

**ADVERSITY QUOTIENT IN PREDICTING
JOB PERFORMANCE VIEWED THROUGH
THE PERSPECTIVE OF THE BIG FIVE**

MASTER THESIS
MAY 2007

MASTER'S DEGREE
PSYKOLOGISKE INSTITUTT
UNIVERSITY OF OSLO

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ABSTRACT

The aim of the present study is to theoretically and empirically investigate a theory labeled the Adversity Quotient (AQ). Its claim of being able to predict all facets of human capacity and performance is being tested by comparing it with the more established Five Factor Model (also known as the Big Five). Data for this study were obtained from Det Norske Veritas and from CORE Learning. A total of 98 participants were recruited (41 females, 57 males). Results indicate that the total score of AQ's measurement tool (ARP) does not predict job performance better than the BFI, a measurement of the Big Five. However, there seemed to be theoretical support for the AQ framework. Implications for the AQ measurement and its practical use as well as the AQ theory overall will be presented.

ACKNOWLEDGEMENTS

I would, first and foremost, like to thank my supervisor, Hallvard Føllesdal, for infinite patience and for helping me throughout the entire process. A special thank you goes also to Yngvar Sjoner at DNV and Lars Terje Pedersen at CORE Learning for making this project possible. It has been interesting. And to Linda Nyheim; thank you for fellow support. And last but not least, a huge thank you to my family for much needed encouragement.

Elizabeth Le

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ADVERSITY QUOTIENT IN PREDICTING JOB PERFORMANCE VIEWED THROUGH THE PERSPECTIVE OF THE FIVE FACTOR MODEL

For several decades industrial-organizational (I/O) psychologists have been trying to find answers to the use of personality measurement in organizational contexts. Clearly, such personnel assessment methods have their practical value. Being able to predict future job performance have important implications for selection method as this, in turn, would lead to overall increased employee performance “as measured in percentage increases in output, increased monetary value of output, and increased learning of job-related skills” (Schmidt & Hunter, 1998, p. 262). Along this body of research is the assumption that the knowledge, skills, abilities and other attributes (KSAO’s) required in a given organizational role can be identified and subsequently that these KSAO’s can be measured on individuals in order to assess and thereby predict job performance (Kierstad, 1998). Indeed, research have repeatedly shown that particularly personality - that is, one of the “O’s” in KSAO – is an essential predictor of job performance, most notably contextual performance and person-organization fit. Most instruments used to assess these qualities relates to aspects of the individual’s personality (Kierstad, 1998). As such, a fundamental concern has been the ability to identify the relations between personality dimensions and job performance (Barrick & Mount, 2003). However, this has proven to be a daunting task. Researchers have not been able to agree as to how well personality measures can actually validly predict real world performance. This could be traced back to the fact that research findings prior to 1990 had turned out rather inconsistent. It was not until the emergence of the Five Factor Model (Big Five), a now widely accepted taxonomy, and the use of meta-analysis, that significant progress was made and research results revealed personality to have a predictive relationship with job performance (Barrick & Mount, 2003).

Personality measurements based on the Big Five as tools for predicting job performance, however, are not the only means. Other examples of personnel measures include general mental ability, structured employment interviews, and job knowledge and work sample tests (Schmidt & Hunter, 1998). In other words, a number of personnel measures have been developed to this purpose, which tests to its significance. However, a near decade of research on this subject has produced general agreement that the one personnel measure demonstrating highest validity

concerning the hiring of employees without prior experience in the job is general mental ability (GMA). GMA can be assessed using commercially available tests (Schmidt & Hunter, 1998).

Nevertheless, GMA is not exhausting; it does not cover the entire scope of possible ways to measure job performance, which leaves researchers to keep developing new measures to use. This study will revisit some of the past literature on personality and job performance with the purpose of reviewing a newly developed theory for predicting performance developed by Paul Stoltz. A theory he has labeled the Adversity Quotient (AQ). It will focus on the theory's background material and its use of certain aspects of personality as predictors of job performance. In addition, the study will examine AQ in view of the more well known and established Big Five dimensions. More specifically, it will explore the potential relationships between the underlying facets of the Big Five and the different personality aspects thought to play a huge role within the AQ theory. It will examine the degree to which some of these variables differ in predicting performance and how there may also be potential overlap between them.

THE BIG FIVE

In terms of industrial-organizational psychology, being able to predict behaviour, and thereby performance, through personality measures could have important implications for organizational productivity (Hogan et al. 1996). However, early research in personality assessment and its predicted value did not bode well as researchers were unable to identify a comprehensive taxonomy of human behaviour. Prior to the early 1990's there was a general agreement among researchers that personality testing in employee selection did not hold ground and thus should not be utilized. The pessimistic conclusion derived in large part from research results by Guion and Gottier (1965) and Schimtt et al. (1984) which subsequently led to the decreased optimism regarding the utility of personality tests in personnel selection (Barrick & Mount, 2003).

However, due to the convergence of two developments in the literature of psychology the recent years the use of personality variables in personnel selection experienced resurgence. These were the development of meta-analytic methods and a common personality framework for organizing the traits which was labeled the Big Five (also known as the Five Factor Model).

Using meta-analytic methods Barrick and Mount (1991) and Tett et al. (1991) presented results that demonstrated personality as important for the prediction of job performance (Hurtz & Donovan, 2000). Consequently, the confidence in the robustness of the Big Five increased and researchers in the early 1990s began to take on this Big Five framework for selection research (Hurtz & Donovan, 2000).

The Big Five is used to organize the many personality traits into a controllable number of personality dimensions. As the personality traits used to reach the Big Five were drawn from everyday language its personality dimensions are also to capture lay-persons descriptions of personality fairly well (Kierstead, 1998). The five dimensions in the Big Five are labeled *Extraversion*, *Conscientiousness*, *Emotional Stability* (sometimes also referred to as Neuroticism, but essentially they are to measure each pole of the same dimension), *Agreeableness*, and *Openness to Experience*. Each of these personality dimensions relates to a specific aspect of human behaviour that is relatively independent of others. They are also found to be quite stable over time. Furthermore, they have been found to be applicable in many different cultures. In addition, research is pointing to a possible genetic basis for the dimensions in which its heritability is thought to be fairly significant (Judge et al., 1999).

The numerous studies conducted using the Big Five reveal that Conscientiousness most often reveal to be most relevant in predicting performance outcomes in most jobs than its other four dimensions (Behling, 1998). These other four, Extraversion, Agreeableness, Openness to Experience, and Emotional Stability are found to be more contingent predictors of performance. That is, they relate to success only in some jobs or with a few criteria (e.g. leadership). It has been demonstrated, for instance, that Extraversion is more related to performance in jobs containing a strong competitive component (Barrick & Ryan, 2003). The Extraversion dimension is thought to consist of sociability, but also includes factors like gregariousness, talkativeness, activeness, and assertiveness. These are factors that are often seen to contribute to success in jobs like managers and sales representatives (Dunn, Mount & Barrick, 1995). According to Judge et al. extraverts are frequently seen as socially oriented, but they are also surgent - that is, dominant and ambitious - and active people (Judge et al, 1999). Agreeable people are typically seen as cooperative and likeable, they are thus often viewed as good-natured and gentle individuals. It thus seems intuitive that the cooperative nature of these individuals may lead to success in jobs

where teamwork or customer service is relevant (Judge et al. 1999). Accordingly, it has been found to be more predictive of performance in jobs that demand cooperation. For example, teams with members scoring high on Agreeableness seem to be more effective than teams with members scoring low on Agreeableness. The last of the five factors, Openness to Experience, has been found to be related to customer service jobs (Hurtz & Donovan, 2000).

Because Emotional Stability and Conscientiousness are the two traits of the Big Five which seem most related to the Adversity Quotient theory, they will be discussed in somewhat more detail.

EMOTIONAL STABILITY AND CONSCIENTIOUSNESS

According to Costa and McCrae Emotional Stability is evident in nearly every measure of personality as it appears in almost every personality measures. The dimension describes how a person handles negative life events. Scoring high on this dimension translates into an individual with lack of positive psychological adjustment and emotional stability (Judge, Higgins, Thoresen & Barrick, 1999). With respect to work relations, being low on Emotional Stability or high in Neuroticism, would generally not bode well as such people can be easily distracted by everyday stresses and strains (Larsen & Buss, 2007).

Conscientiousness defines the hard working and achievement oriented individual, and is the one dimension which has yielded most consistent results in relation to job performance (Judge, Higgins, Thoresen & Barrick, 1999). The lower order facets of Conscientiousness are competence, order, dutifulness, achievement striving, self-discipline, and deliberation (according to the NEO-PI-R). High in this dimension results in punctual and reliable behavior, and in turn this may lead to greater success at work. It is thus not surprising to find that there is a strong link between this dimension and job performance (Judge, Higgins, Thoresen & Barrick, 1999). People scoring high on Conscientiousness are defined as industrious individuals, intent on getting ahead in life (Larsen & Buss, 2007).

ADVERSITY QUOTIENT

AQ describes three types of personalities, these being the Climbers, the Campers and the Quitters. According to the theory, Quitters are people of minimal drive and little ambition. They

are rarely creative, do not like to take risks and tend to avoid challenges. Investing only minimally in their work Quitters are said to be the “dead weight of any organization” (Stoltz, 1997, p. 19). Campers are, by definition, people who have stopped moving forward in life as they have become weary of life’s many obstacles. As such, they have settled for what they think is good enough, rarely ever taking on bigger challenges. Campers are, in other words, people who are satisfied with the current state of affairs, letting greater opportunities pass them by. They will invest as much as is necessary to keep things satisfactory. Consequently, they are able to demonstrate a certain amount of creativity, and sometimes take a few calculated risks. Campers are thus not completely without drive, and do put forth a certain amount of effort. However, in the workplace this only results in satisfactory performance; while organizations struggle to reach the top class, average performance is usually not good enough (Stoltz, 1997). Climbers, in the other hand, are people who continuously seek for improvement and growth. They live to get the utmost out of life, are self-motivated and highly driven. They embrace challenges, are highly visionary people and are often an inspirational source to others. According to Stoltz, Climbers are thus the ideal workforce for any organization.

MEASURING AQ

An individual’s AQ level can be quantitatively measured by taking the Adversity Response Profile (ARP), a questionnaire developed by Stoltz intended to gauge an individual’s pattern of responding when facing challenges or adversities. The higher a person’s AQ score is, the higher his or her ability to withstand adversity, which in turn is thought to translate into increases in performance. A person’s level of AQ is thus said to predict job performance fairly well.

The ARP is a self-rating questionnaire which comprises fourteen to-be-imagined scenarios, each of which are followed by four different questions thought to represent the dimensions known as CORE. The four questions are scored on a five-point bipolar scale. However, only ten out of the fourteen scenarios are actually scored when counting an individual’s total AQ.

THE CONCEPT OF AQ IN VARIOUS PERSONALITY DISPOSITIONS

According to Stoltz AQ derives from three major sciences: cognitive psychology, psychoneuroimmunology, and neurophysiology. However, it should be noted that it borrows heavily from the cognitive branch of personality psychology, although this is not mentioned by Stoltz. Among the concepts listed as important in influencing the AQ theory are Hardiness, Resiliency, Optimism, Locus of Control, Self-Efficacy, Learned Helplessness, and Attribution theory (Stoltz, 2000). Subsequently, some of the concepts found to be more prominent within the AQ framework will be viewed in further detail. In addition, these concepts' relation to AQ will be investigated in greater detail as well as their possible links to job performance.

A CLOSER LOOK AT AQ

AQ is a theory on how some people are better apt at handling adversity than others, with an explanation as to why that is. Drawing from everyday hazards, Stoltz begins a description of a world in a constant change. Accordingly, the pressure to keep up and be able to adapt to unexpected events becomes, in his words, an increasingly important issue in order to meet everyday demands. Individuals incapable of handling these demands are thought to eventually lose hope and become depressed. Stoltz calls it “a crisis of hope” (Stoltz, 1997, p. 38) and further states that: “Despair is sucking vitality from our corporations, institutions, families, children, schools – from our every hearts and souls. We are living in the Age of Adversity, and it is eating us alive.” (p. 38) Following Stoltz' definition of adversity it does not have to include any large-scale negative events - as in being involved in a car accident, or being a victim of cancer. Rather, even minor hassles like a stiff neck when waking up in the morning, getting stuck in traffic, arriving late at work, and so on, are signs of adversity. They are events that carry the potential to negative affect and are not necessarily always easily detected.

In defining these everyday hardships Stoltz outlines three levels of adversity which he labels *the societal, the workplace and the individual adversity*. *Societal adversity* entails the experience of profound shift in wealth, the problems of upsurge in crime and violence while belief in the system and institutions is decreasing, in addition there is a drastic change in how family and home is defined, and a lack of security both when it comes to economy and the future

in general. At the same time, workplace in the new millennia is demanding ever more of their workers in order to stay on top of the game. But while more is required to reach the desired goals less is gained. In addition, constant changes in the workplace make no promises of long-term employment, which in turn can lead to mounting frustrations, all of which brings about what Stoltz calls *workplace adversity*. However, it is the individual that eventually ends up carrying the burden; and the net results of the accumulated weight of societal and workplace adversity makes for the *individual adversity*. As described by Stoltz, people face such adversities everyday and eventually, if these adversities are not met with sufficient capacity in the form of higher-level skills and accessible wisdom, these growing adversities may become too much to handle. Particularly at work these daily annoyances can lead to depression, making it difficult for individuals who feel it is hopeless to perform optimally and can seriously undermine a worker's capacities and willingness to face challenges. As a consequence this may produce resistance to change, helplessness and general stagnation, all of which, according to Stoltz, are indicators of individuals and organizations facing adversities on a daily basis.

HOW TO SOLVE THE MOUNTING ADVERSITIES

To get through the problem of growing adversity Stoltz points to the way in which people respond to adversity. In his view there exist three types of responding styles, each yielding different levels of success. Though he points out that the system is only meant as a guide they nevertheless are concepts in which he uses to classify people with seemingly different patterns of responding. Accordingly, this system will also be taken as Stoltz' attempt at describing three different types of personalities, although he does not claim them to be personality descriptions per se. He explains the system as categories in which it is possible to classify a person based on his or her typical pattern of responding. However, because an individual's personality also entails a person's past behavior (Hogan, Hogan & Roberts, 1996), and three types of responding styles indicate typical patterns of reactions, it is possible to view Stoltz' classifications as personality descriptions. The three classifications make up a mountain-like system in which the *Quitters* are located at the base, *Campers* reside in the middle region, and *Climbers* make for the mountain top (Angelopoulos & Co., 2002).

Quitters, Campers and Climbers

Quitters are defined as bitter and depressed individuals who have given up on their dreams, often choosing the most comfortable and easiest way because they do not want to face challenges. They are also described as feeling resentful of people defined in the Campers and Climbers category because, as opposed to themselves, Campers and Climbers seem able to surmount obstacles and even excel in what they do. According to Stoltz, individuals labeled Quitters are prone to avoiding situations they find uncomfortable, and when adversity hits them they are incapable of responding appropriately and fail to overcome any challenges facing them. Campers are said to be somewhat like Quitters; they do not reach for more than what they have. They are, as Stoltz describes them, individuals who no longer experience excitement, learning, growth or creative energy (Stoltz, 1997, p. 16). But they differ from Quitters in that they seek to preserve what they have. They are keeping to the familiar and what they know while believing that they have reached their ultimate goal. Campers are not willing to put in longer hours of hard work than what is necessary, they do not like to take risks, and only do things satisfactorily with just enough investment to get by. For them, things are just good enough and what lies ahead of “good enough” is hidden from view because they are satisfied with settling down. They will, however, defend what they have. And according to Stoltz this is the reason why, at work, they stay safely employed, although falling short of their true abilities. For any organizations who strive to be among the best, workers in the Campers category are, according to Stoltz, very likely a dead end because average performance is usually not good enough. They lack the creativity and incentive beyond what is needed for the organization to survive. Also, eventually Campers may lose their sharpness, getting slower and weaker by the time with a gradual decline in performance. *Climbers* on the other hand, never lose hope despite the many obstacles life is putting in their path. Rather, they embrace challenges, are extremely self-motivated and driven, intent on getting the utmost out of life. Highly visionary, Climbers are not the kind of people to wait for things to happen, they *make* things happen, and are constantly in search of new ways to grow and to contribute. In short, Climbers are innovative people. Following Stoltz, this system is a guideline that applies to all organizations.

Whether a person is a Quitter, Camper or Climber depends on his or her Adversity Quotient, which comprises four different dimensions known as CORE, an abbreviation for

Control, Openness, Reach and Endurance. A person's inner CORE tells how that person responds to adversity. That is, how he or she handles every conflict, deadline, setback, injustice, opportunity and challenge. The CORE dimensions will be explored in more details at a later point in this paper. At present moment, however, it would be interesting to compare Stoltz' three-level system with the Big Five to see whether or not the same types of behavior description proposed by Stoltz can also be obtained through the more well known and established five dimensions.

COMPARING AQ WITH THE BIG FIVE

The Big Five proposes that nearly all personality measures can be placed within a 5-factor model which subsequently can account for most variations in human behaviour. If that is the case, then it should be possible for the Big Five to also cover the three-level classification suggested by Stoltz. The Big Five's five dimensions Emotional Stability, Extraversion, Openness to experience, Agreeableness, and Conscientiousness (Judge et al., 1999) are each thought to represent the highest level of the personality hierarchy with subsequent underpinnings of narrow traits that gives each of the broader factors its unique definition (Roberts & Hogan, 2001).

As previously mentioned Quitters are unable to deal with challenges and they lack any incentive to pursue higher goals. They also display signs of depression and resentment towards people around them. The marks of Climbers, in contrast, are the exact opposite or counterparts of Quitters. They are individuals who are devoted to a lifelong ascent and who constantly seek for growth and improvement. They embrace challenges and will not accept defeat as an option (Angelopoulos et al., 2002). Campers, on the other hand, can be classified as in the middle of this continuum; they have not completely given up, but neither do they strive to become any better. From this information one could conclude that the behaviours in focus are thus related to a problem of getting ahead as well as the ability to cope with the number of stresses that life can bring about. Of the five dimensions in the Big Five framework that can be said to best capture the corresponding types of behavior are the ones labeled Conscientiousness and Emotional Stability.

CONSCIENTIOUSNESS AND AQ'S MOUNTAIN METAPHOR

Conscientiousness is related to an individual's degree of self-control (Judge et al., 1999). Individuals high on this scale are known to be hardworking and persistent people, often driven by

the need for achievement and to getting ahead. The key aspects of Conscientiousness have generally been found to be achievement, order, cautiousness, and dependability. Achievement is strongly associated with competence and success in one's work. This entails the ability to always set high standards for one's performance and to constantly work to achieve one's goals. Dependability reflects the extent to which a worker is reliable. This entails being respectful of laws, regulations, and authorities, as well as being trustworthy, accountable, and self-disciplined. Cautiousness reflects risk-taking. That is, the ability to consider all relevant possibilities and related consequences before executing an action. Lastly, order is reflected in one's ability to infuse structure in one's working environment. This involves being careful, planful, well-organized, thorough, detail-oriented, and methodical (Dudley et al., 2006). Clearly there is some overlap between that of being a Climber and a Conscientious individual. Both individuals would be described as highly industrious and both would be willing to invest long hours of hard work in order to achieve higher goals. Although Stoltz does not go into details whether or not being a Climber includes being orderly, cautious or dependable, it is perhaps possible to infer that if a person is dedicated towards a pursuit of their goals, then such characteristics would facilitate success. The opposite should also hold true for individuals who are low on Conscientiousness and those classified as Quitters by Stoltz. Low Conscientious people does not engage in behaviours that would get them far in life, they have less self-control, are not of the persistent kind, and have little need for achievement. These same tendencies, as have been mentioned above, are also familiar descriptions of a Quitter.

EMOTIONAL STABILITY AND AQ'S MOUNTAIN METAPHOR

Emotional Stability is related to at least two tendencies; one is how people deal with Anxiety. That is, the way people cope with the many stresses that life poses and which everyone must confront. The other is related to a person's well being (Judge et al., 1999). According to Costa and McCrae Emotional Stability can be broken into six facets, these include: Anxiety, hostility, self-consciousness, vulnerability, depression, and impulsiveness. Research results indicate that neurotic individuals are prone to be particularly affected by negative life events. Judge et al. notes that low Emotional Stability often leads to instability and stress proneness as well as personal insecurity and depression. The former symptoms are related to Anxiety while the latter addresses one's well-being (Judge et al., 1999), both of which can be recognized in a Quitter who

most often are overwhelmed by challenges or adversities and are likely to display signs of depression.

In short, based on the description, Quitters seem to be characterized by a low score on the Conscientiousness dimension, and at the lower end of the Emotional Stability dimension, while Climbers, who seem to be described as the total opposites, can perhaps be characterized at the higher end of the Conscientiousness dimension and the higher end of the Emotional Stability dimension. Campers, on the other hand, might be interpreted as scoring moderately on both the Conscientiousness and Emotional Stability dimensions.

THE BIG FIVE AND JOB PERFORMANCE

What does the Big Five literature say about these types of personalities concerning job performance? Evidence from early meta-analytic work by Barrick and Mount (1991) and Tett et al. (1991) indicated that Big Five may have some degree of usefulness with regards to personnel selection in a variety of jobs. Although not all results have been entirely consistent (Hurtz & Donovan, 2000) results from past research suggest that out of all the five factors of the Big Five Conscientiousness has consistently emerged as the one strongest predictor of job performance. Barrick and Mount (1995) reported a correlation of .30, although Hurtz and Donovan (2000) have argued this to be an overestimation and offered an estimated true criterion-related validity of .22 from their meta-analysis. Nonetheless, they concluded that global measures of Conscientiousness seem to consistently add a certain degree of explained variance in job performance. In addition, they found Emotional Stability to indicate a stable influence on performance throughout most of their analysis (Hurtz & Donovan, 2000). Finally, it is worth noting that researchers also now generally agree that job performance is multidimensional, in addition, there is increasing theoretical and empirical evidence which indicate that different personality variables may be more relevant with regards to different jobs and across criterion dimension (Dudley, Orvis, Lebiecki, and Cortina, 2006).

To return to Stoltz' three-level system, in his view, a whole organization comprised of Campers will have virtually no chance against a team of Climbers. Climbers, according to Stoltz, are the ideal workforce for any organization. There is little empirical foundation provided by

Stoltz to back up his claim. However, there seem to be substantial documentation on the relationship between the characteristics or tendencies associated with the Quitters-, Campers-, Climbers - theory and job performance as provided by the Big Five literature. Thus it is probable to say that individuals high in performance can also be characterized as Climbers in addition to scoring high on Conscientiousness and high on Emotional Stability. On the other hand, as the Quitters, Campers, and Climbers descriptions appears to overlap with characteristics marked by the Conscientiousness and Emotional Stability dimensions of the Big Five it is questionable whether the AQ theory adds anything new to the already existing body of knowledge concerning the personality - job performance relationship. In regards to this question it is time to turn to Stoltz' CORE Model.

THE CORE MODEL

CORE AND AQ-RELATED PERSONALITY CONSTRUCTS

According to Stoltz, whether a person is a *Quitter*, *Camper* or *Climber* depends on his or her Adversity Quotient, which comprises four different dimensions known as CORE, an abbreviation for *Control*, *Openness*, *Reach* and *Endurance*. A person's inner CORE tells how that person responds to adversity. That is, how he or she handles every conflict, deadline, setback, injustice, opportunity and challenge. To further understand the CORE dimensions their relation to other more established constructs within cognitively based personality psychology will be examined. However, due to limited breadth and scope of this paper only the concepts seen as most prominent within the AQ framework will be viewed in more detail.

CONTROL

The Control dimension of AQ seeks to answer the question how well a person thinks he or she is able to positively influence a situation. In addition, it gauges a person's perceived ability to alter or control an adverse event. According to Stoltz, control is the most crucial ingredient of the four CORE dimensions as it speaks directly to a person's inclination to try hard enough in response to a given challenge. Because its impact lies within empowerment and thus whether or not any meaningful action will take place, the control dimension has a strong influence on all other

CORE dimensions. Without it, the ability to hope and take action would be rather small or virtually impossible (Stoltz, 1997). Stoltz outlines a person high in Control as a person who persists relentlessly and never gives up but stays agile in the efforts to finding a solution however difficult the situation may be. Control is about the ability to *always* find a way to improve a situation whether it be at home, at work or elsewhere. Staying in focus on the things that can be improved or influenced, rather than what cannot is what Stoltz calls Response Ability (Stoltz, 2000).

Learned Helplessness and Control

Stoltz' inspiration for his control dimension is said to derive from known literature within personality psychology and various resiliency constructs. Among some of the concepts in his books found to be important are Learned Helplessness, Hardiness and Locus of Control. Learned Helplessness is a theory about how the experience of uncontrollable negative events can create apathy and depression (Atkinson et al., 2000). The earliest studies on this theory were conducted by Martin Seligman nearly forty years ago. He observed in a number of experiments dogs exposed to a series of inescapable shocks would end up respond with passivity and in addition were later unable to learn how to escape and avoid future shocks delivered in a shuttle box. In trying to explain what precisely produces this phenomenon Seligman proposed that when subjected to inescapable shocks the dogs learn that no amount of voluntary behaviour of theirs will enable them to exert *control* over the shock (Seligman et al., 1993). Having such expectations the dogs fail to learn otherwise in the future. In addition, Seligman suggested that such expectancy also reduces the dogs' motivation to attempt to escape which in turn might produce a deficit in response initiation. Lastly, it also produces cognitive deficits because there is an interruption while in the process of learning the response-shock termination relationships (Seligman et al., 1993). In other words, the dog learns that it has no control whatsoever and expects this to also be the case in the future. This expectation in turn changes the dog's motivation and cognition to such a degree that it leads to the dog's failure to learn to escape.

Having established Learned Helplessness in animals, researchers went on to prove its existence in humans as well. Although experiments with humans have been slightly different

from that of animal experiments the general basics have still been the same. Seligman suggests that “Learned Helplessness may involve a ‘trait-like’ system of expectancies that responding is futile” (Seligman et al., 1993, p. 103), an explanation that clearly involves cognitions. The idea behind this includes the manner in which participants explain or interpret the causes of the uncontrollable events, and subsequently how these cognitions affect behaviour (Graziano, Campbell, & Finch, 1997). The theory also suggests how some people eventually become passive through their general belief that no matter how much effort they exert it will still be of no avail. What implications does this have concerning job performance?

Implications for job performance

Firstly, not very many known studies have been conducted regarding the relationship between Learned Helplessness and job performance. Thus not much empirical data could be found to support the link either. However, revised versions of the Learned Helplessness model have been theoretically linked to job performance through theories of work motivation, shedding some lights on the reasons behind performance deficits (Judge & Bono, 2001). In addition, it is likely that beliefs of uncontrollability will lead to non-action as a person under such beliefs can see no ways to improve the situation. Subsequently, no good results will be produced, as was evident with Seligman’s dogs who eventually failed to learn how to escape by the end of the experiment. According to Seligman, the dogs’ expectations changed their motivation and cognition to such a degree that they would fail to learn how to escape (Seligman et al., 1993). Following this logic; people who perceive themselves as having little or no control over an unfavourable event or situation will lose motivation and eventually demonstrate disruptions in their subsequent thoughts, feelings, and actions (Seligman et al., 1993). In work related situations this very likely might lead to performance deficit, a prediction also suggested by Stoltz.

Hardiness and Control

Another concept central to AQ is Hardiness, a concept firstly developed by Suzanne Kobasa (1979), which focuses on how some people are more resistant to stress than others despite facing

major stressful events (Kobasa, 1979). The concept is about individual differences and includes three dimensions labeled *commitment*, *control*, and *challenge*. Commitment speaks to how deep a person is involved in personal projects and goals. The more involved or engaged a person is the higher he or she is in commitment, while those low in commitment are less involved and are said to only be going through the motions. Control is a person's perceived control over important outcomes as well as the belief that it is possible to come up with solutions to whatever problems that life brings about. A person who is high in control will typically confront the problem at hand. In the same token, a person who is low in control typically leaves it to destiny; imagining either luck or faith to prevail. Challenge, the last dimension, is related to how a person interprets stressful events. For instance, a person can perceive the stressful events as either a threat to self-esteem and security, or possibly perceive the stressful events as something challenging. If so, they will not be as devastating, but rather make room for personal growth (Kobasa, 1979).

In his theory, Stoltz also stresses the importance of believing in the possibility of always being able to find a solution and change an aversive situation. In other words, an individual's ability to - at all times - think that he or she is capable of influencing a situation would be the mark of people high in Control (Stoltz, 1997). It is a matter of *trying hard* enough in response to a given challenge, an ingredient closely related to commitment; if an individual is high in commitment, he or she would also be more likely involved or engaged in reaching his or her goals (Kobasa, 1979). Lastly, according to Stoltz, individuals high in control are also more likely to view an aversive event as a challenge more so than an obstacle, a point that can also be likened to the *challenge* dimension found in Kobasa's Hardiness theory.

Self-Efficacy and Control

Another concept that seems to have played a huge role in Stoltz' control dimension is Self-efficacy. The construct, as developed by Albert Bandura, relates to a person's beliefs in his or her capacity to muster the needed motivation, cognitive resources, and courses of action in order to meet given situational demands (Chen, Gully & Eden, 2001). Factors which are also stressed in

AQ's CORE dimensions, in particular its control dimension. The AQ's control signifies how well a person believes he or she is capable of positively influencing a situation. If, for instance, an individual believes he is unable to gather the necessary behavioural, cognitive and motivational resources to carry out a given task, then he or she will most likely feel the task too daunting. The lack of self-confidence will in turn cause the individual to put forth too little effort to be able to succeed in the task. In Stoltz' model lack of control causes loss of hope and a decrease in the willingness to take action (Stoltz, 1997).

Self-efficacy plays a crucial role in social cognitive theory developed by Albert Bandura. The theory identifies several basic human means by which cognitive processes related to motivation operates to initiate, execute, and maintain work behaviour (Stajkovic & Luthans, 2003). According to the theory self-efficacy beliefs vary on three dimensions believed to be crucial for human performance in organizations. The first is the magnitude of self-efficacy beliefs related to the level of task difficulty. The second dimension is the strength of self-efficacy which speaks to an individual's confidence in successfully executing a particular level of task difficulty. The third dimension is generality and is related to the extent to which the strength of self-efficacy beliefs can be said to generalize across tasks and situations. That is, some self-efficacy beliefs may remain specific to a particular task while other self-efficacy beliefs may vary or extend across domain-related tasks and situations.

However, recently there has been a focus on distinguishing between self-efficacy and General Self-Efficacy (Chen, Gully & Eden, 2001). This is because self-efficacy as defined by Bandura is a task- and domain specific cognition, while General Self-Efficacy is more related to dispositional personal characteristics (Stajkovic & Luthans, 2003). That is, instead of being specific to a given situation General Self-Efficacy is thought to be a more trait-like dimension that represents a person's belief in his or her overall competence to perform across a wide variety of different jobs and situations (Judge, Erez, et al., 1998). General Self-Efficacy can thus be thought of as a long-lasting personality trait that speaks to individual differences in their tendency to perceive themselves as either competent enough or not across a wide array of achievement related situations (Stajkovic & Luthans, 2003; Chen, Gully & Eden, 2001). Being high in

General Self-Efficacy is thus thought of as of great value for any job roles in organizations that are becoming increasingly broader, more complex and demanding. The reasons for this is that General Self-Efficacy helps keeping employee's work motivation intact, safeguarding them from any possible decrease in motivation as a consequence of failure while stressful job demands and circumstances are constantly undergoing rapid changes (Chen, Gully & Eden, 2001).

Because AQ have been postulated to predict and influence all facets of human capacity and performance it is assumed that being high in Control is not restricted to task-oriented situations but applies to all manners of aversive situations. The Control dimension seems thus more related to General Self-Efficacy.

Implications for job performance

Evidence from research on self-efficacy suggests that it is an important predictor of performance across various studies and settings (Stajkov & Luthans, 1998). In addition, Stajkovic and Luthans (1998) argue that whether or not an employee will actually initiate work behaviour, in particular if it should be in light of disconfirming evidence, as well as how much effort that will be applied and for how long this effort will be maintained, all depends on self-efficacy. Furthermore, according to Chen et al. (2001), General Self-Efficacy allows individuals to effectively adapt to new and adverse environments (e.g., during training, socialization, and organizational change). In other words, research results demonstrate self-efficacy to have strong predictive power linked to job performance, as well as other work-related outcomes (Chen, Gully & Eden, 2001).

Thus, the idea behind the Control dimension that perceiving oneself as capable and in control of an adverse event is a highly relevant element in predicting performance seems substantially supported by research results.

OWNERSHIP

The dimension Ownership explains the role of *accountability*, which measures the extent to which a person is able to rise above excessive blame, whether it is excessive blame on oneself or on others. However, the critical point is a person's added ability to grasp his or her share of

responsibility, regardless of its cause, so that initiative can be taken in order to improve the situation. In other words, recognizing one's share of responsibility in a situation leads to action. According to Stoltz, blaming is none-productive and at its worse can even be destructive. He further states that blame has in effect of destroying a person's energy, hope and self-worth. In addition, not only does it sidetrack from constructive action, but can also lead to mistrust and alienation. Especially among workers this can prove particularly devastating for any organization. In contrast, demonstrating good comprehension of Ownership creates healthy interdependence, greater agility and authentic trust (Stoltz, 2000). This positive environment in turn leads to better teamwork and greater innovation.

The Ownership dimension of the AQ theory seems at first glance a new introduction. However, Stoltz does not present any empirical data that demonstrates its significance in order to support this claim. Furthermore, upon closer view, it is possible to see a certain relation between this dimension and other constructs that are well-documented within the cognitively oriented personality psychology. One such possible related constructs is Locus of Control.

Locus of Control and Ownership

Locus of Control is a concept concerning an individual's beliefs about the nature of rewards and punishment as a consequence of particular stimuli. That is, whether they believe the responsibility for events can be related to something internally within themselves, or whether they attribute it to something externally (Larsen & Buss, 2007). Some individuals, for instance, believe that the causes behind events in their lives are due to luck or faith while some others again perceive the happenings in their lives as being governed by forces of some kind outside of their control (Hunt, 1993). Such beliefs are generally termed external Locus of Control. On the other side of the coin are the individuals who perceive the events in their lives as entirely controllable by their own efforts and actions. Such a belief is called internal Locus of Control (Judge & Bono, 2001). The term external versus internal Locus of Control was first proposed by Julian Rotter (1973) within his social learning theory and describes the two extreme ends of the

scale in Rotter's locus-of-control continuum. Individuals who perceive themselves as internally controlled are more likely to believe that reinforcement will follow certain behaviours. Consequently, they are more likely to take responsibility for their actions, and are also more likely to exhibit higher motivation and to be more task and goal oriented (Spector, 1982), factors that are also found linked to higher job performance (Barrick & Ryan, 2003).

With regards to AQ, the Ownership category highlights the importance of accountability; the capacity to see your own role in a given situation in order to take initiative and improve it. An important element is to perceive a sense of responsibility, which is also seen in the construct Locus of Control. Believing that you have responsibility, often reflects the belief in oneself as internally controlled, and not to believe that it was caused by uncontrollable others or unknown factors.

Implications for job performance

Results from past research on Locus of Control have demonstrated its link to a wide range of work outcomes (Spector, 1982). For instance, findings indicate that individuals with an internal Locus of Control often have higher levels of job performance than individuals with an external Locus of Control (Spector, 1982; NG, Sorensen, and Eby, 2006). Also, in a meta-analysis conducted by Judge and Bono (2001), results indicated that internal Locus of Control was related to job performance ($r = .22$). Furthermore, the concept has most recently been argued to be one of four other components (Self-Esteem, Generalized Self-Efficacy, and Emotional Stability) which together make for a higher-order construct labeled Core Self-Evaluation (Judge, Erez, Bono, and Thoresen, 2003). Research conducted by Erez and Judge (2001) on Core Self-Evaluation have generated results suggesting the construct to be related to task motivation as well as performance. In another study they also found the Core trait to be linked with task activity and productivity as measured by sales volume, as well as the rated performance of insurance agents (Judge, Erez, Bono, and Thoresen, 2003).

Thus, there seem to be ample support for the idea that Locus of Control; perceiving responsibility for the events in one's life, is an important factor in predicting job performance.

REACH & ENDURANCE

Reach and Endurance are the two final CORE dimensions. They are investigated together as it seems the two constructs are highly related to each other.

The first of the two, Reach, accounts for how far a person will let an adversity reach into other areas of his or her life. Its logic implies that the larger a problem is perceived to be, the greater its potential damage. Apparently, according to Stoltz, this is because a widespread problem more easily induces fear, apathy, helplessness and inaction (Stoltz, 2000). Endurance, measures how long an adversity lasts. In addition, it also measures how long the cause of the adversity will last. An adversity perceived as being permanent is thought to be far more devastating than the same adversity perceived as short-lived. Possessing the ability to see past adversities that would otherwise be thought of as long-lasting or enduring, and instead re-interpreting the adversity as something short-lived will, according to Stoltz (2001), help in strengthening one's response. For instance, being rejected for a job might be interpreted and attributed to something temporal. If so it would allow for the belief that the rejection might have been due to lack of effort, a bad match, or perhaps poor strategy, all of which would make room for adjustment in order to improve on future chances of success. In contrast, if attributing the rejection to either intelligence, appearance or other more enduring causes, it would most likely lead to defeat.

Related to Reach and Endurance is the Attributional Style theory, a revised version of Selgiman's Learned Helplessness. In addition, there seem also to be a close link to the extended version of the Attributional Style theory known as Explanatory Style.

The Attributional Style theory, Explanatory Style and Reach and Endurance

The attributional style theory suggests that humans have a natural inclination towards trying to make sense of the world. In other words, people seek meanings behind their experiences. The meanings that are being assigned to these events will in turn affect one's feelings, thoughts and

actions (Seligman et al., 1993). The theory makes a fundamental distinction between that of stable versus unstable causes of event. If the cause of an aversive event is attributed to a stable characteristic (e.g. intelligence), then it is likely to last forever and affect future similar events in the same manner. However, if attributing the cause of an aversive event to unstable characteristics (e.g. a bad day) then the outcome might turn out differently for future events (Atkinson, 2000). A later extended version of the Attributional Style theory, labeled Explanatory Style, is related to the manner in which people differ in their habitual ways of explaining bad events in their lives. More specifically, the Explanatory Style tries to account for the negative effects associated with the different types of habitual responses made. For instance, if an individual has a habit of interpreting every bad event in his life through explanations that are *stable* in time (it's going to last forever), are *global* (affecting many areas of their lives), and *internal* (it's my fault), then it is believed that the individual is engaging in a pessimistic explanatory style. For these individuals, negative events only induce helpless and depressed responses. In contrast, if the individual habitually associates the bad events to *unstable*, *specific* and *external* causal explanation, then the person's explanatory style would be more on the optimistic side. In short, individuals with a pessimistic explanatory style often find themselves in difficult situations when encountering bad events (Seligman et al., 1993). The global element of the explanatory style; letting an aversive event affecting many areas of one's life, is closely related to Stoltz' Reach dimension. In his theory Stoltz describes how catastrophizing an adversity prevents proper action because such a response can only lead to fear and worry. In contrast, perceiving a problem as small or limited will make it less intimidating to face, and also less daunting. A person with high AQ then, is a person who is able to limit the reach of any adversity and take the needed actions in order to improve an unfavorable situation (Stoltz, 2000). Lastly, the stable element of the explanatory style describes the same phenomenon as Stoltz' Endurance dimension which purports that the longer an aversive event is perceived to last, the more devastating it will be. The last element of the explanatory style; the internal element which relates to self-blame, seems to have been incorporated into the Ownership dimension of Stoltz' CORE concept. As previously mentioned, blame as described in Stoltz' theory and defined in the

Ownership dimension, prevents proper response and consequently is thought to be non-productive. Thus far it seems similar to the internal element of the explanatory style. However, the internal element addresses only the negative effects of blaming oneself while according to Stoltz blame in itself, regardless of who is to blame will have an overall bad or negative effect because it prevents a person from taking responsibility of the situation at hand and thereby improve it. However, there have been virtually no studies or empirical rational presented by Stoltz or otherwise that supports this deviation from the original explanatory style theory. On the other hand, a few studies have been done that indicates a link between the explanatory style and job performance.

Implications for job performance

In an experiment conducted by Peterson and Villanova (1988), 140 undergraduates had their explanatory styles first measured before they returned one month later to describe four of the worst events they had encountered during that time. They were also told to rate the bad events they had encountered according to how long-lasting and widespread they felt the consequences of the bad events had been. Scores across the four events were then averaged to yield composite scores.

Results from this study revealed that both stable and global explanatory styles predicted long-lasting consequences, with global explanatory style predicting pervasive consequences in addition. Internal explanatory style did not show any relation to either chronicity or generality of the consequences of bad events. The general findings in this study are consistent with the attribution theory (Seligman et al., 1993).

Another study conducted by Anderson (1983) measured how explanatory style affected an individual's persistence following failure. Participants who were found to have a pessimistic explanatory style (internal, stable and global causal explanations) had subsequent difficulties when they were later asked to recruit blood donors through phone calls. Their first call was to a confederate who was instructed to turn down the request. Thus, all participants failed in their first attempt. When they were then given several phone numbers to try for new recruits, participants

with a pessimistic explanatory style demonstrated lower expectation of success, were also more passive, making fewer phone calls and were not as successful at obtaining volunteers as were participants who had not exhibited a pessimistic explanatory style.

These study results suggest that there might be a close relation between explanatory style and that of job performance. Particularly, as also previously mentioned, it indicates that people with an optimistic explanatory style are less prone to show motivational deficits, i.e., withdrawing from task-oriented behaviours and lowering their efforts. Conversely, individuals with a pessimistic explanatory style are more likely to show symptoms of helplessness (Judge & Bono, 2001). These results lend strength to Stoltz' own theory as it clearly borrows heavily from this literature. However, as a fairly newly developed theory it lacks a discussion on how it improves upon the already existing body of knowledge with regards to predicting job performance.

SUMMARY

In summary, this paper suggests there to be several theoretical linkages among CORE dimensions and other more well-known personality constructs. To reiterate, it suggests that the dimension Control is highly related to the constructs Learned Helplessness, Hardiness and Self-Efficacy. Both Learned Helplessness and Hardiness have one thing in common; the importance of perceiving a sense of control. In Learned Helplessness, if a person thinks he or she has no control over an aversive event the outcome will eventually be a feeling of helplessness and apathy. For the Hardiness theory, a person who is low in perceived control typically leaves things to destiny and thus less likely to confront a problem. These are elements that are also reflected in AQ's Control dimension. With regards to Self-Efficacy, it stresses a person's confidence in executing actions and behaviours. The Control dimension also points out a person's perceived ability in changing an aversive event.

Furthermore, Ownership was suggested to have a small relation with Locus of Control in that both include a person's perception of responsibility for events in her or his life. However, it

is worth noting that Locus of Control could also be suggested to reflect the Control dimension because both constructs seem to include the degree to which individuals perceive they can control events in their lives. In addition, in past literature researchers have also argued Locus of Control to be strongly related to Generalized Self-Efficacy. For instance, Judge, Locke, Durham and Kluger (1998) suggested that both underlie a higher order construct called Core Self-Evaluation. Locus of Control thus seems to share elements with both Control and Ownership.

Reach and Endurance were suggested to reflect the reformulated version of Learned Helplessness, the Explanatory Style.

HOW IS CORE LINKED TO BIG FIVE?

An important issue to address with the formation of a new conceptualization is its relation with other more established constructs. Thus it is essential to take a closer look at the CORE dimensions and its relationship to the Big Five. According to Stoltz, AQ defines an individual's way of handling negative and stressful events. At least one of the Big Five dimensions describes the same phenomenon; Emotional Stability. In particular, one of the narrow facets of Emotional Stability is Anxiety. Individuals scoring high on Emotional Stability are thought to be less prone to worry about and dwell on negative things. In the same token, individuals scoring high on Reach and Endurance are also less prone to worry too much and letting a negative events linger for too long. Furthermore, according to Stoltz, individuals scoring high in Control are persistent and agile individuals who never give up but always find a solution despite facing difficult situations. Similarly, the Big Five's Conscientiousness dimension is thought to be associated with Accomplishment striving. Individuals scoring high on Conscientiousness are related to planfulness and achievement striving (Barrick & Mount, 2003) which would also make them more likely to exert greater effort and be more committed to their goals, which, according to Stoltz, is also what characterizes a person high in control; to be persistent and relentless until reaching one's goal is to be committed.

In addition, some of the personality constructs discussed above have also been linked to the Big Five in past research. For instance, both Locus of Control and General Self-Efficacy have been theoretically linked to Emotional Stability (Judge, Erez, Bono, and Thoresen, 2002). Furthermore, in a meta-analysis conducted by Judge and Illies (2002) they found Self-Efficacy to be related to Emotional Stability at .35. In other words, research literature on the relevant constructs and Emotional Stability suggest that they are highly related and in fact perhaps even share a common core (Judge, Erez, Bono, and Thoresen, 2002).

DOES AQ PROVIDE ANYTHING NEW?

According to Stoltz the CORE dimensions of AQ define an individual's ways of action. Only by thoroughly understanding one's CORE will one be able to begin to change and strengthen virtues like tenacity, discipline, courage and mastery. And in the same breath, increase one's innovation, agility and performance. Clearly, in Stoltz' view, knowing one's CORE is essential (Stoltz, 2000). What precisely though, leads to the conclusion that one's CORE is so indispensable? Stoltz claims AQ to be the most important factor in achieving success. However, he does not specify what precisely makes AQ such an important predictor of success. To this day, there has been general agreement among personality psychologists that the Conscientiousness dimensions of the Big Five is the one that has frequently yielded consistent results concerning personality traits in relation to job performance. Furthermore, though all of the above mentioned concepts - Learned Helplessness, Self-Efficacy, Hardiness and Locus of Control - are concepts that have previously been investigated with respect to work-related outcomes, not all qualitative reviews in this field have yielded consistent results, although there is a significant theoretical support for such relationships (Judge & Bono, 2001). More specifically, though, these concepts are not new to the field. In addition, some of these concepts are said to also be heavily linked to the more established Big Five, for instance, Self-Efficacy and Locus of Control (Judge et al., 2002). If these concepts are subsumed by the Big Five dimensions, then perhaps AQ is not providing anything new.

So far there seem to be overall lack of any AQ research published in peer-reviewed scientific journals. There are no known studies published independently of *Peak Learning Inc.* in which psychometric analysis of the AQ construct have been conducted. For instance, there have been no reported studies with factor analysis that might confirm the factor structure of the AQ construct. Thus, there is not much empirical data provided concerning the reliability, validity and generalizability of the AQ construct. There exist a few brief summaries of performance studies provided as a technical supplement package at *peaklearning.com* which purportedly testifies to its validity work (Technical Supplement of AQ, 2000). In addition, a few studies have also been conducted for this purpose. One of these studies involved AQ and performance at Deloitte & Touche (D&T). The study reported statistically significant results which indicated a positive relation between AQ and performance. However, there were a number of shortcomings to the study. For instance, the researcher did not make available data concerning what performance measure was used, nor did they report any data relating to its reliability and validity. Moreover, the study did not make available adequate details with regards to the type of procedure for the entire study. The reported results of this study should therefore be regarded with caution (Angelopoulos et al., 2002).

AIM OF THE PRESENT STUDY

The aim of the present study is to firstly investigate the empirical validity of ARP. And secondly, to conduct an empirical evaluation of the ARP measurement and provide results with regards to its reliability, which is a necessary, albeit not sufficient condition for construct validity (Judge, Erez, Bono and Thorezen, 2003). Furthermore, ARP's convergent and discriminant validity will be explored in order to assess the construct validity of this measure. The convergent validity will be done through investigating the correlation between ARP's CORE constructs with other more established personality traits, while its discriminant validity will be examined through evaluating its relation to some of the dimensions in the Big Five. Finally, it is important to ask

whether CORE represents anything unique despite some of its similarity to the five-factor dimensions.

This is the first study to date, which is known of, that seeks to examine the conceptualization of AQ and its ARP measurement by ways of comparison with the Big Five. Furthermore, this study also aims to see whether AQ can predict performance, and if it does, whether it can predict performance better than the Big Five. With regards to the Big Five it is expected that Conscientiousness be related to performance as it has consistently emerged as a predictor in past research. However, as this study was conducted in a job environment which stresses teamwork and overall high level of social skills it is also expected for the dimensions Extraversion, Openness to Experience, and Agreeableness to show significant relation to performance. In addition, because these latter traits of the Big Five are hypothesized to play a more salient role for this particular work setting, the other two traits, Conscientiousness and Emotional Stability, are expected to show a somewhat lower relation with job performance than previous findings have indicated. This also means that AQ, which focuses on handling adversities and thus should be closely related to Emotional Stability, is also expected to play less of a role in predicting job performance for this particular work setting. Finally, this study also seeks to evaluate a possible support for the validity of the ARP. The hypotheses are as follow:

AQ and AQ-related personality traits:

1. General Self-Efficacy will correlate positively with Control
2. Anxiety will correlate positively with Reach and Endurance
3. Diligence will correlate positively with Control and Ownership.

AQ and the Big Five:

4. Control and Ownership will correlate positively with Conscientiousness.
5. Reach and Endurance will correlate positively with Emotional Stability

AQ-related personality traits and performance:

6. General Self-Efficacy, Anxiety, Locus of Control, and Diligence will correlate positively with job performance

AQ and performance:

7. AQ will show a lower correlation with performance than the Big Five.

The Big Five and performance:

8. The five dimensions of the Big Five will correlate positively with job performance

METHOD

SAMPLE AND PROCEDURE

The data used in this study were collected from two independent samples. In the first subsample a total of 100 participants were invited in the study. Out of the 100 there was a 35 % response rate, resulting in N=35. The data were gathered for the purpose of investigating any possible linkages between ARP and Big Five and their ability to predict job performance. Furthermore, the data also made possible the examining of ARP and Big Five with relevant other personality traits related to both Big Five and ARP. These are self-efficacy, Locus of Control, Diligence, and Anxiety.

The sample consisted of 35 employees at Det Norske Veritas (DNV) (15 females, 18 males) participated in the subsample. Participants in this study worked as consultants within risk management, a job demanding good balance between product sales, quality and delivery, which translates into selling as much as possible together with high quality consultancy services that meet their customers' expectations, which includes building good customer relationships. The employees received a request to participate through e-mails in which they were given a link to web-based questionnaires. All participants were informed of the purpose of the study. To encourage participants into taking part they were given the opportunity to receive a general personality profile based on their BFI results. In addition, the option for a more detailed feedback on their BFI scores was also made available for those who did not mind disclosing their identity. Participants were also further informed that their individual responses would be treated anonymously and remain completely confidential (see Appendix C).

Secondly, in order to investigate the psychometric properties of ARP a minimum of 100 participants were required. For that purpose an additional sample of 65 participants were recruited. These were added with the 35 participants from the sub sample, making the total number of participants 100 (N = 100).

The additional 65 participants recruited for the psychometrical data consisted of leaders employed at DNV (12), priests employed at Svenska Kyrkan (33), and additional employees at Nordea (11), Rubberduck Medialab (4), Curious (3), and Halogen (2). All 65 respondents were obtained through CORE Learning Inc. There were altogether 26 females, and 39 men. The questionnaires were administered through mail. Subsequent completed questionnaires were returned through postage-paid envelopes. For the purpose of investigating various aspects of consistency and reliability of the ARP measure, data on ARP scores from the sub sample were also included, making it 98 respondents in total, which is the minimum sample size required to run factor analysis.

MEASURES

The Big Five. The Big Five was measured using the 44-item Big-Five Inventory (BFI) (John et al., 1991). The instrument was chosen because it has been estimated to take no longer than approximately 5 minutes to complete (Gosling, Rentfrow, & Swann Jr., 2003). Because participants in this study would be asked to complete three additional questionnaires, measures had to be taken to ensure they would not find these too long and tedious. It was important that participants would not feel excessively burdened by having had to complete so many questionnaires. The BFI does not use single adjectives as items, but rather, it chooses certain prototypical trait adjectives of the Big Five as the item core and adds additional clarifying and contextual information through short and simple-structured sentences. Developed with the purpose of measuring the five dimensions in an efficient and flexible manner it has been estimated to take no longer than five minutes to complete (Gosling, Rentfrow & Swann Jr., 2003; Benet-Martinez & John, 1998). Alpha reliabilities of the BFI scale have been reported to be

above .80 on average (Benet-Martinez & John, 1998). In this study the questionnaire provided reliable scores for the five scales in the present sample, ranging from $\alpha = .76$ to $\alpha = .82$ (see Table 1).

Adversity Quotient. To measure an individual's level of AQ the instrument Adversity Response Profile (ARP) was used. Being the only means by which to measure AQ it is hypothesized to be an accurate measure of an individual's automatic response patterns to all manners and types of adversity (Angelopoulos et al., 2002). The instrument consists of fourteen scenarios, each of which is followed by four questions that are subsequently scored on a five-point bipolar scale (Angelopoulos et al., 2002). Example items include, "You miss an important appointment," with subsequent question "(a) To what extent can you influence what happens next?" to which an individual is to answer by choosing a score between 1 to 5, where 1 equals "not at all," and 5 equals "completely". Only ten out of the fourteen scenarios are taken into account upon calculating an individual's total AQ level (Stoltz, 2000). It has not been specified the exact purpose as to why the extra items are included when they are not counted for. However, it is thought probable that they are there to distract the respondent from understanding how to reach the highest score by understanding the logic behind the items.

AQ-related personality traits. This is an instrument put together by using items taken from the International Personality Item Pool (IPIP), and was used to measure the traits Locus of Control, Diligence, and Anxiety in the sub sample (see Appendix A). The Locus of Control scale contained 14 items (e.g. "Take the initiative," "Just know that I will be a success"). The Diligence scale contained 10 item (e.g. "Push myself very hard to succeed," "Complete tasks successfully"). And lastly, the Anxiety scale contained 11 items (e.g. "Worry about things," "Get caught up in my problems"). All these personality scales provided reliable scores, with alphas ranging from .81 to .86. General Self-Efficacy was also added in this instrument (see Appendix A). However, this trait was measured with items from the New General Self-Efficacy Scale (NGSE) of Chen et al. (2001). Example of items in this measurement include such as "I will be able to achieve most of the goals that I have set for myself," and "I will be able to successfully

overcome many challenges” (see Appendix A). The NGSE in this study exhibits an internal consistency reliability of $\alpha = .81$

Job Performance. In the sub sample job performance was measured by means of the firm’s (DNV) Annual Performance Score, which is a scale from 1-4, where 1 = development needs, 2 = meets expectations, 3 = exceeds expectations, and 4 = excellent. The scale is a compilation of an employee’s annual sales record in addition to an average of the last three years ratings. These items were then averaged into one objective performance score ($\alpha = .70$). In addition to the objective performance score it was thought necessary to include a self-rated measurement of performance. In cooperation with DNV it was deemed that the Annual Performance Scores might not be a sufficient measurement of job performance; the middle scores, 2 and 3, could be somewhat vague and employees balancing between a number 2 and number 3 might receive either score on a random basis. Furthermore, prior research using both subjective and objective ratings of performance have yielded quite different results (Barrick & Mount, 1991) indicating that the two do not necessarily correlate and thus might be two different measurements. Participants were thus to fill out a self-rated job performance questionnaire which contained six items particularly related to the participants’ job at DNV. These items were also created in cooperation with DNV. The intention was to create a performance measurement that would reflect important aspects of the work environment at DNV. Participants were instructed to compare themselves to other colleagues in their unit, and answer how effective they think they were in various situations. Examples include statements such as “Compared to your colleagues in your unit, how effective are you in “Meeting the various project requirements set by DNV?” and “Meeting the demands of your client?” The reliability for this scale was $\alpha = .73$ in the sub sample. The objective and subjective ratings of performance were found to be weakly related ($r=.13$).

Finally, all measurements used in the study with DNV employees as participants, were in their original English language. There was no attempt at trying to translate the questionnaires into Norwegian as using English within their DNV work setting was quite common.

RESULTS

ARP AND PSYCHOMETRIC ISSUES

Factor structure of ARP. A Principal Axis Factoring of ARP was conducted on the entire sample (N=100) with SPSS 15.0 in order to explore the extent to which the item scores from each scale in ARP were unidimensional. Due to a low subject item ratio each CORE scale had to be analyzed separately as a factor analysis require a minimum of five subjects per item (Pedhazur & Schmelkin, 1991), and the entire questionnaire consists of 40 items, which in turn would require at least 200 subjects. Results from a factor analysis conducted on each of the CORE dimensions, suggested most of the scores to be unidimensional. For the Endurance dimension it seems like there could be two factors. However, a Scree Plot indicated that it is not impossible to regard these as relatively unidimensional (see Appendix B). An additional factor analysis of the sums of the scale scores for the four CORE dimensions indicated each to have a high factor loading on the same factor. For the Reach dimension, however, it seemed possible to be more than just one factor loading, however, these were quite weak and there was obvious one very strong factor in comparison (see Appendix B).

Reliability. In order to estimate the reliability of the scores provided by ARP, Cronbach's alpha was used. Cronbach's alpha is a means by which to assess internal consistency among scores from a scale upon a single test administration. Results from the analysis revealed the CORE scales to have high alpha values ranging between .81 and .83 (see Table 1). Scores on the overall AQ scale revealed a Cronbach's alpha of .80. The internal consistency of the CORE scale is thus satisfactory (Walsh & Betz, 1995).

CONVERGENT AND DISCRIMINANT VALIDITY

For a new scale to demonstrate construct validity its convergent and discriminant validity must be assessed. Convergent validity is the extent to which measurements that are thought to be theoretically related to each other also actually demonstrate the expected relations. Discriminant validity is the extent to which measures that are not theoretically related also demonstrate that

they are not related. This can be done through investigating whether the constructs in question correlate with measures of other constructs in the manner proposed in theory (Judge, Erez, Bono & Thoresen, 2003). In the present study, the Big Five and some more specific personality constructs will serve as criteria for convergent and discriminant validity.

However, before going into details of the results, it should be noted that one of the participants were removed from the total sample of 35 participants. This was done after conducting a scatter analysis in which results revealed there to be one particular participant deviating strongly from the rest of the group, suggesting that this subject was an outlier. The scatter diagram further revealed that the participant had an unusually high score on the subjective performance score, while scoring very low on Control (see Appendix B). On further inspection it seemed probable that this person might not have been aware that, for some of the item questions, the measurement scales in the questionnaire were reversed. Because the total sample size of this study is very low, one outlier can markedly affect the results. It was thus deemed best to remove the participant from the entire sample.

AQ and AQ-related personality traits. According to theory, it was expected that the AQ would correlate with the four more specific personality traits: General Self-Efficacy, Locus of Control, Anxiety and Diligence. More specifically, it was hypothesized that the Control dimension of the CORE scale would correlate positively with the traits Diligence and General Self-Efficacy. The Reach and Endurance variables were hypothesized to correlate negatively with the trait Anxiety. Indeed, the Reach and Endurance dimensions of AQ's CORE scale were found to correlate negatively with Anxiety, -.58, and -.63 respectively ($p < .01$). Locus of Control was not found to correlate with Control. However, it did show a positive correlation with Ownership. Finally, no correlation was found between Control and General Self-Efficacy or between Control and Diligence. Overall CORE scales thus showed substantial convergence with three of the four traits it was hypothesized to correlate with.

AQ and the Big Five. It was also expected for the CORE dimensions of AQ to be highly correlated with two of the Big Five traits, these being Emotional Stability and Conscientiousness. More specifically, it was expected for Control and Ownership to be related to Conscientiousness,

though Ownership less strongly than Control. Reach and Endurance were expected to correlate with Emotional Stability. As results show in Table 1, Control and Ownership did not correlate with Conscientiousness. However, as expected, Reach and Endurance were significantly correlated with Emotional Stability, i.e., $r = .45$ for Endurance and Emotional Stability, and $r = .49$ for Reach and Emotional Stability ($p < .01$). Overall AQ was also found to correlate positively with Emotional Stability, albeit less highly correlated, $r = .38$. Overall, though, there seem to be strong convergence with Emotional Stability. The correlations of the remaining three traits of the Big Five were expected to indicate the discriminant validity of the ARP. Openness, Agreeableness and Extraversion were not expected to show any significant relation with the CORE dimensions of ARP. However, it is interesting to note that all CORE dimensions were found to significantly correlate with Extraversion ($r = .53$, $r = .44$, $r = .44$, $r = .51$ respectively for the four CORE dimensions), findings that subsequently may weaken its discriminant validity. Finally, as shown in Table 1, the relationship of ARP's CORE dimensions with Agreeableness and Openness were found to be relatively weak and nonsignificant.

Overall, only CORE's relationship with Emotional Stability and two of the four investigated traits adhered to theoretical expectations. However, it should be noted that Locus of Control did show a moderate correlation with both Reach and Endurance, $r = .45$, and $r = .40$ respectively, which supports the validity of the latter constructs.

AQ-related personality traits and performance. The AQ-related personality traits and their relation to performance were also studied in order to investigate their strength in predicting performance. Because the traits General Self-Efficacy, Locus of Control, Diligence and Anxiety have all been reported in past literature to share a link with job performance it was hypothesized that these traits would also demonstrate low to moderate correlations with job performance in this study. Anxiety was expected to show a moderate correlation because it is a lower order facet of Emotional Stability, while Diligence, which is another word for meticulousness, thoroughness, and persistence, was seen as a facet of Conscientiousness (Conscientiousness and Diligence were also found to highly correlate revealing an $r = .67$). Indeed, as Table 1 shows, all the AQ-related personality traits correlated positively with self-rated performance, i.e., $.55$, $.45$, $.35$, for Generals

Self Efficacy, Locus of Control, Diligence, respectively while Anxiety was found to have a negative correlation of $-.36$. None of these personality traits, however, did correlate with objective performance. This may indicate that if ARP is a good way of operationalizing the four AQ-related personality traits, then it may be good reason to believe that ARP will also correlate with job performance.

AQ and performance. For the purpose of this study it was claimed that one's overall AQ predicts performance, and because some of the underpinnings that was found to be of great importance to its development and also quite prominent in its framework had been linked to job performance, it was expected that AQ would at least moderately predict job performance. As can be seen in Table 1, the correlation matrix reveals there to be a positive correlation of $r = .43$ between AQ and the subjective ratings of performance. However, there was no correlation between overall AQ and the objective job performance scores. Furthermore, both the Endurance and the Ownership dimensions of the CORE scale revealed a positive correlation with subjective ratings of performance ($r = .36$, and $r = .51$, respectively), but none with objective job performance. The remaining CORE dimensions: Control and Reach, were not found to have any significant relation with either self-rated job performance or objective performance.

The Big Five and performance. In contrast to AQ the Big Five has been well documented in past research as predictive of performance. In particular Conscientiousness has consistently emerged as the one trait that has most often been linked to performance. It was thus also expected in this study that Conscientiousness would predict performance with a correlation that would be moderate in magnitude. Emotional Stability was also expected to show a low positive correlation with performance as it has been reported to exhibit a small but consistent impact on job performance. The traits Extraversion, Openness and Agreeableness were anticipated in this study to show a moderate relation with job performance. As can be seen in Table 1, Conscientiousness revealed a moderate correlation with subjective ratings of performance, $r = .43$. Openness correlated positively with both subjective and objective performance, $r = .41$ and $r = .38$, respectively. Extraversion displayed a very low correlation of $r = .30$, while Agreeableness and

Emotional Stability were essentially unrelated to both subjective and objective performance ratings.

In sum, the Big Five displayed the expected correlations with performance with a few exceptions; apart from Openness to Experience none of the dimensions correlated with the objective ratings of performance. In addition, Emotional Stability did not meet the expected correlations with either performance scores.

INCREMENTAL VALIDITY

In order to investigate whether ARP had any incremental validity over The Big Five, various regression analyses were conducted. The five traits were first entered as a block into the regression analysis. The criterion domain used was the subjective ratings of performance. As can be seen in Table 2, the results suggest that the Big Five explains 35% of the variance in performance ((Adj. $R^2 = .347$, $F(5, 27) = 4.398$, $p = .005$)= .40). The AQ total score was then entered as a second step in the regression analysis. As can be seen in Table 2, the results indicate that AQ is not significantly related to Job Performance, and does not have any incremental validity ($\Delta R^2 = .037$, $F(1,26) = 1.881$, $p = .182$). Second, to investigate whether each of the CORE dimensions might have any incremental validity, each CORE dimensions were added to the regression analysis at a time. This procedure was then repeated for all four CORE dimensions. The results show that only the Ownership displayed incremental validity over Big Five, explaining an additional 8% of the variance in performance ($\Delta R^2 = .076$, $F(1,26) = 4.158$, $p = .052$). In addition, another regression analysis was conducted to see whether CORE alone could explain any variance in performance. Thus, only the CORE dimensions were entered in the same analysis. Results from this analysis indicate that the CORE dimensions explain 23% of the variance in performance (Adj. $R^2 = .229$, $F(4,29) = 3.452$, $p = .020$).

DISCUSSION

ARP AND PSYCHOMETRIC ISSUES

Because all the item scores seemed to load on one factor, results from the factor analysis suggest the CORE constructs to be unidimensional. In addition, alpha values on all the CORE scales indicate a satisfactory internal consistency. However, it still remains to see whether the scales measure what they are intended to measure.

CONVERGENT AND DISCRIMINANT VALIDITY

The main purpose of this study was to assess the construct validity of ARP by comparing its possible convergence with other more established personality traits thought to be related to AQ (General Self-Efficacy, Locus of Control, Diligence, and Anxiety), and its possible discriminant validity with the Big Five trait dimensions. In other words, it aims to see whether the claim that AQ predicts performance can be empirically supported. In addition, if it did predict performance, to also see whether ARP could predict performance better than other more established traits or constructs in past research, and of these most notably the five trait dimensions of the Big Five. However, an important note here is the separation of the criterion domain into subjective ratings and objective ratings of performance, have yielded completely different results. Clearly, these are two different measurements (as the low correlation between them also indicates). However, with regards to which of the two measurements would be most valid and thus useful, is less clear. On the other hand, this is not very surprising and is, in fact, in line with previous findings of Barrick and Mount (1991) who reported their indicators of Conscientiousness to have a somewhat greater impact on subjective ratings than on different types of objective ratings. The same findings were also reported by Salgado (1997). Nonetheless, the present study will take into account both the subjective and objective performance ratings. With that in mind, the results do indicate, *firstly*: AQ was not able to predict job performance as no correlations were found between performance and AQ. *Secondly*: the results replicated previous findings by other researchers that Conscientiousness predicted subjective ratings of performance. However, Openness to

Experience indicated an almost equally high relation, while Extraversion displayed a more moderate correlation. Emotional Stability and Agreeableness were not found to correlate with performance at all. However, these results do indicate that in large parts the Big Five is able to predict performance. *Thirdly*: The findings that two of CORE's dimensions, Control and Ownership, did not correlate as expected with the more specific traits General Self-Efficacy and Diligence, may have important implications for ARP's validity. *Fourth*: There is a close relation among Reach, Endurance and Emotional Stability. There was also an unexpected correlation between Reach and Endurance on the one hand, and Extraversion on the other. These findings raise concern with regards to ARP's discriminant validity as it was not expected that ARP should correlate with Extraversion. *Finally*, there was an overall moderate correlation among all the AQ-related personality traits and performance, findings that might shed some light on the potential impact of AQ on job performance. A further discussion on the relevant points of the overall findings is presented to evaluate AQ and the subsequent usage of its ARP instrument.

ARP and performance. On the whole, results in this study suggest that AQ, as operationalized through ARP, does predict job performance as hypothesized. The findings alleviate concern that the AQ theory claimed to predict performance without empirical grounds. On the other hand, the findings also indicate that not all the CORE dimensions seem relevant with regards to predicting performance. In particular, the Control and Reach dimension did not display any significant relations with either subjective or objective performance scores. This could indicate that the two dimensions are not adequately represented by ARP. Indeed, in theory it was argued that Control would demonstrate significant relations with several other established personality traits. These being, General Self-Efficacy, Diligence and Conscientiousness. However, the results indicate that there are no significant relations between Control and any of the theoretically related traits. It did, however, display a negative relation with the trait Anxiety ($r = -.35$). These results could be interpreted as supporting the idea that the Control dimension, as operationalized through ARP, does not measure what it is intended to measure. In addition, although the Reach dimension displays the expected relations with both Emotional Stability and Anxiety, it seems a rather irrelevant dimension for this particular setting. Both Ownership and

Endurance demonstrated a positive correlation with subjective performance. In particular Ownership displayed a strong relation, which might indicate its significance. It appears that perceiving responsibility over an event is an important element in predicting performance, as this scale also predicted performance after controlling for the Big Five.

The Big Five and performance. In addition to AQ it was also hypothesized in this study that the personality measures Conscientiousness and Emotional Stability of Big Five would correlate positively with job performance. Indeed, in accordance with the hypothesis, Conscientiousness did demonstrate the expected relations. However, it did so only for the subjective performance ratings, but not for the objective ones. Thus, replicating Barrick and Mount's (1991) findings. A more unexpected finding was the non-correlation between Emotional Stability and performance. In past literature researchers have reported a low, but stable correlation between the two variables (Judge et al., 1999; Hurtz & Donovan, 2000). It also seems intuitive that being calm and well adjusted would have a positive impact on performance. However, interestingly it has also been argued that the Emotional Stability dimension of Big Five might be too narrow in scope to be applicable in work contexts (Judge, Erez, Bono & Thoresen, 2003). Researchers debating this issue have suggested that measures of Emotional Stability focus too much on traits that originate from psychopathology which makes it less relevant when it comes to predicting criteria like job performance (Hogan & Roberts, 2001). Judge et al. (2003) have thus proposed a measure that would focus more on capabilities and control (Judge, Erez, Bono & Thoresen, 2003). It seems likely that these particular facets of Emotional Stability would also be more relevant in work settings like DNV where problem solving is an important asset.

As for Extraversion and Openness to experience, both indicated a positive relation with job performance, results that were consistent with the hypothesis. The low correlation between Extraversion and the subjective performance scores might be attributed to the rather low sample size. That is, if the sample size were larger results might have indicated a more significant relation.

A rather interesting find is the relation between Openness to Experience and the subjective ratings of job performance, which is equally strong as the relation between

Conscientiousness and subjective job performance. In addition, Openness to Experience was also found to correlate with objective ratings of job performance. Although the strength of the correlation was low it does indicate the importance of the trait with regards to predicting job performance in DNV. The results might be interpreted as supporting the argument that different types of jobs are variously affected by different personality dimensions (Hurtz & Donovan, 2000). For jobs involving a great deal of interpersonal relations and perhaps coupled with problem solving, it appears that Extraversion (being active, surgent, and sociable), and in particular Openness to Experience (being intellectual, imaginative, and autonomous), have important impacts on performance. In short, although not all of the dimensions of Big Five were able to demonstrate a relation with job performance, an important finding was that the results indicate the model was able to assess the relevant personality traits that seem important in predicting job performance at DNV. However, thus far, it seems both the BFI, and thus the Big Five, and ARP was able to predict job performance equally well. However, whether the ARP measurement is a good representation of the AQ framework remains to be seen. For this purpose, an investigation of the convergent and discriminant validity of the ARP was conducted from which it was possible to infer whether the scale scores of the instrument in effect measure the construct they were intended to measure.

AQ and AQ-related personality traits. The results revealed that the constructs Control did not exhibit the expected relations with other more established psychological constructs that were thought to essentially measure the same characteristics. More specifically, there was no link between Control and the two traits Diligence and General Self-Efficacy. This could be interpreted as evidence that the Control scale is not efficiently represented in ARP. On the other hand, Ownership was found to correlate positively with Locus of Control, as was hypothesized. In addition, the Endurance and Reach dimensions were both found to correlate negatively with Anxiety and to be positively correlated with Emotional Stability, which is also in line with the hypothesis. These findings shed some light on the validity of the ARP. It seems three of the four constructs were found to display convergent validity, while only one did not correlate as expected.

AQ and the Big Five. One area of concern is that ARP's total score seems to overlap with Emotional Stability, conceptually and empirically. Because of the CORE construct's correlation with Emotional Stability, it is relevant to ask whether AQ is simply Emotional Stability but under a different label. If they are very similar then perhaps CORE does not measure any other characteristics than Emotional Stability. Also, another relevant aspect is ARP's total score and its relationship with other traits in the Big Five.

A closer look on the theory of Reach and Endurance does not provide any new information that is not covered by Emotional Stability. Reach have been explained to be a person's habit of letting adversity affect other areas of one's life, while Endurance translates into how long the adversity is allowed to linger and disturb one's well-being. In the same token, a person scoring low on Emotional Stability (high on Neuroticism) is thought to constantly worry and grumble about things as well as being overwhelmed and getting caught up in problems (the International Personality Item Pool). Furthermore, according to Judge et al. (1999), people who frequently experience negative emotions have a habit of dwelling excessively on their failures. In essence Reach and Endurance seem to fall under the Emotional Stability umbrella.

Furthermore, The CORE scale did not, demonstrate any relation with Conscientiousness. More specifically, it was hypothesized that Control would correlate with Conscientiousness as in theory, the two were seen as quite similar concepts. The fact that they did not correlate might shed some light on the validity of ARP. Perhaps this scale does not measure what it is intended to measure. Ideally, it should demonstrate low to moderate correlation, but in addition also reveal something unique which could perhaps explain additional information. However, as results have shown, Control might not be effectively represented in ARP, and thus it might quite possibly be an unreliable source. However, a theoretical investigation of the two concepts does not reveal Control to include anything new or unique and thus it can arguably be seen as merely reflecting Conscientiousness. Another important note at this point is the fact that the findings indicate that Conscientiousness was able to predict performance at least for the subjective ratings of performance, in contrast to Control which did not display any correlation with either subjective or objective performance scores. As the two concepts are thought to be strongly related they should

also, to a certain extent, demonstrate the same relations. However, the findings suggest Control, as operationalized by ARP, to be unrelated to performance.

Concerning remaining three traits of the Big Five - Agreeableness, and Openness to Experience did not display any relation with any of the CORE dimensions, which is in line with the hypothesis and might testify to its discriminant validity. However, with respect to Extraversion, results indicate an unexpected correlation between the trait and all four CORE dimensions, suggesting that these share common elements. In addition, overall AQ is also highly correlated with Extraversion. This is an interesting finding, as Extraversion was hypothesized to correlate positively with job performance, in particular because the job environment set by DNV focuses on interpersonal relations and teamwork. This finding might also help in explaining the correlation between AQ and performance. However, these results also indicate ARP to be less unique inasmuch as it did not completely diverge as expected with all of the five dimensions of the Big Five. In other words, this finding weakens the discriminant validity of the CORE scale as measured by ARP.

AQ-related personality traits and performance. Another interesting aspect of the results is the relations between the AQ-related personality traits that were hypothesized to correlate with the CORE scale of ARP and job performance. All of the four - General Self-Efficacy, Locus of Control, Anxiety and Diligence – displayed at least moderate correlation with subjective performance scores. In particular, General Self-Efficacy demonstrated a strong positive correlation, $r = .54$. Also, an additional noticeable aspect of these findings was the negative relation between Anxiety and performance because Anxiety is a facet of Emotional Stability and Emotional Stability, in contrast to Anxiety, demonstrated no relation with job performance. Perhaps, then, only the Anxiety part of Emotional Stability is an important element in predicting job performance in this particular work setting. Being constantly worried and brooding too much on bad events might actually hinder problem solving and perhaps even create negative moods which in turn might have a negative impact on interpersonal relations, which is an important aspect of DNV. This supports the idea that perhaps more research concerning the relation between performance and the narrower facets of the Big Five trait dimensions should be

conducted, as suggested by Hurtz & Donovan (2000). Finally, the results show that the AQ-related personality measurement was also able to predict job performance. This could be interpreted as a strong support for the theoretical framework of AQ. In other words, the constructs referred to in the AQ theory may be important for performance, but the ARP is not measuring these constructs optimally.

INCREMENTAL VALIDITY

In addition to demonstrating good validity concerning its correlations with various criteria, a newly developed measurement should also demonstrate incremental validity above existing measures. As results from Table 2 indicate, 35% of the subjective performance ratings could be explained by the Big Five, supporting previous findings in past research that the Big Five predicts performance relatively well, and is thus a useful measurement. When the overall AQ score was added results revealed that the AQ total score does not have any incremental validity over the Big Five. Next, each of the four CORE dimensions was entered separately into the regression model. Results from this analysis suggested that only Ownership had an incremental validity explaining an additional 8% of the variance in performance after controlling for the Big Five. It seems then, that Ownership measures something unique that is not assessed by the Big Five.

Moreover, when the four CORE dimensions were entered into the regression model the results suggested an $R^2 = .23$, indicating that CORE explained 23% of the variance in performance. However, this is far from the amount of variance explained by the Big Five. The overall conclusion is thus that the BFI is a better measurement than the ARP with regards to predicting the subjective rated performance at DNV.

LIMITATIONS

There are several important limitations to this study that should be pointed out. First, due to a very low response rate, the results of the analysis conducted in this study were based on a

relatively small sample size. In particular with regards to the correlation analysis and multiple regression analysis, small sample sizes render the conclusions tenuous.

The second important note concerns the treatment of the criterion domain. In this study the criterion domain was split into subjective ratings and objective ratings. The objective ratings of performance were based on an average of the last three years' ratings of DNV's Annual Performance Score. However, at least four respondents reported they had only been employed at DNV for one year. In cooperation with DNV it was decided that these respondents would receive an average score of 2, which is also the score most commonly distributed in DNV. However, this might have weakened the validity of the measurement somewhat. Moreover, because the two measurements - the subjective ratings and objective ratings - were almost unrelated, it is at present moment unclear as to which of the measurements should be regarded as the most valid. Nonetheless, these findings seem to indicate that the degrees of validity of various personality measurements might depend on theoretically relevant criterion dimensions. However, this is an area that should perhaps be addressed directly in future research.

CONCLUSION

What do overall results point towards with regards to AQ and the degree of utility of the ARP instrument as opposed to the Big Five measurements in predicting job performance? It appears that the empirical evidence of this study does not strongly support the validity of the ARP, and thus overall ARP measure cannot be said to consistently predict job performance across jobs and across criterion dimensions. In terms of theory, however, there seems to be possible a pattern of theoretically meaningful relations among the concepts that influenced the formation of AQ. But further research in AQ and its ARP measure is needed to merit its applicability in work related situations. Finally, it is also worth noting that some of the personality concepts, for instance, Locus of Control and General Self-Efficacy have been found to highly correlate with Emotional Stability in past research (Judge, Erez & Bono, 2002). If findings indicate that several of these general personality constructs are subsumed by the Big

Five, then perhaps future research combining facet scales of the Big Five dimensions will yield more precise results, as Hurtz & Donovan (2000) suggest.

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TABLES

TABLE 1

Multiple Correlation Matrix of the Big Five, AQ (CORE), AQ-related personality traits, Subj. Performance and Obj. Performance

TRAIT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1.OPENNESS	—															
2.CONSCIENTIOUSNES	-.14	—														
3.EXTRAVERSION	.30	-.06	—													
4.AGREEABLENESS	.17	.11	.31	—												
5.NEUROTICISM	-.26	.50**	.28	.41*	—											
6.ANXIETY	-.03	-.35*	-.35*	-.26	-.65**	—										
7.DILIGENCE	.04	.73**	-.02	.17	.39*	-.27	—									
8.GEN.SELF-EFFICACY	.47**	.27	.34	.22	.15	-.26	.48*	—								
9.LOCUS OF CONTROL	.22	.34*	.42**	.28	.46**	-.62**	.44*	.63**	—							
10.CONTROL	.23	-.09	.53**	.04	.14	-.35*	.21	-.13	.27	—						
11.OWNERSHIP	.26	.17	.44*	.24	.09	-.30	.31*	.40*	.36*	.53**	—					
12.REACH	.00	.17	.44*	.03	.49**	-.64**	.10	-.03	.41*	.30	.14	—				
13.ENDURANCE	.17	.20	.51**	.11	.47**	-.59**	.15	.16	.44**	.49**	.34	.80**	—			
14.AQ	.21	.21	.64**	.13	.41*	-.64**	.26	.20	.49*	.75**	.62**	.78**	.88**	—		
15.SUBJ.PERFORMANCE	.42*	.43*	.29*	.14	.15	-.37*	.49**	.54**	.45**	-.25	.52**	.21	.36*	.43*	—	
16.OBJ.PERFORMANCE	.39*	-.25	.06	-.14	-.22	.15	-.12	.29	-.05	.01	.12	-.04	.09	.04	.13	—
Mean	4.16	4.72	4.33	4.76	4.99	2.10	3.94	4.09	4.09	3.77	4.46	3.48	3.71	3.85	5.32	2.74
SD	.58	.61	.58	.58	.66	.46	.49	.44	.36	.45	.39	.53	.44	.35	.59	.58
α	.80	.80	.76	.76	.82	.73	.70	.81	.77	.84	.82	.81	.81	.69	.73	.70

Note: N = 100. Correlations in off-diagonal. * $p < .05$ ** $p < .01$

TABLE 2.

Multiple regression in predicting job performance from Big Five and Ownership

Variable	B	SE B	β
Step 1			
E	0.23	0.17	.23
A	-0.03	0.17	-.02
C	0.52	0.17	.53**
N	-0.06	0.19	-.07
O	0.41	0.17	.40*
Step 2			
E	0.09	.18	.08
A	-0.08	.16	-.07
C	0.42	.17	.43*
N	0.00	.18	.01
O	0.38	.16	.38*
Overall	0.49	.24	.33*
Ownership			

Note: $R^2 = .35$ for step 1. $R^2 = .42$ for step 2 * $p < .05$ ** $p < .01$

TABLE 3.

Multiple regression in CORE in predicting job performance

Variable	B	SE B	β
Endurance	0.44	0.38	.33
Control	-0.19	0.26	-.15
Ownership	0.73	0.28	.49*
Reach	-0.09	0.29	-.08

Note: $R^2 = .23$ * $p < .05$

APPENDIX

APPENDIX A

Questionnaires that were distributed to employees at DNV

GENERAL PERFORMANCE MEASUREMENT

Compared to your colleagues in your unit, how effective are you in:
circle the number that best represents your answer.

Not at all effective *Extremely effective*
1 2 3 4 5

1. *solving problems in your job?*
2. *accomplishing the goals agreed for the year?*
3. *meeting the demands of your clients?*
4. *meeting the goals of your organization?*
5. *meeting the deadlines for your projects?*
6. *meeting the various project requirements set by DNV?*

What has your annual performance score been the last three years?

2006 _____ 2005 _____ 2004 _____

GENEREAL PERSONALITY MEASUREMENT
(AQ-RELATED PERSONALITY TRAITS)

Choose the number (ranging from 1-5) that represents your answer. How much do you agree with the following statements?:

Don't agree *Highly agree*
1 **2** **3** **4** **5**

- 1 I worry about things
- 2 I push myself very hard to succeed.
- 3 I will be able to achieve most of the goals that I have set for myself.
- 4 I feel comfortable with myself
- 5 I am not easily bothered by things
- 6 I do just enough work to get by
- 7 When facing difficult tasks, I am certain that I will accomplish them.
- 8 I believe that unfortunate events occur because of bad luck
- 9 I fear for the worst.
- 10 I get started quickly on doing a job.
- 11 In general, think that I can obtain outcomes that are important to me.
- 12 I believe that my success depends on ability rather than luck
- 13 I am relaxed most of the time.
- 14 I stop when work becomes too difficult.
- 15 I believe I can succeed at most any endeavor to which I set my mind.
- 16 I believe that the world is controlled by a few powerful people
- 17 I am afraid of many things.

- 18 I am exacting in my work.
- 19 I will be able to successfully overcome many challenges. *
- 20 I just know that I will be a success.
- 21 I am not easily disturbed by events.
- 22 I do too little work
- 23 I am confident that I can perform effectively on many different tasks.
- 24 I feel that my life lacks direction
- 25 I get stressed out easily
- 26 I work hard
- 27 Compared to other people, I can do most tasks very well.
- 28 I come up with good solutions.
- 29 I don't worry about things that have already happened
- 30 I hang around doing nothing.
- 31 I see difficulties everywhere
- 32 I get caught up in my problems
- 33 I complete tasks successfully
- 34 Even when things are tough, I can perform quite well.
- 35 I love life
- 36 I adapt easily to new situations
- 37 I quickly lose interest in the tasks I start
- 38 I believe some people are born lucky
- 39 I act comfortably with others
- 40 I dislike taking responsibility for making decisions.

- 41 I feel up to any task.
- 42 I am less capable than most people.
- 43 I like to take responsibility for making decisions
- 44 I dislike myself
- 45 I take the initiative.
- 46 I feel that I'm unable to deal with things
- 47 I make a decision and move on.

THE BIG FIVE INVENTORY (BFI)

Here are a number of characteristics that may or may not apply to you.

For example, do you agree that you are someone who likes to spend time with others? Please choose a number for each statement to indicate the extent to which you agree or disagree with that statement.

Disagree strongly (1) Disagree a little (2) Neither agree nor disagree (3) Agree a little (4) Agree strongly (5)

I see myself as someone who....

- 2.1 is talkative
- 2.2 tends to find faults with others
- 2.3 does a thorough job
- 2.4 is depressed, blue
- 2.5 is original, comes up with new ideas
- 2.6 is reserved
- 2.7 is helpful and unselfish with others
- 2.8 can be somewhat careless
- 2.9 is relaxed, handles stress well

- 2.10 is curious about many different things
- 2.11 is full of energy
- 2.12 starts quarrels with others
- 2.13 is a reliable worker
- 2.14 can be tense
- 2.15 is ingenious, a deep thinker
- 2.16 generates a lot of enthusiasm
- 2.17 has a forgiving nature
- 2.18 tends to be disorganized
- 2.19 worries a lot
- 2.20 has an active imagination
- 2.21 tends to be quiet
- 2.22 is generally trusting
- 2.23 tends to be lazy
- 2.24 is emotionally stable, not easily upset
- 2.25 is inventive
- 2.26 has an assertive personality
- 2.27 can be cold and aloof
- 2.28 perseveres until the task is finished
- 2.29 can be moody
- 2.30 values artistic, aesthetic experiences
- 2.31 is sometimes shy, inhibited
- 2.32 is considerate and kind to almost everyone

- 2.33 does things efficiently
- 2.34 remains calm in tense situations
- 2.35 prefers work that is routine
- 2.36 is outgoing, sociable
- 2.37 is sometimes rude to others
- 2.38 makes plans and follows through with them
- 2.39 gets nervous easily
- 2.40 likes to reflect, play with ideas
- 2.41 has few artistic interests
- 2.42 likes to cooperate with others
- 2.43 is easily distracted
- 2.44 is sophisticated in art, music, or literature

If you wish to receive feedback on your BFI, please check one of the options below

If you wish to receive a general personality profile based on your BFI results, please check the relevant box below (you will receive this in a written form through mail).

You may also opt for a more detailed feedback which will be arranged by telephone with master student, Elizabeth Le. Your name will remain confidential as you will use your code number to identify yourself. However, a conversation on phone (preferably a telephone with hidden numbers) may still reduce your anonymity, this means we cannot guarantee your anonymity will remain 100% intact. If you check for the box with detailed feedback you also state your agreement to this.

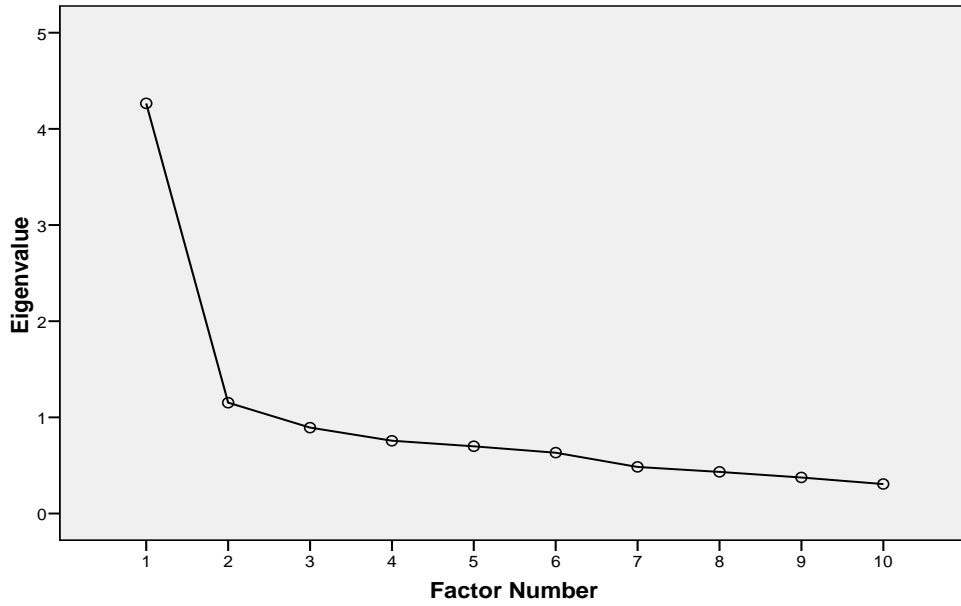
- 3.1 I wish to receive a general personality profile on my BFI
Yes
- 3.2 I wish to receive detailed feedback on my BFI
Yes

APPENDIX B

Scree Plots for each of the four CORE dimensions

SCREE PLOT C
Control

Scree Plot

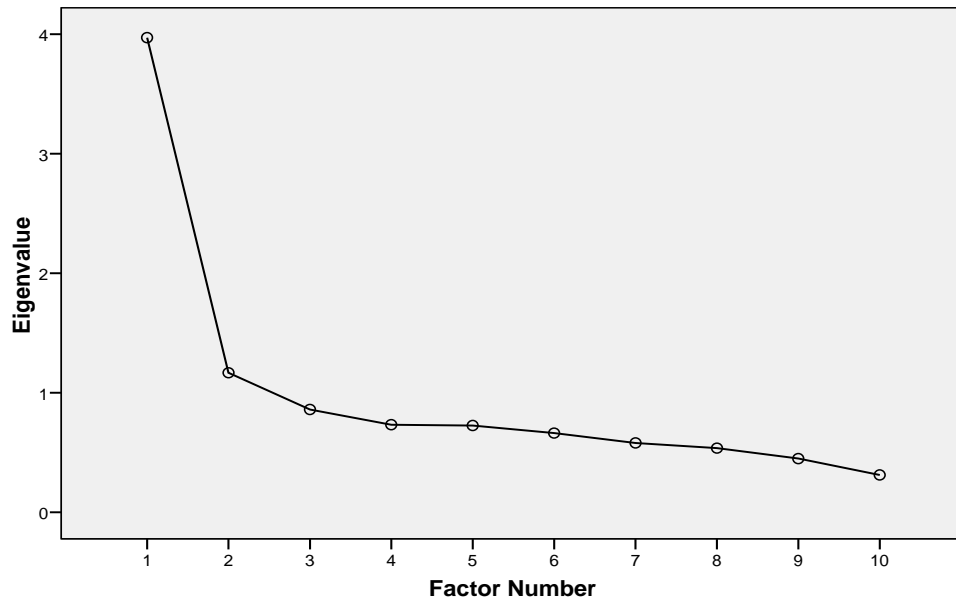


Factor Matrix(a)

	Factor
	1
s2a C2	.772
s14a C10	.692
s4a C3	.668
s6a C5	.663
s1a C1	.645
s8a C6	.616
s5a C4	.576
s11a C8	.509
s10a C7	.454
s13a C9	.351

SCREE PLOT O
Ownership

Scree Plot



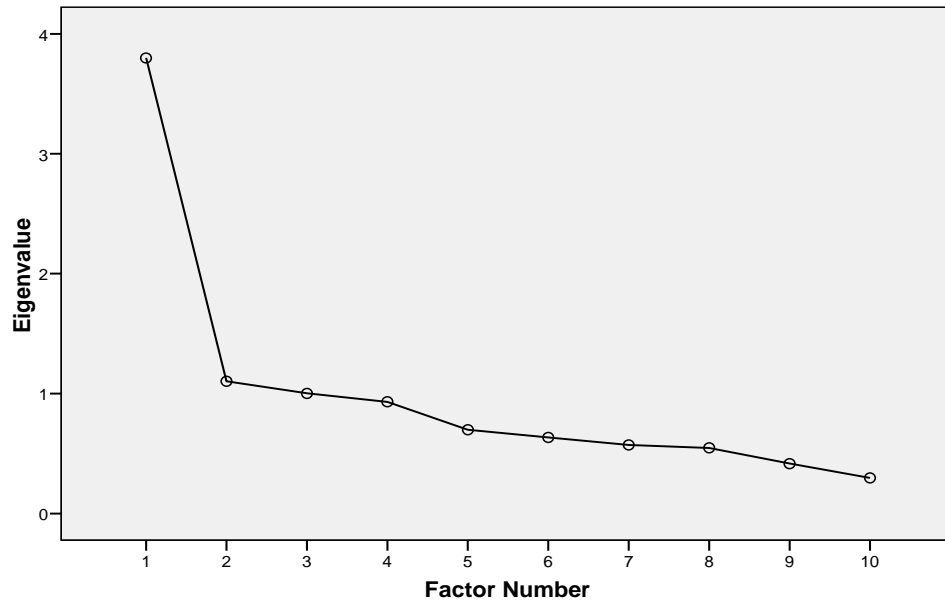
Factor Matrix(a)

	Factor
	1
s14b O10	.691
s6b O5	.678
s10b O7	.638
s4b O3	.627
s13b O9	.563
s2b O2	.549
s1b O1	.549
s5b O4	.543
s11b O8	.489
s8b O6	.375

SCREE PLOT R

Reach

Scree Plot

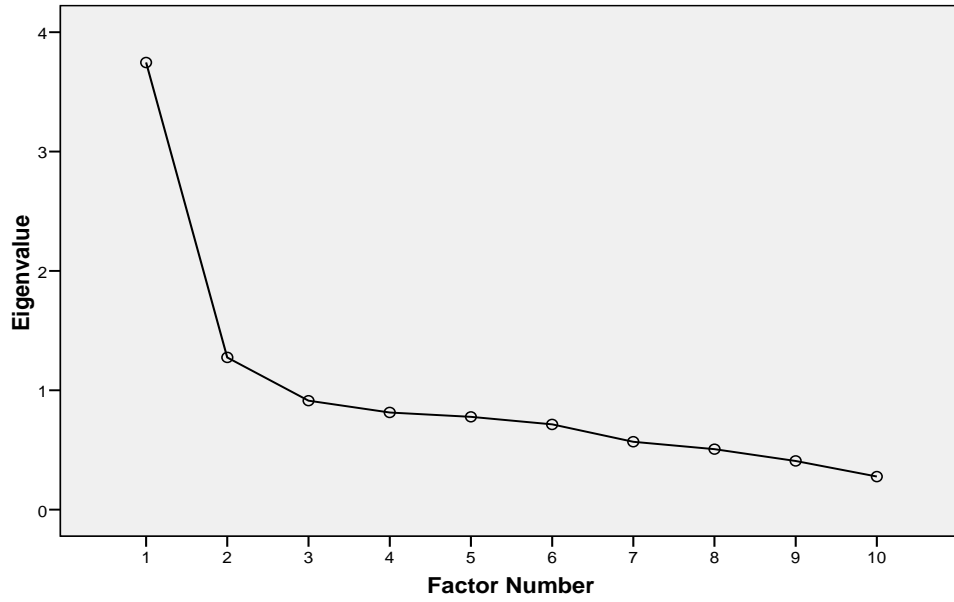


Factor Matrix(a)

	Factor
	1
s5c R4	.752
s14c R10	.724
s13c R9	.647
s4c R3	.582
s2c R2	.545
s1c R1	.540
s11c R8	.509
s8c R6	.469
s10c R7	.397
s6c R5	.318

SCREE PLOT E
Endurance

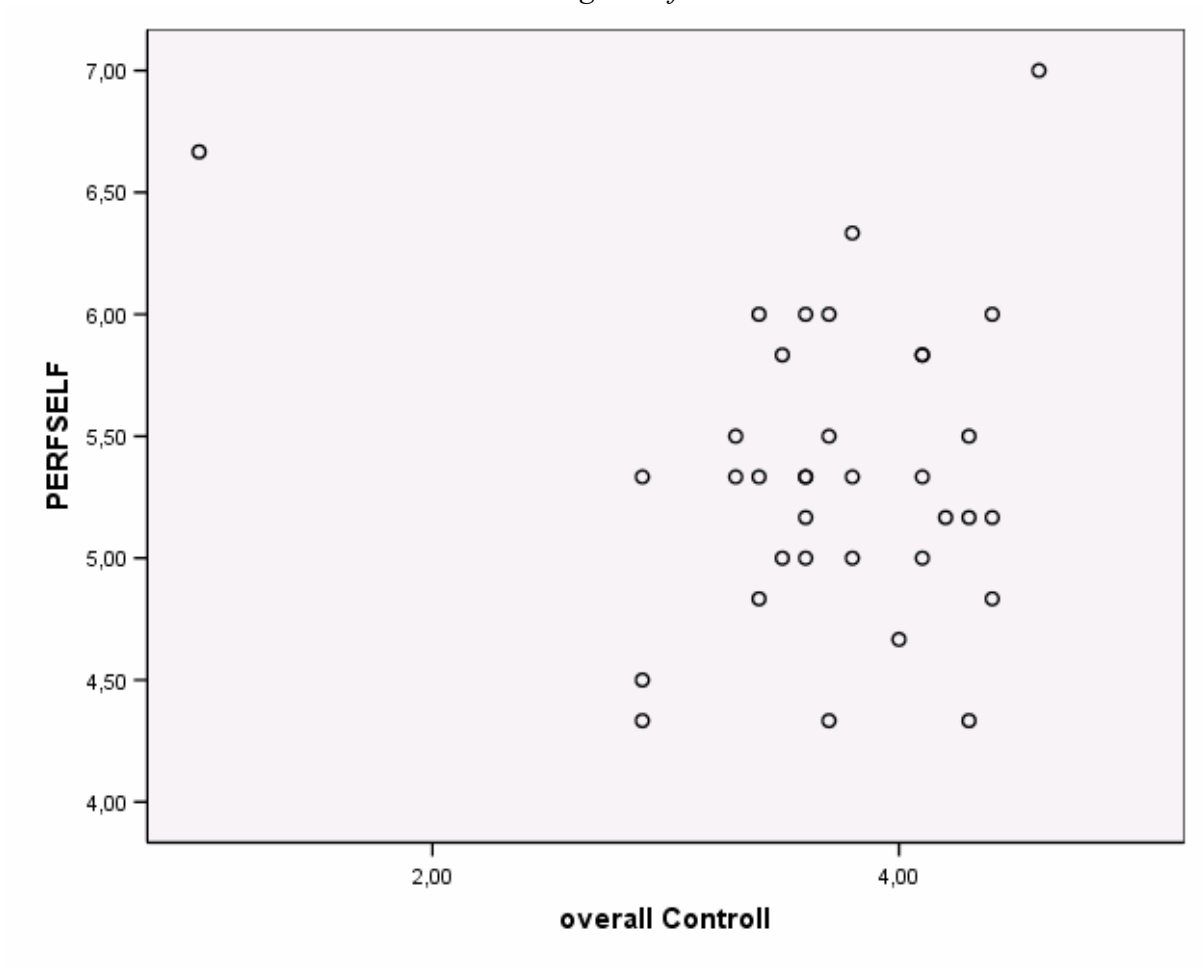
Scree Plot



Factor Matrix(a)

	Factor
	1
s14d E10	.743
s2d E2	.642
s1d E1	.612
s5d E4	.586
s4d E3	.549
s8d E6	.534
s6d E5	.489
s13d E9	.489
s10d E7	.421
s11d E8	.409

SCATTER DIAGRAM
Scatter Diagram of Outlier



APPENDIX C

Invitation letter to the participants

REQUEST TO PARTICIPATE IN A RESEARCH PROJECT

you have been invited to answer 4 different questionnaires on personality measurements related to job performance.

We would like to ask you as an employee at DNV to participate in a research project, where the purpose is to study to what extent various personality characteristics may predict job performance at DNV. The research project is a Master's Thesis assignment and is conducted by Elizabeth Le, master student at the University of Oslo (UiO), in collaboration with psychologist Hallvard Føllesdal (main supervisor) and Head of Leadership & Organizational Development, DNV, Yngvar Sjoner (co-supervisor).

WHY IT WOULD BE INTERESTING FOR YOU TO PARTICIPATE

Through this project you will get the opportunity to have your personality measured against performance with a well known and established measurement tool, the Big Five Inventory (BFI). The project will also be using a fairly new measurement tool designed to assess your response patterns when facing adversity, called the Adversity Quotient Profile (ARP). In return, you may receive a general personality profile by mail, based on your results on the BFI, which measures five important dimensions of personality. If you want a more detailed feedback, you may contact Elizabeth Le by phone. (This will of course take away your anonymity.) The profile will be sent to you during May 2007 and you will also receive a general summary of the overall results from this project. We also intend to provide you with feedback on your ARP scores.

WHAT DO YOU HAVE TO DO AS A PARTICIPANT?

Participating in this project entails completing three different web-based questionnaires which are estimated to take about 35-45 minutes. You will also be given a small questionnaire designed to measure your job performance.

ANONYMITY

All answers will be treated strictly confidential. You will need to make up a personal code number to use when answering the questionnaires (the same code should be used on all the questionnaires). Your names will not be connected to the codes. Hence, your identity will not be revealed to anyone. However, because you will be the only one to know which code number belongs to you it is vital that you later will be able to remember this code if you wish to receive a general personality profile based on your answers to the Big Five Personality questionnaire. Also, it is preferred that you do NOT make a too simple code (f.ex 'abcd' or '1234').

If you wish to receive a more detailed feedback than a general profile on your BFI, you may contact Elizabeth Le for a discussion of your results by telephone. (This may naturally reduce your anonymity somewhat). However, the time and date for a more detailed personality profile will not be available until the project has ended some time in May.

VOLUNTEERISM

Participation is voluntary. It will not have any negative consequences for you if you choose not to participate. However, it is important for the research project that as many as possible participate. Thus, your participation would be greatly appreciated. By handing in a completed questionnaire, you consent that all information can be used in this research project.

Deadline for handing in the answers is the 22nd of December.