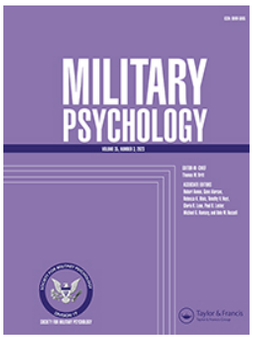
# *General intelligence, personality traits, and motivation as predictors of performance, potential, and rate of advancement of Royal Navy senior officers*



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# General intelligence, personality traits, and motivation as predictors of performance, potential, and rate of advancement of Royal Navy senior officers

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**ABSTRACT**

This paper assesses the impact of general intelligence, as well as specific personality traits, and aspects of motivation, on performance, potential, and advancement of senior leaders. A questionnaire survey was conducted on the full population of 381 senior officers in the Royal Navy with an 80% response rate. Performance, potential, and rate of advancement were established direct from the organization's appraisal system; intelligence, personality traits and motivation were assessed, at the time of the study, using the Verify G+ Test, Occupational Personality Questionnaire, and Motivation Questionnaire. Findings suggest differences in motivation are more important than differences in general intelligence, or personality traits, in predicting assessed performance, potential within, and actual rate of advancement to, senior leadership positions. This is a rare example of a study into very senior leaders, validated against both formal appraisal data and actual rates of advancement. As a consequence of this study the Royal Navy has started to use psychometric-based assessments as part of the selection and development of its most Senior Officers.

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**KEYWORDS**
Motivation; performance; potential; rate of advancement; military command; leadership and management; senior leaders

**What is the public significance of this article?**—This study has identified that aspects of motivation, especially thriving on feeling involved and being driven to achieve career progression, are more important than either cognitive ability or personality traits in predicting performance within, and speed of promotion into, senior levels of a military hierarchy.

## Introduction

Upper echelons (Hambrick & Mason, 1984) or top executives (e.g., Holmes et al., 2021; Weldon et al., 2017) have been a focus for leadership and personality studies for decades. However, within this literature, even though the military was the source of some of the earliest leadership personality research (Lord et al., 2017) empirical studies into the effect of individual differences on the performance of *senior* officers in the armed forces is, with a few notable exceptions (e.g., Kilcullen & Sams, 2010; Zaccaro et al., 2000comparatively sparse.

Hambrick and Mason (1984) noted in their seminal paper that obvious benefit would accrue to those responsible for selecting senior leaders from better researching this group. In the absence of such work, methods to assess potential for, and within, senior officers continue to be heavily reliant on extrapolating from current job performance, which is potentially subject to the "Peter Principle" (Peter & Hull, 1969) whereby individuals rise until they encounter their level of incompetence.

However, previous empirical studies, of more junior and noncommissioned officers in the Royal Navy, identified specific characteristics underpinning superior assessments for command, leadership, and management ability (Young, 2005, 2016; Young & Dulewicz, 2005) and differentiating between leadership and management assessments (Young & Dulewicz, 2008). The studies also suggested a link between interpersonal differences and position in the rank hierarchy (Young & Dulewicz, 2009).

These findings suggest that there is merit in investigating the relationship of factors, potentially more informative than current performance, such as general intelligence, personality traits and aspects of motivation to establish if there is a relationship with the actual rate of advancement of senior naval officers. If such factors can be identified, this new knowledge could be used to improve the assessment and selection of, not only senior leaders in the Royal Navy but also, senior leaders in other similar uniformed services and hierarchies.

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Therefore, the research questions are: What is the influence of senior Royal Navy officers' (NATO OF5-7: Captain to Rear Admiral and the equivalent Royal Marines ranks) general intelligence, personality traits, and targeted motivation on job performance ratings; potential ratings; and rate of advancement?

## Literature review

### General intelligence

General Intelligence (g) has been repeatedly demonstrated to enhance leadership-related job activities ranging from expertise acquisition and problem-solving through to articulated communication (e.g., Gottfredson, 1997; Schmidt & Hunter, 1998). Indeed, general intelligence has been variously described as the best single predictor of occupational performance (Ones et al., 2005) and the most important trait in applied psychology (Schmidt & Hunter, 2000). Within the leadership literature there is also extensive support for a general (e.g., Bass, 1990; Judge et al., 2004; Lord et al., 1986; Simonton, 1995), probably curvilinear relationship (e.g., Antonakis et al., 2017; Ghiselli, 1963; Judge et al., 2004, 2009) between intelligence and leadership. These findings have some support within military settings, with higher order thinking skills (Zaccaro et al., 2012) linked to positive outcomes.

However, Spearman noted, in what has become known as 'Spearman's Law of Diminishing Returns' (see Blum & Holling, 2017 for a recent meta-analysis), that "the influence of g on any ability grows less – in just the classes of person which, on the whole, possess this g more abundantly." (Spearman, 1927, p. 219). Herrnstein and Murray (1994) also noted this lack of impact in highly selected job settings, such as the current study. Spain et al. (2020) actually reported a *negative* association between cognitive ability and American Army officers' early career outcomes. And whilst the latter study was at a more junior level, the mediators and moderators identified, such as range restriction, are equally likely to impact this research.

Another study from the US military (Mumford et al., 2000) proposes it is more likely to be the expression of specific cognitive abilities, required as job-specific competencies (see also Hunt, 1991, and Northouse, 2019), such as problem-solving, that will differentiate performance rather than level of general intelligence alone. Combined, the above literature suggests that the relationship between general intelligence and positive career outcomes among senior Royal Navy officers will be very weak. This leads to the first hypothesis for the study: H1. For Royal Navy senior officers, statistically significant relationships do *not* exist between general intelligence (g) and job performance (H1.1), potential (H1.2), or rate of advancement (H1.3).

If intelligence does regress to a threshold competency, then the literature suggests that other characteristics might be the key differentiators (Goleman, 1998; Goleman et al., 2002, p. 27), such as personality traits and aspects of motivation.

### Personality traits

"The longest-standing research topic in the science of leadership" (Zaccaro et al., 2018) is the potential impact that human characteristics have on work behavior, job activities and so performance (e.g., Blake & Mouton, 1964; Fiedler, 1965, 1967; Fleishman & Harris, 1962; Likert, 1961; McGregor, 1960, 1966). And whilst integrated (Epstein, 1973) or unified (Dweck, 2017) frameworks have been proposed that combine personality traits, motivation, and development; much of the literature addresses, and assesses, these characteristics separately.

In researching individual differences affecting leadership and management, assessment of personality traits is a long-established approach. Indeed, the first article on personality measures published in the Journal of Applied Psychology (Brandenburg, 1925, pp. 282–283) set out to determine "valuable information concerning the traits essential to success in various vocations." However, despite this impressive heritage, prior to the late 1980s, most conclusions in the literature about the usefulness of personality trait measures in personnel selection were quite pessimistic (e.g., Guion & Gottier, 1965; Mischel, 1968).

It was the large-scale meta-analyses of the personality-job performance literature conducted by Barrick and Mount (1991) and Tett et al. (1991) that led to a resurgence in occupational personality research and to the establishment of the Five Factor Model (FFM). But whilst the FFM or "Big Five" led to "a renaissance" (Barrick et al., 2001, p. 10) in linking personality traits to job performance, there were many even at the time (e.g., Ashton, 1998; Schneider et al., 1996) who questioned the emphasis on broad factors at the expense of narrow traits. Part of the recent "refinement" (Sackett et al., 2017) of personality testing has been the recognition that measuring lower order facets will achieve higher criterion-related insights "because they cover a broader domain and do not cancel out differential relationships" (Judge et al., 2013). This recent development in the literature provides additional *post hoc* support for the trait-level approach adopted in the previous Royal Navy

studies, the genesis, and findings, of which are summarized below.

In 2003 (see Young & Dulewicz, 2005 for full details) the Royal Navy adopted "An Integrated Policy for Through-Career Command, Leadership and Management (CLM) Development" based on perceived similarities within the components of these activities, all of which are fundamental to military success. Table 1 compares the key tenets of mission command, as articulated in British Defence Doctrine (2002), with those of leadership and management as proposed by Kotter (1990) who, in common with other members of the "New Leadership School" (Bryman, 1992) "constructed their notions of leadership around contrasts with the role of management" (Conger & Kanungo, 1998, p. 7). Kotter (1990) proposed that "management is about coping with complexity. Leadership, by contrast is about coping with change" (p. 103). This echoed the manager as regulator, leader as change agent view of Zaleznik (1992) and the visionary leader and organizational manager of Bennis and Nanus (1997). In combining this New School view of leadership and management, with the UK Services' own direction on command, it appeared, to the Royal Navy in 2003, that in dealing with challenge, change, and complexity, each of the command/leadership/management trinity involved:

(1) Getting and sharing the picture of what needs to be achieved.
(2) Focusing controllable activity.
(3) Working with and through others.
(4) Habitually delivering success.

(Young & Dulewicz, 2005)

The similarity of these components of command, leadership, and management suggested the existence of individual, or clusters, of underlying characteristics which would support effective performance across all three activities. This proposition was informed by the findings from some significant studies of management competencies (e.g., Boyatzis, 1982; Dulewicz & Herbert, 1999; Schroder, 1989). Subsequent studies in the Royal Navy reported support for the "competency clusters" (Young, 2016; Young & Dulewicz, 2005) detailed in the righthand column of Table 1 which appear to constitute personal determinants of effective Command, Leadership and Management:

(1) *Conceptualize* what needs to be achieved – supported by traits such as being innovative, creative, not restricted by rules, and favoring change.
(2) *Align* people and resources – supported by traits such as enjoying taking charge, goal setting, influencing and being conscientious.
(3) *Interact* effectively with others – supported by traits such as consulting widely, openly expressing feelings, being affiliative and interested in others.
(4) *Create Success* on an enduring basis – supported by traits such as enjoying being busy, working toward ambitious targets and having a high need to win.

The need for, and benefit of, adopting such an integrated approach (first establishing the performance required then identifying its determinants) to the selection and development of military officers has been noted by Paullin et al. (2011), Paullin et al. (2012, 2014).

The general theoretical underpinnings combined with the previous, more specific, findings referred to above lead to the second hypothesis: H2. For Royal Navy senior officers, a statistically significant positive relationship exists between job performance (H2.1), potential (H2.2), rate of advancement (H2.3) and personality traits that enable an individual to: *Conceptualize* what needs to be achieved, *Align* people and resources, *Interact* effectively with others, and *Create Success* on an enduring basis.

## Motivation

"Motivation related to work remains one of the most enduring and compelling topics in industrial/organisational psychology" (Kanfer et al., 2017, p. 228).

**Table 1.** Components and determinants of effective command, leadership, and management.

| Professional Components | | | Personal Determinants |
|---|---|---|---|
| MISSION COMMAND<br>*Coping with Challenge* | LEADERSHIP<br>*Coping with Change* | MANAGEMENT<br>*Coping with Complexity* | Command, Leadership and Management (CLM) Competency Clusters |
| Clarifying superior intent | Setting a Direction | Planning and Budgeting | **Conceptualize**: Characteristics that allow the individual to *"get and share the picture of what needs to be achieved"* |
| Ensuring subordinate ability to meet remit | Aligning People | Organizing and Staffing | **Align**: Characteristics that allow the individual to *"focus controllable activity"* |
| Timely Decision Making | Motivating | Controlling and Problem Solving | **Interact**: Characteristics that allow the individual to *"work with and through people"* |
| Success through determination | Mastery of the Context | Control of the environment | **Create Success**: Characteristics that allow the individual to *"habitually deliver success."* |

However, it is, by comparison, under-represented in studies of leader individual differences (Lord et al., 2017; Zaccaro et al., 2018). Some of the most influential motivation literature focuses on possible distinctions, or contrasts, within motivation such as deficiency versus becoming needs (Maslow, 1954), motivators versus hygiene factors (Herzberg et al., 1959) and intrinsic versus extrinsic Motivators (Deci & Ryan, 1985). Others highlight specific potential sources such as achievement (McClelland, 1961), expectancy (Vroom, 1964), and equity (Adams, 1965).

Whilst the diversity of research and theory on motivation, has yet to coalesce into a unifying comprehensive framework, all contribute something to our understanding of the underlying issues. Needs theories (e.g., Deci & Ryan, 1985; Herzberg et al., 1959; Maslow, 1954; McClelland, 1961) focus on the desires, wants and needs which elicit action. By contrast, what could be described as process-oriented theories (e.g., Bandura, 1977; Kerr, 1975; Locke & Latham, 1990; Vroom, 1964) focus on the psychological mechanisms, such as goal choice, self-regulation, expectancy, and reinforcement, that influence the direction, intensity, and persistence of action. However, regardless of which theoretical school of motivation they fall into, the effect of such identifiable "interindividual differences" in motives continues to be reported (see Kanfer et al., 2017 for a recent review) as key determinants of job performance and progression (e.g., Bartone et al., 2013; Teodorescu et al., 2017).

The importance of motivation to job performance and leadership in the Royal Navy has already been demonstrated (Young, 2005, 2016; Young & Dulewicz, 2005, 2008, 2009); however, these previous studies only examined, and reported, the overall level of motivation expressed by the individual. This study seeks to examine specific facets of motivation that will bring drive and persistence in support of the "Command, Leadership and Management Competency Clusters" (Young, 2005, 2016; Young & Dulewicz, 2005) detailed earlier, e.g.,

(1) *Conceptualize* what needs to be achieved – supported by drivers such as being motivated by creative work, comfortable in fluid situations, and having a high tolerance of ambiguity.
(2) *Align* people and resources – supported by drivers such as being motivated by power, influence, and investing time and energy readily.
(3) *Interact* effectively with others – supported by drivers such as being motivated by affiliation whilst not overly concerned with position and status.
(4) *Create Success* on an enduring basis – supported by drivers such as enjoying being busy, working toward ambitious targets, and having a high need to win.

This leads to the third hypotheses: H3. For Royal Navy senior officers, a statistically significant positive relationship exists between job performance (H3.1), potential (H3.2), rate of advancement (H3.3) and specific motivational factors that will bring drive and persistence to an individual's ability to: *Conceptualize* what needs to be achieved, *Align* people and resources, *Interact* effectively with others, and *Create Success* on an enduring basis.

Previous studies in the Royal Navy (Young, 2005, 2016; Young & Dulewicz, 2005, 2008, 2009) have also consistently identified motivation as the characteristic with *the strongest* relationship with job performance and leadership. This leads to the fourth hypotheses: H4. For Royal Navy senior officers, motivational factors that bring drive and persistence to an individual's ability to: *Conceptualize* what needs to be achieved, *Align* people and resources, *Interact* effectively with others, and *Create Success* on an enduring basis; will account for significantly more of the variance on performance (4.1), potential (4.2), and rate of advancement (4.3) than intelligence and personality traits combined.

## Research methodology

### Research design

Unlike many studies based in the military (e.g., Spain et al., 2020; Zaccaro et al., 2012), this is not a longitudinal study of success based on assessments in early career. This brings some benefits; for example, the general intelligence reported here is that at the time of the study, not at a previous point, and so the findings are not subject any form of validity decay (Ackerman, 1987, 1988; Keil & Cortina, 2001). However, the study population only contains those officers who were both professionally successful enough to reach at least the rank of Captain, and who chose to remain in service. The potential impact of this range restriction is reviewed in the discussion section. The research also includes a combination of both concurrent (assessed performance and potential) and retrospective (actual rate of advancement) success criteria – the limitations of which will also be discussed later.

### Instruments and scales

#### The verify interactive G+ test

The Verify Interactive G+ test is based on the Cattell-Horn-Carroll theory of intelligence, which is one of the

most widely used theories in cognitive ability test development (Alfonso et al., 2003). It is designed to measure inductive, deductive, and arithmetic reasoning while also providing a robust and reliable general mental ability score. The deductive reasoning questions measure the ability to draw logical conclusions based on information provided; the inductive reasoning questions measure the ability to detect regularities, patterns, and generalizations and infer rules that can be applied to different situations; whilst the numerical reasoning questions measure the ability to quickly recognize and attend to the relevant data in tables and charts, to accurately use basic mathematical concepts to analyze data, and to draw the appropriate conclusions based on mathematical analyses. The Verify Interactive G+ Technical Manual (SHL, 2019) reports high reliability, as well as construct, and criterion validity for the instrument.

### *The occupational personality questionnaire (OPQ)*

According to a review by the British Psychological Society (BPS, 2011, p. 31), the OPQ is "amongst the best broad-spectrum personality tests available." It was developed specifically to provide a comprehensive, detailed description of personality traits likely to be relevant in an occupational context via "one of the largest-ever UK studies of the validity of assessment techniques in managers" (Saville et al., 1996, p. 260).

The theoretical basis of the OPQ is similar to some other trait-based measures of personality and proposes that cross situational, stable differences in temperament and disposition, which play some role in determining behavior, can be identified and measured with the aid of self-report questionnaires. The OPQ measures personality at both Costa and MacRae's (1992) Big 5 Factor level (Neuroticism, Extraversion, Openness, Agreeableness, Conscientiousness) and at the more occupationally relevant scale level – which "were designed to provide a more in-depth analysis of personality at the specific trait level than that provided by more parsimonious, but less detailed, factor analytic versions" (Saville et al., p. 245) such as the FFM. Numerous studies (e.g., Bartram, 2013; Joubert et al., 2015; Robertson & Kinder, 1993; Saville et al., 1996; Woods & Hardy, 2012) have demonstrated the validity and high reliability of the OPQ.

The original Royal Navy studies (Young, 2005, 2016; Young & Dulewicz, 2005, 2008, 2009) used the OPQ32 (Ipsative) because of the benefits of its forced-choice format. However, subsequent advances in psychometrics have led to the development of the OPQ32r which was used in this research. It has the key benefits of both forced choice format and normative scaling. This "quasi-ipsative" format increases validity (e.g., Bartram, 2007; Salgado et al., 2015) to the point where "validity is similar to, or even greater than, other well-known procedures (e.g., structured interviews, assessment centres, situational judgment tests)" (Salgado et al., 2015, p. 820). Forced choice structuring is also reported as being more time efficient (Zhang et al., 2020) and more faking resistant (Mengyang & Drasgow, 2019).

The OPQ 32 r Technical Manual (SHL, 2014) reports additional studies from those cited above demonstrating the reliability, as well as construct and criterion validity, of the instrument. The OPQ 32 r has 104 blocks of triads and the respondent is asked to indicate the statements that are "most like me" and "least like me," with 312 items in total. Titles of OPQ Factors and Groupings used in this study are presented in Table 2.

### *Motivation questionnaire (MQ)*

Based on a broad "multivariate systems" (Steers et al., 1996) view of motivation spanning content (needs) context (environment) and process (Kanfer et al., 2017), the MQ was designed to assess the energy with which a person approaches tasks and what situations are likely to increase or reduce an individual's motivation. The MQ.M5 version used in this study is a normative questionnaire designed to be used with managerial/professional staff. The 18 dimensions measured are divided into four broad areas: Energy and Dynamism covers the vigor and drive a person is likely to bring to a task; Synergy scales help assess how well an individual is liable to fit into the prevailing company culture; the

**Table 2.** Occupational personality questionnaire – Factors and groupings.

| **Emotion** | **Influence** | **Structure** | **Creativity and Change** |
|---|---|---|---|
| Relaxed | Persuasive | Detail-Conscious | Conventional |
| Worried | Controlling | Conscientious | Conceptual |
| Tough Minded | Outspoken | Rule Following | Innovative |
| Optimistic | Independent | Forward Thinking | Variety Seeking |
| Trusting | | | Adaptable |
| Emotional Control | | | |
| **Dynamism** | **Empathy** | **Sociability** | **Analysis** |
| Decisive | Modest | Outgoing | Data-Rational |
| Vigor | Democratic | Affiliative | Evaluative |
| Competitive | Caring | Social Confidence | Behavioral |
| Achievement | | | |

**Table 3.** Motivation questionnaire – Factors and groupings.

| Energy and Dynamism | Synergy | Intrinsic | Extrinsic |
|---|---|---|---|
| Level of Activity | Affiliation | Interest | Material Reward |
| Achievement | Recognition | Flexibility | Progression |
| Competition | Personal Principles | Autonomy | Status |
| Fear of Failure | Ease and Security | | |
| Power | Personal Growth | | |
| Immersion | | | |
| Commercial Outlook | | | |

Intrinsic scales look at what type of tasks will motivate an individual; and the Extrinsic scales measure what effect external motivators, such as financial reward and promotion, are likely to have on the individual (SHL, 2018).

The Motivation Questionnaire Technical Manual (SHL, 2018) reports high reliability (pp. 86–91) for the instrument as well as presenting eight studies supporting its construct validity (pp. 93–117) and a further four demonstrating its criterion validity (pp. 118–123). Titles of MQ Factors and Groupings are presented in Table 3.

## Scale selection

General intelligence is operationalized by that scale in the G+ test. However, as noted in the hypotheses above, the personality traits and motivation of interest to this study are those most likely to be determinants of successful performance in the key components of command, leadership, and management as detailed in Table 1. Bartram's (2005) "Great Eight Competencies," based on a meta-analysis of 29 validation studies ($N$ = 4861), nest neatly in pairs into the "Command, Leadership and Management Competency Clusters" as shown in Table 4. Commonalities in the findings of that research, also using OPQ, and the previous Royal Navy studies (Young, 2005, 2016; Young & Dulewicz, 2005, 2008, 2009) were used to select the most appropriate, and justifiable, OPQ and MQ scales for this study as detailed in columns 3–5 of Table 4.

## Performance and potential measures

The current Officer's Joint Appraisal Report (OJAR) and associated appraisal and promotion process used in the Royal Navy is a sophisticated system that conforms with good practice for performance appraisal (e.g., Fay, 2018; Zigon, 1994). Detailed guidance on the reporting requirements, conduct, definitions, and indicators fills over 100 pages in Joint Service Publication 757. A two-week training course followed by a qualifying exam are required prior to an officer being allowed to complete an appraisal on another officer. Additionally, the grades awarded within the reports must be moderated, and agreed to, by a more senior "expert panel" prior to report finalization.

The report itself contains a 7-point scale of current performance from "A" (7) – Performing to the highest

**Table 4.** Selecting the appropriate scales from the instruments.

| | | | Personality Trait (OPQ) | Motivation (MQ) |
|---|---|---|---|---|
| CLM Competency Clusters Young and Dulewicz (2005) | Great Eight Competencies Bartram (2005) | Intelligence (G+) | Scale selection based on Bartram (2005) meta-analysis and previous RN Findings Young and Dulewicz (2005, 2008, 2009) and Young (2016) | |
| **Conceptualize**<br>Characteristics that allow the individual to *"get and share the picture of what needs to be achieved."* | Creating and Conceptualising<br>Analyzing and Interpreting | General Intelligence | Innovative<br>Conventional (-)<br>Conceptual<br>Variety Seeking<br>Rule Following (-) | Interest<br>Flexibility |
| **Align**<br>Characteristics that allow the individual to *"focus controllable activity."* | Organizing and Executing<br>Leading and Deciding | | Conscientious<br>Persuasive<br>Forward Thinking<br>Controlling<br>Evaluative | Power<br>Level of Activity |
| **Interact**<br>Characteristics that allow the individual to *"work with and through people."* | Interacting and Presenting<br>Supporting and Cooperating | | Behavioral<br>Democratic<br>Affiliative<br>Emotionally Controlled (-)<br>Independent Minded*(-) | Affiliation<br>Status (-) |
| **Create Success**<br>Characteristics that allow the individual to *"habitually deliver success."* | Adapting and Coping<br>Enterprising and Performing | | *Achieving**<br>*Competitive** | Achievement<br>Competition<br>Immersion<br>Fear of Failure<br>Progression<br>Ease and Security (-) Personal Growth |

*OPQ dynamism scales not included as these preferences will be assessed by the directly corresponding MQ Scales.

standard in all respects through to "D" (1) – Performing below the standard expected in most or all respects. The Overall Performance Grade is based on 10 subordinate assessments of attributes including Problem Solving and Decision Making, Communication and Influence, Leadership, Adaptability and Initiative and Delivering Results. Future potential is rated, in the same report, on a 5-point scale, from "Exceptional" (5) to "Not suitable for promotion" (1). Rate of Advancement, as an assessment of previously demonstrated potential, was measured as the time taken to be promoted from OF4 (Commander) to OF5 (Captain) as this is the most recent promotion hurdle that all of the study population shared and is the entry point into the "Naval Staff" of senior officers.

Table 5 shows the intercorrelations of the performance and potential assessments along with actual rate of advancement. The high intercorrelations between performance and potential assessed in the OJAR may reflect common method variance or bias, as both assessments are being made by a single rater, in a single report. However, the significant correlation between potential and actual rate of advancement, not present for performance, suggests that OJAR assessed potential is providing additional useful information, over and above the OJAR performance assessment, relevant to the research questions. Most importantly, however, for this research, when the dependent variables from OJAR (performance and potential) and the G+/OPQ/MQ scales (the independent variables) are assessed together (which is the basis of all the analyses) there is little likelihood of common method bias. This is because the DV and IV are different instruments, containing different items, completed by different raters, in different contexts – all of the proposed techniques for reducing common method bias. (Podsakoff et al., 2003, p. 885).

### Sample

Questionnaires were distributed in February 2020, by the first named author who is Head of Leadership Assessment and Development for the Royal Navy, to all 381 regular officers from OF5-OF7 (Captain to Rear Admiral, including the equivalent Royal Marines ranks). Whilst participation was voluntary the survey was preceded by a letter from the First Sea Lord to all senior officers highlighting the importance of the research. This level of support doubtless contributed to 303 senior officers completing all forms (80%). Biographical details of respondents are summarized as follows: The average (mean) age was 50 years with a standard deviation of 3.3. A large majority of the respondents were male (95%), reflecting the population of senior officers. In terms of rank 209 (69%) were OF5 (Captain), 71 (23%) OF6 (Commodore), and 23 (8%) OF7 (Rear Admiral).

**Table 5.** Correlations between dependent variables (Appraisal grades of performance and potential and actual rate of advancement from OF4 to OF5).

| | Performance | Potential | Rate of Advancement |
|---|---|---|---|
| Performance | 1 | **.54**** | .03 |
| Potential | **.54**** | 1 | **.261**** |
| Rate of Advancement | .03 | **.261**** | 1 |
| n*** | 285 | | |

**Correlation is significant at the 0.01 level (2-tailed).
***18 individuals did not have performance/potential assessments.

### Procedure

Questionnaire responses were combined with personnel information to enable predictor-criterion domain analysis (Bartram, 2005). Data on assessment of performance, potential, and actual rate of advancement were captured directly from the RN's Oracle-based Joint Personnel Administration System after a full UK General Data Protection Regulation Impact Assessment had been completed and passed. The letter and word based (A-, High, etc.) ratings of Performance and Potential on the appraisal forms were transposed into standardized numerical scales. Raw scores from G+, OPQ, and MQ were used, and all analyses were conducted using SPSS for Windows, version 25.

## Results

The analyses were performed in the order they are presented below: correlations then regressions.

The correlations between the dependent variables (DVs), performance, potential, rate of advancement and general intelligence, OPQ personality and MQ motivation scales, based on their hypothesized support for the CLM Competency Clusters, are presented in Table 6. Where the hypothesized correlation is negative, a negative sign follows the scale name (e.g., Emotional Control OPQ -).

General intelligence scores were not significantly related to any of the three DVs. Only one of the OPQ scales was significantly correlated with performance (Conscientious) and potential (Controlling). Both of these personality traits were hypothesized as contributing to the ability to *Align*. Three motivation scales were significantly correlated with performance: Fear of Failure, Immersion and Ease and Security (negative as hypothesized); all three motivations were hypothesized as contributing to the ability to *Create Success*. Four MQ scales were correlated to potential: Achievement, Fear of Failure, Immersion and Progression, all four were hypothesized as contributing to *Create Success*.

In contrast, actual rate of advancement showed many more significant correlates. Six OPQ personality scales (40% of the total hypothesized) were significantly related: Not being Conventional or Rule Following (negative correlations) were hypothesized as contributing *Conceptualize*. Forward Thinking and Persuasive contributing to *Align*, and Behavioral and Democratic which were hypothesized as contributing to the ability to *Interact*. Seven MQ scales (54%) were significant: Interest and Flexibility from *Conceptualize*; Status (negative as hypothesized) from *Interact*, and Achievement, Competition, Progression and Personal Growth from *Create Success*. Overall, many more personality and motivation scales (46% of total hypothesized) were significant predictors of actual rate of advancement than of assessed performance and potential.

Hypothesis testing with the number of scales in Table 6 does inflate the chance of type I error, and the authors did consider making an adjustment such as the Bonferroni. However, Armstrong (2014) proposes that such adjustments "should not be used routinely and should be considered if: (1) a single test of the 'universal null hypothesis' that all tests are not significant is required, (2) it is imperative to avoid a type I error, and (3) a large number of tests are carried out without preplanned hypotheses." In this study none of the above conditions apply and therefore the authors, whilst recognizing the increased risk of type I error, judged an adjustment not appropriate.

The regression and hierarchical regression results for the DVs with the independent variables (IVs) general intelligence (single G+ scale), and the combined 15 OPQ personality traits and the 13 hypothesized MQ motives are presented in Table 7.

With the DV performance, the G+ scale's multiple correlation is not statistically significant. This accounts for 0.2% of the explained variance on performance; the OPQ scales' multiple correlation is not statistically significant. This accounts for 3.9% of the explained variance on performance; The MQ multiple correlation is also not significant. MQ, G+, and OPQ account cumulatively for

**Table 6.** Correlations between performance, potential, rate of advancement and G-plus, OPQ, MQ scales based on their hypothesized support for the CLM competency clusters.

| CLM Competency Cluster | Scale (Instrument) | Performance | Potential | Rate of Advancement |
|---|---|---|---|---|
| **Conceptualize** Characteristics that allow the individual to *"get and share the picture of what needs to be achieved."* | General Intelligence (G-Plus) | −0.05 | −0.04 | 0.01 |
| | Innovative (OPQ) | 0.06 | 0.04 | 0.11 |
| | Conventional (OPQ -) | −0.01 | −0.07 | **−0.17**** |
| | Conceptual (OPQ) | 0.07 | 0.03 | 0.06 |
| | Variety Seeking (OPQ) | −0.03 | 0.024 | 0.06 |
| | Rule Following (OPQ -) | −0.03 | −0.09 | **−0.14*** |
| | Interest (MQ) | 0.00 | 0.10 | **0.13*** |
| | Flexibility (MQ) | 0.06 | 0.10 | **0.12*** |
| **Align** Characteristics that allow the individual to *"focus controllable activity."* | Conscientiousness (OPQ) | **0.12*** | 0.10 | −0.07 |
| | Persuasive (OPQ) | 0.06 | −0.01 | **0.14*** |
| | Forward Thinking (OPQ) | 0.08 | 0.07 | **0.12*** |
| | Controlling (OPQ) | 0.11 | **0.16**** | 0.08 |
| | Evaluative (OPQ) | 0.07 | 0.02 | 0.07 |
| | Power (MQ) | 0.07 | 0.04 | 0.10 |
| | Level of Activity (MQ) | 0.04 | 0.09 | 0.10 |
| **Interact** Characteristics that allow the individual to *"work with and through people."* | Behavioral (OPQ) | −0.06 | −0.06 | **0.21**** |
| | Democratic (OPQ) | 0.04 | 0.03 | **0.15**** |
| | Affiliative (OPQ) | −0.02 | 0.06 | 0.10 |
| | Emotional Control (OPQ -) | −0.06 | −0.10 | −0.04 |
| | Independent Minded (OPQ -) | 0.05 | 0.05 | −0.07 |
| | Affiliation (MQ) | 0.05 | 0.04 | 0.04 |
| | Status (MQ-) | 0.00 | −0.01 | **−0.14*** |
| **Create Success** Characteristics that allow the individual to *"habitually deliver success."* | Achievement (MQ) | 0.30 | **0.13*** | **0.14*** |
| | Competition (MQ) | 0.05 | 0.10 | **0.14*** |
| | Immersion (MQ) | **0.16**** | **0.17**** | 0.09 |
| | Fear of Failure (MQ) | **0.14*** | **0.17**** | 0.04 |
| | Progression (MQ) | 0.06 | **0.20**** | **0.24**** |
| | Ease and Security (MQ -) | **−0.12*** | −0.11 | −0.05 |
| | Personal Growth (MQ) | −0.02 | 0.01 | **0.15**** |
| | n*** | 285 | 285 | 303 |
| | OPQ and MQ N significant | 4 (14%) | 5 (18%) | 13 (46%) |
| | OPQ N significant | 1 (7%) | 1 (7%) | 6 (40%) |
| | MQ N significant | 3 (23%) | 4 (31%) | 7 (54%) |

**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).
***18 individuals did not have performance/potential assessments.

12.4% of the variance on performance. The MQ augmentation of 8.2% to the total variance is significant. From the standardized Beta weights in model 2, four scales significantly contributed to the regression function: one OPQ scale (Conscientious) and three MQ Scales: Fear of Failure, Ease and Security and Affiliation.

Turning to the DV potential, the G+ scale's multiple correlation is not statistically significant. This accounts for 0.1% of the explained variance. The OPQ scales' multiple correlation is also not statistically significant. Combined G+ and OPQ scales account for 4.8% of the explained variance on potential. The MQ multiple correlation is highly significant. Adding MQ to the G+ and OPQ scales accounts for 14.6% of the explained variance. This augmentation, by the MQ scales, of 9.8% to the total variance, is highly significant. From the standardized Beta weights, three MQ scales (highly significant) contributed to the regression function: Fear of Failure, Immersion and Progression.

Against the DV rate of advancement, the G+ scale's multiple correlation is not statistically significant. This accounts for 0.006% of the explained variance; the OPQ scales' multiple correlation is highly statistically significant. Combined G+ and OPQ scales account for 9.8% of the explained variance on rate of advancement. The MQ multiple correlation is highly significant. Adding MQ to the G+ and OPQ scales accounts for 20.1% of the explained variance. This augmentation by the MQ scales of 10.3% to the total variance is highly significant. From the standardized Beta weights, three scales significantly contributed to the regression function: OPQ Behavioral and MQ Progression and Status (both highly significant).

In the above hierarchical regression analyses personality and intelligence, even when not significant, were left in the final models to illustrate how motivation augments these characteristics. This approach was adopted because a key aim of the study is to explain to practitioners how the interplay of intelligence, personality, and motivation affects positive career outcomes – not just establish the most parsimonious academic representation of the relationship.

## Discussion

This study provides further evidence that "individual differences matter in leadership" (Zaccaro et al., 2018, p. 37) but expands the senior leadership research findings beyond what has been described as a "heavy focus on narcissism and hubris" (Holmes et al., 2021, p. 14). General intelligence showed no evidence of prediction of all DVs within this study. This lack of impact was expected because of the degree of selection (Herrnstein & Murray, 1994), and associated mediators and moderators (Spain et al., 2020) such as range restriction and the associated "Law of Diminishing Returns" (Blum & Holling, 2017; Spearman, 1927). The participants in this study have all been successfully promoted through a competitive hierarchy, to at least the rank of Captain, in part on their perceived ability to think on a level above peer group (a component of the Royal Navy's definition

**Table 7.** Regression and hierarchical regression: IVs general intelligence (G), Hypothesized OPQ then MQ scales; DVs performance, potential and rate of advancement.

| | | | Change Statistics | | | | |
|---|---|---|---|---|---|---|---|
| Model | R | R Square | R Square Change | F Change | df1 | df2 | Sig. F Change |
| **1. Performance - OPQ Regression** | | | | | | | |
| OPQ | 0.198 | 0.039 | 0.039 | 0.732 | 15 | 269 | 0.751 |
| **2. Performance - MQ Regression** | | | | | | | |
| MQ | 0.276 | 0.076 | 0.076 | 1.724 | 13 | 271 | 0.056 |
| **3. Performance - Hierarchical Regression (G, OPQ then MQ)** | | | | | | | |
| G | 0.045 | 0.002 | 0.002 | 0.569 | 1 | 283 | 0.451 |
| G+OPQ | 0.206 | 0.042 | 0.040 | 0.751 | 15 | 268 | 0.731 |
| G+OPQ+MQ | 0.352 | 0.124 | 0.082 | 1.831 | 13 | 255 | ***0.039*** |
| **4. Potential - OPQ Regression** | | | | | | | |
| OPQ | 0.212 | 0.045 | 0.045 | 0.848 | 15 | 269 | 0.624 |
| **5. Potential - MQ Regression** | | | | | | | |
| MQ | 0.335 | 0.113 | 0.113 | 2.644 | 13 | 271 | **0.002** |
| **6. Potential - Hierarchical Regression (G, OPQ then MQ)** | | | | | | | |
| G | 0.038 | 0.001 | 0.001 | 0.404 | 1 | 283 | 0.526 |
| G+OPQ | 0.219 | 0.048 | 0.047 | 0.873 | 15 | 268 | 0.595 |
| G+OPQ+MQ | 0.382 | 0.146 | 0.098 | 2.246 | 13 | 255 | **0.008** |
| **7. Rate of Advancement - OPQ Regression** | | | | | | | |
| OPQ | 0.313 | 0.098 | 0.098 | 2.073 | 15 | 287 | **0.011** |
| **8. Rate of Advancement - MQ Regression** | | | | | | | |
| MQ | 0.363 | 0.132 | 0.132 | 3.377 | 13 | 289 | **0.000** |
| **9. Rate of Advancement - Hierarchical Regression (G, OPQ then MQ)** | | | | | | | |
| G | 0.008 | 0.000 | 0.000 | 0.017 | 1 | 301 | 0.896 |
| G+OPQ | 0.313 | 0.098 | 0.098 | 2.066 | 15 | 286 | **0.012** |
| G+OPQ+MQ | 0.448 | 0.201 | 0.103 | 2.709 | 13 | 273 | **0.001** |

of merit for promotion). It is therefore very likely that intelligence has regressed to being a threshold competency (Goleman, 1998; Goleman et al., 2002).

Only one out of 15 hypothesized OPQ personality Scales (Conscientious) was significantly related to assessed performance and only one (Controlling) was significantly related to assessed potential. Whilst our understanding of top executives' personalities, and the associated outcomes, remains "incomplete" (Holmes et al., 2021, p. 18) the presence of a relationship with Conscientious is unsurprising. At the "Big 5" Level (Costa & MacRae, 1992) Conscientiousness is reported as the strongest and most consistent predictor of career success (Barrick et al., 2001) and has occasionally been reported correlating with objective measures of success at work at the individual trait level (e.g., Teodorescu et al., 2017). However, a greater number of MQ scales showed significant correlations with performance (3/13) and potential (4/13) and all were from the *Create Success* cluster of motivators hypothesized to contribute to an individual's ability to "habitually deliver success." Moreover, whilst actual rate of advancement showed more significant correlates overall (6/15 for OPQ and 7/13 for MQ), aspects of motivation again appeared to be a better predictor than personality traits. This interpretation is given further support by hierarchical regression with the MQ motivation scales significantly augmenting intelligence and OPQ personality scales in accounting for the variance in assessed performance and potential as well as actual rate of advancement. These findings potentially add value, given the comparative paucity of research (see Lord et al., 2017; Zaccaro et al., 2018), into the impact of motivation on leadership outcomes, especially at the upper echelon (Hambrick & Mason, 1984) or top executive (Holmes et al., 2021) level.

The primacy of motivation was expected, based on the findings of previous studies (Young, 2005, 2016; Young & Dulewicz, 2005, 2008, 2009) however, the additional use of a specific motivation questionnaire revealed more detailed insights. Being motivated by investing time and energy in a job had the strongest relationship with assessed performance whilst being motivated by progression (career advancement) had the strongest relationship with assessed potential and actual rate of advancement. Kilcullen and Sams (2010) note two very similar "temperaments" (1. Giving best effort and working hard. 2. Seeking positions of authority and influence) found to be predictive of advancement to general officer rank in the US Army. These findings potentially add to the concept of "motivational orientation" as a "leadership capacity" (Zaccaro et al., 2018) and may reflect superior (reporting) officers' expectation of a "24/7 commitment" from military leaders and the associated benefits of the commitment element of "psychological hardiness" (Bartone et al., 2013).

The relationship between "progression motivation" (as assessed by the MQ) and actual rate of advancement certainly seems to highlight the importance of targeted ambition and meets the call for more research into the characteristics that help top executives attain leadership positions (Holmes et al., 2021). This finding also provides strong evidence of the criterion validity of the scale in this setting. Of note, whilst "investing energy in job and being prepared to work long hours" (scale descriptor of Immersion) was highly significantly correlated with assessed performance and potential, it was not a significant predictor of actual rate of advancement.

However, as expected, (Young, 2005, 2016; Young & Dulewicz, 2005, 2008, 2009) being motivated by competition, achievement and personal growth were all significant predictors of actual rate of advancement; but so too was being forward thinking, less conventional, bureaucracy averse, democratic, *not* motivated by status and being interested in people. It appears that the twenty-first-century Royal Navy is actively avoiding the promotion of the sort of rule following, "regulators" and "autocrats" who have been repeatedly reported as making ineffective senior military leaders. (Dixon, 1979; Gordon, 1996)

As a consequence of the study on which these findings are based, the Royal Navy has started to use psychometrically based assessments (using the same instruments) as part of a more informed, and rigorous, approach to the selection and development of its senior officers. By better understanding what individual differences are currently being assessed (performance and potential) and have historically been (rate of advancement) "rewarded" the Royal Navy is now in a more informed position to query, and if necessary, shape, the characteristics of its next generation of senior leaders. Other armed and uniformed services might also consider using the framework and findings contained in this paper.

## Limitations and further research

This paper only reports the impact of intelligence, and individual personality traits and motivation factors on assessed performance, potential and rate of advancement. Other potential influencers of "person-organisation fit," such as climate and culture, which may have an impact, were not assessed. Furthermore, whilst the performance and potential assessments were those live at the time of the study, rate of advancement is a historic measure, therefore what is being reported is the currently measured individual differences of individuals who were historically promoted faster. These individuals, because of more rapid promotion, may have

subsequently developed a more motivated approach to their work (affecting their assessed immersion motivation) and careers (affecting their assessed progression motivation). As a result of this study, the Royal Navy has established an enduring assessment process, as described in this paper, and extended it to more junior officers. This will allow simultaneous measurement of personal characteristics with rate of advancement to test this potential limitation. Similarly, testing more junior officers will allow comparative analysis of intelligence levels across the hierarchy to establish if range restriction at the senior level limited the impact of differences in general intelligence in this study. Finally, the research was conducted within the highly regulated, promotion hierarchy of the Royal Navy which may restrict the generalizability of the findings beyond other similar organizations.

The potential value of these findings to talent management in any similar, internally selecting hierarchy such as other navies, armies, air forces, and uniformed civilian emergency services will hopefully encourage further research in such settings. Extending the research to senior managers in the private sector would also be useful to test generalizability. Furthermore, such studies could include other attributes such as values, competences, climate, and culture.

## Conclusion

This is a unique empirical study of very senior leaders measured against not only live organizational appraisal data but also an objective measure of actual rate of advancement. Given poor response rates have been highlighted (Holmes et al., 2021) as a key weakness in most top executive research, this study's response rate of 80% of the total population provides great confidence in the representativeness of these clear findings: at senior levels in the Royal Navy, aspects of motivation have been found to be more important than differences in mental ability or personality traits in securing a strong report and on actual rate of advancement.

However, the real applied benefit, and associated opportunity, of this study must be to highlight how implicit organizational preferences can, through rigorous research, be made explicit and so allow the organization to understand what it currently rewards and to address the question *"is this what we need in the future?"*

## Disclosure statement

No potential conflict of interest was reported by the authors.

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## Data availability statement

The study data contain personal information on currently serving senior officers in the Royal Navy and is therefore kept in a restricted area and not publicly available.

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