind to everyone I know
52. I like to spend time in intellectual discussions with my friends
53. I like to have a place for everything and everything in its place
54. I often have headaches when things are not going well
55. I try to always be polite, even to those who are not polite to me
56. I have thought a lot about the origins of the universe
57. When I am emotionally upset I can't think clearly
58. I try to set a schedule for accomplishing tasks and stick to it
59. I speak up when I feel I can make a contribution
60. I often wind down towards the end of the day for lack of energy

GO ON TO THE NEXT PAGE

61. I try to be fully prepared before I undertake any task
62. I like to strike up conversations with strangers
63. I try to analyse and evaluate conditions, so that I can predict the future
64. Some days, it is difficult for me to get going
65. I am always generous when it comes to helping others
66. Sometimes I am discouraged and simply want to give up
67. I am highly interested in all fields of science
68. I often worry a lot about the future
69. I get along well with almost everybody
70. When I get an assignment, I always do my best
71. I am a very shy person
72. I am jealous of others who get what I would like to have
73. I enjoy reading poetry
74. I often feel jittery and tense
75. I tend to set higher standards for myself than others set for me
76. I am often nervous and tense
77. Philosophical discussions bore me
78. I always treat other people with kindness
79. Most of my friends would describe me as a 'talker'
80. I often lose my temper with other people

GO ON TO THE NEXT PAGE

81. I spend a lot of time analysing the motives behind the actions of others
82. I try to be pleasant to everyone I know
83. I was willing to work hard for good grades at school
84. At social functions, I talk to as many people as possible
85. I have a habit of putting off things that I should be attending to
86. I am considered by others to be a very friendly person
87. I go out of my way to meet people
88. I enjoy visiting art museums
89. I often feel tired and run down
90. I believe that rules and regulations should always be followed
91. I am cheerful most of the time
92. I am often sad and depressed
93. I tend to be a loner
94. Even if I don't like them, I try always to be considerate of others
95. I am often in deep thought, when others think that I am day dreaming
96. I'm often fearful that I will fail to reach my goals
97. I try to be cheerful, even when things are not going well
98. I often think about the wonders of nature
99. I worry more than most people

GO ON TO THE NEXT PAGE

PLEASE CHECK NOW THAT YOU HAVE COMPLETED BOTH THE ADJECTIVES AND THE STATEMENTS AND THAT YOU HAVE CORRECTLY FILLED IN YOUR PERSONAL DETAILS ON THE ANSWER SHEET

Appendix A

TEXT BOUND INTO THE SPINE

S-D INVENTORY

ADJECTIVES

SOCIAL SECURITY NUMBER

_ _ _ – _ _ – _ _ _ _

0 1 2 3 4 5 6 7 8 9

DATE OF BIRTH

DAY | MON | YEAR

0 1 2 3 4 5 6 7 8 9

SEX Ⓜ Ⓕ

MISCELLANEOUS

0 1 2 3 4 5 6 7 8 9

TODAY'S DATE

0 1 2 3 4 5 6 7 8 9

	Extremely uncharacteristic	Very uncharacteristic	Quite uncharacteristic	Slightly uncharacteristic	Neutral	Slightly characteristic	Quite characteristic	Very characteristic	Extremely characteristic
01	1	2	3	4	5	6	7	8	9
02	1	2	3	4	5	6	7	8	9
03	1	2	3	4	5	6	7	8	9
04	1	2	3	4	5	6	7	8	9
05	1	2	3	4	5	6	7	8	9
06	1	2	3	4	5	6	7	8	9
07	1	2	3	4	5	6	7	8	9
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15	1	2	3	4	5	6	7	8	9
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31	1	2	3	4	5	6	7	8	9
32	1	2	3	4	5	6	7	8	9

	Extremely uncharacteristic	Very uncharacteristic	Quite uncharacteristic	Slightly uncharacteristic	Neutral	Slightly characteristic	Quite characteristic	Very characteristic	Extremely characteristic
33	1	2	3	4	5	6	7	8	9
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Appendix A

MARKING INSTRUCTIONS

- Use No.2 pencil ONLY
- Make dark heavy marks that fill the oval completely
- Erase unwanted marks cleanly
- Make no stray marks on this answer sheet

Proper Mark

Improper Marks

ADDITIONAL INFORMATION — Please do not mark outside this box

COURSE	INSTRUCTOR
TEST	YOUR SURNAME

TS-D INVENTORY

STATEMENTS

	Very strongly disagree	Strongly disagree	Moderately disagree	Neutral	Moderately agree	Strongly agree	Very strongly agree
01	1	2	3	4	5	6	7
02	1	2	3	4	5	6	7
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99	1	2	3	4	5	6	7

MARKING INSTRUCTIONS

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- Erase unwanted marks cleanly
- Make no stray marks on this answer sheet

Proper Mark ●

Improper Marks ✗ ⊘ ⊘

Appendix A

ADDITIONAL INFORMATION — Please do not mark outside this box

COURSE

INSTRUCTOR

TEST

YOUR SURNAME

Appendix B

Summary Soldier Recruit Selection Process

Appendix B

SUMMARY SOLDIER RECRUIT SELECTION PROCESS

ALLOCATION TO TRADE/SPECIALISM
BRITISH ARMY RECRUIT BATTERY (GTI)
PERSONAL QUALITIES ASSESSMENT PROFILE (PQAP)

RECRUIT SELECTION CENTRE
APTITUDE, TECHNICAL SELECTION
PHYSICAL FITNESS
MEDICAL

ARMY TRAINING REGIMENT
COMMON MILITARY SYLLABUS (RECRUITS)
(12 WEEK PHASE 1 TRAINING)

SPECIAL TO ARM TRAINING
(PHASE 2 TRAINING)

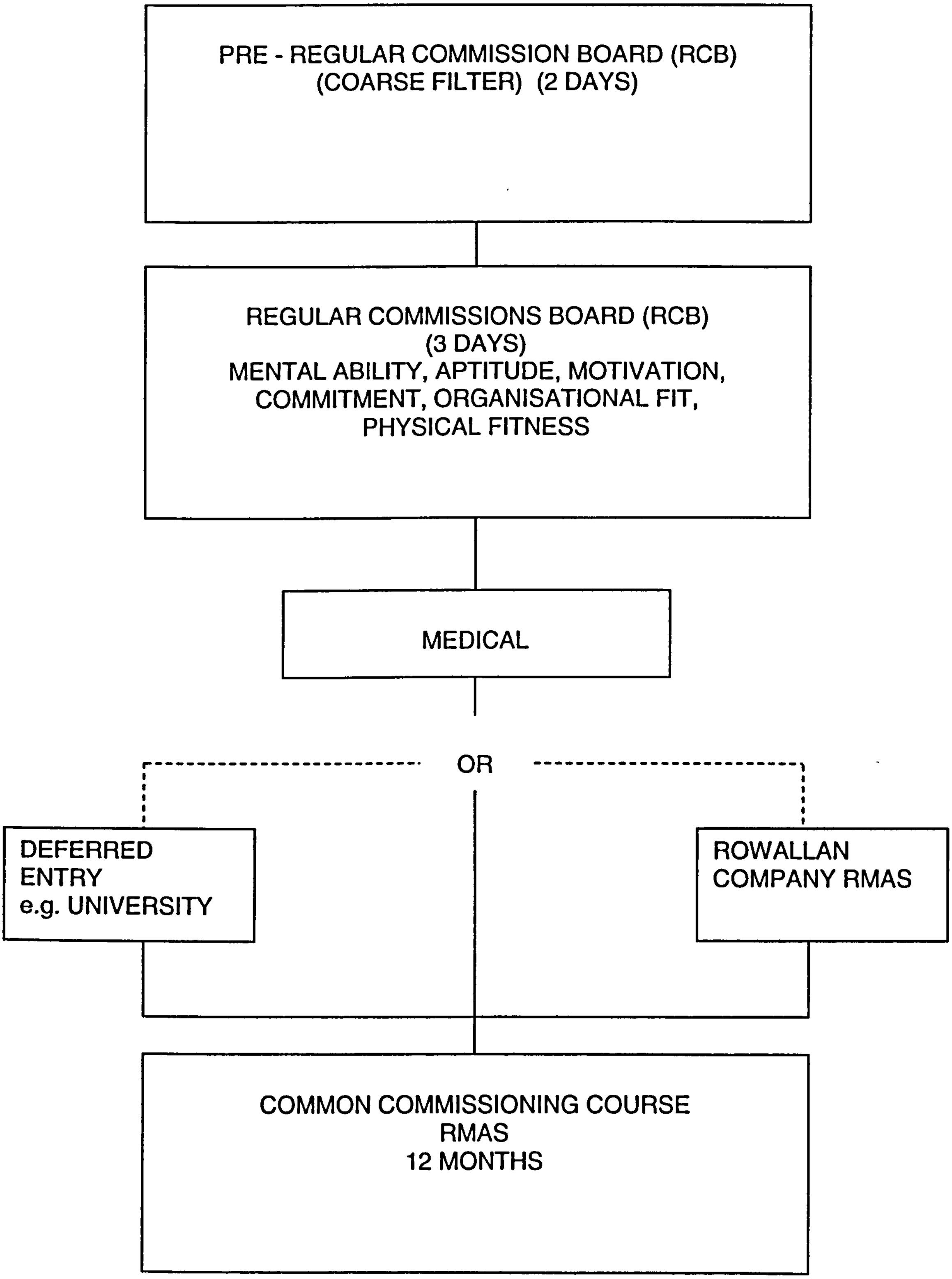
FIELD ARMY

Appendix B

Appendix C

Summary Army Officer Selection Process

SUMMARY ARMY OFFICER SELECTION PROCESS



Appendix C

Appendix D

Summary Police Recruit Selection Process

Appendix D

SUMMARY POLICE RECRUIT SELECTION PROCESS

WRITTEN APPLICATION

COMPETENCY BASED INTERVIEW
POLICE INITIAL RECRUITMENT TEST (PIRT)

MEDICAL
PHYSICAL TEST

RECRUIT TRAINING
PEEL CENTRE, HENDON
(23 WEEKS)

PROBATIONARY
PC
(2 YEARS)

Appendix D

Appendix E

Intercorrelations of Big Five Factors - All Studies

Appendix E Intercorrelations of Big Five Personality Factors

Army Recruits in ATRs (Study 1)

	A	C	E	N	O
Agreeableness (A)		.499** (.53)	.545** (.51)	-.243** (-.41)	.312** (.09)
Conscientiousness (C)			.399** (.29)	-.286** (-.38)	.532** (.12)
Extraversion (E)				-.477** (-.48)	.190** (-.03)
Neuroticism (N)					-.028 (-.13)
Openness (O)					

Note: n= 467

Administrators Guide and Test Manual intercorrelations (1997) for RN personnel (n=508) shown in brackets

Table 1 (4.4) Intercorrelations between the Big Five Factors

RMAS Queens Medal Sample (Study 2)

	A	C	E	N	O
Agreeableness (A)		.036	-.085	.461**	.225**
Conscientiousness (C)			.498**	.148*	.313**
Extraversion (E)				-.302**	.058
Neuroticism (N)					-.058
Openness (O)					

Note: n= 178

Table 2 Intercorrelations between the Big Five Factors

RMAS Rowallan Company (Study 3)

	A	C	E	N	O
Agreeableness (A)		.280*	.158	-.274*	.101
Conscientiousness (C)			.146	-.353**	.109
Extraversion (E)				-.011	.026
Neuroticism (N)					.078
Openness (O)					

Note: n=67

Table 3 Intercorrelations between the Big Five Factors

RMAS Leadership Rating Sample (Study 4)

	A	C	E	N	O
Agreeableness (A)		.392**	.389**	-.016	.299**
Conscientiousness (C)			.249**	-.167**	.370**
Extraversion (E)				.308**	.415**
Neuroticism (N)					.209**
Openness (O)					

Note: n=298

Table 4 Intercorrelations between the Big Five Factors

Metropolitan Police Recruits Sample (Study 5)

	A	C	E	N	O
Agreeableness (A)		.566**	.238**	-.398**	.153**
Conscientiousness (C)			.131**	-.387**	.254**
Extraversion (E)				.252**	.195**
Neuroticism (N)					.019
Openness (O)					

Note: n=863

Table 5 Intercorrelations between the Big Five Factors

Appendix F

Correlations for Studies 1 ,2 and 3, Big Five factors and sub factors with Main Training Performance Measures

(Note: Full Correlation Matrices for all five studies are enclosed in SPSS format on the attached CD)

Appendix F

Appendix F.

1. All Correlations Study 1, 2 and 3 Big Five factors and sub factors with Main Training Performance Measures (below).

2. Full correlation matrices for tables studies 1 to 5 (on CD attached)

Army Recruits in ATRs, Study 1; Overall Performance as Dependent Variable (n = 467)

	A1	A2	A3	A4	A5	A
Overall Performance	.025	.001	.021	.018	.013	.006

	C1	C2	C3	C
Overall Performance	.121*	.108*	.070	.128**

	E1	E2	E3	E4	E5	E
Overall Performance	- .003	.042	.010	.000	- .002	.018

	N1	N2	N3	N4	N
Overall Performance	- .174**	- .069	- .086	- .021	- .131**

	O1	O2	O3	O4	O5	O
Overall Performance	.035	.028	.035	.031	.061	.051

Note: Reverse scored N1, N2, N3, N4, A4, E1, E5

** = Correlation is significant at the 0.05 level (2 tailed)*

*** = Correlation is significant at the 0.01 level (2 tailed)*

RMAS Queens Medal Sample, Study 2; Academic and Military Total Score as Dependent Variable (n = 178)

	A1	A2	A3	A4	A5	A
Academic and Military Total Score	.268**	.103	.084	- .104	.084	- .047

	C1	C2	C3	C
Academic and Military Total Score	.188*	.131	.109	.169*

	E1	E2	E3	E4	E5	E
Academic and Military Total Score	.008	.118	- .054	.112	- .152*	.169*

	N1	N2	N3	N4	N
Academic and Military Total Score	-.241**	- .065	- .049	-.102	-.167*

	O1	O2	O3	O4	O5	O
Academic and Military Total Score	.146	.006	.100	.031	-.068	.146

Note: Reverse scored N1, N2, N3, N4, A4, E1, E5

** = Correlation is significant at the 0.05 level (2 tailed)*

*** = Correlation is significant at the 0.01 level (2 tailed)*

RMAS Rowallan Company Study 3; Overall Leadership Rating and Leadership Factor 1 and Leadership Factor 2 as Dependent Variable (n = 48)

	A1	A2	A3	A4	A5	A
Overall Leadership Rating	- .145	.160	.169	- .132	- .108	- .028
Leadership Factor 1 (Factor scores)	- .022	.279	.145	- .182	- .008	.106
Leadership Factor 2 (Factor scores)	- .194	.135	.016	- .047	- .123	- .125

	C1	C2	C3	C
Overall Leadership Rating	.005	.047	- .037	- .002
Leadership Factor 1 (Factor scores)	.152	.150	.070	.146
Leadership Factor 2 (Factor scores)	.029	.001	- .002	.013

	E1	E2	E3	E4	E5	E
Overall Leadership Rating	- .028	.093	- .020	.178	.032	.045
Leadership Factor 1 (Factor scores)	- .118	.176	.112	.297*	- .120	.211
Leadership Factor 2 (Factor scores)	.083	.047	- .066	.079	.076	- .060

	N1	N2	N3	N4	N
Overall Leadership Rating	- .040	- .106	- .051	- .239	- .114
Leadership Factor 1 (Factor scores)	- .065	- .166	- .065	- .219	- .142
Leadership Factor 2 (Factor scores)	- .017	- .042	- .038	- .205	- .074

	O1	O2	O3	O4	O5	O
Overall Leadership Rating	- .219	- .229	- .089	- .132	- .096	- .232
Leadership Factor 1 (Factor scores)	- .162	- .240	- .050	- .134	- .011	- .190
Leadership Factor 2 (Factor scores)	- .209	- .188	- .160	- .167	- .181	- .248

Note: Reverse scored N1, N2, N3, N4, A4, E1, E5

** = Correlation is significant at the 0.05 level (2 tailed)*

*** = Correlation is significant at the 0.01 level (2 tailed)*

Key

Agreeableness (A)	*Conscientiousness (C)*	*Extroversion (E)*	*Neuroticism (N)*	*Openness (O)*
A1. Warm & Sympathetic	*C1. Efficient & dependable*	*E1. Shy & Bashful*	*N1. Nervous & stressed out*	*O1. Philosophical*
A2. Friendly	*C2. Hard working*	*E2. Talkative*	*N2. Worrying*	*O2. Scientific Interest*
A3. Considerate	*C3. Organised*	*E3. Socially active*	*N3. Irritable*	*O3. Creative*
A4. Cold & Insensitive		*E4. Assertive*	*N4. Envious & Jealous*	*O4. Reflective*
A5. Helpful		*E5. Unsociable*		*O5. Cultured*

Trait Self Description Inventory (TSDI) Factors and Sub-Factors for Reference

Appendix G

Does the Army Need an OCEAN ?

International Military Testing Association 2000 Paper

Does the Army Need an OCEAN?

C JJ Allender (British Army)
JE Greig (Australian Defence Force)

The emergence of the Five Factor Model (FFM), or the Big 5, as an organising framework for personality research (Mount & Barrick, 1995) brought renewed interest in personality measures as predictors of job performance (Matthews, 1997; McManus & Kelly, 1999) including military training and job performance (Christal & Collis, 1997). Interest has overwhelmingly been on predicting overall job performance from the five factors (Ones & Viswesvaran, 1996) as opposed to predicting various performance criterion from the factors or sub-factors (Schneider & Hough, 1995). The wider aims of this paper are to investigate the merit of a Big 5 measure and its sub-factors, the OCEAN personality inventory, for predicting various British Army Officer Training requirements. These aims are against three antecedent factors.

First, conceptualizations of job performance have expanded (Campbell, 1990) and the few limited studies of personality against more specific performance domains have shown differential prediction both for different personality factors and measures of ability (Borman & Mottowildo, 1993; Hough & Oswald, 2000). Thus overall job criterion may obscure relationships and advances in military selection may be achieved through operationalising finer level criterion. Secondly, and relatedly, Hough and colleagues (Hough, 1997; Hough & Schnieder, 1996; cited Hough & Oswald, 2000) have provided evidence in military populations that the factors contain facets with both high and low criterion-related validity which act to dilute the criterion-related validity of the 5 factors. Selection strategies may thus need to attend to maximising the predictive facets. Thirdly, more specific and dynamic theories linking personality with components of job performance, such as leadership behaviour (Pratch & Jacobowitz, 1997), have yet to be adequately empirically tested with more 'narrow band width' (Schneider, Hough, & Dunnette, 1996) personality and criterion measures. This paper serves as a first step to begin to develop the personality and criterion taxonomies appropriate for testing such theories with a view to enhancing selection of future military leaders.

The Big 5 & Predicting Job/Training Performance

The FFM, most often held up to account for differences in human behaviour, consists of Extroversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience (Hough & Oswald, 2000; Matthews, 1997). Factor analysis has supported generalizability across different theoretical frameworks, assessments, rating sources (eg individuals & peers) and cultures (Hough & Oswald, 2000). In terms of predicting job performance, the meta-analyses (Barrick and Mount, 1991; Tett, Jackson & Rothstein, 1991) and individual studies (eg. Barrick and Mount, 1993; Hogan & Ones, 1997; Mount & Barrick, 1995; Salgado, 1997), have lead many researchers to claim Conscientiousness to be a valid predictor across organisations, jobs and situations. In military studies Conscientiousness, and indeed Neuroticism (or Emotional Stability), have been found to be relatively consistent predictors of overall training performance (Christal & Collis, 1997; Elshaw & Abram, 1999; Sutherland & Watkins, 1997).

At the same time, however, there is evidence that Conscientiousness as a unitary construct is less predictive than other Big 5 measures (Tett et al, 1995). Extraversion and Openness to Experience have been found to correlate highly with training proficiency (Barrick &

Mount, 1991). The Tett et al. (1991). meta-analysis found Agreeableness, Openness to Experience, and Neuroticism to be more highly related to job performance. Conscientiousness has also been found to have a curvilinear relationship with performance (Robertson & Callinan, 1998) and narrower band-width measures, namely, achievement (Hough, 1992), has been evidenced as more predictive for a number of United States Army training courses (Hough & Oswald, 2000). Further examination of the Big 5 and its sub-factors against a variety of criterion has thus been strongly recommended (Matthews, 1997; Schneider & Hough, 1995).

Commercially available measures of the Big 5 include the Revised NEO Personality Inventory (NEO-PI-R) (Costa & McCrae, 1992) and the Hogan Personality Inventory (Hogan, 1986). However, the Air Force Self Description Inventory (AFSDI), developed against the earlier work of Tupes and Christal (1961) which was critical in evidencing the generalizability of the Big 5 (Collis, 1997), is available to military organisations under specific collaborative research agreements. In particular the OCEAN, the paper and pencil derivative of the TSDI, has been developed with Royal Naval Officer data (Collis, 1997) and studied against British Army populations (Elshaw & Abram, 1999; Perkins, 1998). The instrument is also being researched by the Australian Defence Force (ADF) (Sutherland & Watkins, 1997), the Canadian Forces (CF) (O'Keefe, 1999), and the New Zealand Defence Force (NZDF). Given its low cost, military development, and findings to date, it appears a promising instrument both for military selection and assessment.

The Big 5 & Ability

The utility of the Big 5 has been further demonstrated where Conscientiousness and Emotional Stability (High Neuroticism) have been found to contribute to the prediction of overall job performance over and above general mental ability (Hough & Oswald, 2000; Salgado, 1997). The interaction between cognitive ability and personality in predicting performance (Maier, 1955), while evidenced as 1958 early (French, 1958), has not been thoroughly examined using the Big 5 taxonomy (Perkins & Corr, 2000). Using other methods, the interaction between cognitive ability and self-esteem (Hollenbeck, Brief, Whitener & Pauli, 1988) and ability and need for achievement (Wright, Kacmar, McMaham & Deleeuw, 1995) have been found to contribute incrementally to job performance over individual measures. Personality has been found to be positively related to performance among high aptitude individuals, but negatively related amongst those low in cognitive ability.

The Big 5, Ability, & Job Performance

Efforts to improve selection models and better understand the nature of job performance have lead to specific models of job performance, highlighting its multi-facetted nature (Campbell, 1990). For example, two distinct aspects, contextual and task performance, have been identified (Borman & Mottowildo, 1993). It has been hypothesised that personality measures should predict contextual performance or organizational citizenship behaviour (behaviours that assist and support the organizational and social environment in which the tasks are performed). Alternatively, ability measures should be more predictive of task performance (Borman & Motowildo, 1993; Motowildo & Van Scotter, 1994). Indeed, in the United States Army, McHenry, Hough, Toquam, Hanson and Ashworth (1990) found that personality variables were predictive of the contextual performance factor of Personal Discipline, and both personality and cognitive variables were predictive of Effort and Leadership.

Borman and Brush (1993) have been more specific, in developing a taxonomy for management performance, including 18 dimensions and four orthogonal factors (Interpersonal Dealings & Communication, Leadership & Supervision, Technical Activities & the Mechanics of management, and Useful Personal Behaviour & Skills). Personality is implicated in all of the factors apart from the third, where mental ability is deemed most critical (Schneider & Hough, 1995). Against these models and data, and as military organisations move further away from work role to more dynamic environments (Anderson & Ostroff, 1997), further understanding of predicting the organisational fit of personnel and military leaders would appear particularly critical.

Big 5 Versus Narrower Width

The evidence or arguments in support of narrower width personality measurement to predict job performance has subsequently emerged in two ways. Some ascertain that the breadth of personality measurement should be matched to the bandwidth of the criterion so that in some instances a narrower bandwidth is needed and matched with greater specificity in terms of criterion (Hogan and Roberts, 1996). This could take on the form of a greater number of factors, or utilizing sub-factor or facet dimensions (Schmidt & Ryan, 1993; cited Matthews, 1997).

Others suggest more emphatically that the Big 5 is just too broad to most effectively account for work behaviour and that narrower bands, or a 7 to 9 factor model, should be considered for a taxomony of personnel selection (Hough, 1992; Hough et al, 1990; Schnieder and Hough, 1996). A taxomony which is based on a construct oriented approach is proposed; this specifies a personality taxomony, and also a job performance taxomony, with a nomological net, or theory, that links them.

A Personality and Job Performance Taxonomy

The latter arguments were largely borne out of the Project A studies of military performance, which in utilizing a nine factor model, showed different patterns between the factors and job and life criteria (technical proficiency, general soldiering proficiency, effort and leadership, personal discipline and physical fitness and military bearing).

In essence Conscientiousness is divided into distinct Achievement and Dependability constructs; the former may perhaps be seen to relate to the OCEAN facet C2 'Hard Working' and the latter to the OCEAN C1 facet, 'Efficent and Dependable'. Hough (1992) suggests Extroversion should be split into Potency and Affiliation, and extra dimensions of Rugged Individualism and Locus of Control should be considered essential constructs. More recent meta-analyses studies have given partial support to this. For instance Hough (2000) points to the studies of managerial performance (Hough et al, 1998) and sales performance (Vinchur, et al., 1998) which have shown the importance of recognising Achievement from Conscientiousness and Affiliation from Extroversion. However, there remain few examples in the literature, or tests, of more refined personality taxonomies integrated with theoretically driven performance taxonomies.

In evaluating the OCEAN inventory as a potential selection and/or assessment tool for British Army Officer Training the specific research aims are thus:

- To contrast the predictive validity of the OCEAN factors and facets against broad and narrow criterion.

- To examine the incremental validity of the factors over mental ability and their interaction with ability, and if appropriate given the above also the facets.

- To examine the results in terms of developing a future performance taxonomy.

Method

Participants

Participants included 178 cadets, 143 males and 25 females aged between 18 and 26 years, who had completed RMAS training in 1998. All had met educational requirements for a Commission in the British Army.

Measures

The predictors included the OCEAN inventory, and measures used as part of the officer selection process. The latter included cognitive tests, administered in the pre- Regular Commissions Board (RCB) phase, and overall assessor ratings for the group and command tasks that constitute the RCB.

OCEAN: The OCEAN (Collis, 1997), a paper and pencil derivative of the TSDI (Christal & Collis, 1997), assesses the Big 5 personality factors. It comprises 64 trait name items and 99 behavioural statement items where participants must decide how characteristic the trait or behaviour is of themselves. The McCrae & Johns (1992) labels of Extroversion, Agreeableness, Conscientiousness, Neuroticism and Openness to Experience are used to describe the OCEAN factors. Facet, or sub-factor, scores are also produced, as detailed in Table 2.1 below. Test-retest reliability for the sub-factors is reported as .75, with corrected split-half reliabilities for composite scores reported between .89 and .95 (Collis, 1997). Predictors included both the Factor and Sub-factor scores.

Table 2.1: OCEAN Factor and Sub-Factors

Agreeableness	Conscientiousness	Extroversion	Openness	Neuroticism
A1. Warm & sympathetic	C1. Efficient & dependable	E1. Shy & Bashful	O1. Philosophical	N1. Nervous & stressed out
A2. Friendly	C2. Hard working	E2. Talkative	O2. Scientific interest	N2. Worrying
A3. Considerate	C3. Organised	E3. Socially active	O3. Creative	N3. Irritable
A4. Cold & insensitive		E4. Assertive	O4. Reflective	N4. Envious & Jealous
A5. Helpful		E5. Unsociable	O5. Cultured	

Cognitive Tests: Tests included those comprising the ARCOM, a paper and pencil and more complex derivative of the British Army Recruit Battery (BARB) (Irvine & Dann, & Anderson, 1990), and the RCB test battery. ARCOM comprises three tests taken from BARB, Alphabet Lag (AL), Number Distance (ND), Letter Checking (LC), and an additional Reasoning (RES) test. All were derived against item-generative principles (as described by Itvine et al., 1990) and use elementary cognitive tasks (ECTs) to measure constructs including perceptual speed, working memory, and speed of information processing. Test-retest reliabilities are reported as satisfactory by Tapsfield (1993). T-scores for each of the tests, and a combined equally weighted composite, were used as predictors.

The RCB Battery included a multiple-choice numerical reasoning test and a verbal reasoning test. The numerical reasoning test consists of interpreting data from tables and graphs and answering questions related to the data. The verbal test is a critical reasoning test that involves the subject reading a written passage and then answering a series of questions.

RCB Ratings: Candidates who perform adequately at the Pre-RCB Phase are progressed to the RCB. This process lasts 3 days where candidates are assessed by 3 assessors on a number of group and command tasks (see Appendix A) and rated on a scale of 0-9 (0 = very bad to 9 = very good) on 11 dimensions (see Appendix A). Scores are then derived, using subjective formulae, to give a rating of between 0 and 9 on 4 final dimensions. These final dimension ratings were used as the RCB criterion, including, Intellectual Potential (IP), Potential for Problem Solving (PPS), Physical Potential (PP), and Personality and Character Potential (PC).

Training Performance Measures

Criterion included 'Military' and 'Academic' RMAS training performance data used to assist adjudicators in the award of the Queens Medal, given to the best cadet for each 23 week training intake. The Military criterion included course T-scores for Military Knowledge (MK), Signals (SIGS), Military Tehcnical (MTECH) and Regimental Medal Qualification (RMQ) components. The 'Academic' components covered Written Skills (WS), Defence International Affairs (DIA), and Communication Skills (CS). Individual component scores were used, and composite scores were also derived through equally weighting the individual components. In relation to the Military composite, the variable of 'Practical' was also added to the composite; a dichotomous (pass/fail practical) variable used by RMAS assessors to derive the composite Military score.

The Queens Medal data is deemed useful in providing a range of training performance measures and has been used for other research purposes (Elshaw et al 1996; McFarlane 1999), although it cannot be assumed to be a direct substitute or entirely representative of formal course outcomes. Formal outcome data was not available as it is closely guarded by the British Army to ensure that later Army service is not influenced by traceable shortcomings which might have been exposed during their basic training and thus to ensure that Officers commence with a 'clean sheet'. It must also be acknowledged that the sample is restricted in the sense that many of the weak candidates self-select out at early stages, the majority in the first six weeks (Elshaw 1996), and Queens Medal data was not available for this group.

Procedures

The OCEAN was administered to participants on 8 December 1998 at 0800hrs prior to cadets passing out of Sandhurst on Friday 11 December 1998. The selection and training data was obtained from databases held by the training school.

Analyses

All analyses were performed using SPSS for Windows Version 9. Bivariate and multivariate data screening were performed in accordance with Tabachnick and Fidell (1996). Outliers were removed if they constituted data entry errors; otherwise they were considered representative of the population. Descriptive statistics and pearson correlations between variables were first computed. T-scores for the tests and training criterion were used whilst raw scores (Collis, 1997) for the OCEAN factors and sub-factors were used.

The incremental validity of OCEAN factors and the interaction between OCEAN factors and cognitive tests, over ability measures was then examined using hierarchical multiple regression (Wright et al., 1995). For the hierarchical regression, and for computation of interaction terms z scores were used. Principal components analysis with varimax rotation was used to investigate the criterion constructs.

Results

Big 5, Ability and Performance

Table 3.1 below presents correlations between OCEAN Factors and military, academic, and overall 'military/academic criterion for Officer training. Four of the five factors, Openness, Conscientiousness, Extroversion and Neuroticism correlate significantly with one of the two or the combined training performance criteria, or show small effects. In each case the significant correlation is for either military or academic criteria, rather than for both.

Table 3.1: Correlations Between OCEAN Factors & Military and Academic Performance Measures

OCEAN	Military	Academic	Military/Academic
Openness	.052	.194**	.146
Conscientiousness	.157*	.114	.160*
Extroversion	.179*	.130	.175*
Agreeableness	-.106	.011	-.068
Neuroticism	-.152*	-.133	-.157*

N=156 * p<.05, **p<.001

Correlations between the individual cognitive tests and test battery composites are shown in Table 3.2. The ARCOM test battery, with the exception of the reasoning test (RES), is more related to the military criterion, whilst the RCB tests correlate more highly with the academic criteria.

Table 3.2: Correlations Between Cognitive Tests & Military and Academic Performance Measures

Cognitive Test	Military	Academic	Military/Academic
ARCOM Tests			
LC	.163	.115	.154
AL	.085	.154	.128
RES	.263*	.120	.256*
ND	.060	.128	.085
Total	.195*	.178*	.212*
OFFICER Tests			
Numerical	.123	.185*	.171
Verbal	.161	.227*	.230*
Total	.166	.257**	.241**
ALL Tests	.211*	.268**	.275**

N= 124

The hierarchical regression results for the overall academic/military criterion presented in Table 3.3 below show the RCB ratings, specifically the Personal Character rating, provides significant incremental prediction over and above cognitive ability. The OCEAN factors together do not add incrementally.

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Table 3.3: Hierarchical Regression Results for Ability, RCB Ratings & OCEAN for Overall RMAS Criterion

Step	IV	R^2	ΔR^2	Sig F Change	Beta
1.	Cognitive Ability	.076			
2.	RCB Ratings	.194	.118*	.006	
	ip				.191
	pps				.013
	pp				-.127
	pc				.252*
3.	OCEAN	.221	.027	.628	
	O				.016
	C				.137
	E				.030
	A				-.008
	N				-.027

Results for individual hierarchical regression analysis for predicting overall academic/military performance, with the cognitive ability composite entered first, followed by the OCEAN factor and the interaction variable, are presented in Table 3.4 below. Of the factors, only Extroversion accounted for significant additional variance (3%) over cognitive ability (7.6 %). Only for Agreeableness did the interaction term appear to show incremental validity, however, this result was not statistically significant.

Table 3.4: Hierarchical Regression Results for Cognitive Ability, OCEAN Factors & Military/Academic Criterion

	Beta	R^2	Adjusted R	F(Sig)	ΔR^2
1. Cognitive	.275*	.076	.067	8.930* (.003)	
2. Conscientiousness	.150	.098	.082	5.883* (.004)	.023
3. Cognitive X C	-.044	.100	.075	3.958* (.010)	.002
1. Cognitive	.275*	.076	.067	8.487* (.003)	
2. Neuroticism	-.090	.084	.067	4.941* (.009)	.008
3. Cognitive X N	.061	.084	.061	3.399 (.020)	.000
1. Cognitive	.275**	.076	.067	8.487* (.003)	
2. Extroversion	.173*	.106	.089	6.386* (.002)	.030*
3. Cognitive X E	.109	.115	.091	4.652* (.004)	.009
1. Cognitive	.275**	.076	.067	8.487* (.003)	
2. Openness	.054	.079	.062	4.611* (.012)	.003
3. Cognitive X O	.062	.082	.057	3.207 (.026)	.003
1. Cognitive	.275**	.076	.067	8.487* (.003)	
2. Agreeableness	-.040	.077	.060	4.521* (.013)	.001
3. Cognitive X A	.131	.094	.069	3.270* (.014)	.017

*p<.05, ** p<.001

Big 5 Versus Facets

Correlations between the Facets and the components of the military and academic training criterion are presented in Table 3.5. The factor and overall criterion correlations are also presented in bold for ease of comparison.

Table 3.5: Correlations between OCEAN Factors & Facets with performance criteria

	Military Know-ledge	Signals	RMQ	Tech-nical	Total Mili-tary	WS	DIA	CS	Overall Academ ic	Mil/Acad
C1	.201*	.160*	.103	.011	.185*	.076	.128	.053	.110	.173*
C2	.148	.028	.080	.079	.131	.048	.091	-.039	.123	.153
C3	.153*	.087	.102	-.112	.081	.155*	.060	.161*	.059	.082
C	.198**	.122	.112	-.011	.157*	.099	.037	.150*	.114	**.160***
N1	-.198*	-.252**	-.077	-.195*	-.221**	-.104	-.163*	-2.34**	-.206**	-.204**
N2	-.097	-.141	-.117	-.042	-.070	-.026	-.016	-.094	-.027	-.058
N3	-.074	-.031	-.046	-.009	-.017	-.033	-.049	-.014	-.043	-.010
N4	-.153	-.127	-.097	-.029	-.107	-.057	-.004	-.119	-.064	-.092
N	-.171*	-.191*	-.096	-.115	-.152	-.066	-.095	-.166*	-.133	**-.157***
O1	.137	.056	.073	.212*	.080	.228**	.224**	.142*	.262**	.196*
O2	.078	.068	.011	.142	.001	.131	.057	-.001	.087	.051
O3	.118	.052	.036	.099	.137	.075	.078	.157*	.125	.169*
O4	.048	-.049	.008	.124	.001	.111	.146*	.017	.127	.073
O5	-.032	-.041	-.074	.024	-.057	.014	.011	-.029	.002	-.020
O	.113	-.008	.023	.187*	.052	.182*	.164*	.090	.194*	**.146**
E1	-.051	.002	.088	-.025	-.015	.009	-.040	.064	.006	-.004
E2	.054	.070	.088	.108	.077	.147*	.096	.128	.157*	.153*
E3	.018	-.053	.006	-.019	-.020	-.017	-.034	-.048	-.041	-.035
E4	.138	.034	.127	-.008	.103	.118	.069	.071	.111	.114
E5	-.131	-.216**	-.087	-.014	-.172*	-.045	-.062	-.151*	-.102	-.161*
E	.166*	.179*	.127	.006	.179*	.091	.080	.148*	.130	**.175***
A1	.299**	.244**	.298**	-.019	.272**	.102	.074	.262**	.171*	.268**
A2	.129	-.009	.089	.072	.067	.128	.117	.029	.126	.108
A3	.136	.004	.027	.028	.091	.136	.048	.072	.110	.124
A4	.085	-.139	-.199*	.007	-.160*	-.008	.006	-.128	-.044	-.122
A5	.135	.076	.131	-.033	.081	.090	.022	.077	.078	.078
A	.012	-.089	-.112	-.018	-.106	.058	.023	-.078	.011	**-.068**

The data shows that for each Factor one or two of the facets correlated significantly with the various training criteria. It also shows that, apart for the Neuroticism Factor, the facets correlate with different training components (ie military or academic). Broadly, where the facets correlate significantly with training components, they are at a higher level than the correlations of the Factors to the broader criteria. Apart for Extroversion the facets also correlate more highly with the broad criteria. The results are summarised as follows:

- The Conscientiousness facets did not relate to all training criterion. C1 (Efficient & Dependable) correlated overall with military criteria, and at the course level C1 correlated significantly with military knowledge whilst C3 (Organised) was more related to written and communication skills

- For Neuroticism, only the N1 facet (Nervous & Stressed out) correlated with training outcomes, and this was the case for nearly all components.

- O1 (Philosophical) correlated with all academic criteria. At the course level O3 (Creative) correlated with Communication Skills and O4 (Reflective) with Defence International Affairs. O1 also correlated with the Technical component of the military criteria.

- E2 (Talkative) correlated significantly with the academic criteria, whilst E5 (Unsociable) with the military criteria. E5 was also significantly negatively correlated with Signals and Communication Skills.

- A1 (Warm & Sympathetic) was correlated with both academic and military criteria and with most course components. Also, A1 and A4 were the only of all OCEAN facets to correlate with RMQ.

Results for individual hierarchical regressions for specific training criterion (academic or military) using facets (selected on the basis of academic or military correlations shown in Table 3.3) are presented in Tables 3.5 and 3.6 below.

Table 3.5: Hierarchical Regression for Cognitive Ability, Facets and Military Criterion.

Step IV	Beta	R Square	Adjusted R	ΔR^2
1. Cognitive	.211*	.044	.036	
2. C1	.157	.069	.052	.025
3. Cognitive X C1	-.017	.069	.043	.000
1. Cognitive	.211*	.044	.036	
2. N1	-.108	.056	.039	.012
3. Cognitive X N1	.193*	.091	.066	.035*
1. Cognitive	.211*	.044	.036	
2. E 5	-.211*	.089	.072	.044*
3. Cognitive X E5	-.068	.094	.068	.005
1. Cognitive	.211*	.044	.036	
2. A1	.155	.068	.051	.024
3. Cognitive X A1	-.045	.070	.044	.002

Table 3.6: Hierarchical Regression Results for Cognitive Ability, Facets and Academic Criterion.

Step IV	Beta	R Square	Adjusted R	ΔR^2
1. Cognitive	.268*	.072	.064	
2. O1	.229*	.124	.110	.052*
3. Cognitive X O1	.111	.137	.115	.012
1. Cognitive	.268*	.072	.064	
2. E2	.177*	.103	.089	.031*
3. Cognitive X E2	-.041	.105	.083	.002
1. Cognitive	.268*	.072	.064	
2. N1	-.103	.083	.067	.010
3. Cognitive X N1	.029	.083	.060	.001
1. Cognitive	.268*	.072	.064	
2. A1	-.018	.072	.057	.000
3. Cognitive X A1	.009	.072	.049	.000

The above regression analyses showed that for the military criterion, E5 accounted for an additional 4.4 % variance over ability (which accounted for 3.6% alone) and the interaction between N1 and Cognitive ability also accounted for significant variance (3.5%). For the academic criterion, O1 and E2 both accounted for a significant degree of incremental variance (5.2% and 3.1% respectively).

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The nature of this interaction was plotted in Figure 1 by using the regression equation to compute predicted performance scores for hypothetical individuals one standard deviation above and one standard deviation below the mean on the two predictors. As can be seen in the figure, N1 impacts on performance only for those lower in cognitive ability. For cadets in the bottom 25% on cognitive ability tests, N1 correlated .460 ($p<.05$). For cadets in the next 50% it correlated only .07 and it held no relationship with those in the top 25%.

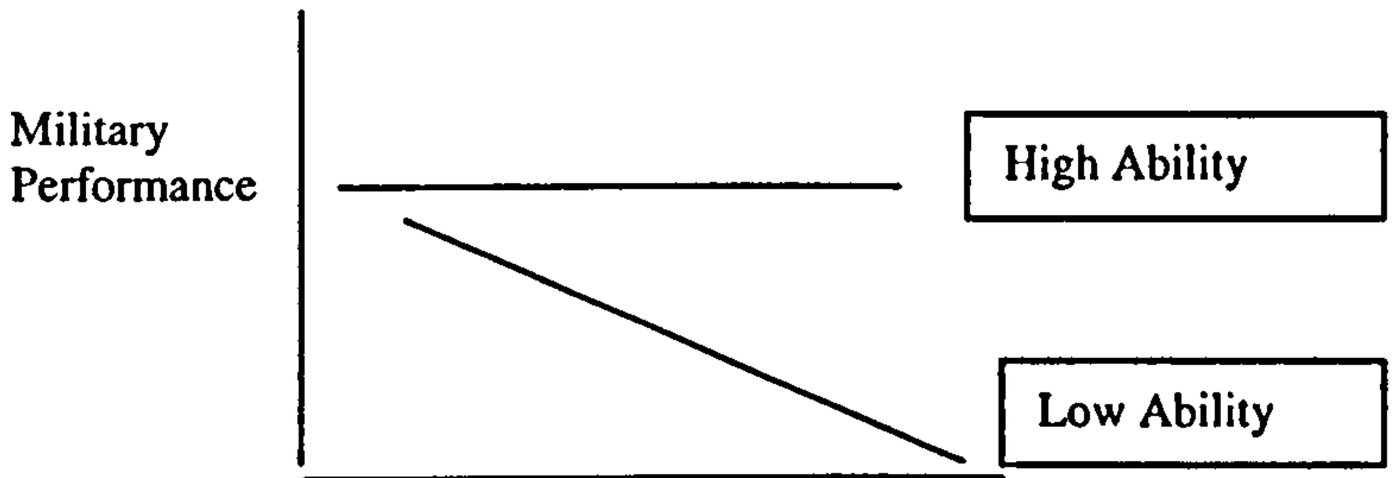

Figure 1: Interaction between ability and N1 in predicting Military performance

Training Performance Criterion

Table 3.7 reports the results of a principal components factor analysis on the training criterion with varimax rotation. A three factor solution was preferred given inspection of the scree plot, that the third eigen value was close to one, and resemblance or consistency with other performance models (Borman and Brush, 1993; Borman & Mottowildo, 1993).

Table 3.7: Principal Components Analysis: Component Loadings for RMAS Courses

Course	Academic	Applied Knowledge	Contextual/Communication
Defence Affairs	**.79**	.13	.27
Military Technical	**.74**	.33	-.23
Written Communication	**.66**	.07	.55
Signals	.23	**.78**	.07
Range Qualification	.07	**.74**	.17
Military Knowledge	.48	**.51**	.33
Communication Skills	.07	.23	**.85**

The solution accounted for 68% of the variance, and the factors were labelled as follows. Factor 1, 'Academic', represented defence affairs, and the technical and written skills criterion, and was considered to be representative of both contextual and task skills. Factor 2, 'Applied knowledge', captured the learning of particular skills and application to perform specific tasks for the range medal qualification and signals components. Factor 3, comprised only of the 'Communication Skills' area, appears to represent the more contextual skills needed for RMAS training.

Discussion

The OCEAN inventory may serve as a useful tool for RMAS selection. However, this study pointed to the utility of the Facets, as opposed to the Big 5 Factors. While not a primary aim, the study also reinforced the utility of the RCB ratings, specifically those assessing Personal Character, which accounted for significant incremental validity over cognitive ability. Factor analysis of the training criterion itself, and comparison of

correlations against these factors, also lent support to the utility of personality measures in predicting more contextual, as opposed to task, criterion (Borman & Mottowildo, 1993).

Of the four factors that shared significant correlations with RMAS training criterion (Conscientiousness, Extroversion, Neuroticism and Openness) they did not correlate with both military & academic criterion. Openness correlated with academic studies, and this is consistent with previous research (Matthews, 1997), whilst Conscientiousness, Extroversion and Neuroticim correlated significantly with the military criteria. Contrary to the Barrick and Mount (1991) meta-analysis, therefore, Conscientiousness did not correlate with all performance criteria. In terms of incremental validity, only Extroversion contributed to prediction over cognitive ability.

As regard the Facets, firstly, for each Factor only one or two of its facets correlated with the different criterion. While clearly the small sample size for this study limits conclusions, some thought to reducing the length of the OCEAN may be warranted. Investigation of the reliability of the scales including fewer facets could be the first step in this regard. Secondly, with the exception of Neuroticism, for each Factor its facets correlated with different criteria. For instance, C1 (Efficient & Dependable) correlated significantly with military knowledge whilst C3 (Organised) correlated significantly with academic studies. Thus, the Hough and colleagues (Hough, 1992; Hough et al, 1990; Schnieder and Hough, 1996) hypothesis that the factors dilute relationships with criterion, which is perhaps most strongly argued in regard to Conscientiousness and Extroversion to criteria (Hough, 1992), was seemingly supported. For Neuroticism, however, where only N1 (Nervous & Stressed Out) correlated, the pattern was relatively consistent across the training outcomes.

In terms of incremental validity, and with a view to developing an integrated selection model, the facets would appear to provide more powerful information. For the military criterion, E5 (Unsociable) accounted for additional variance over ability, and the interaction between N1 (Nervous & Stressed Out) and Cognitive ability also accounted for significant incremental variance. N1 was found to impact on performance only for those lowest in cognitive ability. For the academic criterion, O1 (Philosophical) and E2 (talkative) both accounted for a significant degree of incremental variance.

Factor analysis of the criterion suggested three factors representative of 'Academic', 'Applied', and 'Communication' domains. The latter perhaps being most representative of contextual skills, as opposed to being task oriented, although criterion making up the Applied factor also containing some contextual aspects. Comparison of OCEAN correlations between the three factors would indeed suggest that personality measures are better predictors of the more contextual elements of performance (Borman & Mottowildo, 1993). For example, nearly all facets correlated with the Communication Skills performance measure, but comparatively few with academic and particularly technical criterion. Consistent with other findings (Schneider & Hough, 1995) ability was more important for the technically oriented criterion.

Models utilising the facets, specifically N1, E5, O1 and E2, and which account for other selection criteria (cognitive ability), are thus proposed for further investigation on broader and larger samples. Following on from Perkins and Corr (2000), interactions between personality measures may also be of interest as potential predictors. In such investigations, the facets may be weighted according to chosen criterion not only to enhance prediction, but in the spirit of Hough and Schneider's (1995) recommendations, to assist in identifying appropriate performance taxonomies.

Appendix G

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Appendix G

Appendix H

Leadership Trait Rating Proforma and Instructions for Administration

Appendix H

Company

Platoon

Platoon Commander/ Nominated Cadet (Insert Name)

LEADERSHIP ASSESSMENT RATINGS QUESTIONNAIRE

Introduction

1. Cadets at RMAS are being used as subjects in a research project to investigate the relationship between personality factors and performance in training. Cadets have been asked to fill in a questionnaire to provide information about their personality (the Trait Self Description Inventory, TSDI). The results from this are then to be compared with a range of training performance measures. For this group of research subjects, the results from the personality questionnaire completed by the Cadets will be compared with their leadership performance. Information about Cadet leadership performance is to be derived from ratings provided by Platoon Commanders and Nominated Cadets on 16 identifiable leadership traits, an overall rating for leadership, and an order of merit of the adjudged leadership abilities of Cadets within their platoons.

2. In order to strengthen credibility of subsequent findings, Platoon Commanders are asked to nominate 3 x Cadets within each platoon to similarly score the other members of his or her platoon on the criteria above on three further separate questionnaires. **Note: it is essential to the design of the study that the Platoon Commander and the Nominated Platoon Cadets complete the questionnaire in isolation without conferring.**

3. All findings from this research will be treated as confidential information and will not be disclosed to any third party; i.e. any information on individuals gathered will not be disclosed to anyone else either inside or outside the Army.

4. Please read the attached instructions carefully before proceeding. If you require any assistance, please ring Major Chris Allender on Upavon Mil 5458.

Instructions for Completion of the Leadership Rating Questionnaire

5. Below are instructions for completion of the questionnaire covering ratings for 16 identifiable leadership traits, together with an overall rating and an order of merit for each of the Cadets in your platoon. You are asked to enter numbers in the boxes in the table attached in pencil.

6. For each Cadet, you are asked to :

a. Provide a score using a 1 to 9 rating scale for each of the 16 traits.

b. Provide an overall score on a 1-9 scale as how you rate them overall as a leader.

c. Place them all in order of merit within your platoon (1 = top, 2 = 2nd etc).

Please do this as accurately as possible, basing your judgement on the knowledge you have gained on each of the individual's leadership skills being rated during the RMAS course. **Although this exercise may appear subjective, your knowledge and experience is the only source of measurement of these criteria as applied to known individuals, and your input therefore represents high value, unique information which is essential to this research project.**

7. On the attached table, the name of each Cadet and his or her Army Number is given. Please Insert on a scale of 1 to 9 a single score for each of the Cadets in each of the columns where the rating criteria are specified. The scores are as follows:

1 = Very weak
2 = Weak
3 = Less than adequate
4 = Adequate
5 = Satisfactory
6 = More than Satisfactory
7 = Good
8 = Very Good
9 = Exceptional

Work column by column across the table; i.e. score the whole platoon for Planning Ability, then move on to Initiative, score the whole platoon for Initiative, then Intelligence and so on.
Do not try to score each Cadet across the range of criteria, then move on to the next Cadet, as this will distort the results.

The simplest way to tackle this is to first identify the Cadet you feel should be the top scorer on the particular criteria (e.g. for "Planning Ability", O/C Smith, Good, score "7") and then identify the Cadet you feel should be the lowest scorer, then score them (O/C Jones, weak score "2"), then using these as the baseline, score the remainder accordingly. Then move on to the next criteria, "Initiative" and repeat until all boxes contain a score.

8. For guidance on the Overall Rating, these numerical scores relate broadly to Good /Satisfactory/ and Unsatisfactory (G/S/U) scales that may have been used previously as follows:

1 = (Fail)
2 = U
3 = S - -
4 = S -
5 = S
6 = S+
7 = G
8 = (Top Cadet/ contender)
9 = (Top Cadet)

Leadership Traits Key

9. For ease of reference the short form abbreviations of the leadership traits given on the top of the columns on the platoon table are given below.

Planning Ability	PA
Initiative	Ini
Intelligence	Int
Analysis and Judgement	AnJ
Powers of Expression	Pex
Controlling Ability	Con
Zeal and Energy	ZnE
Composure	Com
Impact	Imp
Self Confidence	S Co
Physical Ability	Phys
Determination and Commitment	DnC
Adaptability	Ada
Military Compatibility	M Com
Personal Relations and Team Spirit	Per Rel
Integrity	Integ
Overall Rating	OvR
Order of Merit (Leadership)	OrM

10. Once completed, please reinsert this document together with the completed platoon table in the envelope provided and return to ACI Senior (Prog/Res), Capt Coward. Thank you for your assistance.

LEADERSHIP RATING QUESTIONNAIRE

Platoon/Class **Rater Instructor/ Cadet/ Recruit Name** **Page of**

Name	DOB	Army No	PA	Ini	Int	AnJ	PEx	Con	ZnE	Com	Imp	SCo	PA	DnC	ADA	Comp	Integ	Per Rel TS	OrR	OvM

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