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**INCREMENTAL VALIDITY OF ASSESSMENT CENTRE EXERCISE
RATINGS OVER AND ABOVE GENERAL MENTAL ABILITY AND
PERSONALITY TRAITS IN PREDICTING FINANCIAL INTERMEDIARIES
REGULATORY EXAMINATION SUCCESS AND SALES PERFORMANCE**

A dissertation submitted in partial fulfilment of the requirements for the award of the
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Abstract

The present study explored the optimal selection of financial intermediaries in the South African insurance services industry. We examined the potential predictive value of competency-based selection assessment centre (AC) exercises, when used in combination with other traditional measures (e.g., interviews, work style interest questionnaire, general mental ability and personality traits) in an incremental validity study. Moreover, the study expanded the criterion domain by considering prediction models for multiple outcome measures, including examination success of intermediaries and their objective sales performance.

The sample consisted of 425 intermediaries in the middle and affluent market segments in South Africa. We reduced the large number of potential predictors through principle component analysis and subsequently conducted hierarchical regression analysis.

Results showed that when the independent variables were restricted to correlating predictors as part of the further analysis, assessment centre exercises, especially the role-play, had a significant incremental effect ($\Delta R^2 = .07, p < .05$) over general mental ability (GMA) in predicting examination marks. Personality traits (e.g., emotional stability) and assessment centre ratings contributed significantly to examination success.

To predict sales performance, the personality measure incremented GMA and AC exercises ($\Delta R^2 = .08, p < .05$). GMA and AC exercises did not contribute in predicting sales performance and could not add incremental validity ($\Delta R^2 = .01, p > .05$). The work style questionnaire ($\Delta R^2 = .03, p < .05$) and interview ($\Delta R^2 = .012, p < .05$) selection measures incremented both AC exercises and personality traits in predicting sales performance.

The study contributes to our understanding of predictor combinations when academic and objective performance criteria are considered in a specific applied setting (e.g., a niche industry). The practical implications of the findings are that the validity of the assessment centre exercises together with other measures could be enhanced since it can predict different aspects of performance.

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Introduction

The purpose of selection and assessment centre (AC) practices are to enhance organisational and individual effectiveness. The process of personnel selection identifies the individual requirements of job performance and uses a variety of selection procedures, including cognitive ability tests, personality inventories, interviews, job knowledge tests, situational judgement tests, job experience, work sample tests, ACs, biodata and reference checks (Salgado, 2017). Whilst this study will explore some of these selection procedures mentioned above, the principal focus will be on AC exercises and whether the AC exercises can show incremental validity over and above other selection procedures like general mental ability (GMA) and personality measures.

Assessment centres is a well-established process in personnel selection. Thornton and Gibbons (2009) state that a wide variety of evidence have been accumulated demonstrating the validity of ACs for selection purposes. This evidence suggests that the assessment centre method offers a viable alternative and supplement to other personnel selection methods.

Assessment centres aim to simulate job tasks so that an applicant exhibits behaviour that is relevant to the job. Simulations is a central element of ACs. They comprise of exercises or techniques requiring the participants to respond behaviourally to situational stimuli. This includes group exercises, role- playing, and presentations (Benit, Mojzisch & Soellner, 2014).

AC costs are high. Although the AC method is frequently used and allows a good prediction of applicants' job performance, the extent to which the variance in job or training performance explained by ACs is questionable in terms of costs incurred. Meriac, Hoffman, Woehr and Fleisher (2008) mentioned that the same constructs measured in the AC could be evaluated by more cost-effective measures.

The concern with costs is especially relevant with respect to cognitive ability tests that are generally regarded as significant predictors of job performance (Schmidt & Hunter, 1998). To justify the use of AC exercises, it is important to determine whether AC ratings can incrementally add value in a candidate's performance that cannot be explained by GMA. GMA is generally regarded as the best predictor of job performance. Schmidt and Hunter (1998) estimated that ACs would explain only an

additional 2% variance in job performance ratings over GMA, thus questioning the justification of the use of ACs.

In contrast to the lack of conviction concerning the usefulness of ACs, evidence from a recent meta-analysis showed that ratings of AC dimensions have more incremental validity over individual difference variables than previously thought (Meriac et al., 2008). The researchers found AC dimensions explained nearly 10% variance beyond GMA and the Big Five personality dimensions. A limitation of these meta-analytic findings is that the studies are reportedly based on a narrow empirical basis and therefore the available evidence to date remains inconclusive (Meriac et al., 2008). The present study seeks to broaden this limited empirical basis and investigates the incremental validity of AC ratings over GMA in a niche industry of financial intermediaries.

The concept of incremental validity is essentially about whether a measure adds to the prediction of a criterion above what can be predicted by other measures (Hunsley & Meyer, 2003). In the opinion of Lievens, Harris, Van Keer and Bisqueret (2003) it is both theoretically and practically essential to examine the predictive validity of different predictors over and above each other. According to Schmidt and Hunter (1998) incremental validity translates into incremental utility, increasing its practical value. Because validity is directly proportional to utility, the percentage of increase in validity produced by adding the second measure is also the percentage of increase in practical value (utility).

The financial services environment is highly regulated and this has implications for selection. The Financial Services Board (FSB) in South Africa is an independent body that supervises and regulates the financial services industry in the public interest. The Financial Advisory and Intermediary Services (FAIS) Act (37 of 2002) affects the way in which a Financial Services Provider (FSP) conducts business, interacts with and guides consumers in their daily dealings with their chosen product provider (Financial Services Board (South Africa), n.d.).

The FAIS Act requires that FSP's be licenced and create a professional code of conduct with specific enforcement measures. All FSP's must ensure that they comply with the legislation as well as with certain specific fit and proper requirements as stipulated in the Act (Financial Services Board (South Africa), n.d.). One of the most

important requirements is that all FSP's, representatives and key individuals must pass the industry's Regulatory Examinations within a certain deadline period. Regulatory Examination Level 1 is a legislative examination. The regulatory examinations are competency assessments and not regarded as qualifications.

Given the above and the necessity to deliver on sales performance targets, it is critical for the organization to employ the most suitable and cost-effective selection procedures when employing financial intermediaries. This is relevant because historically the high turnover (21%-28% over 2016/2017) of financial intermediaries within the insurance industry has been unbridled.

With the above as backdrop, the present study investigates the incremental validity of AC exercises over and above GMA and personality measures in predicting financial intermediaries' regulatory examination success and sales performance.

The following objectives and hypotheses of this study were formulated.

1. Do overall measures (pre-screening elements, interview ratings, personality measures, and behavioural assessment measures) make a unique contribution over cognitive ability tests in predicting regulatory examination success?
2. Do overall measures make a unique contribution over cognitive ability tests in predicting performance?
3. Which specific assessment centre exercises (in-basket or role-play) used in the AC explains the greatest portion of variance in the regulatory examination success and performance of the financial intermediary?
4. Which combination of exercises and dimensions used in the AC significantly correlate with the output criteria?
5. After the above-mentioned possibilities have been investigated, will the AC measures illustrate incremental validity over and above the cognitive ability measure?

The present study will identify ways to improve the overall selection and assessment process and specifically give guidance on the future use of assessment centre measures within the organisation. A study of this nature will contribute to the improvement of assessment centre processes which are characterized by large

investment costs within organizations for e.g., designing the AC centre exercise, assessor training and assessment centre facilities.

The relevance of this field study is of particular importance for the niche industry of financial intermediaries. By suggesting value-added predictive measures, a large segment of the South African economy may benefit. The study's findings in terms of incremental validity outcomes will have practical implications for the AC field and selection and human resource management practices. While retention and people development strategies may be impacted, recommendations in terms of the design of parts and combinations of AC measures may impact the AC assessors.

In a surge of defining predictive measures and understanding a variety of performance outcomes, the study will be enhanced by using expanded criteria. This will allow for the testing of the incremental validity of measures across a broad spectrum of criteria, reflecting the financial intermediary's overall success.

The structure of this dissertation will be covered over the following five chapters: Chapter 1 (Introduction) describes the context of the research topic, outlining the purpose of this study and illustrate the benefits of conducting an incremental validity study. Chapter 2 (Literature Review) of this dissertation provides an overview of the existing literature on job and academic performance and selection procedures. In Chapter 3 (Method) the research design, discussion of predictor measures and criteria are outlined. This is inclusive of the statistical methods applied to address the research questions. Subsequently, Chapter 4 (Results) presents the descriptive statistics of dependent and independent variables, provides a preliminary analysis of the predictors and measures and finally the exploring and testing of hypothesis. In Chapter 5 (Discussion), the main findings of the study will be summarized and the implications for theory and practice will be discussed. The chapter will conclude with limitations and recommendations for future research.

Literature Review

This literature review will firstly provide an overview of the dependent variables (regulatory examination success and sales performance) showcasing the internal and external environment which it inhabits. This paper then gives an overview of the existing literature on job and academic performance. Following this, the chapter will focus on clearly defined selection procedures.

Selection procedures are classified into reflective measures which is inclusive of the procedures for assessing constructs (cognitive and personality tests) and formative measures which encompasses the assessment centre, the structured interview as well as workstyle interests’.

As this is an incremental validity study, the purpose of which is to focus on ways to improve on or maximize the prediction of a criterion, the review concludes accentuating the research that has shown that assessment centres show incremental validity over and above other forms of assessment.

Regulatory Examination Success

The Financial Intermediary’s role within the insurance industry is to meet the evolving financial needs of their clients’ throughout their lifetime. This is achieved by forming professional relationships with clients, considering the client’s financial and personal situation to construct a suitable financial plan and managing the plan in partnership with the client.

The Financial Services Board (FSB) is an independent institution established by statute to oversee the South African Non-Banking Financial Services Industry in the public interest. Its mission and vision are to promote and maintain a sound financial investment in South Africa. The FSB is there to ensure that the public is treated fairly by the financial service providers and that you enjoy a safe investment and risk environment (Financial Services Board (South Africa), n.d.).

The FSB protects many South Africans from losing their hard-earned money to illegal money-making schemes. Clients can confirm with the FSB whether the intermediary they are dealing with has a valid FSB licence because only licenced providers are authorised to provide clients with sound financial advice and solutions.

The Financial Advisory and Intermediary Services (FAIS) is a division within the FSB that was set up to administer the FAIS Act, 37 of 2002 which came into effect on 30 September 2004. The objective of the FAIS Act is twofold, namely to protect consumers and secondly to professionalise the financial services industry (Financial Services Board (South Africa), n.d.).

The FAIS Act requires all financial intermediaries (providers) to meet specific competence requirements. Early in 2008, a draft set of competency requirements were reviewed by the FAIS Advisory Committee. These competency requirements included experience, qualification and a regulatory examination. The experience required must fit the financial product, i.e. the more complex the product the more experience would be required (Financial Services Board (South Africa), n.d.).

In terms of qualification, based on the principle of fairness, a distinction should be made between persons that have been in the industry for a long time (“existing intermediaries”) and new entrants to the industry. The existing providers must only meet the credit requirements and should not be required to complete a full qualification. This means that a skills programme of 30 or 60 credits should be regarded as sufficient. All new entrants into the industry must obtain a “full” qualification (Financial Services Board (South Africa), n.d.).

In so far as the regulatory examination (RE) is concerned, it is an accepted international practice and standard to set professional examinations for various professions. The FAIS regulatory examinations are, therefore, not unique. The purpose of the RE level 1 is to ensure that all key individuals and intermediaries fully understand their regulatory role, as well as the accountability and responsibility they have in terms of this role. As experience does not equate to sufficient knowledge regarding the FAIS Act and its requirements, all intermediaries are expected to complete the level 1 RE, regardless of the number of years’ experience gained in the industry (Financial Services Board (South Africa), n.d.).

Performance (Productivity)

The productivity measurement commonly referred to as “Score” was devised by the organization, in which the current study is taking place, after the introduction of Conflict of Interest regulation that forms part of FAIS legislation.

“Score” is calculated by a formula taking the premium, term and product type into account. Typically, the formula will be Premium X Term X Factor. The factor that is determined by the product type was originally linked to the profitability of the product type being sold.

With the introduction of the Conflict of Interest regulation (in terms of FAIS), it became necessary to ensure that the same recognition measurement (i.e. “Score”) is granted to the intermediary for all products that address the same client need. This is to ensure that the financial intermediary’s advice will not be unduly influenced by the lure of recognition at the cost of not providing the most suitable product advice to the client.

“Score” accumulated by a financial intermediary (“Score” is only used within the organization in which the study is based) is used as a measurement for various criteria, inter alia the following: Contract retention, the percentage of maximum commission paid out, bonuses and other incentives.

“Score” is also used as a target mechanism to measure the performance of management that are working directly with the financial intermediary and who have the potential ability to influence the advice given by the financial intermediary.

Job Performance

Whilst there are several definitions of job performance that have been proposed, according to Viswesvaran and Ones (2000, p. 216) job performance refers to “scalable actions, behaviour and outcomes that employees engage in or bring about that are linked with and contribute to organizational goals.”

Job performance is important for both the organization and the individual. Viswesvaran and Ones state that organizations need highly performing individuals to meet their goals, to deliver the products and services they specialize in and finally to achieve a competitive advantage over rivals. However, performance is also important for the individual as the accomplishment of tasks and performing at a high level can be a source of personal fulfilment. Sonnentag and Frese (2011) state that performance is a multi-dimensional concept and can be predicted and measured in different ways.

Models of job performance suggests that specific stand-alone dimensions developed to apply across jobs can be grouped primarily around three broad domains namely task proficiency, contextual (citizenship) performance, and counterproductive performance (Viswesvaran & Ones, 2000). Task performance is defined as the proficiency with which employees perform core technical activities that are relevant for the job (Borman, Bryant, & Dorio, 2010; Sutherland, De Bruin, & Crous, 2007). It can be further subdivided into individual performance and work-team performance.

Contextual performance (also called citizenship performance) relates to the contributions of the employee to the organizational, social and psychological environment to help accomplish organizational goals (Allworth & Hesketh, 1999; Dorsey, Cortina, Luchman, 2010). Contextual performance is further subdivided into interpersonal performance and job dedication. Behaviours that have negative value for organizational effectiveness that have also been proposed as constituting distinct dimensions of job performance is known as counterproductive performance (Viswesvaran & Ones, 2000).

There have been several theoretical and empirical reports published that presented causal models of performance that explain relations between traits such as cognitive ability and personality and job performance. Viswesvaran and Ones (2000) state that Hunter (1983) developed and tested a causal model where cognitive ability was a direct causal antecedent to both job knowledge and job performance where job knowledge was an antecedent to job performance and both job knowledge and job performance contributed to supervisory ratings. These findings suggested that cognitive ability contributes to overall job performance (Viswesvaran & Ones, 2000).

Bartram (2005) state that ability measures have been acknowledged as good predictors of job performance and even better predictors of training performance. The early meta-analyses (e.g., Hunter & Hunter, 1984) showed the generalizability of this finding.

In a study of sales personnel Barrick, Mount, and Strauss (1993) found that goal-setting mediated the relation between conscientiousness and job performance. Those who were highly conscientious exhibited a greater tendency for setting performance-related goals than those who were less conscientious. This affinity for setting goals lead to increased levels of job performance (Viswesvaran & Ones, 2000)

Ones and Viswesvaran (1996) argued that conscientiousness has multiple pathways which affects overall performance. Thus, the productivity and ratings may be improved if conscientious individuals engage in organizational citizenship behaviours. Finally, conscientious individuals are expected to pay more attention to detail and profit more via vicarious learning (Bandura 1977) which would result in higher job knowledge and productivity. In supporting the idea of multiple pathways for conscientiousness Organ and Ryan (1995) found a sizable relationship between organizational citizenship behaviours and conscientiousness (Viswesvaran & Ones, 2000).

Motowidlo, Borman, and Schmit (1997) developed a more nuanced model where contextual performance was modelled as dependent on contextual habits, contextual skills, and contextual knowledge. The results were that contextual knowledge was influenced both by personality and cognitive ability. Task performance on the other hand is influenced by task habits, task skill and task knowledge. Whereas task skill and task knowledge are influenced solely by cognitive ability, task habits are affected by both cognitive ability and personality variables. This model therefore implies that both ability and personality contributes to contextual performance (Viswesvaran & Ones, 2000).

In essence based on the existing literature it appears that each performance dimension is complexly determined (jointly by ability and personality) and that it is impossible to specify a sole cause or antecedent of a particular dimension of job performance.

Academic Performance

Ruffing, Wach, Spinath, Brunken and Karbach (2015) state that important factors that may contribute to academic performance (AP) are traditional cognitive variables and psychosocial predictors, like motivational variables (Robbins, Lauver, Le, Davis, Langley & Carlstrom, 2004; Crede & Kuncel, 2008).

Compelling empirical evidence exists regarding the significant relationship between general cognitive ability and academic achievement. The impact of general cognitive ability, which falls under the category of cognitive determinants of AP, is well documented throughout previous research (e.g., Kuncel, Hezlett, & Ones, 2004;

Rhode & Thompson, 2007) where it was indicated that it is regarded as the most powerful single predictor of academic achievement (Ruffing et al., 2015).

Richardson, Abraham and Bond (2012, p. 353) stated “that predictions of AP may be more accurate if they are based on assessment of a variety of individual differences, not just of past achievement and cognitive capacity.” Crede and Kuncel (2008) also highlighted the importance of including non-cognitive factors to reduce the adverse impact of substantial group differences in cognitive predictors (Ruffing et al., 2015).

Ruffing et al. (2015) states that over the last decades, there have been increasing interest in psychosocial or non-cognitive determinants of AP (e.g., Sackett, Schmitt, Ellingson & Kabin, 2001; Robbins et al., 2004). ‘Non-cognitive’ refers to ‘behavioural dispositions, tendencies and habits that are not measured by typical cognitive tests. An important non-cognitive predictor of AP is the construct of study skills; Crede and Kuncel (2008, p. 425) stated that “overall, study habit and skill measures improve prediction of AP more than any other non-cognitive individual difference variable examined to date.” (Ruffing et al., 2015).

Learning strategies as “behaviours and thoughts that a learner engages in during learning and that are intended to influence the learner’s encoding process” (Weinstein and Mayer, 1986, p. 315) are made up in all recent theories of strategic and self-regulated learning (Weinstein, Acee & Jung, 2011). Pintrich (1999, p. 459-460) also concluded that “most models assume that an important aspect of self-regulated learning is the students’ use of various cognitive and metacognitive strategies to control and regulate their learning” (Ruffing et al., 2015).

He described a model of self-regulated learning including three general categories of strategies. This classification includes cognitive (e.g., organization), metacognitive (e.g., planning), and resource- management (e.g., effort management) abilities.

Ruffing et al. (2015) states that in a recent meta-analysis by Richardson et al. (2012), the strongest association with AP was established for effort regulation ($r = 0.32$). Other learning strategies, such as metacognition ($r = 0.18$), critical thinking ($r = 0.15$), elaboration ($r = 0.18$), time/study management ($r = 0.22$), and help seeking ($r = 0.15$) showed lower yet significant positive correlations with AP. This meta-analysis

also addressed the important issue as to whether learning strategies can explain incremental variance even when controlling for the predictor general cognitive ability. “Effort” seems to be the one learning strategy that adds incremental variance over cognitive ability (Ruffing et al., 2015).

In so far as personality is considered as an antecedent of academic performance, Farsides and Woodfield (2002) evaluated academic success against the Big Five Model of personality. This study states that individual differences in normal behaviour should be classified in terms of five independent dimensions. These five dimensions are Neuroticism, Extraversion, Openness to Experience, Agreeableness and Conscientiousness. Their study found that openness to experience had a positive correlation with academic success among first year students, as well as with Business School graduate students (Ruffing et al., 2015).

Trapmann, Hell, Hirn and Schuler (2007) identified conscientiousness and openness to experience as the traits that are the main psychological contributors in learning and education and indicated that they are valid indicators to predict college performance. Goldberg (2001) also confirms that conscientiousness is a useful predictor of academic performance (Ruffing et al., 2015).

Selection procedures

Several authors have identified that there are two main outlooks in so far as personnel selection is concerned that being the predictivist and constructivist perspective. Salgado (2017) states that the former aims to establish the person-job fit and according to this perspective, selection procedures are predictors of future job performance. The constructivist perspective states that candidates and organizations make decisions in personnel selection. Thus, from this perspective, personnel selection focuses not only on ensuring person-job fit but also person-organization fit and team organization fit.

Notwithstanding which selection approach is used Salgado (2017) asserts that the appropriateness of the hiring decision will depend upon the criterion-related validity of assessment procedures used for making decisions.

Selection procedures can be classified by two types: procedures for assessing constructs and procedures that are assessment methods (Hunter & Hunter, 1984). The main difference between a construct and an assessment method resides in the fact that the latter consists in grouping several constructs or measures. In other words, an assessment method is an aggregate of other variables (Salgado, 2017).

More recently, assessment procedures have been classified in terms of reflective measures and formative measures (Edwards & Bagozzi, 2000). The first type of measures includes the procedures for assessing constructs (e.g., cognitive test, job experience, and personality inventories), and the second type of measures are the actual assessment methods (e.g., interviews, situational judgement tests, and assessment centres) (Salgado, 2017).

For the purposes of this study the focus will be on general mental (cognitive) ability and personality factors as the reflective measures and the assessment centres, the employment interview and work interests as the formative measures.

Assessment Centres

Murphy (2010) states that assessment procedures in organizations can be carried out for a variety of purposes, many with significant implications for both individuals and organizations. The stakes can be risky considering these are used for decision making about staff selection and placement or about advancement and development of individuals once they are employed (Murphy, 2010).

If assessments are focused on traits, attributes, or outcomes that are not relevant to success and effectiveness, both organizations and individuals may end up making poor job fit decisions. If assessments are properly but poorly executed (perhaps the right attributes are measured, but they are measured with very low levels of reliability and precision), these assessments may lead to poor decisions which may adversely affect both organization and the individual (Murphy, 2010).

The person orientated approach, as opposed to the work-orientated approach, is likely to provide the most useful guidelines for selection and placement. A very different strategy for making decisions about what attributes should or should not be included in assessments originates from the perspective of differential psychology:

using what we know about individual differences to drive what we assess (Murphy, 2010).

The purpose of assessment centres (ACs) is selection and promotion. In these AC applications, the so-called overall assessment rating (OAR) plays a predominant role as selection and promotion decisions are contingent upon it. It is stated that Gaugler, Rosenthal, Thornton, and Bentson (1987) reported findings supporting the validity of predictions based on the OAR. Specifically, their meta-analysis estimated the mean operational validity of the OAR to be .36 with respect to the criterion of job performance ratings (Hermelin, Lievens, & Robertson, 2007).

The best definition and explanation of what ACs are (and are not) is provided by the Guidelines and Ethical Considerations for Assessment Centre Operations (Guidelines and Ethical Considerations for Assessment Centre Operations, 2015). As explained in the Guidelines, a procedure should not be represented as an AC unless it includes at least one, and usually several, job-related simulations that require the assessed to demonstrate a constructed response. These guidelines also provide recommendations on all the major components of the AC method, including job analysis, assessor training, candidate orientation and rights of participants (Joiner, 2002).

Most ACs are designed to measure highly specified, and often unique, organizational “competencies” by a variety of methods. Many reviewers place ACs above other methods (like personality tests) in terms of their validity. However, it is not always possible to separate out different methods because more complex ACs tend to use cognitive ability and personality tests as part of the process to derive data (Furnham, Taylor, & Chamorro-Premuzic, 2008).

As predictors, ACs are best conceptualized as a method by which information concerning multiple constructs or dimensions (content) is collected. Content is used here to refer to the constructs and variables that are being measured, and method refers to the techniques or procedures that are used to accomplish the measurement of the specified content (Arthur, Day, Mcnelly, & Edens, 2003).

As high-fidelity simulations, AC exercises focus on actual candidate behaviour, which is observed and evaluated by trained assessors on various dimensions in multiple job-related situations/ simulations exercises. Based on these components, ACs enjoy a

credible psychometric record. On average, ACs have good criterion-related validity, ranging from .25 to .39 depending on the dimension measured (Arthur et al., 2003).

ACs remain a popular tool for the evaluation of job applicants and employees, especially for managerial positions. As an assessment method (ACM), ACs involve a unique combination of essential elements codified in the Guidelines and Ethical Considerations of Assessment Centre Operations (International Taskforce Force on Assessment Centre Guidelines, 2015). The ACM can be designed to measure a multitude of individual characteristics (e.g., interpersonal skills, communication skills, personality, cognitive ability). A variety of tools or exercises can be employed to measure these characteristics as part of an AC (e.g., simulations, interviews, in-baskets) (Dilchert & Ones, 2009).

ACs are most commonly used for the selection, identification and development of managers but can also be effectively adapted for non-managerial positions. It is important that AC's are developed, implemented and validated to ascertain alignment to the intended purpose of the AC and the broader strategic talent management goals of the organization (Meiring & Buckett, 2016).

All AC's must contain the essential elements as stipulated in the best practice guidelines and hence at a very basic level show content and face validity. Thornton, Rupp, and Hoffman (2015) concludes that the evidence comes in the form of systematic procedures to identify appropriate focal constructs; evidence of careful construction of exercises to elicit overt behaviour relevant to focal constructs and evidence of their fairness and validity; research confirming the reliability of assessor ratings and psychometric evidence of predictive accuracy and construct validity.

What do Assessment Centres measure?

The modern approach to test validation has been codified in "Standards for Educational and Psychological Testing" (American Educational Research Association, APA & National Council for Measurement in Education, 2014). The Standards (2014) describes several strands of evidence that must be intertwined to form conclusions about test validity. This should be inclusive of test content, internal structure, response processes, convergent and discriminant relationships, test criterion relationships, validity generalization and the consequences of testing (Thornton & Rupp, 2009).

When using ACs for selection/or promotion, an inference is made that AC ratings will predict future job performance. Specifying the type of validity evidence relevant to selection or promotion, provides a framework for interpreting the research findings to date and understanding the overall effectiveness of the AC method (Thornton & Rupp, 2009). The content of assessment centres designed for selection and promotion is typically built to simulate the ‘target job’ (i.e., the job or set of jobs for which the person is being considered).

The validity inference is supported if the AC begins with a careful identification of job tasks and the attributes underlying effectiveness on the tasks through systematic job analysis and or competency modelling. The foundation of validation in employment settings should always involve the development of a clear understanding of job and organizational requirements.

Criterion-related validity

Several meta-analyses have been conducted to establish the operational validity of OARs as well as the operational validity of the ratings of the dimensions. The seminal meta-analysis conducted by Gaugler et al. (1987) found an operational validity of .36 for predicting job performance when an overall assessment rating (OAR) was used.

According to Salgado (2017) the operational validity of most of the standard exercises of assessment centres, including oral presentations, in-basket exercises, case analysis, leaderless group discussions, and role play most recently was found to range from .18 to .26 (Hoffman, Kennedy, Lance, LoPilato, & Monahan, 2015). This clearly indicates that the best estimate of the operational validity of the OAR seems to be the score reported by Gaugler et al. (1987).

Utility of Assessment Centres.

Whereas validity evidence tells us the extent to which the test correlates with measures of job performance, utility tells us whether job performance improvements in employees selected using the assessment procedure are sufficient to justify the costs of administering the test. Utility analysis requires that we compare the new test with the

organization's existing selection procedure to demonstrate that there is some improvement in the benefit-cost ratio (Thornton & Rupp, 2009).

Role-play (Job simulation exercises)

While ACs may include a variety of evaluation techniques, all ACs include job simulation exercises. ACs allow candidates to demonstrate job-related dimensions of performance (worker characteristics) in job simulation exercises that replicate the most important and typical situations that occur on the job. It is extremely important that these exercises simulate the typical conditions and contexts that occur on the target job(s). The reason why job-related simulations are so important, is that the contexts within which the performance dimensions are measured have a significant effect on the scores achieved by candidates (Joiner, 2002; Potgieter & Van der Merwe, 2002).

Hence, although every role-play exercise may be slightly different, consistency is maintained by (1) using a consistent discussion topic and starting the simulation the same way, (2) using a script or guidelines for the role player during the first few minutes of the simulation, and (3) training role players to convey key points during the interaction (O'Connell, Hatrup, Doverspike, & Cober, 2002).

In-basket exercises

Many of the exercises associated with assessment centres are being used as stand-alone examination components and/or as hurdles in multiple hurdle examination processes. A very common exercise used outside of AC programs is the in-basket exercise. This exercise was developed and first used as part of the AT&T assessment centre program in the late 1950s (Joiner, 2002).

An in-basket test is the most frequent exercise of an AC. Applicants are presented with a set of memos, letters and telephone messages similar to those they would have to deal with in the actual job. The individuals are asked to organize all this information, in a fixed period during which they must demonstrate how they would deal with such tasks and problems in the real work situation (Potgieter & Van der Merwe, 2002; Salgado, 2017).

For jobs that involve a considerable amount of written work, in-basket exercises can be a very heavily weighed examination component (accounting for a large portion of the job by sampling many of the critical job tasks) (Joiner, 2002).

Advantages of Assessment Centres

ACs have several strengths ranging from having the ability to measure complex attributes; they are regarded as fair and valid by those that participate in them; they show little adverse impact; they predict a variety of criteria (e.g., performance, potential, training success, career advancement) (Gaugler et al., 1987). In addition, technological innovations have been incorporated into the AC method to allow the method to adapt to the globalization and computerization of the business environment (Thornton & Rupp, 2009).

Disadvantages of Assessment Centres

ACs does however experience challenges in that it can be a very complex undertaking and can be difficult to develop and maintain. ACs are expensive and prone to cost-benefit comparisons with other predictors. There is a significant amount of cost associated with ACs when taking into consideration the amount of resources required ranging from assessors to the administrative staff, the time involved both from the line manager and participants' perspective, depending on the level of the assessment, typically only 3 people can be assessed at a time for a senior position. Physical space does become an issue specifically when larger groups are being assessed at junior levels for e.g., call centre positions. It is also critical that the assessors receive ongoing training which will incur additional costs (Dayan, Kasten & Fox, 2002; Thornton & Rupp, 2009).

The Employment Interview.

In numerous surveys across many countries, the interview appears to be the most extensively used procedure for personnel selection (Salgado, Viswesvaran, & Ones, 2001). These surveys showed that almost all candidates will be interviewed at least once during the selection process. For this reason, the employment interview can be considered the foremost standard formative-assessment procedure.

Research conducted during the past 25 years has shown that the selection interview was not a single and unitary method. Employment interviews have been classified using a two-fold scheme of the structure and content of the questions (Salgado & Moscoso, 2002). Three main types of interviews were found: unstructured interviews, conventional structured interviews and behavioural structured interviews.

Unstructured interviews have no fixed format regarding the content of the questions and the assessment of the answers. During conventional structured interviews the same questions are asked to all candidates and answers can be rated using the same format. The behavioural structured interview, and the interview format used in the current study, poses the following characteristics as described by Salgado & Moscoso (2006):

- (a) The questions are based on a job analysis, using typically the critical incident technique;
- (b) The job analysis also serves to identify the main job dimensions that should be assessed with the interview;
- (c) The same questions are asked to all the candidates;
- (d) The same procedure is used for all candidates;
- (e) In many cases, the candidate answers are assessed using behavioural anchoring rating scales (BARS);
- (f) The interviewer is previously trained in this technique;
- (g) The decision is made only when all the candidates have been interviewed.

The behavioural structured interview, also known as a situational interview requires applicants to provide responses to hypothetical dilemmas that might be encountered in the job in question (Latham, Saari, Pursell, & Campion, 1980). The situational interview has roots in goal-setting theory in that behavioural intentions (i.e. goals) as expressed in response hypothetical scenarios, are thought to be the immediate precursors to actions (Latham & Sue Chan, 1996).

One of the most consistent findings in the history of research on the employment interview is that structured interviews are much more reliable and valid than unstructured interviews (Levashina, Hartwell, Morgeson & Campion, 2014). It is

indicated that twelve meta-analyses have been conducted on this topic, and it was found that structured interviews were far more superior than unstructured interviews.

According to Salgado and Moscoso (2006) several meta-analyses have reported the criterion-related validity of employment interviews. A meta-analysis of behavioural structured interviews found an operational validity of .62 the highest in comparison to conventional structured interviews .35 and unstructured interviews .20.

In addition, structured interviews often provide incremental validity over personality tests and cognitive ability tests because they are typically only weakly related to each other. Finally, structured interviews can be designed to measure different constructs and predict different criteria (Levashina et al., 2014).

Work Interests

In 1943, E. K. Strong published his seminal book, *Vocational Interests of Men and Women* where he contextualized and defined occupational interest as the similarity of an individual's preferences to the preferences of incumbents in various occupations. Thus, Strong's research demonstrated that an individual's preferences *in relation to the environment*, as measured by interest scales, are highly relevant to the success of the individual's behaviours in that environment (Rounds & Su, 2014).

Organizational assessments are used not only to predict performance and efficiency but also to evaluate the fit-level between people and environments or jobs. Ability and personality measures can be very useful in assessing fit-level but many discussions of job-fit focus on interests and value orientation, based on the argument that the congruence between the interests and the values of an individual and the environment in which he or she functions is an important determinant for long-term success and satisfaction. Interest measures are widely used to help individuals identify vocations and jobs that are likely to satisfy and engage them (Murphy, 2010).

Assessing a person's cognitive ability and conscientiousness alone cannot predict a candidate's passion to perform a particular job. Consequently, an additional, often overlooked factor that offers valuable insight into an individual's passion for a job is his/her interests and preferences.

A meta-analysis was conducted by Van Iddekinge, Roth, Putka and Lanivich (2011) using data from 74 primary studies (and 141 independent samples) to examine

the relationship between interests and employee performance, training performance and turnover. The estimated mean validities for studies that used multiple interest scales were .14 for job performance, .26 for training performance, -.15 for turnover.

Moreover, they found that as the job relevance of a particular interest construct increased, its correlation with job performance became more positive. In addition, the use of multiple interest scales as opposed to any single interest scale yielded higher levels of validity for criteria that reflect employee performance. Overall, these results support the value of assessing a candidate's interests in predicting job performance.

Rounds & Su (2014) in a recent meta-analysis examined the correlation between interests and performance over the past 70 years. They included studies that measured interests using either (1) interest-scale scores that assessed the strength of interests; and (2) interest-congruence indices that showed the fit between the individual and his/her environment. Results of the meta-analysis found moderate correlation between interest-scale score and job performance ($r=.20$). The correlation was even higher when interest-congruence was used ($r=.36$). These findings support that employees who are interested in their occupation perform better, contribute more to the organizations and co-workers, and persist longer in their jobs.

Despite their significance to both individuals and organizations, interests are often misunderstood, and their predictive power is often overlooked (Rounds & Su, 2014). Knowing an individual's interests and preference before a candidate is hired can save a company valuable time and money in hiring an individual who may possess the knowledge and abilities to perform the job but lacks the interest that contribute to the motivational potential of the job (Doyle, 2015). A candidate who possesses the capabilities to perform the job and show high interest in job related tasks is likely to be motivated to succeed. In other words, the individual possesses the passion to perform the job duties and therefore, exert maximum effort to ensure goals are accomplished.

General Mental (Cognitive) Ability

General cognitive ability (GCA) can be defined as the capacity of a person to learn some material rapidly and accurate in optimal conditions of instruction. Therefore, less time taken, and greater accuracy reflect greater GCA. Among the specific cognitive abilities most frequently used in personnel selection are abstract

reasoning, spatial mechanical reasoning, verbal reasoning, numerical reasoning, perceptual ability, and memory; but there are many other specific abilities (Salgado, 2017).

A plethora of validity studies has been carried out to determine the predictive value of a variety of selection measures in predicting training and job success. There is well-established evidence that cognitive ability tests are superior to other selection measures in the prediction of performance for most professions (Conzelmann & Keye, 2014).

The most commonly used estimates for the criterion related validity of General Mental Ability (GMA) stem from Schmidt and Hunter (1998), who presented validity coefficients of .51 for job performance and .56 for training performance. Compared to ACs, GMA is thus usually a better predictor of job performance. Schmidt and Hunter (1998) estimated that AC's would explain only an additional 2% variance in job performance ratings over GMA, thus generally questioning the use of ACs (Melchers & Annen, 2010).

Salgado (2017) states that the meta-analytic findings across the globe obtained over the last 35 years have demonstrated that:

(1) GCA tests or a combination of several specific cognitive ability tests are the most valid predictor of overall job performance for all types of occupations (Hunter, Schmidt, & Le, 2006; Salgado, Anderson, Moscoso, Bertua, & De Fruyt, 2003A; Schmidt, Oh, & Le, 2006), and that .62 is the best estimate of operational validity;

(2) The sizes of the estimates of criterion-related operational validity are similar across countries (Salgado, IN PRESS; Salgado & Anderson, 2003);

(3) Job complexity is an important moderator of the validity of cognitive ability tests (Hunter & Hunter, 1984; Hunter, et al., 2006; Salgado et al., 2003A; Schmidt et al., 2006);

(4) Specific cognitive tests are also valid predictors of overall performance, but their validity is smaller than the GCA validity (Salgado, Anderson, Moscoso, Bertua, De Fruyt, & Rolland, 2003B);

(5) Cognitive tests are the most valid predictors of task performance, but they are less valid for predicting contextual performance, and they are not valid predictors of counterproductive work behaviour (Gonzalez-mule, Mount, & Oh, 2014);

(6) Cognitive tests show(s) evidence of ethnic differences but they do not produce differential prediction (Berry, Cullen, & Meyer, 2014).

Measures of general ability will usually be as good as, and often better than, measures of specific abilities as a predictor of performance and effectiveness. The decision to use cognitive ability tests in organizations is necessarily also a decision to accept a certain level of adverse impact; the decision to refrain from using such tests is almost always also a decision to sacrifice validity (Murphy, 2010).

Despite issues associated with cognitive ability, it is clearly one of the most valid predictors of job performance in various professions. Therefore, cognitive ability is a pre-requisite especially in jobs that are cognitively challenging, but does not automatically lead to a sufficient prediction of job performance from the perspective of personnel selection (Viswesvaran & Ones, 2002).

Validity generalization research has advanced the understanding and prediction of job performance by demonstrating that, for most jobs, GMA is the most important trait determinant of job and training performance (Schmidt, 2002).

Personality

Much of the recent enthusiasm for the Big Five in personnel selection has been based on the body of meta-analytic work, especially the original work of Barrick and Mount (1991). Based on this work, most researchers seem satisfied to conclude that conscientiousness is a valid predictor of job performance and that it represents the primary, if not the sole, personality dimension for use in personnel selection (Hurtz & Donovan, 2000).

Many surveys conducted around the world since the 1950's have shown that practitioners typically include personality measures in the personnel selection process. In the last 25 years, hundreds of primary studies and dozens of meta-analyses have examined the validity of personality measures as predictors in personnel selection. The five-factor model of personality (FFM) proved to be a successful taxonomy for classifying the various measures included in the validity studies (Salgado, 2017).

The FFM, often referred to as the "Big Five" has emerged as a dominant model for describing "normal personality". According to Murphy (2010) this model has been replicated across many methods, settings, and cultures and it provides a good starting

point for describing what personality means. This model suggests that normal personality can be described largely in terms of five broad factors:

- (1) Neuroticism: emotional instability, tendency to experience negative emotions easily;
- (2) Extraversion: outgoing, energetic, tending toward positive emotions;
- (3) Agreeableness: cooperates with, is compassionate and considerate toward others;
- (4) Conscientiousness: reliability, self-discipline, achievement orientated, planning;
- (5) Openness to Experience: curiosity, imagination, appreciation for new ideas and experiences, appreciation of art, emotion, adventure.

Based on the summarized results of 15 prior meta-analytic studies that investigated the relationship between the Five Factor Model personality traits and job performance, it was concluded that conscientiousness is a valid predictor across performance measures in all occupations studied. Emotional stability was also found to be a generalizable predictor when overall work performance was the criterion, but its relationship to specific performance criteria and occupations was less consistent than conscientiousness. Though the other three Big Five traits (extraversion, openness and agreeableness) did not effectively predict overall work performance, they did predict success in specific occupations or relate to specific criteria (Barrick, Mount & Judge, 2001).

Lievens, Harris, Van Keer, and Bisqueret, (2003) states that although the meta-analysis of the Big Five personality dimensions conducted by Barrick and Mount's (1991) focused on Conscientiousness as a predictor of job performance, their results also supported the validity of personality for predicting training performance.

Based on the best meta-analytical data available, Salgado (2017) states that the following conclusions can be drawn:

- (1) The taxonomy of the personality traits derived from the FFM has proved to be a very useful framework for organizing the various single measures and is now accepted as the paradigm in the field;

- (2) Conscientiousness is the best personality predictor of job performance and counter-productive behaviours, and it has shown validity generalization across samples, occupations and countries;
- (3) Emotional stability was the second most relevant personality predictor of job performance and counterproductive work behaviours;
- (4) Conscientiousness, emotional stability, and agreeableness are the most valid predictors of overall counterproductive behaviours, interpersonally orientated counterproductive behaviours, and organizationally orientated counterproductive behaviours (Berry, Ones, & Sackett, 2007);
- (5) Conscientiousness, emotional stability and agreeableness showed incremental validity over GCA for predicting overall job performance (Salgado & De Fruyt, 2005);
- (6) The format of the personality inventory is an important moderator of the criterion-related validity of the Big Five dimensions, so that the validity increases dramatically when quasi-ipsative forced choice formats are used (Salgado, Anderson, & Tauriz, 2015); Salgado & Tauriz, 2014); and
- (7) The facets of the Big Five do not show evidence of criterion-related validity for predicting job performance when the validity of the factor is residualized (Salgado et al., 2015; Salgado, Moscoso, & Berges, 2013).

Based on the cumulative research, Salgado (2017) concludes that the Big Five personality dimensions are important variables for predicting and explaining overall job performance, task performance, contextual performance, and counterproductive work behaviours, and that personality inventories measure variables that are not assessed by other selection methods, and hence provide unique and non-overlapping variance for explaining the criterion space (Salgado 2017).

Personality tests have also proven to be popular in prediction of salesperson performance (Barrick & Mount, 1991). Meta-analyses of the “Big Five” personality factors have shown that conscientiousness demonstrates consistent validity in selection situations, including validity in predicting sales performance among sales representatives in a wholesale sales environment (Barrick, Mount, & Strauss, 1993).

Validation of Selection Procedures

The validation of selection procedures is necessary for various reasons. A much broader view of the nature of validity is accepted today, and in general it is seen as the degree to which the inferences we draw from a set of test scores about job performance is accurate. The “Trinitarian” approach to validity holds that there are three approaches to the validation of tests, namely content, criterion and construct validity (Schmitt, Arnold & Nieminen, 2010).

Content validation involves a demonstration that test items are a representative sample of the behaviours to be exhibited in some performance domain. Content validation typically depends heavily on job analysis that specifies the tasks performed on a job and how those tasks are reflected in the tests used to make decisions. Criterion-related validation involves the demonstration that scores on a test are related to job performance measures. Construct validation often includes a series of studies or collections of evidence that a psychological concept or construct explains test performance (Schmitt et al., 2010).

Validation studies within the context of personnel selection should be structured to include the following three elements: (1) job analysis – the foundation of validation in employment settings always involves the development of a clear understanding of job and organizational requirements; (2) systematic development – as measures are developed, they need to follow an architecture that is firmly grounded in the results of the job analysis. As the development of the measure is planned and as tools are being constructed, activities need to be focused on ensuring that the measures are carefully targeted to address the intended constructs; (3) independent verification – once the measures developed, they need to be subjected to independent verification that they measure the intended constructs (Schmitt et al., 2010).

Nearly all information about a selection procedure, and inferences about the resulting scores, contributes to an understanding of its validity. Evidence concerning content relevance, criterion relatedness, and construct meaning is subsumed within this definition of validity (SIOP, 2003).

The focus of this study is to establish criterion-related validity within the context of selection. Personnel selection procedures are used to predict future performance or other work behaviour. Evidence for criterion-related validity typically consists of a

demonstration of a relationship (via statistical significance testing or establishing confidence intervals) between the results of a selection (predictor) and one or more measures of work-relevant behaviour or work outcomes (criteria). The choice of predictors and criteria should be based on an understanding of the objectives for test use, job information, and existing knowledge regarding test validity (SIOP, 2003).

Validation is required by law in South Africa, as stipulated in the Employment Equity Act (RSA, 1998, p. 10); Psychological testing and other similar assessments of any employee are prohibited unless the test or assessment being used has been scientifically shown to be valid, reliable; can be applied fairly to all employees; and is not biased against any employee or group.

The expectation of eliminating unfair discrimination in the selection process is grounded in Section 8 of *the Employment Equity Act (Act No. 55 of 1998)* which was amended by the *Employment Equity Amendment Act (No. 47 of 2013)*, Section 8, clause d, paragraph 4, which stipulates that psychological testing and other similar assessments of an employee are prohibited unless the test or assessment being used meets with very specific requirements as it pertains to bias, validity, reliability, fairness (Meiring & Buckett, 2016; Muchinsky, Kriek & Schreuder, 2005).

As a general rule, when AC's are used as a selection device, this automatically falls under the auspices of the *Employment Equity Act (Act no 55 of 1998)* insofar as the AC must be valid and reliable, must be applied fairly to different groups and must measure inherent requirements of the job (Meiring & Buckett, 2016; Muchinsky, Kriek & Schreuder, 2005).

Incremental Validity

The concept of IV was first proposed and articulated by Sechrest (1963) who argued that, in addition to evidence for convergent and discriminant validity, a psychological test that was intended for applied use (i.e., academic, clinical, or personnel applications) must yield an improvement in prediction compared with the result derived from using data that is easily and routinely obtained as part of the process of assessment.

According to Thornton et al. (2015) research has shown that (AC)s show IV over and above other forms of assessment. Overall assessment ratings (OAR) have been

shown to contribute to prediction over and above scores stemming from intelligence tests (Dayan, et al., 2002; Krause, Kersting, Heggestad, & Thornton, (2006); Melchers & Annen, 2010), personality tests (Goffin, Rothstein, & Johnson, 1996; Hardison, 2005), biodata (O'Connell et al., 2002), behavioural description interviews (Lievens et al., 2003), situational judgement tests (Lievens & Patterson, 2011), and supervisory performance ratings (Chan, 1996) in the prediction of outcomes.

Having said the above, there is some research that has suggested that the “increment” of AC OARs over other forms of assessment is small (e.g., 2% or less for intelligence tests; Hardison, 2005; Schmidt & Hunter, 1998. However, other researchers have reported larger estimates (e.g., 7%-15%; Melchers & Annen, 2010), with an average of 10% in incremental variance for dimensions and beyond intelligence and the big five facets of personality (Meriac et al., 2008).

This body of research is further supported by a meta-analysis documenting the IV of the OAR, as well as unit and optimally weighted composites of dimensions, over personality and cognitive ability (Dilchert & Ones, 2009).

These findings are especially important for estimating the utility of ACs, which are almost always significantly higher in cost compared with other forms of assessment. The IV over and above intelligence is especially relevant here, in that cognitive ability tests have been shown to create adverse impact against minority groups (Schmitt, 2014). To the extent that AC's can predict future performance at nearly the same levels of intelligence tests but in a less discriminatory way, the more their costs can be justified.

Although AC's do not seem to be adverse-impact free as they once were, they do show less subgroup differences relative to purely cognitive intelligence tests (Dean, Roth, & Bobko, 2008).

These studies also clearly demonstrate that AC's are measuring some unique attributes in comparison with the attributes measured by other methods. Further examples of studies pertaining to the incremental validity of ACs over and above GMA were conducted by Cortina, Goldstein, Payne, Davison and Gilliland,(2000) on the incremental validity of interview scores over and above cognitive ability and conscientiousness scores where the results suggested that interview scores contribute to the prediction of job performance over and above cognitive ability and

conscientiousness to the extent that they are structured, with scores from highly structured interviews contributing substantially to prediction;

Borteyrou, Lievens, Bruchon-Schweitzer, Congard, and Rascle, (2015) on the incremental validity of leaderless group discussion (LGD) ratings over and above general mental ability and personality in predicting promotion, where the results indicated that LGD ratings accounted for incremental variance in the prediction of promotion criterion measures, beyond cognitive ability and personality test scores;

Krause et al., (2006) on the incremental validity of AC Ratings over cognitive ability tests in a study at the Executive Management level, where it was found that the overall AC ratings provided incremental predictive validity for training success at the executive management level when used in combination with cognitive tests.

Method

Research design

For the purposes of analysing data to answer the research questions in this predictive criterion-related validation study, a number of data points along the selection and assessment process were collected and coded. In this retrospective study, historical data was gathered from the various stages in the selection and assessment process. The output criteria as measured through examination success and performance ratings were obtained from the financial institution.

All contracted intermediaries are comprehensively screened, interviewed and assessed at the organisation's national assessment centres. The screening and assessment procedure is compulsory for all recruits who are seeking to be representatives for the organisation. Recruiting and assessment information of the applicants are kept and managed by the assessment centre (AC) personnel. The assessment centre is managed by a registered psychologist who signed off the data available in the context of the expected contribution of the present study. The confidentiality of data was supervised by the internal psychologist according to the HPCSA requirements.

Data was extracted from the financial organisations' data platforms namely, the on-line application- and pre-screening platform, the assessment centre data basis, the

training centre's academic records and the financial departments' sales figures. The biographical, interviewing, pre-screening and assessment information originating from the various measures was coded in such a manner that the Statistical Package for Social Sciences (SPSS) could be used to test the predictive correlations and incremental value of the assessment centre exercise ratings. The numerical values of examination outcomes and sales performance needed little transformation.

Sample and Procedure

The sample consisted of 425 contracted intermediaries at a large financial organisation in South Africa and the details of the sample's characteristics are set out in Table 1.

Race

The white group constituted 45.2% of the sample, followed by the black group at 24%. The coloured and Indian groups were least represented, at 10.1% and 7.8% respectively. There were 55 (12.9%) missing values.

Gender

Males dominated the sample, representing 54% of the sample while females constituted 31.8% of the sample. There were 60 (14%) missing values.

Region

The Gauteng region (24.7%) was the best represented sub-group in the sample. Western Cape followed with 21.4% representation. KwaZulu Natal represented 13.4% of the sample while both the Free State and Eastern Cape had 7.8% representation. Limpopo, Mpumalanga, North West and Northern Cape all had less than 5% representation in the sample of producing financial intermediaries for whom assessment measure ratings were available for analysis.

The invalid data shown in Table 1, between 12.9% and 14.1% in some cases, were due to absence of biographical data. This was contributed to loss of back-up data as discovered during the data capturing process.

Ethics clearance to conduct this study was obtained from the Commerce Faculty Ethics in Research Committee at the University of Cape Town prior to commencing the empirical work. Approval to collect data at the financial organisation was obtained from the Head of Assessments, prior to the research being conducted.

The research guidelines of the American Psychological Association (2009) were followed and the participating organisation and respondents were assured of confidentiality and anonymity.

Table 1

Sample characteristics of financial intermediaries

Race	Frequency	%
Invalid	55	12.9
Asian	33	7.8
Black	102	24.0
Coloured	43	10.1
White	192	45.2
Total	425	100.0
Gender	Frequency	Percent
Invalid	60	14.1
Female	135	31.8
Male	230	54.1
Total	425	100.0
Region	Frequency	Percent
Invalid	55	12.9
Eastern Cape	33	7.8
Free State	33	7.8
Gauteng	105	24.7
KwaZulu-Natal	57	13.4
Limpopo	6	1.4
Mpumalanga	17	4.0
North West	18	4.2
Northern Cape	10	2.4
Western Cape	91	21.4
Total	425	100.0

Note: The large number of invalid data were caused by computer theft and loss of biographical data.

Selection criteria for intermediaries

Once contracted, the purpose of the role of the intermediary is to provide new and existing clients with professional and relevant financial advice, -planning and products that are suited to their risk and savings needs and to fulfil their other financial planning requirements. They need to undertake the procurement of high quality sustainable business in accordance with determined business targets. Intermediaries need to maintain and service clients as part of a long term relationship which builds loyalty to the brand and generate the ongoing sales of financial solutions. They also need to undertake these activities within a professional, compliant and ethical framework which should result in supporting the sustainability of the organisation.

The intermediary operates in an environment where specific industry and role requirements exist and consequently the following selection criteria examples are considered during recruitment and assessment of intermediaries:

- No person with a previous record of criminality and/or insolvency may be contracted as an intermediary.
- Grade 12 schooling qualification is a requirement where this level of comprehension should enable candidates to understand assessment instructions and content.
- The organisations' on-boarding orientation, training and materials are English medium and requires an adequate comprehension of the English language.
- The industry's product complexities, regulatory examinations and client compliance factors imply that candidates should be able to integrate and solve fairly complex problems in a structured and regulated environment.
- A professional people orientated career interest should prevail where customers are protected and sustainable customer relations are ensured.

The intermediaries' remuneration is based on commission. If specific targets are not reached within a set time period, the intermediary's contract will be terminated within reasonable guidelines. Therefore, an effective selection and validated assessment process to predict the success of the intermediary is critical since a period of non-

commission will result in career failure and wasted organisational infra-structure support. Given the mentioned organisational risks in the contracting of intermediaries, the financial institution in the present study has developed a comprehensive selection and assessment procedure to mitigate possible risks and enhance business success.

It is therefore meaningful that the present validation study tests the possible predictive correlations between the selection and assessment measurements and the intermediary's success criteria. To achieve a comprehensive analysis of all the possible predictors, especially the hypothesised incremental value add by the assessment centre measures, the information and assessment ratings of recruits who were contracted were collected.

Selection procedure, legislation and data capturing

The recruitment, selection and contracting of intermediaries at the participating financial organisation is an integrated process based on principles like confidentiality, fairness, objectivity, market alignment, predictability and internal governance.

Selection specialists like managers, recruitment selection consultants (RSC), human resource consultants (HRC), system specialists and psychologists work together as a team to attend to appointment decisions and development suggestions. The heads of businesses, human resources executive (HRE) and head of assessments collectively ensure that the process is integrated and aligned with the vacancy needs and growth potential. Together with the training centre and support specialists, the generic and individual development areas identified are crafted into various programmes and development initiatives.

The goal of the selection and assessment process is to provide recommendations on career fit and development areas, and to ensure guidance to line managers regarding employees and intermediaries which should create productive and meaningful work.

The HRE and assessment team oversee and govern the end-to-end selection and assessment process. This is done through regular training, project meetings, performance reviews, quarterly reporting, statistical and trend analysis, industry benchmarking, professional networking and the maintenance of a pool of professional external service providers like assessors, psychologists, test providers and

researchers. In this regard, global and internal validity findings and recommendations are considered to inform the content and predictions of the selection and assessment process.

A potential intermediary will proceed through the following stages of the selection and assessment process where data is collected and saved for future analysis:

1. Informal meeting with the manager or internal recruitment and selection consultant (RSC) where the minimum requirements for the role of the intermediary are discussed. The RSC keep notes on the digital platform regarding the content and outcome of the informal meeting that informs the candidate about the expectations of the intended role.
2. Digitalised application (URL web-based) where the recruit completes a comprehensive application form with sections on biographical, educational, previous employment and financial status information, integrity background questions and work style interests with specific reference to sales interest questions and responses.
3. Digitalised and automated selection stage management with regards to standard reference checking, qualifications, criminal record, credit checks and status of previous industry contracts. The automated selection is coordinated by the internal RSC and captured at a central data point.
4. The compulsory AFIS, automated fingerprint imaging system scanning checks are done by trained and registered biometric officers at the national assessment centre venues.
5. Panel interview by management with a structured face-to-face competency based interview guide where the job related interview questions assist management to match an intermediary to a specific market segment. The interview ratings are captured on the digitalised application and selection platform.
6. A face-to-face assessment centre where job related tasks are completed. The tasks, a typical intermediary case study and role play, simulate the required

competencies that an intermediary must demonstrate in the work context. The general mental ability and personality psychometric measures are also supervised and administered by registered professionals at the suitable national assessment centre's facilities.

7. In a final recommendation stage, an assessment report and consideration for contracting is generated. The final business decision to contract the candidate is made by managers who consider the final recommendation, development areas, portfolio type, possible work site allocations and available support structures. The assessment centre report recommendation and contract decision is captured and loaded on the digital platform.

Assessor training, requirements and ratings

The assessments are done by a network of trained and registered psychologists and psychometrists. All reports and recommendations are supervised, monitored and signed off by an experienced internal psychologist. Consultation between specialists and managers is encouraged regarding recommendations and possible recommendation overrides may be considered. It should be noted that the assessment centre is requested to always indicate unqualified recommendations in the report, indicating *recommended* or *not recommended*. All intermediaries in the sample group were recommended by the assessment centre.

All psychologists, psychometrists, assessors and administrative coordinators are regularly trained and monitored to comply with standard internal processes, procedures, benchmarks, validated selection criteria and professional assessment conduct and protocol. In this regard, the financial institution indicated that assessor training guidelines and methodologies are followed according to global best practice (International Taskforce on Assessment Center Guidelines, 2015; Society for Industrial and Organisational Psychology of South Africa, 2005).

Only a selected and qualified number of service providers are requested to deliver on specific parts of the selection and assessment process. It is the task of the assessments manager to attract and maintain said service providers. Regular interaction and meetings with the external assessors ensure a shared and informed assessment

model while a compliant, unified and standardised approach is monitored. These actions intend to limit assessor rating inconsistencies and to ensure similar interpretation on all assessment centre measured findings.

The service providers are private practitioners with their own infra-structure. They provide services at a pre-contracted rate. Since assessment batteries differ depending on the work profile, fees are also structured according to the type of assessment battery, test materials needed and the applied scoring systems.

The selection process and the governing of assessment practices and assessors are largely driven by the Employment Equity Act (Section 5), stating the following:

Psychometric testing and other similar assessments of an employee are prohibited unless the test or assessment being used:

- a) *Has been scientifically shown to be valid and reliable;*
- b) *Can be applied fairly; and*
- c) *Is not biased against any employee or group.*

The Employment Equity Act's guidance is a major process consideration for South African assessment processes. Reliability of selection procedures and correlation studies that analyse the relationship between selection findings and intermediary's performance are compulsory. The present study fulfils the need to validate the assessment centre's incremental validity over and above existing performance criterion predictors like general mental ability (GMA). It is of particular importance to validate the AC exercises given the unstructured and non-standardised nature and scoring of traditional AC exercises.

A previous study in the organisation indicated reasonable predictive validity towards sales performance after investigating the effect of the pre-screening work styles questions during the application phase (Adams, 2008). Another study in the same organisation found significant positive correlations for intermediaries between personality test ratings and performance criteria (Solomon, 2005). However, the incremental validity of the assessment centre measures has not been investigated.

Measures

Assessment centre exercises and ratings

The financial organisation involved in the study started with assessment centre methodology more than 2 decades ago. The centre's participants respond to tasks where trained assessors make observations and ratings on scoring sheets that are based on predetermined, job related behavioural competencies. The competencies are defined on the basis of the job analysis where context, core outputs, competencies, requirements and the complexity of the role of an intermediary is carefully described.

During AC exercises, the recruit is exposed to exercises to assess his/her potential to do a needs analysis, give appropriate advice and illustrate customer centricity and relationship management. The simulations are exercises that copies the actual job activities. It gives the individual the opportunity to demonstrate the relevant competencies. At the assessment centre, the candidate receives exposure to the following exercises:

In-Basket

This is a written exercise that copies the typical written activities (e.g. letters, memos, e-mails, problems) that the person will deal with in the role of an intermediary. The in-basket exercise evaluates insight in protocol and the relevant procedures which is essential for client- and practice management. Furthermore, the in-basket (IB) also serve as a preparation for the role-play (RP) that follows. The IB and preparation for the RP has a time limited of one hour.

Role-play

The role-play is an interactive exercise that copies the typical interactions that the individual will encounter in the role. Trained assessors utilising standard response scripts are involved in the role-play which is limited to a 20 minute session. The role-play assesses general sales skills and interactive solution based competencies.

Given the South African context, the assessment centre ensure that multilingual instructions could be presented on request. In this regard Lievens and Thornton (2005) indicated that challenging issues may arise in multi-cultural situations. To overcome

such obstacles, the internal recruiting consultants prepare the candidates for the assessment centre and enquire about language preference.

The AC exercise competencies are measured on a 5-point scale and the following are measured through the work related case study and client role-play: entrepreneurship, client focus, decision making, gaining commitment, work standards, adaptability, tenacity, initiative, communication, impact and treating customers fairly. The competency definitions and score sheet template are showed in Appendix 1.

The ratings on a 5-point scale are similar to the interview guide and are based on specific behavioural indicators. An average assessment centre competency rating indicates the person's behavioural competence in relation to the role requirements. The behavioural indicators were determined by subject matter experts and validated during national pilot focus groups. The behavioural indicators on the scoring sheets are revisited by the contributing assessors and adjusted on a yearly basis during the assessor's yearly frame of reference training and work session. Ratings are determined from the standard scoresheets where the competency indicators are listed. The assessor will audio record the role-play and complete the scoring sheets during an additional scoring session. The in-basket and role-play has separate score sheets and the ratings are entered in a final scoring competency matrix. The final assessment centre ratings are always verified between assessors through both consensus and statistical integration.

Market, strategic and legislative changes are considered every year since such changes may impact behavioural requirements. The mentioned assessment centre methodology has been ongoing for the past 15 years and more than 30 000 intermediary recruits have completed assessment centre exercises.

For the purpose of the present study, the data points were transferred from the individual assessment centre scoring sheets to MS Excel in order to analyse the impact and incremental value of the assessment centre measures on the examination and performance criteria of vested intermediaries.

Cognitive ability measure

The General Reasoning Test (version 2; GRT2), is utilised as a measure of general mental ability during the intermediary's assessment. This measure is provided by Psytech International and the psychometric properties of the test, including reliability and validity studies are described in the technical manual (Psytech International Pty Ltd, *General, critical and graduate test battery*, 2006).

The measure's purpose is to evaluate general reasoning abilities through three standardised sub-tests: verbal-, numerical- and abstract reasoning:

Verbal Reasoning

The verbal reasoning test assesses a person's ability to use words in a logical way. Consisting of items which involve an understanding of vocabulary, class membership and the relationships between words, this test measures the ability to perceive and understand concepts and ideas expressed verbally.

Numerical Reasoning

The numerical reasoning test assesses a person's ability to use numbers in a logical and rational way. The test consists of items which assess the candidate's understanding of number series, numerical transformations, the relationships between numbers and the ability to perform numerical computations.

Abstract Reasoning

The abstract reasoning test assesses the ability to understand complex concepts and assimilate new information beyond previous experience. The test consists of items which require the recognition of patterns and similarities between shapes and figures.

As a measure of reasoning it is independent of attainment and can be used to provide an indication of intellectual potential. Testing the ability to quickly understand and assimilate new information, the test is likely to predict how responsive to training the person will be.

According to Psytech International (2017), tests such as the General Reasoning Test have consistently been found to be the best single predictor of both performance and trainability in roles that require a good level of general mental ability. Psytech Ltd indicated that:

“Combining reasoning test scores with the results from personality tests can further improve the prediction of job performance, as can the use of job sample tests and structured interviews. In roles where experience and acquired knowledge are central to effective performance, it may be particularly appropriate to combine information obtained from reasoning tests with that obtained from these latter sources” (Psytech International, 2017).

The GRT2 is administered at the assessment facility with pen, booklets and answer sheets. The GRT2 results are expressed as *stanines*, a standard 9-point scale. Individual *stanines* of subtest reasoning abilities were utilised for analysing the predictive value of general mental ability on the criteria examination success and intermediary performance.

Personality assessment

Personality assessment measures are used to identify an individual’s characteristics and how that individual interacts with others (Foxcroft & Roodt, 2001). Once the personality characteristics of an individual are identified, it can be matched with requirements of occupations. The 15 Factor Questionnaire (Plus) (15FQ+) by Psytech International is one of the many personality assessment measures used in industry today.

Cattell (1946) constructed the well-known 16 Personality Factor (16PF) questionnaire and identified 16 core personality factors expressed on a bipolar scale. The 15 Factor Questionnaire (15FQ+) was designed by Psytech as a relevant alternative assessment to the 16PF (The 15FQ+ Technical Manual, 2002). It measures the same personality characteristics as the 16PF, but omitted the Intelligence Factor as it is difficult to measure reasoning ability in a personality test (Tyler, 2003). The 16 primary factors are displayed in Appendix 2.

The primary personality factors can be grouped to create second order or global factors. Also known as the Big Five, these traits provide a broad description of the individual's personality orientation (The 15FQ+ Technical Manual, 2002). The Big Five traits enhance comparisons with previous studies since many personality measures utilised in previous validations studies aim to group and express a number of traits within the Big Five traits. The Big Five traits and their originating factors can be viewed in Appendix 3.

Tredoux (2002) found a significant correlation between primary personality factors and performance in a sales environment. A step-wise multiple regression indicated that four of the 15FQ+ primary factors predicted sales performance ($R=.42$). The results of the step-wise multiple regression indicated that effective sales staff were socially bold, less self-doubting and more emotionally stable than those who were rated as being less effective. As mentioned before, Solomon (2005) also found a significant correlation between financial advisers 15FQ+ reported traits and performance.

The 15FQ+ is administered as a pen-and-paper or on-line computerised test. The scoring is done using Psytech software programme and provides a comprehensive report of the individual. The 15FQ+ Technical Manual (2002) provides instructions where pen-and-paper tests are done. Scoring involves converting raw scores to sten scores. The sten scores are plotted on a profile chart. Second order factors are also displayed on sten scores.

The personality evaluation is part of the organisation's assessment centre process. It was decided to investigate the predictive validity of the personality evaluation and the incremental effect when considering all measures, especially together with assessment centre exercise ratings. Intermediaries' personality data for the present study were collected from the Psytech scoring system to analyse the impact of the measure on the examination and performance criteria.

According to The 15FQ+ Technical Manual (2002), data analysed towards psychometric properties demonstrated that the 15FQ+ meets the necessary requirements. The manual describes and explains how the requirements are met with regard to standardisation, reliability and validity. The authors indicated that assessors

can use the tool with confidence to aid their selection and assessment decisions. The test provider listed and reported on large South African samples (N > 20 000) with specific reference to the fairness on the measure.

Interview measure

The interview process is conducted by panel members and includes a competency-based structured interview guide for intermediaries. The purpose of this guide is to provide relevant and structured guidelines to managers to conduct panel interviews in such a way that sufficient information is gathered from the recruit to make an informed and fair decision.

During the interview, panel members write their competency ratings in the spaces provided on the interview guide. Ratings are compared after the interview, during the panel discussion. The final competency matrix mirrors the competencies in the assessment centre and final ratings are submitted by the facilitating manager.

The competency rating scale for panel interviews and assessment centre exercises is as follow:

Rating scale (1 to 5)

1	2	3	4	5
<ul style="list-style-type: none"> ▪ Far short of expectations ▪ Far below adequate ▪ Long-term development area 	<ul style="list-style-type: none"> ▪ Just short of what is expected ▪ Not adequate ▪ Short-term development area 	<ul style="list-style-type: none"> ▪ Meets expectations ▪ Effective ▪ Adequate 	<ul style="list-style-type: none"> ▪ More than expected ▪ Good ▪ Motivational 	<ul style="list-style-type: none"> ▪ Far more than expected ▪ Superior

The consolidated interview ratings were available for analysis through the digital application and selection management information platform. It is imperative for

the internal recruitment selection consultant (RSC) to enter each recruit's panel interview ratings on the platform. This available data has not previously been used for predictive analysis. In the present study, the data points were used to explore the predictive ability of the collective interview ratings. In addition, the incremental validity of the assessment centre ratings over and above interview ratings was explored.

Pre-screening and Sales Interest Measure

The pre-screening questionnaire, a Web based URL is the measuring instrument used to identify and pre-select potential intermediaries at the financial institution. The pre-screening questionnaire was developed by the financial institution for the purpose of standardising and monitoring the recruitment and selection process. The pre-screening questionnaire is comprised of three questionnaires or subscales outlined below.

Biographical data subscale

The biographical questionnaire requires respondents to provide personal details such as gender, disability, income status and education. A total of 19 items are presented in the biographical questionnaire. Respondents are expected to select on a dropdown screen the category that best describes them on each biographical aspect.

Integrity subscale

The integrity questionnaire assesses possible counter-productive behaviours in the workplace. The items in the questionnaire requires respondents to honestly declare past convictions or civil cases lodged against them and their personal state of solvency. Job applicants respond to a set of 14 dichotomous items, where a response of 1 indicates *yes* and a response of 2 means *no*. The integrity subscale is an important selection enquiry where specific outcomes are expected, for example an applicant with a reported fraudulent criminal record may not be contracted. The data collected in this regard, will not be utilised in the study. The importance of immediate exclusion from becoming a financial intermediary in the case of a dubious work related history was observed in the organisation data sets.

Interest subscale

The interest questionnaire is a match between the respondent's preference or career interests and the requirements of a sales-type role. Responses are measured using a Likert-type scale ranging from 1 to 5, where a score of 1 indicates *strongly disagree* and a score of 5 indicates *strongly agree*. This is inclusive of items referring to interests such as working in a team, sales activities, influencing and leading others. This work style questionnaire (WSQ) has been investigated by Adams (2008). She indicated the following:

“Given the significant correlations, a reliability analysis was conducted to establish to what extent each item was contributing to the reliability of the interest subscale. The overall Cronbach's alpha for the interest subscale was ($r=.985$). The results showed that interest subscale's Cronbach's alpha remained consistent ($r=.984$) irrespective of which items was deleted, meaning that all the items were contributing equally to the reliability of the interest subscale” (Adams, 2008, p. 47).

The internally designed WSQ originated in September 2003 when the assessment centre manager proposed that a number of interest questions to sense an applicants' career interest should be considered. The purpose was to enhance pre-screening selection methodologies and reduce the number of formal comprehensive assessments. The questions were formulated by a focus group consisting of internal and external psychologists. Focus group members were selected on the basis of their knowledge of formal assessments and consumer psychology. A number of 37 questions were presented to the sales business committee and 14 questions were selected to be placed as content on the on-line intermediary application platform. The WSQ has been in use since 2003 and are useful to explore applicants' commitment to the intermediary's role. Applicants' responses on the WSQ are explored during interviews. The WSQ utility was confirmed when Adams (2008) validated the reliability of the sales construct interest measure. The incremental validity of assessment centre exercise ratings over and above the WSQ was considered in this study.

The pre-screening information of the vested intermediaries will be used to identify and describe the sample group in the present study. Biographical information

such as length of service was previously utilised to explore adverse effect. In a previous internal study regarding the performance of intermediaries, Adams (2008) analysed tenure as control variable and concluded that the duration of the intermediary's service contract had a significant positive impact on performance. The impact of tenure on the performance criteria was therefore explored as a control variable in the present study.

Criterion measures and data recording

The Regulatory Examination (RE)

All intermediaries in a specific category of advice, must complete the RE examination with a pass rate of 65%. They have two years from the date of contracting to the financial industry to reach this milestone that will grant them the professional registration and licensing at the Financial Services Board (FSB). In the case of failure, even though a number of examination sittings are allowed during the two-year period, the intermediary may not continue with advice and need to leave the industry where the specific category of advice is required. The organisation who participated in the present study where more than 2 000 intermediaries were contracted, all requires the RE5 qualification. In addition, after a two-year period of failures to pass, the candidate may never in a lifetime return to attempt the same category of advice in the financial industry. Obvious exceptions like illness may be considered through a formal application at the FSB.

The ending of an intermediary's two-year contract comes at a very high infrastructure and support cost. Each examination sitting also incurs cost for the organisation and the individual.

The content of the RE is described in Government Gazette (No. 33166, 12 May 2010, pages 22 to 33). Tasks, knowledge criteria and skills criteria are detailed in the Gazette and the organisation training academy uses the documented content to support and facilitate the RE examination of contracted intermediaries. The data points which consisted of name lists of registrations, number of RE sittings per intermediary and marks achieved were obtained from the training academy and prepared for statistical analysis in terms of this study's purpose and hypothesis.

Sales performance

The internal performance measurement referred to as *score* was devised by the organisation after the introduction of conflict of interest regulation. *Score* is calculated by a formula taking the premium size, term and product type into account.

With the introduction of the conflict of interest regulation, it became necessary to ensure that a standardised recognition measurement, *score* is granted to the intermediary to ensure that products and advice address the client need. This is to ensure that the financial intermediary's advice will not be unduly influenced by the lure of recognition at the cost of possible unsuitable product advice to clients.

Score accumulated by a financial intermediary is used as a single measure of the following sales performance: total premium volumes of sales, number of products sold and sales target achieved.

The sales performance criteria data points were collected from the financial and remuneration departments.

Statistical Analysis

Statistical computations and analysis thereof to test the research questions were accomplished via MS Excel data collection and SPSS analysis. The purpose of the statistical analysis is to find meaningful relationships between the variables as indicated in the research questions. Furthermore, regression analysis is appropriate to indicate a stepwise analysis of the incremental predictive ability of the assessment centre's behavioural based results.

From the onset of the analysis, sample descriptions and sample analysis were investigated. Frequency statistics described and were graphically presented. The mean, standard deviations, skewness and kurtosis coefficients were calculated to obtain information of the biographical characteristics of the sample group. The same descriptive and utility analysis was done in terms of the distribution of ratings from the various selection and assessment measures. The criterion measures, examination success and performance indicators were described in terms of statistical utility.

Given the large number of measures as possible predictive variables, it was appropriate to make use of factor analysis. The systematic exploration of the large number of variables revealed specific clusters or components that were used to explain variance in the criterion measures.

In terms of the specific research questions, the following analysis per hypothesis were applied:

1. Do overall measures, pre-screening work styles questionnaire, interview ratings, personality measures, and behavioural assessment measures make a unique contribution over cognitive ability tests in predicting regulatory examination success? Pearson's correlation coefficients were applied to assess the independent relationship between all the selection and assessment ratings and the criterion, examination output. Furthermore, factor analysis to determine which ratings and other information across the selection process together may create components or factor structures whereby combinations of ratings are significant predictors of the criterion. Multiple analysis of variance and factor analysis were deemed appropriate to investigate this research question.
2. Do overall measures make a unique contribution over cognitive ability tests in predicting performance? Pearson's correlation coefficients were applied to assess the independent relationship between all the selection and assessment ratings and the criterion, sales related performance. Factor analysis was to determine which ratings and other information across the selection process together may create components whereby combinations of ratings are significant predictors of the criterion.
3. Which specific assessment measures, in-basket or role-play used in the AC, explains the greatest portion of variance in the RE success and performance of the financial intermediary? The impact of the various AC ratings was analysed by considering multiple-correlation and stepwise regression analysis.
4. Which combination of measures and dimensions used in the AC significantly correlate with the output criteria? Multiple regression was utilised to analyse the combinations of the ratings of the different measures to test the combined strength

in the possible prediction of performance and examination outputs of intermediaries.

5. After the above mentioned analysis were completed, the hierarchical regression method was utilised to ultimately explore the incremental validity of the assessment centre measures over and above the cognitive ability measure.

Results were tabled and discussed based on the above mentioned analysis. Reference to previous research findings and integration of previous and current findings led to conclusions and recommendations.

Results

Descriptive Statistics

Examination and Sales Performance criterion measures

The performance of the intermediaries represented in the sample was considered by analysing six criteria underlying the sustainability of the job. Table 2 illustrates that the average sales performance was 106208.46 for a seven-month period. The standard deviation (81052.93) implied obvious differences between intermediaries' income where total sales is measured by the organisation as a monetary value (ZAR). The mean sales target achievement by the sample group was 93.38% while on average, 32.89 products per intermediary were sold during the same seven-month period.

Table 2

Examination and sales performance criteria

Descriptive statistics	N		Mean	Std. Deviation	Variance	Kurtosis	Skewness
	Valid	Missing					
Sales performance	421	0	106208.46	81052.93	6569577561.67	1.136	.765
Sales target achieved	390	31	93.38	56.56	3199.29	2.378	.811
Number of products sold	420	1	32.89	20.57	423.25	.779	.876
RE qualified	421	0	0.55	0.50	0.25	-1.971	-.196
RE mark (%)	135	286	0.67	0.11	0.01	1.475	-.759
RE attempts	135	286	0.59	0.49	0.24	-1.883	-.381

Note: RE=Regulatory Examination; RE qualified: *yes or no* (nominal scale); RE attempts: *one or more than one* attempt (nominal scale). RE number of cases limited since the Financial Services Board (FSB) does not release the intermediaries' percentage marks or number of attempts of qualified intermediaries previously employed elsewhere.

In terms of regulatory examination (RE) successes, the average percentage achieved by the sample group was 67% (n=135). The pass rate for RE is 65%. The available sample group was slightly divided by the qualification achievement (mean = 0.55) towards more qualifications achieved (n=231) than without (n=190) – see figure 1. As per illustration, 55 (40.7%) intermediaries in the sample group (n =135) had to attempt the examination more than once since many attempts were allowed within a two-year period after appointment to the industry. Eighty (59%) passed and achieved the qualification with the first attempt.

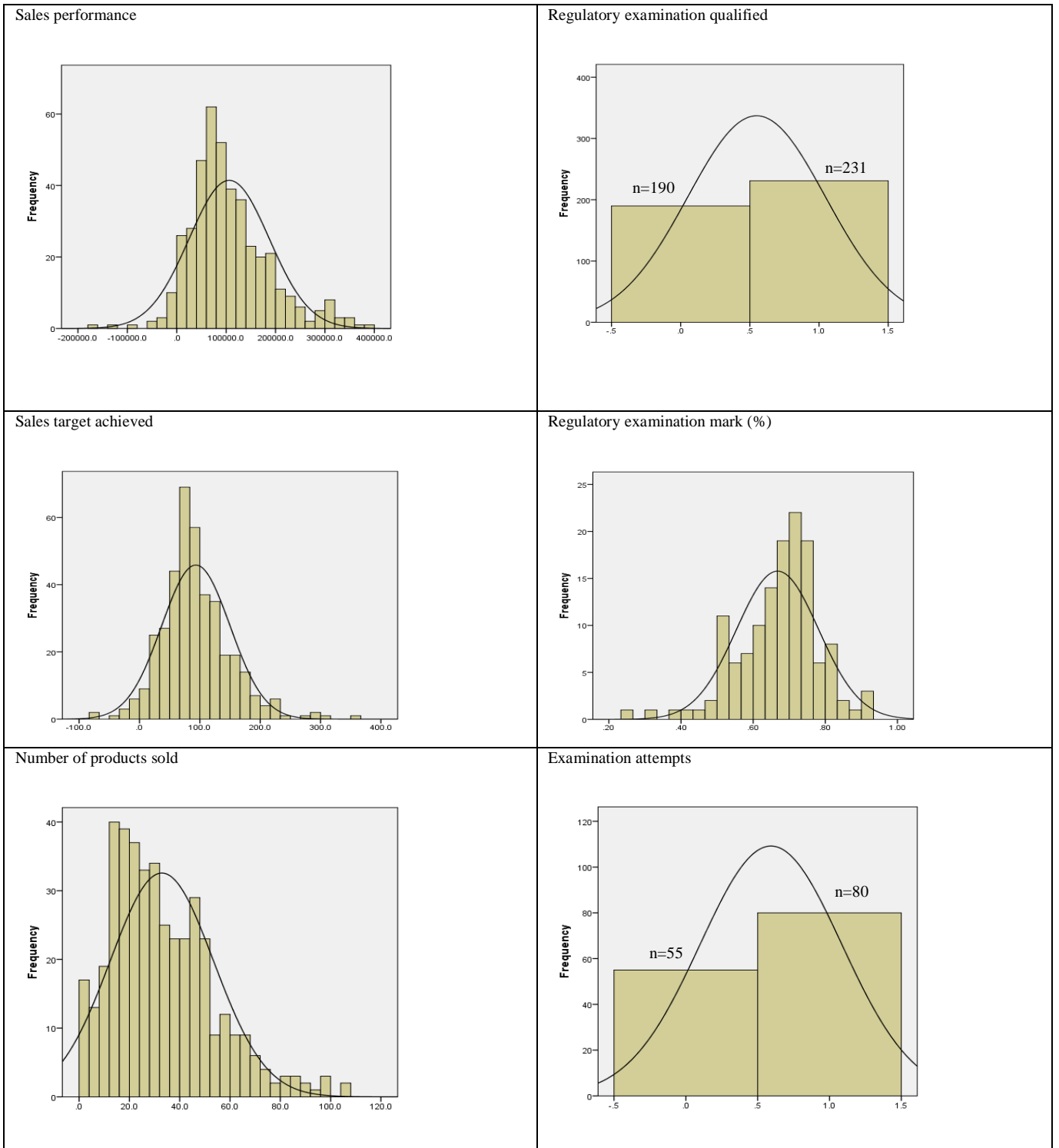


Figure 1: Histograms for intermediaries' examination and sales performance criteria.

Assessment centre exercise ratings as predictors

Both of the assessment centre (AC) exercises, the in-basket (IB) and role play (RP) produced ten competency ratings on a *1 to 6 point scale*. To limit the large number independent variables for the assessment exercises, a total competency rating for each relevant AC exercise was calculated by totalling the competency ratings. The interactive simulations had a total mean of 30.73 (in-basket) and of 45.21 (role play) respectively. The AC composite is a combination or total of both interactive exercises averages and delivered a composite total rating means of 40.87 (Table 3).

Table 3

Descriptive statistics of assessment centre exercises total ratings

Measure	N		Mean	Std. Deviation	Variance	Kurtosis	Skewness
	Valid	Missing					
AC in-basket competency total	420	1	30.738	7.2502	52.566	-.471	-.049
AC role play competency total	420	1	45.217	7.2103	51.989	.217	-.327
AC exercises composite	421	0	40.867	6.3928	40.868	-.305	-.172

Note: AC=assessment centre.

Although the total ratings for the AC measures may be useful, the detailed competency ratings of the various AC measures are important to better understand the specific successes of financial intermediary behaviours. In this regard, the mean, standard deviation and number of cases available for analysis are illustrated in Table 4. To allow for more variance, it should be noted that all assessment ratings were converted from a five- point scale to a six- point rating scale.

The original scale at the assessment centre allowed for an additional decimal *2.5 rating* on the five-point assessor scoring sheet scale. It was therefore possible to convert to a six-point rating for the purposes of statistical analysis. This scale transformations' effect can be seen in Table 4.

Table 4

Descriptive statistics of assessment centre exercises competency ratings

Assessment centre variables	N	Min	Max	Mean	SD	Variance	Kurtosis	Skewness
AC Work Standards IB	420	1.0	5.0	3.367	1.122	1.259	-1.054	-.525
AC Tenacity IB	419	0.0	5.0	3.451	1.014	1.028	-.746	-.703
AC Communication IB	420	0.0	6.0	4.052	.807	.651	4.122	-1.519
AC Impact IB	420	0.0	6.0	3.174	1.311	1.729	-1.270	-.184
AC Decision Making IB	420	1.0	5.0	2.924	1.277	1.631	-1.450	-.147
AC Entrepreneurship IB	420	1.0	5.0	2.900	1.033	1.069	-1.625	.292
AC Client Focus IB	420	1.0	5.0	3.117	1.111	1.235	-1.459	-.222
AC Adaptability IB	420	1.0	5.0	2.538	1.213	1.471	-1.263	.362
AC Gaining Commitment IB	420	0.0	5.0	2.490	1.111	1.234	-.825	.591
AC Initiative IB	420	1.0	5.0	2.733	1.066	1.136	-1.411	.346
AC IB Competency Total	420	6.0	48.0	30.738	7.250	52.56	-.471	-.049
AC Work Standards RP	420	1.0	6.0	3.950	1.112	1.236	-.154	-.498
AC Tenacity RP	420	1.0	6.0	4.079	1.069	1.142	.275	-.700
AC Communication RP	420	1.0	6.0	4.348	.889	0.791	.975	-.638
AC Impact RP	420	1.0	6.0	4.357	.935	0.875	.416	-.627
AC Decision Making RP	420	1.0	6.0	4.064	1.237	1.530	-.411	-.662
AC Entrepreneurship RP	420	1.0	6.0	3.657	1.175	1.381	-1.006	-.408
AC Client Focus RP	420	1.0	6.0	4.195	.8874	0.788	.742	-.784
AC Adaptability RP	420	2.0	6.0	4.245	.9985	0.997	.406	-.738
AC Gaining Commitment RP	420	1.0	6.0	4.095	1.048	1.098	.144	-.779
AC Initiative RP	420	1.0	6.0	3.981	.991	0.983	.004	-.641
AC TCF RP	415	2.0	6.0	4.296	.826	0.682	-.154	.021
AC RP Competency Total	420	20.0	66.0	45.217	7.210	51.98	.217	-.327
Work Standards AC Total	420	2.0	6.0	3.721	.855	0.731	-.458	-.122
Tenacity AC Total	421	1.0	5.0	3.829	.910	0.828	-.342	-.475
Communication AC Total	421	2.0	6.0	4.276	.697	0.486	.474	-.519
Impact AC Total	421	1.0	6.0	3.891	.866	0.750	.145	-.539
Decision Making AC Total	421	1.0	6.0	3.496	1.11	1.227	-.492	-.366
Entrepreneurship AC Total	421	1.0	5.0	3.359	.975	0.950	-.879	-.025
Client Focus AC Total	421	1.0	5.0	3.727	.795	0.632	.037	-.441
Adaptability AC Total	421	1.0	6.0	3.473	.904	0.817	.031	-.512
Gaining Commitment AC Total	421	1.0	6.0	3.428	.967	0.936	-.123	-.436
Initiative AC Total	420	1.0	5.0	3.476	.875	0.766	-.601	-.120
TCF Total	413	2.0	6.0	4.291	.817	0.668	-.093	.036
AC Total (IB+RP)	421	23.0	57.0	40.867	6.393	40.868	-.305	-.172

Note: AC = assessment centre; IB = in-basket assessment exercise; RP = role play assessment exercise; TCF = treating customers fairly.

General mental ability (GMA) as predictor

Given the relevance of general mental ability (GMA) as measured by 3 general reasoning subtests (GRT) and the importance of subtest content differences, the reasoning tests were separately considered during analysis. Table 5 illustrates the uniformity of the means of the 3 subtests (verbal reasoning = 5.71; numerical reasoning = 5.77 and abstract reasoning = 5.71). The reasoning subtests reflect ratings on a stanine. To allow for range in terms of comparative and regression analysis, a composite GRT rating comprising of the 3 subtest ratings was utilised. The mean of the total general reasoning composite was 17.16 with a standard deviation of 3.76. The sample's GRT ratings and assessment centre total ratings produced reasonably normal distributions and no further transformations were required.

Table 5

Descriptive statistics of GMA measures

Measure	N		Mean	Std. Deviation	Variance	Kurtosis	Skewness
	Valid	Missing					
GRT: Verbal reasoning	421	0	5.710	1.3738	1.887	-.188	.256
GRT: Numerical reasoning	421	0	5.767	1.6339	2.669	-.344	-.039
GRT: Abstract reasoning	419	2	5.711	1.6281	2.651	-.509	.112
GRT total	421	0	17.162	3.7553	14.102	-.318	.250

Note: GRT=general reasoning test

Personality traits as predictors

The descriptive statistics for the personality related traits are shown in Table 6. The Big Five traits descriptive are included in the table. A fairly normal distribution of the five traits were observed although a tendency towards the positive side of scales for extraversion, agreeableness and anxiety was noted.

Table 6

Descriptive statistics of personality factors and Big Five traits

Personality traits	Minimum	Maximum	Mean	SD.	Variance	Kurtosis	Skewness
Factor A - warmth	1	10	7.37	2.052	4.212	-.577	-.431
Factor B – intellectance	1.0	10.0	4.980	2.0190	4.076	-.829	.021
Factor C – emotional stability	2.0	10.0	7.300	1.8139	3.290	-.405	-.361
Factor E – dominance	1.0	10.0	7.116	1.8573	3.450	.175	-.449
Factor F - liveliness	3.0	10.0	7.909	1.7910	3.208	-.619	-.570
Factor G – rule- consciousness	1.0	10.0	6.402	1.4799	2.190	.817	-.313
Factor H – social boldness	0.0	10.0	9.008	1.3515	1.827	6.624	-2.015
Factor I – sensitivity	1.0	10.0	5.014	2.1866	4.781	-.669	-.212
Factor L – vigilance	1.0	10.0	3.181	1.7729	3.143	.237	.698
Factor M – abstractedness	1.0	8.0	4.068	1.5285	2.336	-.044	-.053
Factor N – privateness	2.0	10.0	6.652	1.8449	3.404	-.647	-.033
Factor O – apprehension	1.0	10.0	4.235	1.8259	3.334	.039	.459
Factor Q1 – openness to change	1.0	10.0	5.207	2.3318	5.437	-.777	.096
Factor Q2 – self-reliance	1.0	10.0	3.351	1.9191	3.683	.320	.733
Factor Q3 – perfectionism	1.0	10.0	6.907	1.9843	3.937	-.272	-.383
Factor Q4 - tension	1.0	10.0	3.952	1.9541	3.819	.077	.582
Big Five - extraversion	2.30	11.26	8.6328	1.54484	2.387	.113	-.564
Big Five - anxiety	.01	9.34	3.4952	1.77669	3.157	.057	.450
Big Five - openness	.30	9.14	4.9383	1.84519	3.405	-.433	-.249
Big Five - agreeableness	.60	9.94	5.6410	1.46765	2.154	.116	-.066
Big Five - control	2.02	10.89	7.0387	1.53162	2.346	.004	-.295

Note: N=353. Factors names adapted from Catell and Schuerger (2003, p.5); Factor B (intellectance) adapted from Psychometrics Limited (2002). SD=standard deviation.

Work style questionnaire and structured interview as predictors

In terms of the predictive analysis of the other selection measures that took place before the actual assessment centre event, i.e. the online work style questionnaire (WSQ) and competency based interview, items of both measures were totalled to increase the variables comparative ability. Table 7 illustrates the means of the totalled WSQ items, i.e. fourteen questions on a 5-point scale and the 12 interview competency ratings, also on a 5-point scale. The means were 62.98 for the WSQ and 37.11 for the total of the interview ratings. Table 6 shows that while variance on the WSQ was 34.60, the interview ratings produced limited variance at 6.84 with a standard deviation of 2.62. Figure 2 illustrates the distribution of totals for the WSQ and interview ratings. The centrality of interview ratings was observed.

Table 7

Selection measures: work style questionnaire (WSQ) and interview rating totals

Descriptive statistics	N		Mean	Std. Deviation	Variance	Kurtosis	Skewness
	Valid	Missing					
Work style questionnaire total	369	52	62.981	5.882	34.600	11.844	-2.253
Interview ratings total	369	52	37.111	2.615	6.838	3.026	1.336

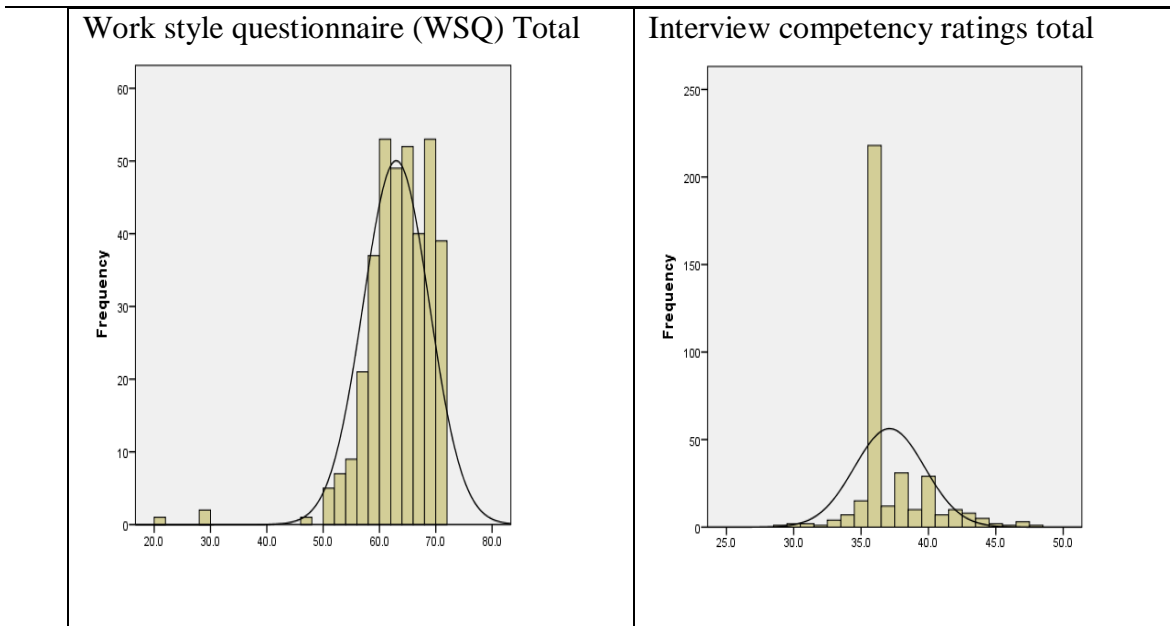


Figure 2: Histograms of work style questionnaire and interview rating totals.

Preliminary Analysis

Correlation coefficients

Inter-correlations between examination and performance criteria

The interaction between the criteria is relevant in providing a sound understanding of the elements that defines overall performance in the applied setting, the financial industry. The potential incremental validity or effect of AC exercise ratings on a criterion implies an effect on other success criteria. The following section describes the results of the inter-correlation analysis between the aspects of examination and performance dependent variables. In summary, statistically significant correlations were obtained within each of the three aspects of the two primary dependent variables: regulatory examination success and sales performance.

As shown in Table 8, intermediaries in the sample group's total sales performance during a seven-month period correlated significantly with the corresponding period's percentage sales target achieved ($r = .681, p < .01$) and the number of products sold ($r = .650, p < .01$). The criterion variable, regulatory examination (RE) success of the financial intermediary also obtained significant inter-correlations.

In this regard, the examination qualification achieved significantly correlated with the examination marks (percentage) achieved ($r = .731, p < .01$). However, as illustrated in Table 8, no significant correlation was evident between the above mentioned aspects of examination success and the aspect of number of attempts to write the examination.

Statistically significant correlations were obtained between aspects of the performance criteria, regulatory examination success and sale performance. Table 8 shows a significant correlation between total sales performance and regulatory qualification achieved ($r = .194, p < .01$) as well as regulatory examination marks ($r = .224, p < .01$). In this regard, number of examination attempts as well as the examination marks correlated moderately with the sales target achieved ($r = .197, p < .05; r = .212, p < 0.05$).

The results showed a notable interaction within and between the dependent variables. The relationship of the examination based qualification and total sales performance provided insight into possible additional influences in predicting overall performance.

Table 8

Inter-correlation coefficients (Pearson) between regulatory examination success and sales performance criteria

Intermediary examination success and sales performance	1	2	3	4	5	6
1. Sales performance	-					
2. Sales target achieved	.68**	-				
3. Number of products sold	.65**	.40**	-			
4. RE qualified	.19**	.01	.17**	-		
5. RE mark (%)	.22**	.21*	.14	.73**	-	
6. RE attempts	.09	.20*	.02	.02	.04	-

Note: N=421. ** $p < 0.01$, 2-tailed. * $p < 0.05$, 2-tailed.

Predictors of examination success across measures

The correlations of the potential 88 predictors were investigated and a large number of statistically significant correlations were obtained between the independent variables and the criteria. Regulatory examination (RE) success was considered a success measure by determining whether the intermediaries in the sample successfully achieved their RE qualification within the allowed 2-year period since appointment to the industry. RE qualification completion correlated significantly with the work standards competency ($r = .144$, $p < .05$) as measured in the in-basket exercise at the assessment centre.

The role play exercise during the assessment also yielded significant correlations between RE qualification completed and the competencies work standards ($r = .097$, $p < .05$), communication ($r = .162$, $p < .01$) and impact ($r = .158$, $p < .01$). The assessment centre total ratings where the in basket and role play exercises together provide a total rating, the following competencies correlated significantly with RE completion: work standards ($r = .219$, $p < .01$), communication ($r = .181$, $p < .01$) and impact ($r = .172$, $p < .01$). The total composite of all the assessment centre exercise ratings also correlated significantly ($r = .104$, $p < .05$) with RE qualification completed.

In terms of other measures, the following individual WSQ questions negatively correlated with RE qualification achieved: “*I like activities that permit influencing other*

people” ($r = -.104, p < .05$) and “I like to develop my persuasive ability” ($r = -.106, p < .05$). Some of the competencies rated by panel interviewers also showed a significant correlation with RE qualification achieved: technical and professional knowledge and skills ($r = .130, p < .05$) and decision making ($r = .115, p < .05$).

Examination success was also investigated by considering the marks achieved of the financial intermediaries in the sample group. The following assessment centre role play competencies ratings correlated significantly with RE marks: communication ($r = .297, p < .05$), decision making ($r = .171, p < .05$) and entrepreneurship ($r = .194, p < .05$). The role play total of all competencies also correlated significantly with RE marks ($r = .199, p < .05$). Total assessment ratings, including the in basket and role play ratings correlated significantly with RE marks in respect of the following competencies: work standards ($r = .214, p < .05$), communication ($r = .240, p < .01$), entrepreneurship ($r = .210, p < .05$) and treating customers fairly ($r = .175, p < .05$). The total of all the assessment centre exercise ratings also correlated significantly ($r = 0.200, p < .05$) with positive RE success as measured by the marks achieved.

The general mental ability measure, general reasoning test (GRT) results showed significant correlations with RE marks achieved. In this regard, verbal reasoning ($r = .308, p < .01$) and the GRT total ($r = .226, p < .01$) correlated significantly with RE marks. In terms of personality factors, the following significant correlations were evident: intellectance ($r = .188, p < .05$), emotional stability ($r = .187, p < .05$), and dominance ($r = .209, p < .05$). The following Big Five traits also correlated significantly with RE marks: extraversion ($r = .208, p < .05$) and agreeableness ($r = -.272, p < .05$).

To some extent, RE examination success can also be considered by investigating the number of RE examination sittings the financial intermediaries in the sample group attempted before they qualified. The number of examination attempts correlated significantly with tenacity ($r = .225, p < .01$) measured in the assessment centre’s role play exercise. The total for both the assessment centre exercise ratings (in basket and role play) showed significant correlations between the number of RE attempts and the following competencies served as predictors: tenacity ($r = .195, p < .05$), communication ($r = .177, p < .05$) as well as the total composite of all the

assessment centre exercise ratings ($r = .199, p < .05$). Verbal reasoning as measured by the GRT subtest correlated significantly with RE examination attempts ($r = .234, p < .01$). The GRT total of the subtests verbal, numerical and abstract reasoning that is considered to be a measure of general mental ability also correlated significantly ($r = .190, p < .05$) with the number RE examination attempts.

Predictors of sales performance across measures

From a financial organisations' point of view, sales performance of the intermediaries secure profits and sustainability and is probably the most critical measure of performance. In the study, performance as measured by total sales marginally correlated with the competency work standards in the assessment centre in-basket exercise ($r = .096, p < .05$), numerical reasoning in the general reasoning test (GRT) ($r = .131, p < .05$), and total GRT score ($r = .100, p < .05$). With regards to total sales performance and other measures, significant correlations were observed between total sales and the following specific work-style questions (WSQ): "*I could manage a small business or service*" ($r = .159, p < .01$) and "*I like to do presentations*" ($r = .106, p < .05$). The total WSQ score also correlated significantly with sales totals $r = (.104, p < .05)$. The total panel interview rating also correlated significantly with total sales performance ($r = .127, p < .05$) while the following specific competencies rated by the panel interviewers correlated significantly: decision making ($r = .140, p < .01$) and work standards ($r = .121, p < .05$).

The performance indicator, sales target achieved yielded a number of significant modest correlations with variables in the different measures. The following WSQ questions correlated with target achieved: "*I like jobs where I can be outgoing and relate to others*" ($r = .110, p < .05$) and "*I could manage a small business or service*" ($r = .123, p < .05$). The competency rating for entrepreneurship in the panel interview correlated significantly ($r = .115, p < .05$) while a number of personality factors significantly correlated with sales target achieved: warmth ($r = .129, p < .05$), vigilance ($r = -.129, p < .05$), apprehension ($r = -.117, p < .05$) and perfectionism ($r = .132, p < .05$). In terms of the Big Five personality traits, correlations were found between sales target achieved, anxiety ($r = -.120, p < .05$) and control ($r = .133, p < .05$).

The dependent variable number of products sold as third performance criteria output by the financial intermediaries in the sample group, yielded a significant modest correlation with the competency entrepreneurship as measured in the in-basket assessment exercise ($r = .098, p < .05$). A significant negative correlation was found with the treating customer fairly competency as measured in the assessment centre role play exercise ($r = -0.146, p < .05$). The same significant negative correlation regarding treating customers fairly (TCF) was also found between number of products sold and the assessment centre total rating (in basket and role play exercise) of the competency ($r = -.148, p < .01$). Although this unexpected finding portrays a negative scenario where sales achievements seemingly precedes TCF, the harsh industry and organisational policies regarding RCF, may have resulted in a strict assessment centre rating. The possible overhaul of the assessment centre rating will be further discussed in this study.

In terms of GMA and performance, the verbal reasoning subtest in the general reasoning test (GRT) as an ability indicator correlated negatively with the number of products sales ($r = -.101, p < .05$). Although the negative correlation could not be easily explained, it was noted that the organisation's various products differ in complexity. The specific sales process required in terms of the number of products sold may share more insight into this unexpected finding, for example, making many appointments with prospective clients may be a superior element of the sales process that drives the number of products sold. In this regard, the number of products sold could also be understood by considering the other significant correlations across measures.

With regards to the other measures and number of products sold, a few of WSQ questions significantly correlated with products sold: "*I like to develop my persuasive ability*" ($r = .137, p < .01$), "*I like jobs that need strong self-confidence*" ($r = 0.106, p < .05$), "*I like to convince other people*" ($r = .124, p < .05$), "*I like to do presentations*" ($r = .147, p < .01$), "*I like to meet important people*" ($r = .102, p < .05$) and "*I would like to sell a company's products*" ($r = .131, p < .05$). The WSQ total rating also correlated significantly with the number of products sold ($r = .120, p < .05$). In terms of the competency panel interview ratings, the following competencies correlated significantly with the number of products sold: decision making ($r = .115, p < .05$),

gaining commitment ($r = .106, p < .05$), work standards ($r = .119, p < .05$), and tenacity ($r = .106, p < .05$). The total competency rating for the panel interview also correlated significantly with the number of products sold ($r = .128, p < .05$). In terms of the personality measure, a significant correlation was found between warmth ($r = .125, p < .05$) and rule-consciousness ($r = .115, p < .05$). Control, one of the Big Five personality traits correlated modestly ($r = .111, p < .05$) with the number of products sold.

From the above described predictor analysis, it was clear that various ratings across measures contributed to all six of the intermediaries' performance output criteria where both examination success and sales performance are vital to personal commission income earned and sustainable, profitable growth for the organisation. Furthermore, the significant correlations across measures prepared the way for further incremental validity analysis in the study.

Inter-correlations between total ratings of predictors across measures

The large number of independent variables obtained from all the selection and assessment measures, showed significant inter-correlations. Table 9 illustrates how the totals obtained from the various measures inter-correlates and the most relevant findings are described below.

Table 9

Inter-correlations (Pearson) of total ratings from selection and assessment measures

Independent variable descriptors	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. AC IB Competency total	-													
2. AC RP Competency total	.213**	-												
3. AC IB & RP total	.680**	.802**	-											
4. GRT: Verbal	.110*	.163**	.176**	-										
5. GRT: Numerical	.136**	.114*	.147**	.445**	-									
6. GRT: Abstract	.064	.098*	.075	.444**	.534**	-								
7. GRT total	.124*	.153**	.161**	.750**	.825**	.830**	-							
8. WSQ total	-.15**	-.048	-.11*	.03	-.00	.01	.01	-						
9. Interview competency total	.032	-.025	.01	-.004	-.011	-.001	.005	-.028	-					
10. Extraversion	.141**	.091	.148**	0.086	0.017	0.056	0.063	.148**	0.083	-				
11. Anxiety	-.078	.044	-0.007	0.09	.106*	0.088	.114*	-.131*	-0.016	-.272**	-			
12. Openness	.028	.055	.021	.136*	.168**	.071	.147**	.046	.034	-.132*	.071	-		
13. Agreeableness	-.001	-.08	-.076	-.214**	-.074	-.129*	-.163**	-.112*	-.037	-.163**	-.140**	.044	-	
14. Control	.064	-.005	.026	-.181**	-.169**	-.113*	-.190**	.043	.063	.163**	-.532**	-.121*	.157**	-

Note: AC = assessment centre; IB = in-basket exercise; RP = role-play exercise; GRT = general reasoning test; WSQ = work style questionnaire; RE = regulatory examination; ** $p < 0.01$, 2-tailed. * $p < 0.05$, 2-tailed.

During the investigation of inter-correlations between AC exercise ratings, GMA, and personality traits, a significant correlation between the GMA measure and total assessment ratings was detected. The GRT total score ($r = .161, p < .01$) and more specifically verbal reasoning ($r = .176, p < .05$) and numerical reasoning ($r = .147, p < .01$) significantly correlated with the total of the AC measures. The total assessment rating also correlated significantly with the Big Five traits, anxiety ($r = .114, p < .05$), openness ($r = .147, p < .01$), agreeableness ($r = -.163, p < .01$) and control ($r = -.190, p < .01$).

In keeping with analysing the correlations with other measures, specifically the total WSQ rating, a significant correlation was observed in Table 9 between the WSQ total and assessment centre role play total ratings ($r = -.152, p < .01$). This negative but significant correlation was expected since both theory and previous studies indicated that interest does not necessarily relate to behaviours. However, the Big Five trait extraversion correlated significantly ($r = .148, p < .01$) with the WSQ total. With regards to personality traits, a statistically significant inter-correlations between the Big Five traits relations were observed in Table 9 where the control trait significantly correlated with the anxiety trait ($r = -.532, p < .01$). The findings suggest that positive disciplined control may reduce anxiety for a sample of intermediaries.

The findings with regards to independent variable inter-correlations suggest a high overlap between variables included in the selection and assessment measures. The strength of the predictor inter-correlations pointed to the overall direction of data readiness in terms of testing measures incremental validity. Furthermore, predictor inter-correlations are valuable in terms of formulating the practical implication of this study.

Tenure as a control variable and predictor

Tenure was also included in the comparison based on the multiple correlation effect observed. The analysis of correlation coefficients revealed that tenure, the duration of time the financial intermediary in the sample group has been contracted at the organisation, yielded a number of significant correlations with both dependent and independent variables. Tenure significantly correlated with the sales target achieved (r

= -.132, $p < .01$) as well as the regulatory qualification achievement ($r = .344$, $p < .01$) and RE marks achieved ($r = .326$, $p < .01$).

Tenure also inter-correlated significantly with the following variables relevant to the study: total interview competency ratings ($r = .167$, $p < .01$), the treating customer fairly competency measured in the assessment centre's exercises total rating ($r = -.226$, $p < .01$) and the tension personality trait tension ($r = .147$, $p < .01$). It was clear from the analysis that tenure plays a role in the overall success of an intermediary. Tenure as a predictor of performance is important since the finding will have practical implications for the organisations' retention strategies.

Measurement properties

The captured data points represented a large number of variables with a variety of loadings and rating scales. The data consisted of 88 independent variables and six dependent variables. Due to the large number of variables, factor analysis (principle component analysis) was applied to reduce the number of independent variables and six output criteria (dependent variables).

Principle component analysis

Principle component analysis (PCA) was used to extract a reduced number of meaningful independent and dependent variable components to reduce the high dimensionality of the variables. The sets of independent variables belonged to the various selection and assessment measures and each set was independently analysed. These sets include the measures of the assessment centre (in-basket and role-play), an assessment centre total rating, panel interview ratings and work-style questionnaire (WSQ) ratings. Given the importance of general mental ability (GMA) in previous research, the various sub-tests of the mental ability measure were not submitted to PCA or other form of transformation. Personality factors were already compounded within the Big Five traits and were also excluded from PCA.

For the dependent variables that reflect the intermediaries' performance output criteria, two factors were extracted that are referred to as sales performance and examination success as per their dominant variable loadings.

The cut-off eigenvalue for each factor analysis was set to one. This resulted in two components being extracted in most cases while discarding the components that did not individually contributed meaningfully to the variance explained by the components. All meaningful components were named with relevant descriptions that were derived from the dominant factor loadings. In this regard, all principle component analyses used the Varimax rotation method. This rotation was chosen as it allowed for the maximum loadings per item per component. As mostly only two components were extracted, meaningful interpretation of the components was expected.

Success criteria components

The results of the factor analysis on the intermediaries' success measures are set out in Table 10. The factor analysis suggested that the success measures consisted of two distinct underlying components. Component one and component two explained 66.26% of the total variance. Component one consisted of high loadings on total sales performance, sales target achieved and number of products sold. Component two consisted of high loadings on regulatory examination qualified and regulatory examination marks. Both components represented the performance criteria, namely sales performance success (component 1) and examination success (component 2).

Table 10

Component analysis of examination and performance criteria

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1 Sales perform success	2.573	42.879	42.879	2.168	36.136	36.136
2 Examination success	1.403	23.376	66.255	1.807	30.119	66.255
3	.974	16.237	82.492			
4	.506	8.431	90.923			
5	.289	4.812	95.735			
6	.256	4.265	100.00			

Note: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. A significant Barlett's test (chi squared = 252.01, $p < 0.01$) and KMO test (0.652) indicates that principle component analysis is suited for the variables.

Assessment exercise components

All meaningful components indicated through PCA were named with relevant descriptions that were derived from the dominant factor loadings. The factor names and labels were deducted from dominant loadings as indicated in the component analyses. The factor names reflect the various dominant competencies as measured in the assessment exercises.

The results of the PCA on the of the AC in-basket (IB) measures are set out in Table 11. The factor analysis suggested that the AC in-basket measure consisted of two distinct underlying components. Component one and component two explained 53.17% of the total variance. Component one consisted of high loadings on the assessment centre competencies decision making, entrepreneurship, impact, gaining commitment, initiative, and adaptability. IB. Component two consisted of high loadings on the competencies communication, work standards, client focus and initiative. Component one was named AC IB resilient entrepreneurship (component 1) and AC IB consistent standards (component 2).

Table 11

Component analysis of assessment centre in-basket competency measures

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1 AC IB Resilient entrepreneurship	4.280	42.797	42.797	2.908	29.081	29.081
2 AC IB Consistent standards	1.037	10.373	53.170	2.409	24.089	53.170
3	.913	9.128	62.298			
4	.809	8.087	70.385			
5	.670	6.702	77.087			
6	.543	5.426	82.514			
7	.524	5.243	87.756			
8	.467	4.670	92.426			
9	.423	4.234	96.660			
10	.334	3.340	100.000			

Note: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. A significant Barlett's test (chi squared =1319.23, $p < 0.01$) and KMO test (0.88) indicates that principle component analysis is suited for the variables.

The results of the factor analysis on the AC role-play measures are set out in Table 12. The factor analysis suggested that the success measures consist of two distinct underlying components. Component one and component two explained 52.26% of the total variance. Component one consisted of high loadings on the assessment centre competencies tenacity, decision making, client focus, adaptability, gaining commitment

and initiative. Component two consisted of high loadings on work standards, communication and impact. Component one was named AC RP assert client centricity (component 1) and AC RP impact communication (component 2).

Table 12

Component analysis of assessment centre role-play measures

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1 AC RP assert client centricity	4.645	42.231	42.231	3.124	28.399	28.399
2 AC RP impact communication	1.102	10.017	52.248	2.623	23.849	52.248
3	.984	8.944	61.192			
4	.788	7.167	68.359			
5	.673	6.115	74.474			
6	.631	5.732	80.206			
7	.565	5.137	85.344			
8	.506	4.602	89.946			
9	.457	4.151	94.096			
10	.347	3.157	97.253			
11	.302	2.747	100.000			

Note: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. A significant Barlett's test (chi squared =1543.38, $p < 0.01$) and KMO test (0.865) indicates that principle component analysis is suited for the variables.

The results of the components analysis for the assessment centre totals on both the in-basket and role-play exercise measures are set out in Table 13. Component one explained 43.32% of the total variance. Component one consisted of high loadings on the measures of all variables together and was named AC global factor (component 1). There was no rotation observed as only a single component was extracted.

Table 13

Component analysis of the total of assessment centre exercise measures

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1 AC global factor	4.766	43.324	43.324
2	0.942	8.568	51.892
3	.885	8.047	59.939
4	.762	6.928	66.867
5	.624	5.675	72.543
6	.618	5.614	78.156
7	.607	5.516	83.673
8	.545	4.956	88.629
9	.457	4.150	92.779
10	.411	3.736	96.515
11	.383	3.485	100

Note: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. A significant Barlett's test (chi squared =1460.12, $p < 0.01$) and KMO test (0.911) indicates that principle component analysis is suited for the variables

Components of the interview and WSQ measures

For the additional selection measures, the structured interview was explored in terms of component analysis. The results of the PCA analysis for the competency based interview ratings are set out in Table 14. The component analysis suggested that the success measures consist of two distinct underlying components. Component one and component two explained 51.20% of the total variance. Component one consisted of high loadings on the competencies client focus, continuous learning, gaining commitment, work standards, tenacity and initiative. Component two consisted of high loadings on technical and professional knowledge and skills, decision making, adaptability, communication and impact. Component one was named interview influence style (component 1) and interview knowledge decisions (component 2). The understanding of the components will have implications for the organisation since managers from all regions are involved in the costly structured panel interviewing of potential intermediaries.

Table 14

Component analysis of the competency based interview measure

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1 Interview influence style	4.679	38.991	38.991	3.573	29.778	29.778
2 Interview knowledge decisions	1.465	12.207	51.197	2.570	21.419	51.197
3	.918	7.649	58.847			
4	.761	6.342	65.189			
5	.735	6.123	71.311			
6	.703	5.858	77.169			
7	.575	4.791	81.960			
8	.561	4.674	86.634			
9	.487	4.060	90.694			
10	.437	3.643	94.336			
11	.385	3.209	97.545			
12	.295	2.455	100			

Note: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. A significant Barlett's test (chi squared = 1434.44, $p < 0.01$) and KMO test (0.861) indicates that principle component analysis is suited for the variables.

Next, the data of the WSQ responses of the intermediaries in the sample group was submitted for PCA. The results of the component analysis on the WSQ measures are set out in Table 15. The analysis suggested that the success measures consist of two distinct underlying components. Component one and component two explained 51.903% of the total variance. Component one consisted of high loadings on the WSQ questions *I like to develop my skills in relating to others, I prefer jobs such as a*

salesperson and/or advisor, I like jobs where I can be outgoing and relate to others, I like jobs that need strong self-confidence, I like to convince other people, I like to do presentations, I like to meet important people, I like to listen to the needs of others, I would like to sell a company's products and I would rate my sales ability as high. Component two consisted of high loadings on *I like activities that permit influencing other people, I like activities that permit leading other people and I like to develop my persuasive ability.* Component one was named WSQ sales orientation (component 1) and WSQ leading persuasion (component 2).

Table 15

Component analysis of work style questionnaire selection measures

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1 WSQ sales orientation	6.167	44.048	44.048	4.655	33.249	33.249
2 WSQ leading persuasion	1.100	7.854	51.903	2.612	18.654	51.903
3	.929	6.634	58.537			
4	.782	5.586	64.123			
5	.756	5.399	69.522			
6	.665	4.750	74.271			
7	.650	4.644	78.915			
8	.583	4.163	83.078			
9	.464	3.317	86.395			
10	.439	3.135	89.531			
11	.414	2.961	92.491			
12	.388	2.773	95.265			
13	.345	2.463	97.727			
14	.318	2.273	100.000			

Note: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. A significant Barlett's test (chi squared =2028.91, p<0.01) and KMO test (0.92) indicates that principle component analysis is suited for the variables.

Component analysis for the WSQ was an important consideration in the study since the critical WSQ aspects in terms of overall effect size may have practical implications for the organisations. The WSQ is hosted on a digital platform and available for all intermediary applicants at the study's target organisation. Moreover, the components of all the measures allowed for a meaningful incremental analysis of all the measures through the hierarchical regression method.

Testing of Hypothesis and Regression

Through the use of multiple and hierarchical regression, the components obtained from the selection and assessment measures were analysed and compared. Utilising hierarchical regression, all the extracted components, with a specific focus on AC exercise ratings were compared to the predictive capabilities of the general mental

ability and personality traits measurements. The latter measures being stalwarts in terms of previous criterion validation studies.

Additional models of prediction were investigated by considering all independent variables and components thereof across measures. Independent variables which significantly correlated with the criterion were filtered, ranked and grouped together. The groups of variables across the selection measures were submitted to hierarchical regression to investigate the overall possibilities of incremental validity of the measures utilised by the organisation during the selection and assessment process of intermediaries. In this regard, hierarchical regression allowed for a stepwise approach to analyse the available data in terms of incremental validity.

The analysis gave a broad overview of the predictive capabilities of the assessment centre and other selection measures. The statistical indicators or change statistics that was obtained to illustrate the incremental validity of the various measure, was the significance of the change in R^2 , i.e. the F change significance. As mentioned before, all Pearson correlation coefficients of the predictors on the dependent variables were inspected. These significant predictors of sales target achieved and intermediary regulatory examination marks were filtered and used in multiple regression analysis where each step adds filtered variables across selection and assessment measures to test the incremental validity of distinguishable predictors per selection measure. Notably, both these criterion of intermediary performance success were expressed as a percentage measure of performance, namely a percentage towards target reached and an examination marks. Examination marks refer the percentage or results of the intermediaries' written examination.

Considering a critical organisational criteria, sales target percentage achieved was chosen as a dependent variable for the final hierarchical regression analysis. Sales target performance reflects whether an intermediary reached his/her set goal. The goals are set by the organisation for each individual intermediary where social, economic and organizational strategic context are kept in mind. This serves as a powerful measure of sales performance. In general, total sales volume performance was discarded in the final regression analysis as a dependent variable since it does not take social and economic circumstances in consideration as in the case of the sales target achieved. RE

examination qualified and RE examination attempts were also discarded in the final exploration for incremental validity since these criteria measures were binary (0 or 1) and did not allow for depth of variance. Instead, examination test marks achieved was chosen as another critical dependent variable since intermediaries who do not reach a 65% pass rate within the allowed 2-year period must leave the industry in terms of advice towards the middle and affluent market segments. Such an exit is detrimental for both individual and the financial industry as a whole.

Incremental validity of assessment centre exercises above GMA towards examination success

Despite various benefits illustrated through correlations and PCA, the primary purpose of the study is to investigate whether AC exercise is worthwhile in addition to other known measures. Testing this hypothesis, Table 16 illustrates the predictability of general mental ability (GMA) towards examination success in a first step. The following steps added the assessment centre components to test for incremental effect.

When only GMA is considered, the results in Table 16 indicate a significant correlation ($R = 0.316, p < .01$) between RE examination success as the dependent variable and the general reasoning measures as independent variables. The subtest verbal reasoning made the largest contribution ($\beta = 0.397, p < .01$) in the prediction of RE examination success. It should be noted that the GRT total did not contribute to a large extent to the model ($\beta = -0.237, p > .05$) and abstract reasoning was automatically excluded during statistical analysis of the GMA model. However, the total of the three subtests, verbal, numerical and abstract was included in the analysis.

While the first model (GMA) explained 10% ($R^2 = 0.100$) of variance, adding the assessment centre in-basket exercise components insignificantly contributed another 3.2% in explaining the variance on the dependent variable ($\Delta R^2 = 0.032, p > .05$). During step two, the in-basket extracted components together with GMA significantly influenced the criteria examination success ($R = 0.323, p < .05$) although no incremental validity was indicated ($\Delta R^2 = 0.004, p > .05$). When adding the assessment centre components extracted from the role-play in step 3, another 2.4% variance is gained although no incremental validity was evident ($\Delta R^2 = 0.024, p > .05$).

In this model, the second extracted component of the role-play contributed significantly to the model if 10% of freedom is allowed ($\beta = 0.153, p < .10$).

Table 16

Regression analyses of general mental ability and assessment centre components in predicting examination success

Components	R	R ²	ΔR^2	Step Model sig.	Sig. F change	β	β Sig.
Step 1	.316**	.100	.100**	.005	.005		
GRT Verbal						.397**	.005
GRT Numerical						.215	.211
GRT Total						-.237	.281
Step 2	.323*	.104	.004	.020	.742		
AC IB Resilient entrepreneurship						-.042	.630
AC IB Consistent standards						.053	.547
Step 3	.358*	.128	.024	.021	.207		
AC Role-play Factor 1						.045	.622
AC Role-play Factor 2						.153	.088
Step 4	.364*	.132	.004	.030	.452		
AC Global Factor 1						.241	.452

Note: GRT = general reasoning test. AC = assessment centre. ** $p < 0.01$, 2-tailed. * $p < 0.05$, 2-tailed.

Incremental validity of components of all measures towards examination success

The hypothesis that consider the predictive and incremental effect across all measures were able to consider the effect size of the end-to-end selection and assessment process. When all the extracted components, including the Big Five personality traits from all the selection and assessment measures were submitted in a stepwise regression (see Table 17), the results showed that all the extracted components together, significantly correlated with examination success ($R = 0.593, p < .01$). GMA could explain 15.6% of the variance. The verbal reasoning subtest again demonstrated to significantly contribute ($\beta = 0.513, p = .002$). When all other selection measure components were added, another 19.6 % variance could be explained. In total, GMA and all the extracted components of the other measures, explained 35.2% of variance.

In terms of the expression of incremental effect between the two models GMA (1) and GMA with components of all the other selection measures (2), the effect was almost significant when an approximate 90% level of certainty is accepted ($\Delta R^2 =$

0.196, $p = .107$). The assessment centre total rating largely contributed ($\beta = 0.617$, $p = .115$).

Table 17

Regression analyses of selection and assessment measure components in predicting examination success

Components	R	R ²	ΔR^2	Step Model sig.	Sig. F change	β	β Sig.
Step 1	.395**	.156	.156**	.002	.002		
GRT Verbal						.513**	.002
GRT Numerical						.170	.376
GRT Total						-.250	.316
Step 2	.593**	.352	.196	.007	.107		
Extraversion						.178	.134
Anxiety						.030	.819
Openness						.090	.394
Agreeableness						-.112	.328
Control						.221	.093
AC IB Factor 1						-.379	.051
AC IB Factor 2						-.150	.355
AC RP Factor 1						-.210	.307
AC RP Factor 2						-.192	.354
AC Global Factor						.617	.115
WSQ Factor1						-.117	.290
WSQ Factor2						-.116	.270
Interview Factor 1						-.115	.330
Interview Factor 2						.046	.646

Note: GRT = general reasoning test. AC = assessment centre. IB = in-basket. RP = role-play. WSQ = work style questionnaire. ** $p < 0.01$, 2-tailed. * $p < 0.05$, 2-tailed. AC IB Factor 1 = resilient entrepreneurship. AC IB Factor 2 = consistent standards. AC RP Factor = assert client centricity. AC RP Factor 2: impact communication. WSQ Factor 1 = sales orientation. WSQ Factor 1 = leading persuasion. Interview Factor 1 = influence style. Interview Factor 2 = knowledge decisions.

Incremental validity of the AC exercises and other measures towards sales performance success

The present study considered predictors and the validity of measures on various performance criteria. Sales performance criteria was a relevant performance criterion measure. In testing the strength of measures towards sales performance, Table 18 illustrates that none of the AC components submitted for stepwise regression correlated with the intermediary performance criterion. The dependent variable, sales performance was defined by all 3 underlying aspects of performance, i.e. volume of total sales, percentage target achieved and number of products sold.

Table 18

Regression analyses of general mental ability and assessment centre factors in predicting sales performance success

Components	R	R ²	ΔR^2	Step Model sig.	Sig. F change	β	β Sig.
Step 1	.079	.006	.006	.859	.859		
GRT Verbal						.079	.418
GRT Numerical						-.033	.752
GRT Total						.006	.955
Step 2	.080	.006	.000	.978	.986		
AC IB Factor 1						-.007	.942
AC IB Factor 2						-.014	.879
Step 3	.125	.016	.009	.965	.575		
AC RP Factor 1						.080	.413
AC RP Factor 2						-.061	.517
Step 4	.151	.023	.007	.947	.355		
AC Global Factor						-.314	.355

Note: GRT = general reasoning test. AC = assessment centre. IB = in-basket. RP = role-play. WSQ = work style questionnaire. AC IB Factor 1 = resilient entrepreneurship. AC IB Factor 2 = consistent standards. AC RP Factor = assert client centrality. AC RP Factor 2: impact communication.

When all the other selection and assessment measures components were added in a stepwise regression (see Table 19, the results showed that all the components together, did not correlated with sales performance. GMA could only explain 2.9% of the variance. In terms of the expression of incremental effect between the two models GMA (1) and GMA with components of all the selection and assessment measures (2), the effect was not significant although the components of all the measures together, including GMA could explain 15.6% of the variance. However, this was not significant ($\Delta R^2 = 0.029$, $p > .05$). Although not significantly founded, the assessment centre exercise total ratings as expressed in one component, accounted for most contribution in the model, although insignificant ($\beta = 0.252$, $p > .05$).

Table 19

Regression analyses of selection and assessment measure components in predicting sales performance success

Components	R	R ²	ΔR ²	Step Model sig.	Sig. F change	β	β Sig.
Step 1	.172	.029	.029	0.455	.455		
GRT Verbal						.169	.342
GRT Numerical						-.046	.823
GRT Total						.012	.964
Step 2	.395	.156	.126	0.695	.686		
Extraversion						.086	.523
Anxiety						-.009	.952
Openness						.149	.217
Agreeableness						.128	.327
Control						.147	.324
AC IB Factor 1						-.135	.539
AC IB Factor 2						-.168	.364
AC RP Factor 1						-.078	.738
AC RP Factor 2						-.121	.607
AC Total Factor1						.252	.571
WSQ Factor 1						.157	.214
WSQ Factor 2						.081	.494
Interview Factor 1						.185	.169
Interview Factor 2						.180	.120
Step 3	.406	.165	.009	0.707	.391		
Tenure						.106	.391

Note: GRT = general reasoning test. AC = assessment centre. IB = in-basket. RP = role-play. WSQ = work style questionnaire. AC IB Factor 1 = resilient entrepreneurship. AC IB Factor 2 = consistent standards. AC RP Factor = assert client centrality. AC RP Factor 2: impact communication. WSQ Factor 1 = sales orientation. WSQ Factor 1 = leading persuasion. Interview Factor 1 = influence style. Interview Factor 2 = knowledge decisions.

Further Analysis

Selected criteria: incremental validity of AC exercises over GMA, traits and other measures

Correlating predictors across measures were considered to rerun incremental analysis to test the validity and incremental effect of the AC exercises. One of the hypothesis of the study was to investigate the combination of the measure's correlating predictors. Pearson correlation coefficients of the predictors on the performance criteria were inspected and the significant predictors of sales target achieved and intermediary regulatory examination marks achieved were used in an additional multiple regression analysis. Each step in regression adds filtered variables across selection and assessment measures to test the incremental validity of distinguishable predictors per selection measure.

Firstly, testing validity towards examination success, Table 20 illustrates the predictive capabilities of the significantly correlating predictors with examination

marks achieved. In Step 1, the correlating GRT (GMA) variables were added. The GRT variables explain 12.5% of the total variance significantly ($R^2 = 0.125, p < .05$). Verbal reasoning significantly contributed the most of the GRT measurements in the model ($\beta = 0.313, p < .01$) while GRT total score's was insignificant ($\beta = 0.057, p > .05$).

Step 2 added the role-play assessment centre exercise. This step adds 7% to the explained variance and showed a significant change in terms of the incremental validity of the model in the second step ($\Delta R^2 = 0.072, p < .05$). The AC competency communication measured in the role-play, significantly predicted the most of role-play measures and third most within the total model. The other role-play competency ratings made an insignificant contribution.

In step 3, the role-play assessment centre total competency rating were added. This step made an insignificant contribution ($\Delta R^2 = 0.011, p > .05$). When all the ranked variables from the AC measurements were added in step 4, an insignificant incremental contribution) was made ($\Delta R^2 = 0.026, p > .05$) with no significant β values (all p for β in step 4 $> .05$).

Step 5 added the personality factor measures which made a significant contribution to the total variance explained ($\Delta R^2 = 0.081, p < .05$). The personality trait emotional stability correlated significantly with examination marks achieved and made a moderate contribution to the model ($\beta = .186, p < .05$) in step 5. However, when extraversion and agreeableness, two of the Big Five personality traits were added. These measurements made an insignificant contribution ($\Delta R^2 = 0.017, p > .05$), with no significant β values (all p for β in step 6 $> .05$).

In the regression model above, the assessment centre role-play exercise ratings showed significant incremental effect over and above GMA measures in terms of examination marks achieved. While all the AC ratings explained 7% of variance in the prediction model, personality traits also contributed 8% variance. Both measures significantly contributed to the model but AC ratings did not show incremental validity over and above the personality trait measure.

Table 20

Multiple regression on examination marks achieved with significantly correlating predictors across measures

Predictors	R	R ²	ΔR^2	Step Model sig.	Sig. F change	β	β Sig.
Step 1	.354**	.125	.125**	.000	.000		
GRT Verbal						.313**	.009
GRT Total						.057	.627
Step 2	.443**	.197	.072*	.000	.023		
AC Communication RP						.289**	.005
AC Decision Making RP						-.035	.725
AC Entrepreneurship RP						.005	.963
Step 3	.455**	.207	.011	.000	.229		
AC RP Total						-.232	.229
Step 4	.483**	.233	.026	.002	.623		
AC Work Standards Total						.129	.299
AC Communication Total						.045	.764
AC Entrepreneurship Total						.187	.417
AC Treating Customers Fairly Total						.140	.259
AC Composite Total						-.048	.842
Step 5	.560**	.313	.081**	.000	.010		
Personality – intellectance						.119	.201
Personality – emotional stability						.186*	.037
Personality - dominance						.133	.149
Step 6	.575**	.331	.017	.000	.281		
Extraversion						.102	.336
Agreeableness						-.195	.183

Note: GRT = general reasoning test. AC = assessment centre. ** $p < 0.01$, 2-tailed. * $p < 0.05$, 2-tailed.

Secondly, testing the combined strength of all predictors across measures, considering measures incremental effect towards the sales target achieved criteria, Table 21 illustrates the stepwise model. It is important to note that GMA, the GRT measurements did not correlate significantly with sales target achieved. GRT measures has therefore been omitted from further analysis. However, the personality factors in step 1 significantly explain sales percentage target achieved ($R = .228$, $p < .01$) and significantly explained 5.2% of the variance ($\Delta R^2 = .052$, $p < .01$). The personality factors perfectionism significantly explained the most of the four correlating personality factors ($\beta = .128$, $p < .05$) depicted. Only tenure demonstrated a bigger β magnitude. The remaining three personality factors had statistically insignificant β values (p for all $\beta < .05$). Although two of the Big Five traits added 1% of variance ($\Delta R^2 = .009$, $p > .05$), this was an insignificant incremental change.

Step 2 added the correlating WSQ variables and gathered 2% to the total explained variance. The change was significant ($\Delta R^2 = .028, p < .05$). The WSQ question, “*I could manage a small business or service*”, significantly contributed the most of the WSQ variables ($\beta = .128, p < .05$). In adding the panel interview competency measured ratings, entrepreneurship in step 3 further explained another 1% of the variance significantly ($\Delta R^2 = .012, p < .05$). Entrepreneurship had a significant β value ($\beta = .112, p < .05$).

Sales target achieved as a measure of performance reflected the organisations expectations. The actuarial approach towards target setting is an obvious goal setting mechanism while managerial and intermediaries’ contracting regarding annual targets are common place in financial institutions. Target setting reflects the realistic contextual and regional expectation from management, for example an inexperienced intermediary outside the metropolis may be served with a smaller target expectation in comparison to a more experienced intermediary in a city or metropolis.

Tenure was allowed in this model as control variable since the suspect of other influences towards sales performance needed investigation where weaker measure predictors were identified. In a final model step, tenure significantly explained another 3% of the variance ($\Delta R^2 = .026, p < .01$). Tenure significantly explains the most contribution of all the variables in this multiple regression model ($\beta = -.164, p < .01$), but contributes negatively towards the performance model. Again the role of tenure, as previously mentioned will need to be considered in terms of retention strategies.

Table 21

Multiple regression on sales target achieved with significantly correlating predictors across measures

Predictors	R	R ²	ΔR ²	Step Model sig.	Sig. F change	β	β Sig.
Step 1	.228**	.052	.052**	.004	.004		
Personality - warmth						.102	.086
Personality – vigilance						-.086	.169
Personality - apprehension						-.027	.672
Personality - perfectionism						.136*	.024
Step 2	.283**	.080	.028*	.000	.013		
WSQ: I like jobs where I can be outgoing and relate to others						.078	.187
WSQ: I could manage a small business or service						.128*	.032
Step 3	.304**	.092	.012*	.000	.050		
Interview: Entrepreneurship						.112*	.050
Step 4	.318**	.101	.009	.000	.258		
Anxiety						.177	.116
Control						.080	.404
Step 5	.356**	.126	.026**	.000	.004		
Tenure						-.164**	.004

Note: WSQ = work style questionnaire. ** $p < 0.01$, 2-tailed. * $p < 0.05$, 2-tailed.

The exploration of all measures' correlating predictors with the sales target achieved criteria clearly showed that both AC and GMA measurement ratings had limited predictive powers. The possible ways of target setting, environmental factors and tenure all have implications for the present study's conclusions. These implications together with the interpretation of the overall results as it relates to the purpose of the study will be discussed in the next chapter.

Discussion

The primary aim of this study was to determine whether assessment centre (AC) exercise ratings have incremental predictive powers over and above validated measures of general mental ability (GMA) and personality traits. Using historical data, this incremental validity study followed an approach whereby the relational strength of 88 individual independent variables were investigated. The potential predictors are used as selection criteria in the assessment centre in making recommendations regarding the future fit of recruits into the role of the financial intermediary. The intermediaries work and study performance were reflected through expanded success criteria. The six aspects of performance were explored through two broad criteria, sales performance

and regulatory examination success. The criteria were viewed as indicators of quality of work and a reflection of profitable outcomes for the financial institution.

Main findings

Components of all the other measures illustrated an incremental effect over and above GMA and the hypothesis was confirmed that a combination of measure ratings will have significant incremental effect on the examination success criterion. This finding is aligned with a number of previous studies where GMA significantly influenced academic success (Hermelin, Lievens & Robertson, 2007; Salgado, 2017). In addition, studies in different applied settings have found incremental validity by utilising a number of measures where GMA and personality are usually included in the selection and assessment value chain. This bulk of evidence (Salgado, 2017) mirrored our study's findings even though the present study was in a specific niche setting.

The hypothesis for across measurement predictions and increment was partially supported when the specific sub-criteria of regulatory examination success, namely examination percentage marks achieved was considered. In this regard the personality evaluation and assessment centre role-play exercise illustrated significant predictive contributions over and above GMA. The assessment centre ratings and the personality evaluation together explained 31.3% of the variance in examination marks achieved. Both the assessment centre role play ratings and personality traits like emotional resilience and assertiveness gained incremental effect over and above the GMA measure. The selected personality traits predictors and assessment centre role-play ratings contributed equally to the predictive model and it could not be confirmed that personality measures has a stronger predictive ability than assessment centre ratings. The finding is similar to meta-analysts' conclusions where both cognitive ability and attitudes are viewed as important in predicting academic success (Crede & Kuncel, 2008).

The GMA measures explained 12.5% of the total variance in examination success while verbal reasoning contributed the most in the GMA component. The assessment centre role-play competencies ratings of communication, decision making and entrepreneurship, were mostly responsible for the significant incremental effect

obtained. The competency communication predicted the most within the role-play measure and second most within the total model. Again, the unique combination of predictors, communication as measured in the role-play and verbal reasoning as measured in the GMA measure, pointed in the direction of a unique work role, being the intermediary within the financial industry.

In the present study, GMA measures could as expected, significantly illustrate predictive value, however it could not significantly predict intermediaries' sales performance success. During further investigation of sales performance success, the findings could not support the hypothesis in terms of the incremental validity of the selection and assessment measures over above general mental ability. However, when the selected correlating personality factors were considered towards the prediction of sales target achieved, perfectionism significantly explained most of the variance. The combined personality factors perfectionism, warmth, vigilance and low apprehension significantly explained variance in sales percentage target achieved. Furthermore, the validated consciousness factor measured during the personality evaluation, contributed significantly with the number of products sold by the intermediaries. The significant personality findings supported a number of studies that illustrated the predictive value of personality measures, especially in terms of Big Five trait constructs towards the prediction of performance (Salgado, 2017). Although the Big Five traits could not gain incremental effect in the present study, the traits low anxiety and higher control clearly contributed to the intermediaries' sales target achievements. The lower predictive values of the present study's selection and assessment value-chain ratings on sales performance success may be contributed to environmental or contextual factors. These factors may include the organisations value proposition like intermediary support and access to client portfolios or data.

The important contribution of the assessment centre global rating in predicting the overall examination success was valuable within the model where all measures were included. The assessment centre total rating reflects a compounded effect from both the in-basket and role-play exercise ratings. It was notable in the principle component analysis that the eleven competencies rated in the assessment centre exercise measures were evenly distributed in terms of loadings on the rotation matrix. It concluded that all

exercise ratings obtained during the assessment centre measures contributed to the assessment centre global factor. In addition, the study posited that both assessment centre exercises, the in-basket and role-play, will equally contribute to variance in the examination success and sales performance. However, the findings illustrated that the assessment role play exercise had considerable more predictive value over the in-basket exercise. Notwithstanding, the assessment exercises global factor significantly contributed to the prediction model when examination success as broad criterion was considered.

A beneficial finding of this study was the value illustrated by the WSQ and interview. Although interest questionnaires criterion validity has traditionally not been directly related to output performance or performance (Foxcroft & Roodt 2005), the present study confirmed the predictive incremental validity of selected work style questions. The findings are valuable since the questions in the WSQ utilised by the organisation are related to the sales interest construct (Adams, 2008). It is generally accepted that interest questionnaires' purpose is to evaluate career preference (Schmidt & Hunter, 1998) and not performance. However, the present study's incremental finding confirmed the additional usefulness of the WSQ for the organisation given the added predictive powers on sales target achieved. The cost-effective nature of the digital on-line based questionnaire increases the strength of the recommendation to investigate the expansion of the questionnaire number of items and construct development.

In terms of the interview as a selection measure, the predictive value of the competency based interview was investigated. Researchers like Salgado (2017) and Levashina et al. (2014) indicated that a number of meta-analysis found structured interview measures to illustrate predictive powers towards performance criteria. The present study showed that the entrepreneurial competency rating is of specific importance in the context of the intermediary's performance criterion.

The present study confirmed that the structured competency panel interviewing measure can contribute to the prediction of intermediaries' sales target achieved. This finding may reiterate the idea that managers and interview specialists should

continuously be trained in behavioural structured competency based interviewing methodology and practice.

Tenure was considered as a control variable in the present study. Tenure illustrated incremental validity in the regression model towards sales target achievement. The significant correlation implied that newly contracted intermediaries may reach target more easily than the longer serving intermediaries. This implication may have strategic human resources management implications and needs further exploration. For example, the logic may be to first build confidence with smaller targets but management support may be abandoned too quickly. Start-up network business prospects may also be quickly exhausted, or initial business may be of poor quality and erode with rebates. Furthermore, target setting may not be aligned with the intermediary's positive potential. Bear in mind that Hinrichs (1978) found that for most dimensions, the accuracy of prediction increased as tenure after assessment increased. The average correlation one year after assessment was 0.28, compared to 0.42 after eight years. The present study incrementally confirmed the correlation between longer tenure and sales performance successes.

Implications for theory

The present study shared in the theory domains of learning and performance or productivity. Firstly, in terms of learning, this study's findings suggest that intermediaries' successful examinations and subsequent professional registration with the industry regulator requires a level of independence as oppose to agreeableness. Independence as a Big Five construct, can be described as self-determination, independent minded, strong-willed and even confrontational. In addition, dominance and emotional stability traits also predicted successful RE examinations. The self-regulated learning theories promulgated by Weinstein, Acee and Jung (2011) was confirmed and contributed to the theory that both cognitive and self-regulation aspects should be present for successful learning. Pintrich (1999, p. 459-460) reasoned that most learning models assume that self-regulated learning means the use of various cognitive and metacognitive strategies to control and regulate successful learning. This reasoning postulated that the model of self-regulated learning includes three general categories of learning: cognitive-, metacognitive- and resource- management abilities.

Practical examples cited were mental organisation and planning abilities. Although the study could investigate two aspects of this theory, GMA as cognitive ability and self-regulation personality traits, the third critical part of the theory, namely resource management was unfortunately not considered and unexpectedly resulted in limitations. In this regard, the exact complexity requirements, exposure to field work, study support and proportion of self-study were unfamiliar aspects of the intermediaries' examination learning journey towards successful examination. In terms of the categories of the self-regulated theory, this would imply that it is advisable to investigate all three categories in validation studies where learning is implied.

Secondly, an interesting finding of the present study was that a significant correlation existed between examination success and sales performance measures of work performance. It is general industry knowledge that the RE examination requires extensive learning and that personal income (commission) is based on sales performance. One of the early behavioural learning theories postulated that vicarious learning would result in higher job knowledge and productivity (Bandura, 1977). The present study confirms the underlying theoretical assumption that knowledge and productivity co-exists. Our findings contribute beyond the theoretical cognisance of the co-existing factors, productivity and knowledge. It also showed that in a specific applied setting, the South African financial industry, a cause – effect sequence exists where more knowledge and relevant qualifications over time (tenure) resulted in higher levels of sales performance.

Thirdly, the trait-activation theory as explored by Lievens and Thornton (2005) in the context of assessment centre exercises was upheld. The findings support the theory where it was argued that multi-trait multi-method could elicit relevant trait activation through assessment centre behavioural task expressions. This argument was supported in so far the study's findings showed that a selection of predictors may constitute a dimension that relates to expected real life work requirements. However, the question what constructs are actually measured when trait-activation theory is considered remains. According to Lievens and Thornton (2005), the forming of constructs, traits and dimensions continues to be a contentious validity issue in assessment centres. The issue of construct validity may be addressed through further

construct analysis since the findings suggest that a number of selected behavioural assessment ratings points to potentially valuable criterion validity. The potential usefulness of constructs that may predict output criterion seems to be within a single assessment centre exercise and across assessment exercises. Both trait-activation theory discussions and the study's findings support the suggestion that traits may consist of various behavioural expressions within and across assessment centre exercises. However, many of the assessment centre ratings analysed in the study did not illustrate a significant relation with the output criteria. In the context of the study's findings and exploration of the trait-activation theory, the basic considerations of the assessment centre design should be revisited. This would practically mean that criterion relevant behavioural expressions are analysed through construct validity. The power of prediction of validated constructs may further corroborate trait-activation theory and have positive implications for assessment centres.

Practical implications

The study's multiple correlation findings and incremental validity outcomes have practical implications for the assessment centre field, selection- and human resource management practices. With regards to the assessment centre exercises, it is proposed that the role-play's predictive validity is expanded by focussing on the strength findings of this study, for example the communication and work standards competency may receive more rated observations in the future. In contrast, the in-basket should be reconsidered in terms of content, assessor ratings interpretation and scoring methodology. The in-basket proposal is relevant since the sample group's assessor ratings produced a non-ideal kurtosis. Furthermore, it was clear that assessors' in-basket ratings were lower than the role-play ratings. However, it is important to note that the in-basket's content was related to the role play preparation. In other words, the organisation could not fully disregard the in-basket since it prepares the recruit for the role-play. Although future transformations on the assessors rating scale may stimulate the in-basket exercise's validity and perhaps overall incremental validity, a formal project plan may be required to do the in-basket overhaul and role play enhancements. The primary statistical vehicle to enhance the assessment centre at a detailed level

would be methods of construct-validity. The study's findings pointed the organisation to further the assessment centre's construct validity.

Staying in the assessment centre arena and knowing that the end-to-end selection and assessment measures added significant predictive value, and in some case incremental value, improvements and expansions to the other measures may be considered. The verbal reasoning aspect of GMA is of particular importance and more measures in this regard may be required. Exploring the concepts of verbal reasoning, it was noted that the intermediary's role is based on verbal reasoning or explanation during client interactions. It should be considered that experiences in verbal fluency may account for RE examination successes. It may imply that an intermediary under supervision should receive broad exposure, for example exposure to various client situations, product complexities and comprehension of market segments. In terms of GMA and personality traits effect sizes in the present study, the practical implications for the organisation may be to focus with vigour on verbal reasoning training, study methods, especially memory techniques and summaries of written text.

Despite various other possible influences like management support, intermediaries traits like being self-assured, perfectionism, extraversion and vigilance could be associated with intermediaries sales target achievements. The Big Five trait control, which considers the compounded effect of the traits conscientiousness, discretion and perfectionism would be an important correlating predictor to consider in the assessment and development practices. The same consideration will apply for the lower anxiety trait where the compounded effect of emotional stability, vigilance, and lower tension were considered. Both aspects, control and lower anxiety are considered to be trainable traits, for example stress reducing interventions and time management structures. However, when the statistical vehicles of construct and incremental are continuously utilized, intervention and development recommendations may add even more organizational value.

Limitations

One of the limitations of this study relates to the intermediary sampling method. The sample in the study was formally pre-selected. Recruits are only referred for comprehensive assessments once they have filtered through the pre-screen application and evaluation, the comprehensive interview and reference checking. Furthermore, only producing intermediaries were included in the sample. There were a number of contracted intermediaries with no performance indicators. It is unsure whether this may be due to illness, non-performance, absences or busy in training periods. The pre-selected sample may have impacted effect size. Although generalisation is in question given the fenced applied setting, the power of the effect size may have been improved if data from out of service intermediaries were considered. Such an exit-group may have increased the possibilities of comparative analysis and allowed for further testing of the incremental validity of measures. Given the high investment costs, exit profiling may be considered in the future and intermediary flight risk should be explored by considering departed intermediaries' assessment and performance data.

It was difficult to compare this study's findings to that of similar research since previous studies seemed to focus on other well-established measures in different and unique combinations. Assessment batteries differ. In addition, limited incremental predictive validity studies in the South African financial industry context involving on-line pre-screening work style questions, assessment center exercise competency ratings, personality-, cognitive- and interview ratings have been published. The role of the integrating psychologist and inter-rater effects of such a specific selection and assessment centre process is also debatable.

The descriptive statistics revealed limited variance on the mean assessment measure ratings. The limited variance on the measures may suggest the effect of central tendency. The limited variance is also pointing to recruits who were not contracted based on their low assessment ratings. The organisation should consider to apply rating scales with better range, for example to replace the five-point scale with a ten-point scale. This simple transformation may bring about more advantages in terms of data analysis and validity studies.

Future research

In the present study, a large number of variables were utilised to ultimately explore measures' incremental validity. However, the analysis of this large number of variables did not allow for in-depth study of thematic findings. In this regard, a theory based theme to explore, is the role of environmental factors. Boyatzis, Good and Mass (2010) indicated that sales managers and intermediaries' compensation are based on financial performance. Their idea that intermediaries sell financial products from an approved portfolio with agreed sales targets, reiterated the organisational context of the intermediaries' successes. The influence of the organisations' target size expected, sales support, client leads provisions, mentorship, management negotiation style, training programmes and other work environmental factors must be considered in future research, preferably in combination with selection and assessment data. In doing so, ground will be covered in terms of performance theory where contextual and personal factors should be considered.

Future assessment design studies may consider building assessment measures in a condensed format, only based on predictive measures and constructs. In such designs, reliability and construct development techniques need to be applied. Although some initial effort may prevail, the effectiveness of such a cost-effective and focused selection and assessment centre could be re-evaluated and validated. The re-evaluation design may learn from the methodological alternatives applied in the present study. The incremental validity approach could point to the value of specific measures in the selection and assessment process; factor analysis (PCA) grouped the large number of variables and assisted in construct understanding; multi-variant and multiple regression assisted in understanding specific measurements or competency ratings that impacted at a granular level on intermediary success while the large simplistic correlation tables assisted in understanding associated success variables. The expanded success criteria that reflected intermediaries work performance and regulatory required qualification outputs, should be considered in such future evaluative designs. The influence of tenure may be approached differently by comparing various groups with different tenure means.

Conclusion

The findings suggested that the selection and assessment measures could predict different aspects of performance although the assessment centre did not always demonstrate incremental effect on the performance measures. Incremental validity across measures was demonstrated and as previously indicated by Ryan and Ployhart (2013), the expanded criteria assisted in a better understanding of the measured constructs across the various measures, a form of cross-validation.

Based on the hypothesis confirmation and the discussion thereof, the organisation can rely with certain levels of confidence on the different measures, including the assessment centre exercises to contribute to the organisations growth strategy. However, the recommendations and proposals as indicated may optimise the selection and assessment measures and process.

The conclusions and recommendations are beneficial since it included recommendations in terms of the parts and combinations of the assessment measures that create the most impact on success criteria. Since the organisation invested in interviewers and assessors, further training and focus group discussions based on the present study's findings can enhance the measures. The questions that may be posed to internal and external specialists are whether some measures and constructs may be better developed. Positive correlations from the present study may entuse further measures in relation to the specific construct, for example expanded measures of the communication competency in the assessment centre role-play and more verbal reasoning tests. These design proposals should be submitted to future incremental validity studies as soon as the changes are implemented.

Future research may consider the designing of an intervention programme with large scale intermediary involvement. The programme design will focus on selection and assessment predictive constructs. The programme's effect could be measured through a large scale evaluative design. The impact of such assessment and intervention programmes on the industry may be considered by allowing organisational cross-boundary participation. Such funding and innovations may be considered by regulatory bodies or at least, internally by a large organisation who hosts global intermediaries

across market segments with tied or multi-tied organisational relations. The South African intermediary context may create a specific research focus since service and product offerings varies greatly in complexity in diverse market segments.

Appendix 1: Assessment Centre competency definition and scoring template

Competency	Definition	In-Basket	Role Play	Total (Ave)
Work Standards	Setting high standards and performance for self and others; taking ownership for completing assignments or tasks successfully; checking and reviewing process for accuracy and compliance to the required standards.			
Tenacity	Persevering with an individual task and seeing it through to its conclusion despite obstacles that may arise.			
Communication	The ability to express oneself clearly and effectively by employing appropriate techniques and media when required to convey a meaningful and compelling message to individuals or groups.			
Impact	Making a strong positive impression with personal authority, displaying confidence and commanding respect in interpersonal interactions.			
Decision Making	The ability to thoroughly and accurately identify, define and analyse a problem with a view to committing to the most appropriate course of action after considering relevant facts, constraints and organisational views. This sometimes entails the creation of new methodologies and the application of new ideas and concepts.			
Entrepreneurship	Knowledge and awareness of commercial matters, opportunities and organisational activities and competitor activity with a view to optimise profitability and ultimately, market share.			
Client Focus	The ability to build and maintain relationships with internal and external clients on all levels and positions; promote client satisfaction and sound customer services through needs and client focussed actions. Creates well-being and harmony in relationships with clients.			
Adaptability	The ability to adapt to and work effectively with a variety of situations, individuals, or groups and to understand and appreciate different and opposing perspectives on an issue, to adapt an approach as the requirements of a situation change, and to change or easily accept changes in one's own organisation or job requirement.			
Gaining Commitment	The ability to utilise appropriate interpersonal styles and techniques to positively influence the opinions, mental attitudes and behaviour of others.			
Initiative	Taking quick action to achieve goals beyond what is required which will improve or enhance job results and avoid problems or proactively finding or creating new opportunities.			
Treating Customers Fairly	Develops and sustains customer relationships by understanding, anticipating and focusing on market needs and expectations; being accountable for customer satisfaction and retention, ensuring accurate communication and considering customers in a fair and equitable manner. Consistently strives to engage with clients in honest, committed, considerate and receptive manner to drive company values of integrity and client-centricity.			

Appendix 2: Personality measure: 15FQ+ primary factors

15FQ+ PRIMARY FACTORS		
<i>fA</i>	Distant Aloof Lacking empathy, Distant, Detached Impersonal	Empathic Friendly, Personable, Participating, Warm-hearted, Caring
B	Low Intellectance Lacking confidence in own intellectual abilities	High Intellectance Confident of own intellectual abilities
<i>fC</i>	Affected by Feelings Emotional, Changeable, Labile, Moody	Emotionally Stable Mature, Calm, Phlegmatic
<i>fE</i>	Accommodating Passive, Mild, Humble, Deferential	Dominant Assertive, Competitive, Aggressive, Forceful
<i>fF</i>	Sober Serious Restrained, Taciturn, Cautious	Enthusiastic Lively, Cheerful, Happy-go-lucky, Carefree
<i>fG</i>	Expedient Spontaneous, Disregarding of rules and obligations	Conscientious Persevering, Dutiful, Detail-conscious
<i>fH</i>	Retiring Timid, Socially anxious, Hesitant in social settings, Shy	Socially-bold Venturesome, Talkative, Socially confident
<i>fI</i>	Hard-headed Utilitarian, Unsentimental, Lacks aesthetic sensitivity	Tender-minded Sensitive, Aesthetic, Sentimental
<i>fL</i>	Trusting Accepting, Unsuspecting	Suspicious Sceptical, Cynical, Doubting
<i>fM</i>	Concrete Solution-focused, Realistic, Practical, Down-to-earth	Abstract Imaginative, Absent-minded, Impractical, Absorbed in thought
<i>fN</i>	Direct Genuine, Artless, Open, Direct, Straightforward	Restrained Diplomatic, Socially astute, Shrewd, Socially aware
<i>fO</i>	Confident Secure, Self-assured, Unworried, Guilt-free	Self-doubting Worrying, Insecure, Apprehensive
<i>fQ₁</i>	Conventional Traditional, Conservative	Radical Experimenting, Open to change, unconventional

<i>fQ</i>₂	Group Orientated Sociable, Group dependent, a 'Joiner'	Self-sufficient Solitary, Self-reliant, Individualistic
<i>fQ</i>₃	Informal Undisciplined, Lax, Follows own urges	Self-disciplined Compulsive, Fastidious, Exacting willpower
<i>fQ</i>₄	Composed Relaxed, Placid, Patient	Tense-driven Impatient, Low frustration tolerance

Note: Copied Primary Factors of the 15FQ+, (Tyler, 2003; The 15FQ+ Technical Manual, 2002).

Appendix 3: The Big Five Personality

The second order factors are tabled below, together with a brief description of each one and primary factors that contribute to this global factor.

15FQ+ SECOND ORDER FACTORS	
<p>Extraversion</p> <p>Orientated to the outer world of people, events and external activities.</p> <p><i>fA+, fF+, fH+, fQ2-</i></p>	<p>Introversion</p> <p>Orientated towards their own inner world of thoughts, perceptions and experiences. Not requiring much social contact & stimulation.</p> <p><i>fA-, fF-, fH-, fQ2+</i></p>
<p>Low Anxiety</p> <p>Well adjusted, calm, resilient, and able to cope with emotionally demanding situations.</p> <p><i>fC+, fL-, fO-, fQ4-</i></p>	<p>High Anxiety</p> <p>Vulnerable, touchy, sensitive, prone to mood swings, challenged by emotionally gruelling situations.</p> <p><i>fC-, fL+, fO+, fQ4+</i></p>
<p>Pragmatism</p> <p>Influenced more by hard facts and tangible evidence than subjective experiences. May be insensitive to people and subtleties.</p> <p><i>fA+, fL-, fM-, fQ1-</i></p>	<p>Openness (to experience)</p> <p>Influenced more by new ideas, feelings, and sensations than tangible evidence and hard facts. Open to possibilities and subjective experiences.</p> <p><i>fA-, fL+, fM+, fQ1+</i></p>
<p>Independence</p> <p>Actively self-determined in own thoughts and actions. Independent minded. Can be intractable, strong-willed and confrontational.</p> <p><i>B+, fE+, fL+, fQ1+</i></p>	<p>Agreeableness</p> <p>Agreeable, tolerant and obliging. Neither stubborn, disagreeable nor opinionated, will be happy to compromise.</p> <p><i>B-, fE-, fL-, fQ1-</i></p>
<p>Low Self-control</p> <p>Exhibiting low levels of self-control and restraint. Not influenced by social norms and internalised parental expectations.</p> <p><i>fG-, fN-, fQ3-</i></p>	<p>High Self-control</p> <p>Exhibiting high levels of self-control determined by social norms and internalised parental expectations</p> <p><i>fG+, fN+, fQ3+</i></p>

From the 15FQ+ Technical Manual (2002).

References

- Adams, R. (2008). Evaluating a pre-screening questionnaire's predictive validity at a large financial institution (Master's thesis). Master of Commerce in Organizational Psychology, Faculty of Commerce, University of Cape Town (UCT).
- Allworth, E., & Hesketh, B. (1999). Constructed-orientated biodata: Capturing change-related and contextually relevant future performance. *International Journal of Selection & Assessment*, 7(2), 97-111.
- American Educational Research Association, American Psychological Association, & National Council for Measurement in Education. (1999). Standards for Educational and Psychological testing. New York: McGraw Hill.
- Arthur, W., Jr., Day, E. A., Mcnelly, T. L., & Edens, P. S. (2003). A meta-analysis of the criterion-related validity of assessment centre dimensions. *Personnel Psychology*, 56, 125-155.
- Bandura, A. (1977). Self-efficacy: towards unifying theory of behavioural change. *Psychology Review*, 84(2), 191-215.
- Barrick, M. R., & Mount, M. K. (1991). The Big Five personality dimensions and job performance. A meta-analysis. *Personnel Psychology*, 44, 1-26.
- Barrick, M. R., Mount, M. K., & Judge, A. T. (2001). Personality and performance at the beginning of the new millennium: What do we know and where do we go next? *International Journal of Selection and Assessment*, 9(1/2), 9-30.
- Barrick, M. R., Mount, M. K., Strauss, J. P. (1993). Conscientiousness and performance of sales representatives: Test of the mediating effects of goal setting. *Journal of Applied Psychology*, 78(5), 715-722.
- Bartram, D. (2005). The great eight competencies: A criterion-centric approach to validation. *Journal of Applied Psychology*, 90(6), 1185-1203.
- Benit, N., Mojzisch, A., & Soellner, R. (2014). Preselection methods prior to the internal assessment centre for personnel selection in German companies. *International Journal of Selection and Assessment*, 22(3), 254-260.

- Berry, C. M., Cullen, M. J., & Meyer, J. M. (2014). Racial/ethnic subgroup differences in cognitive ability test range restriction: Implications for differential validity. *Journal of Applied Psychology, 99*(1), 21-37.
- Berry, C. M., Ones, D. S., & Sackett, P. R. (2007). Interpersonal deviance, and their common correlates: A review and meta-analysis. *Journal of Applied Psychology, 92*(2), 361-364.
- Borman, W. C., Bryant, R. H., & Dorio, J. (2010). The measurement of task performance as criteria in selection research. In J. L. Farr & N. Tippens (Eds.), *Handbook of employee selection* (pp. 439-462). New York: Routledge.
- Borteyrou, X., Lievens, F., Bruchon-Schweitzer, M., Congard, A., & Rascle, N. (2015). Incremental validity of leaderless group discussion ratings over and above general mental ability and personality in predicting promotion. *International Journal of Selection and Assessment, 23*(4), 373-381.
- Boyatzis, R. E., Good, D., & Mass, R. (2010). Emotional, social, and cognitive intelligence and personality as predictors of sales performance. *Journal of Leadership and Organizational Studies, 19*(2), 191-201.
- Cattell, R. B. (1946). *The Description and Measurement Of Personality*. Yonkers-on-Hudson, New York: World Book Co.
- Chan, D. (1996). Criterion and construct validation of an assessment centre. *Journal of Occupational and Organizational Psychology, 69*(2), 167-181.
- Conzelmann, K., & Keye, D. (2014). Which aspects of a semistructured interview, besides cognitive ability tests, contribute incrementally to predicting the training success of air traffic controller trainees? *International Journal of Selection and Assessment, 22*(3), 240-251.
- Cortina, J. M., Goldstein, N. B., Payne, S. C., Davidson, H. K., & Gilliland, S. W. (2000). The Incremental Validity of Interview Scores Over and Above Cognitive Ability and Conscientiousness Scores. *Personnel Psychology, 53*(2), 325-351.
- Crede, M., & Kuncel, N. R. (2008). Study habits, skills and attitudes: the third pillar supporting collegiate academic performance. *Perspectives on Psychological Science, 3*(6), 425-453.

- Dayan, K., Kasten, R., & Fox, S. (2002). Entry-level police candidate assessment centre: An efficient tool or a hammer to kill a fly? *Personnel Psychology*, *55*, 827–849.
- Dean, M. A., Roth, P. L., & Bobko, P. (2008). Ethnic and gender subgroup differences in assessment centre ratings: A meta-analysis. *Journal of Applied Psychology*, *93*, 685-691.
- Dilchert, S., & Ones, D. S. (2009). Assessment centre dimensions: Individual differences correlates and meta-analytic incremental validity. *International Journal of Selection and Assessment*, *17*(3).
- Dorsey, D. W., Cortina, J. M., & Luchman, J. (2010) Adaptive and citizenship-related behaviours at work. In J. L. Farr & N. Tippins (Eds.), *Handbook of employee selection* (pp. 463-487). New York: Routledge.
- Doyle, M. G. (2015). The Value of Assessing a Candidates Interests in Personnel Selection: An Overlooked Predictor in Job Success. Applied Assessment, Inc.
- Edwards, J. R., & Bagozzi, R. P. (2000). On the nature and direction of relationships between constructs and measures. *Psychological Methods*, *5*(2), 155-174.
- Farsides, T., & Woodfield, R. (2002). Individual differences and undergraduate academic success: The roles of personality, intelligence and application. *Personality and Individual Differences*, *34*, 1225-1243.
- Financial Services Board (South Africa). (n.d.). In Wikipedia. Retrieved 12/12/2017. from: [http://en.wikipedia.org/wiki/Financial_services_board_\(South_Africa\)](http://en.wikipedia.org/wiki/Financial_services_board_(South_Africa))
- Foxcroft, C., & G. Roodt, (Eds.). (2005). An introduction to psychological assessment in the South African context (2nd ed.). Johannesburg: Oxford University Press.
- Foxcroft, C. & G. Roodt, (Eds.) (2001). An introduction to psychological assessment in the South African context (pp. 1-398). Oxford University Press.
- Furnham, A., Taylor, J., & Chamorro-Premuzic, T. (2008). Personality and intelligence correlates of assessment centre exercises. *Individual Differences Research*, *6*(3), 181-192.

- Gaugler, B. B., Rosenthal, D. B., Thornton, G. C., III., & Bentson, C. (1987). Journal of applied psychology monograph: Meta-analysis of assessment centre validity. *Journal of Applied Psychology*, 72(3), 493-511.
- Goffin, R. D., Rothstein, M. G., & Johnston, N. G. (1996). Personality testing and the assessment centre: Incremental validity for managerial selection. *Journal of Applied Psychology*, 81(6), 746-756.
- Gonzalez-Mule, E., Mount, M. K., & Oh, I. S. (2014). A meta-analysis of the relationship between general mental ability and nontask performance. *Journal of Applied Psychology*, 99(6), 1222-1243.
- Guidelines for Assessment Centre Operations: Guidelines and Ethical Considerations for Assessment Centre Operations. (2015). International Taskforce on Assessment Centre Guidelines. *Journal of Management*, 41(4), 1244-1273.
- Hardison, C. M. (2005). Construct validity of assessment centre overall ratings: An investigation of relationships with and incremental criterion related validity over Big 5 personality traits and cognitive ability. Unpublished doctoral dissertation, University of Minnesota.
- Hermelin, E., Lievens, F., & Robertson, I. T. (2007). The validity of assessment centres for the prediction of supervisory performance ratings: A meta-analysis. *International Journal of Selection and Assessment*, 15(4), 405-411.
- Hinrichs, J. R. (1978). An eight-year follow-up of a management assessment center. *Journal of Applied Psychology*, 63, 596-601.
- Hoffman, B. J., Kennedy, C. L., Lance, C. E., LoPilato, A. C., & Monahan, E. (2015). A review of the content, criterion-related and construct-related validity of assessment centre exercises. *Journal of Applied Psychology*, 100(4), 1143-1168.
- Hunsley, J., & Meyer, G. J. (2003). The incremental validity of psychological testing and assessments: conceptual, methodological, and statistical issues. *Psychological Assessment*, 15(4), 446-455.
- Hunter, J. E. (1983). A casual model of cognitive ability, job knowledge, job performance and supervisor ratings. In F. Landy, S. Zedeck, & J. Cleveland (Eds.), *Performance measurement and theory* (pp. 257-266). Hillsdale, NJ: Lawrence Erlbaum.

- Hunter, J. E., & Hunter, R. F. (1984). Validity and utility of alternative predictors of job performance. *Psychological Bulletin*, 96(1), 72-98.
- Hunter, J. E., Schmidt, F. L. & Le, H. (2006). Implications of direct and indirect range restriction for meta-analysis methods and findings. *Journal of Applied Psychology*, 91(3), 594-612.
- Hurtz, G. M., & Donovan J. J. (2000). Personality and job performance: The big five revisited. *Journal of Applied Psychology*, 85(6), 869-879.
- Joiner, D. A. (2002). Assessment centres: what's new? *Public Personnel Management*, 31(2), 179-185.
- Klimoski, R. J., & Zuckin, L. B. (2003). Psychological assessment in industrial/Organizational settings. *Handbook of Psychology*. J. R. Graham, J. A. Naglieri (Eds.),
- Krause, D. E., Kersting, M., Heggstad, E. D., & Thornton, G. C. III. (2006). Incremental validity of assessment centre ratings over cognitive ability tests: A study at the executive management level. *International Journal of Selection and Assessment*, 14(4), 360-369.
- Kuncel, N. R., Hezlett, S. A., & Ones, D. S. (2004). Academic performance, career potential, creativity, and job performance: can one construct predict them all? *Journal of Personnel Social Psychology*, 86(1), 148-161.
- Latham, G. P., & Sue-Chan, C. (1996). A meta-analysis of the situational interview: An enumerative review of reasons for its validity. *Canadian Psychology*, 40, 56-67.
- Latham, G. P., Saari, L. M., Pursell, E. D., & Campion, M. A. (1980). The situational interview. *Journal of Applied Psychology*, 65, 569-573.
- Levashina, J., Hartwell, C. J., Morgeson, F. P., & Campion, M. A. (2014). The structured employment interview: Narrative and quantitative review of the research literature. *Personnel Psychology*, 67, 241-293.
- Lievens, F., & Patterson, F. (2011). The validity and incremental validity of knowledge tests, low-fidelity simulations, and high-fidelity simulations for

- predicting job performance in advanced level high-stakes selection. *Journal of Applied Psychology*, 96, 927-940.
- Lievens, F., & Thornton, G. C. III (2005). Assessment centres: Recent developments in practice and research. In A. Evers, O. Smit-Voskuyl, & N. Anderson (Eds.) *Handbook of Selection* (pp. 243-264). Blackwell Publishing.
- Lievens, F., Harris, M. M., Van Keer, E., & Bisqueret, C. (2003). Predicting cross-cultural training performance: the validity of personality, cognitive ability, and dimensions measured by an assessment centre and a behaviour description interview. *Journal of Applied Psychology*, 88(3), 476-489.
- Meiring, D., & Buckett, A. (2016). Best practice guidelines for the use of the assessment centre method in South Africa (5th ed.). *SA Journal of Industrial Psychology*, 42(1), 1-15.
- Melchers, K. G., & Annen, H. (2010). Officer selection for the Swiss armed forces: An evaluation of validity and fairness issues. *Swiss Journal of Psychology*, 69(2), 105-115.
- Meriac, J. P., Hoffman, B. J., Woehr, D. J., & Fleisher, M. S. (2008). Further evidence for the validity of assessment centre dimensions: a meta-analysis of the incremental criterion-related validity of dimension ratings. *Journal of Applied Psychology*, 93(5), 1042-1052.
- Motowidlo, S. J., Borman, W. C., & Schmit, M. J. (1997). Theory of Individual Differences in Task and Contextual Performance. *Human Performance*, 10(2), 71-83.
- Muchinsky, P. M., Kriek, H. J., & Schreuder, D. (2005). *Personnel Psychology*. (3rd ed.). South Africa: Oxford University Press.
- Murphy, K. R. (2010). Framework for organizational assessment: Individual differences that influence performance and effectiveness. Scott, J. C., & Reynolds, D. H. (Eds.), *Handbook of Workplace Assessment*, (pp. 3-23). San Francisco, CA: Jossey-Bass.
- O'Connell, M. S., Hattrup, K., Doverspike, D., & Cober, A. (2002). The validity of "mini" simulations for mexican retail salespeople. *Journal of Business and Psychology*, 16(4), 593-599.

- Ones, D. S., & Viswesvaran, C. (1996). Bandwidth-fidelity dilemma in personality measurement for personnel selection. *Journal of Organizational Behaviour*, 17(6), 609-626.
- Organ, D. W. & Ryan, K. (1995). A meta-analytic review of attitudinal and dispositional predictors of organizational citizenship behaviour. *Personnel Psychology*, 48(4), 775-802.
- Pintrich, P. R. (1999). The role of motivation in promoting and sustaining self-regulated learning. *International Journal of Educational Research*, 31, 459-470.
- Potgieter, T. E., & Van Der Merwe, R. P. (2002). Assessment in the workplace: A competency-based approach. *SA Journal of Industrial Psychology*, 28(1), 60-66.
- Psytech International (2017). Confidential GRT2 report of candidate generated from Psytech Genesys system after assessment, Expert GRT2 report, 15 May 2017. System enquiries: www.psytech.com
- Psytech International (2006). General, critical and graduate test battery. Psychometrics Ltd.
- Psychtech International (2002). The 15FQ+ technical manual. Psychometrics Ltd.
- Richardson, M., Abraham, C., & Bond, R. (2012). Psychological correlates of university students' academic performance: a systematic review and meta-analysis. *Psychological Bulletin*, 138(2), 353-387.
- Robbins, S. B., Lauver, K. Le H., Davis, D., Langley, D., & Carlstrom, A. (2004). Do psychosocial and study skill factors predict college outcomes? A meta-analysis. *Psychological Bulletin*, 130(2), 261-288.
- Rohde, T. E., & Thompson, L. A. (2007). Predicting academic achievement with cognitive ability. *Intelligence*, 35, 83-92.
- Rounds, J., & Su, R. (2014). The nature and power of interests. *Current Directions in Psychological Science*, 23(2), 98-103.

- Ruffing, S., Wach, F. S., Spinath, F. M., Bruken, R., & Karbach, J. (2015). Learning strategies and general cognitive ability as predictors of gender-specific academic achievement. *Frontiers in Psychology*, *6*, 1238.
- Ryan, A. M., & Ployhart, R. E. (2014). A Century of Selection. *Annual Review of Psychology*, *65*, 693-717.
- Sackett, P. R., Schmitt, N., Ellingson, J. E., & Kabin, M. B. (2001). High- Stakes Testing in Employment, Credentialing, and Higher Education: Prospects in a Post-Affirmative-Action World. *American Psychological Association*, *56*(4), 302-318.
- Salgado, J. F. (2017). Personnel selection. (pp. 1-32). Oxford Research Encyclopaedia of Psychology. USA, Oxford University Press.
- Salgado, J. F. (in press). Using ability tests in selection. In H. Goldstein, E. Pulakos, J. Passmore, & C. Semedo (Eds.), *Handbook of psychology of recruitment, selection, and retention*. New York: Wiley/Blackwell.
- Salgado, J. F., & Anderson, N. (2003). Validity generalization of GMA tests across countries in the European community. *European Journal of work and Organizational Psychology*, *12*(1), 1-17.
- Salgado, J. F., & De Fruyt, F. (2005). Personality in personnel selection. In A. Evers, N. Anderson, & O. Voskuilj (Eds.), *Handbook of Personnel Selection* (pp. 174-198). London:Blackwell.
- Salgado, J. F., & Moscoso, S. (2002). Comprehensive meta-analysis of the construct validity of the employment interview. *European Journal of Work and Organizational Psychology*, *11*(3), 299-324.
- Salgado, J. F., & Moscoso, S. (2006). Work and Organizational Psychology: An international perspective. (3rd ed.). In Chmiel, N., Fraccaroli, F., & Sverke, M. (Eds.), :Wiley.
- Salgado, J. F., & Tauriz, G. (2014). The Five-Factor Model, forced-choice personality inventories and performance: A comprehensive meta-analysis of academic and occupational validity studies. *European Journal of work and organizational psychology*, *23*(1), 3-30.

- Salgado, J. F., Anderson, N., & Tauritz, G. (2015). The validity of ipsative and quasi-ipsative forced-choice personality inventories for different occupational groups: A comprehensive meta-analysis. *Journal of Occupational and Organizational Psychology*, 88(4), 797-834.
- Salgado, J. F., Anderson, N., Moscoso, S., Bertua, C., & De Fruyt, F. (2003a). International validity generalization of GMA and cognitive abilities: A European community meta-analysis. *Personnel Psychology*, 56(3), 573-605.
- Salgado, J. F., Anderson, N., Moscoso, S., Bertua, C., De Fruyt, F., & Rolland, J. P. (2003/b). A meta-analytic study of general mental ability validity for different occupational in the European community. *Journal of Applied Psychology*, 88(6), 1068-1081.
- Salgado, J. F., Moscoso, S., & Bergees, A. (2013). Conscientiousness, its facets, and the prediction of job performance ratings: Evidence against the narrow measures. *International Journal of Selection and Assessment*, 27(1), 74-84.
- Salgado, J. F., Viswesvaran, C., & Ones, D. S., (2001). Predictors used for personnel selection: An overview of constructs, method and techniques. In N. Anderson, D. S. Ones, H. K. Sinangil, & C. Viswesvaran (Eds.), *Handbook of Industrial, work and organizational Psychology*. *Personnel Psychology* (vol. 1, pp. 165-199). London:Sage.
- Saucier, G., & Goldberg, L. (2001). Lexical Studies of Indigenous Personality Factors: Premises, Products, and Prospects. *Journal of Personality*, 69(6), 847-879.
- Schmidt, F. L. (2002). The role of general cognitive ability and job performance: Why there cannot be a debate. *Human Performance*, 5(1/2), 187-210.
- Schmidt, F. L., & Hunter, J. E. (1998). The validity and utility of selection methods in personnel psychology: Practical and theoretical implications of 85 years of research findings. *Psychological Bulletin*, 124(2), 262-274.
- Schmidt, F. L., Oh, I. S., & Le, H. (2006). Increasing the accuracy of corrections for the range of restriction: Implications for selection procedure validities and other research results. *Personnel Psychology*, 59(2), 281-395.
- Schmitt, N. W., Arnold, J. D., & Nieminen, L. (2010). Validation strategies for primary studies. In J. L. Farr & N. T. Tippins (Eds.), *Handbook of Employee Selection* (pp. 51-71). New York: Routledge.

- Schmitt, N. (2014). Personality and Cognitive Ability as Predictors of Effective Performance at Work. *Annual Review of Organizational Psychology and Organizational Behaviour*, 1, 45-65.
- Sechrest, L. (1963). Incremental validity: A recommendation. *Educational and Psychological Measurement*, 23, 153-158.
- SIOPSA (Society for Industrial and Organisational Psychology of South Africa). (2005). Guidelines for the validation and use of assessment procedures in the workplace. Johannesburg, South Africa: Society for Industrial and Organizational Psychology of South Africa.
- Society for Industrial and Organizational Psychology. (2003). Principles for the validation and use of personnel selection procedures (4th ed.). Bowling Green, OH: Author.
- Sonnetag, S., & Frese, M. (2011). Performance concepts and performance Theory. In Sonnetag, S. (Ed.), *Psychological Management of Individual Performance*, (pp. 4-25).
- Solomon, V. (2005). Predictive validity of the 15FQ+ on performance indicators of financial advisers at an insurance company (Master's thesis). Faculty, Department of Industrial Psychology, University of Western Cape (UWC).
- Sutherland, R., De Bruin, G., & Crous, F. (2007). The relationship between conscientiousness, empowerment and performance. *South African Journal of Human Resource Management*, 5(2), 60-67.
- Thornton, G. C., III. & Gibbons, A. (2009). Validity of assessment centres for personnel selection. *Human Resource Management Review*, 19, 169-187.
- Thornton, G. C., III. & Rupp, D. E. (2009). Assessment centres in human resource management: Strategies for prediction, diagnosis and development. Mahway: NJ, Erlbaum.
- Thornton, G. C., III. Rupp, D. E., & Hoffman, B. J. (2015). Assessment centre perspectives for talent management strategies (2nd ed.). New York:Routledge

- Trapmann, S., Hell, B., Hirn, J. W., & Schuler, H. (2007). Meta-analysis of the relationship between the big five and academic success at university. *Journal of Psychology, 215*(2), 132-151.
- Tredoux, N. (2002). Validation Report: Prediction of sales success among insurance salespeople in a specialised market. Psytech Ltd.
- Tyler, G. (2003). A review of the 15FQ+ personality questionnaire. *Selection & Development Review, 19*(2), 7-11.
- Van Iddekinge, C. H., & Ployhart, R. E. (2008). Developments in the criterion-related validation of selection procedures: A critical review and recommendations for practice. *Personnel Psychology, 61*(4), 871-925.
- Van Iddekinge, C. H., Roth, P. L., & Lanivich, S. E. (2011). Are you interested? A meta-analysis of relations between vocational interests and employee performance and turnover. *Journal of Applied Psychology, 96*, 1167-1194.
- Viswesvaran, C., & Ones, D. S. (2000). Perspectives on models of job performance. *International Journal of Selection and Assessment, 8*(4), 216-226.
- Viswesvaran, C., & Ones, D. S. (2002). Agreements and disagreements on the role of general mental ability (GMA) in industrial, work, and organizational psychology. *Human Performance, 15*, 211-231.
- Weinstein, C. E., & Mayer, R. E., (1986). The Teaching of Learning Strategies, " In Wittrock, M., (Ed.), *Handbook of Research on Teaching*, Macmillan, New York, 315-327.
- Weinstein, C. E., Acee, T. W., Jung, J. (2011). Self-regulation and learning strategies. *New Directions for Teaching & Learning, 126*, 45-53.
- Wiggins, J. S. (1973). *Personality and Prediction: Principles of Personality Assessment*, Reading, Mass: Addison Wesley.