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Personality matters: Relevance and assessment of personality characteristics

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PERSONALITY MATTERS: RELEVANCE AND ASSESSMENT OF PERSONALITY CHARACTERISTICS

OECD Education Working Paper No 157

By Mr. Miloš Kankaraš, OECD

This working paper has been authorised by Andreas Schleicher, Director of the Directorate for Education and Skills, OECD.

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ABSTRACT

Personality characteristics shape human behaviour and influence a wide range of life events and outcomes. They do so not only through their direct effects on life outcomes, but also through their indirect effects on other important personal factors and intermediate life events, such as the development of cognitive capacities, the attainment of educational qualifications and the formation of a family. As such, personality characteristics have a demonstrable relevance for a wide range of policy issues and represent an important, although often neglected, subject of policy interest.

This paper reviews the scientific literature covering a wide range of personality characteristics, discussing their conceptualisations and main features, their relevance for important outcomes in life and work, and the chief ways they are measured. It aims to provide a comprehensive overview of various attributes of personality from the perspective of their potential importance for the Survey of Adult Skills (PIAAC), taking into account their analytical potential and policy relevance. The paper also outlines and evaluates the most important measurement instruments for each personality characteristic, with a focus on short self-report scales as the most appropriate form for inclusion in large-scale international surveys. Finally, it presents some considerations related to the evaluation and promotion of personality characteristics and introduces the substantive and measurement criteria that could be used to select the personality attributes, and related measurement scales, to include in large-scale surveys.

RÉSUMÉ

Les traits de personnalité déterminent les comportements humains et influent sur bon nombre des événements de la vie et sur leurs répercussions. Ces effets s'exercent non seulement de façon directe sur le vécu lui-même, mais aussi de façon indirecte sur d'autres grands facteurs de structuration de la personnalité et sur les stades intermédiaires de la vie, comme le développement des facultés cognitives, l'obtention d'un diplôme ou la fondation d'une famille. Par conséquent, les traits de personnalité ont une portée évidente pour tout un éventail de questions de fond et constituent un thème d'intérêt important, quoique souvent méconnu, pour l'élaboration des politiques.

Cet ouvrage passe en revue des travaux scientifiques consacrés à divers traits de personnalité, en examinant les analyses théoriques dont ils font l'objet et les éléments essentiels qui les caractérisent, leur incidence sur les événements importants de la vie personnelle et professionnelle, ainsi que les principales méthodes utilisées pour les mesurer. Le but est de dresser un tableau détaillé des différents attributs de la personnalité sous l'angle de leur importance possible pour l'Évaluation des compétences des adultes (PIAAC), en tenant compte de leur potentiel en matière d'analyse et de leur intérêt pour l'action des pouvoirs publics. Les auteurs décrivent et évaluent aussi les principaux instruments de mesure utilisés pour chaque trait de personnalité, en portant notamment l'attention sur les échelles d'autoévaluation réduites, qui apparaissent comme la formule la mieux adaptée pour les enquêtes internationales de grande portée. Enfin, ils exposent des considérations touchant à l'évaluation et à la promotion des traits de personnalité, et présentent les critères de fond et les critères de mesure qui pourraient être appliqués pour déterminer les traits de personnalité - et les barèmes de mesure correspondants - à prendre en compte pour les enquêtes d'envergure.

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INTRODUCTION

There is growing evidence in recent years that personality characteristics represent an important and often neglected set of determinants of various life outcomes. They not only foster (or hinder) the development and use of cognitive skills but also affect a wide range of life circumstances and work and life achievements. In this paper, we review the scientific literature covering a wide range of personality dispositions, discussing their conceptualisations and main features, their relevance for important outcomes in life and work, as well as the ways they are measured. Our aim is to provide a comprehensive overview of different attributes of personality from the perspective of their potential importance for the Survey of Adult Skills (PIAAC), taking into account their analytical potential and policy relevance within the PIAAC framework.[1] This paper also outlines the most important measurement instruments for each personality characteristic, concentrating on short self-reporting scales as the most appropriate form for possible inclusion in the next cycle of PIAAC survey.

The paper is organised as follows. The first section presents a general discussion on personality characteristics, including their definition and conceptual clarification, their relevance for various life outcomes, their malleability, the ways they are measured and related measurement issues. The second section describes selected personality characteristics individually, starting with the presentation of each one's conceptual background, followed by the discussion of its importance and its measurement options. The third and final section first discusses some of the considerations, dangers and limitations related to the selection and promotion of personality characteristics and related criteria for evaluation. It then introduces substantive and measurement criteria that could be used to evaluate the personality attributes considered in the second section and the adequacy and usefulness of the available scales for PIAAC or other similar large-scale surveys.

1. The Survey of Adult Skills, a product of OECD's Programme for International Assessment of Adult Competences (PIAAC), measures adults' proficiency in key information-processing skills - literacy, numeracy and problem solving in technology-rich environments of working-age adult populations, based on large representative samples from more than 40 countries/economies around the world. The survey also gathers data on how adults use their skills at home and at work and offers insight into the relationship between the skill level and the intensity of skill use with a number of labour market and non-economic outcomes. More information about the survey is available at www.oecd.org/skills/piaac.

PERSONALITY CHARACTERISTICS: AN OVERVIEW

Definition and characteristics

In the field of personality psychology, personality is defined as the psychological system of traits, emotions, motivation, behaviour and thought patterns that characterise individual and distinguish them from each other (Funder, 2001). Among the various personality attributes, personality traits or dispositions have a central position in the personality conceptual system. Personality traits are defined as "relatively enduring patterns of thoughts, feelings, and behaviours that reflect the tendency to respond in certain ways under certain circumstances" (Roberts, 2009:140). Specifying that these are "relatively enduring patterns" suggests that these traits tend to be consistent characteristics of one's personality but also that they are not set in stone and are susceptible to change to some degree. Likewise, the fact that they reflect a "tendency to respond in certain ways under certain circumstances" indicates that their influence on behaviour is not absolute and certain but rather that it increases or decreases the probability of certain actions that are at the same time shaped by other personality and situational factors. We will discuss predictive power of personality traits in more details in the next section. For now we can conclude that personality traits are relatively consistent attributes of personality that differ across individuals, influence behaviour and have confirmed psychological, hereditary and even neurological foundations (Bouchard and Loehlin, 2001; Canli, 2006; Roberts et al., 2007).

Apart from personality traits or dispositions, many other personality characteristics are important determinants of human behaviour and life outcomes. These include motives, interests, self-representations, cognitive and socio-emotional competences, attitudes, values, and beliefs. We will discuss each of these in more details in the next section.

Personality characteristics are also sometimes called "non-cognitive skills", representing personal attributes that are not part of the wide range of cognitive abilities. Hence, it is useful to first specify what is meant by cognitive skills. Cognitive skills or competences are usually defined as abilities to process (linguistic, numeric, graphical or analytical) information and solve (abstract) problems. When defined in the more narrow sense of information-processing capacities, these skills are often identified with (some form of) intelligence and are measured with various forms of intelligence tests. When considered more broadly to include acquired knowledge and related attitudes, they are assessed with so-called "achievement tests" in specific academic domains such as reading, numeracy and science.

The easiest way to define non-cognitive skills is therefore to describe them as those skills that are not measured by achievement or IQ (intelligence quotient) tests (Messick, 1979). However, in addition to being both "too broad to be useful" and yet incomplete, the term is an obvious misnomer as it implies the absence of cognitive activities in spite of the fact that every aspect of mental functioning is based on some form of information processing and cognition (Duckworth and Yeager, 2015). For example, social competences, one of the prime examples of a non-cognitive skill, are so fundamentally dependent on perception, memory and reasoning abilities that they are often conceptualised as a form of intelligence (e.g. Marlowe, 1986; Murphy and Hall, 2011).

Alternatively, personality characteristics are sometimes also called by terms such as "character", "character skills" or "virtues" (Berkowitz, 2012; Tough, 2013; Kristjansson, 2013). One objection to these terms is that they imply certain moral connotations that many researchers and policy advisers would like to avoid. As a consequence, in the economic literature and applied policy settings, non-cognitive skills are called "socio-emotional skills", emphasising the importance of their social and emotional aspects, or "soft skills", as opposed to the "hard skills" represented by cognitive abilities. (Brunello and Schlotter, 2011;

Kautz, et al., 2014; Heckman and Kautz, 2012). Some authors favour the term "skills" as it indicates the possibility of change and development thus representing viable targets of policy interventions, which is less the case with the term "trait" which has connotations of permanence and heritability (Duckworth and Yeager, 2015; Heckman and Kautz, 2012).

But even these broad notions may be too narrow given that these attributes are not necessarily or exclusively skills but are rather personal attributes that include quite different classes of psychological constructs in the field of personality psychology. For example, it is difficult to think of personality dispositions such as introversion/extraversion or a liberal/conservative political attitude as a "skill". The term socio-emotional skills may also be too narrow as it misses important personality characteristics that are not directly related to person's social or emotional competences, such as their self-concepts, motives, interests, values and aspirations.

Recently, a growing number of studies have referred to "21st-century skills" or "new basic skills" (Kyllonen, 2012; Autor, Levy and Murnane; 2003; Soland, Hamilton and Stecher, 2013). While it may be meaningful to stress the importance of certain personality characteristics for modern life, it should not be overlooked that most of the attributes mentioned in the context of 21st century skills, such as self-control or perseverance, have been the focus of philosophical, religious and cultural considerations since ancient times (Duckworth and Yeager, 2015). Thus, rather than considering them as new skills for a specific time it would be more appropriate to emphasise their timeless character that speaks about their universal value.

The terminology used, although seemingly disparate, overlaps considerably and refers to the same conceptual space. It implies that these personality attributes are relatively stable dispositions, independent from cognition, potentially responsive to interventions, dependent on situational factors and potentially beneficial for a range of life outcomes (Duckworth and Yeager, 2015). Thus, although it would be better to have a consensual terminology that would make it clearer that researchers and practitioners are talking about the same constructs, it is more important to turn our attention to investigating the relevance of these personality attributes for life events and the best ways to measure them. In this paper, we will refer to these as "personality characteristics"; a term that is broad enough and does not have strong connotations regarding ethics, malleability or relevance to modern or future societies. In contrast, we will use the term "non-cognitive skills" in a narrower sense, to refer to the abilities that, like cognitive skills, enable people to complete various tasks, based on certain type of information processing. These include emotional intelligence, social competence or social intelligence, self-control and self-regulation.

Different types of personality characteristics

As noted previously, personality characteristics represent a very broad set of personality attributes that comprise a wide range of personality constructs. These personality characteristics differ in their nature, determinants, mode of action, the range and type of behaviour they affect, and their development and malleability. Figure 1 presents an overview of some of the most important domains of personality and individual differences.

Figure 1. Various personality domains

In the last three decades the field of personality psychology has made considerable progress in identifying some of the basic dimensions or factors that can be used to describe the multitude of personality attributes. The most prominent and commonly used model of personality traits today is the so-called "Big Five" model. This specifies five higher-order dimensions (factors) each of which can be further divided in more narrow traits or "facets" (Goldberg, 1990; McCrae and Costa, 1987; Digman, 1990). The five dimensions are usually called openness to experience, conscientiousness, extraversion, agreeableness and neuroticism. These dimensions account for a large part of individual differences in personality attributes and have important consequences in a wide range of life settings (Judge, Heller and Mount, 2002; McCrae, 2009; John, Naumann and Soto, 2008; Heckman and Kautz, 2012). However, there are also competing models which postulate different number of dimensions with somewhat different underlying attributes. For example, the six-dimensional HEXACO model builds on research into the Big Five model and has a similar taxonomy of factors with the addition of an honesty-humility dimension.

Motives represent another distinct class of psychological attributes which are important determinants of human behaviour. Motives represent reasons for people's actions, feelings and needs. They direct and drive behaviour and thus strongly affect people's life choices and outcomes. Motives can be intrinsic or extrinsic and can drive individuals to seek or avoid certain outcomes. They represent a wide spectrum of needs, from basic physiological needs for food or sleep, to rather complex goals of self-actualisation or achievement of one's own potential.

Similar to motives, interests are another driving force of human behaviour. They represent personal evaluations of occupational, leisure or general intellectual activities. They influence people to seek those environments that would allow them to express their interests and values and to employ their skills and abilities. The congruence between a person's interests and the characteristics of their environment has a profound effect on their satisfaction and general well-being. Interests are also one of the main determinants of intellectual development and general knowledge acquisition as they influence how and to what degree people will use their intellectual potential.

People's collections of beliefs, feelings and knowledge about themselves represent another important set of personality characteristics, shaping their feelings, thoughts and actions. Self-concept (also called self-perspective or self-construction) is a cognitive and descriptive representation about oneself. It embodies the answer to the question: "Who am I?" and as such includes elements of one's academic or work performance, gender or social status roles and ethnic or racial identity. Self-control or self-regulation is the ability to control one's emotions, goals and actions in the face of external demands in order to properly function in society. Self-efficacy is the extent or strength of one's belief in one's own ability to complete tasks and achieve goals. People's beliefs regarding their power to affect situations influence not only their capacity to act and deal with challenges competently but also whether or not they will be ready to face the challenge in the first place. It is an essential capacity in regard to achieving goals and avoiding negative emotions or situations. Self-esteem represents another related construct that denotes people's overall subjective and emotional evaluation and opinion of their own worth. It is both a judgement and an attitude towards oneself. "Locus of control" is a related construct that refers to the extent to which individuals believe they can control events affecting them. People with a strong internal locus of control believe that they themselves can control their lives, while those with a strong external locus of control assume that their lives are predominantly under the influence of situational or random factors.

In contrast to the attributes that describe the way people perceive and relate to themselves, another set of personality characteristics describes how they relate and act towards other people. Social competence is a complex set of social, emotional, cognitive, motivational and behavioural skills that shape the way people interact with their social surroundings. It reflects their ability to take another person's perspective, to effectively evaluate and understand social situations, to regulate affect and adjust goals, and to act effectively and socially appropriately. The concept of social competence overlaps with related concepts such as emotional intelligence, social skills and interpersonal sensitivity.

Emotions represent another important sphere of human experience that is closely linked to personality, motivation, temperament and cognition. They are states of feeling or mood that evoke physical and psychological reactions and influence behaviour. Some types of emotions are more common with certain types of temperament and personality. Emotions are also thought to influence motivation, positive or negative. The degree to which people are able to control and regulate their emotions is an important individual difference. This is represented in the recently introduced concept of emotional intelligence, which is defined as the ability to recognise one's own and other people's emotions and to use emotional information to guide thinking and behaviour (Goleman, 1998).

Attitudes and values are another class of personality attributes that are important determinants of individual behaviour. Attitudes are "a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour" (Eagly and Chaiken, 1993:1). Attitudes can be formed and changed and are generally considered much less enduring and stable than other personality attributes such as traits or temperament. Personal values are defined as "core conceptions of the desirable within every individual and society" (Rokeach, 1979). They determine broad preferences about appropriate courses of action or desirable outcomes. As such, they indicate a person's sense of right or wrong, his or her strivings or ideals. Due to their all-encompassing nature, they influence the formation of more specific beliefs, attitudes and opinions and, as such, have a persistent influence on behaviour.

The importance of personality characteristics

Personality characteristics are key determinants of human behaviour. They influence all aspect of one's life, including the academic achievements, job performance, social inclusion and overall well-being of individuals and societies as a whole. Their significance in people's lives makes them universally valued in all cultures, societies and religions.

Among the eight key competences listed in the *European Framework for Key Competences for Lifelong Learning* at least four primarily refer to personality traits and non-cognitive skills:[2]

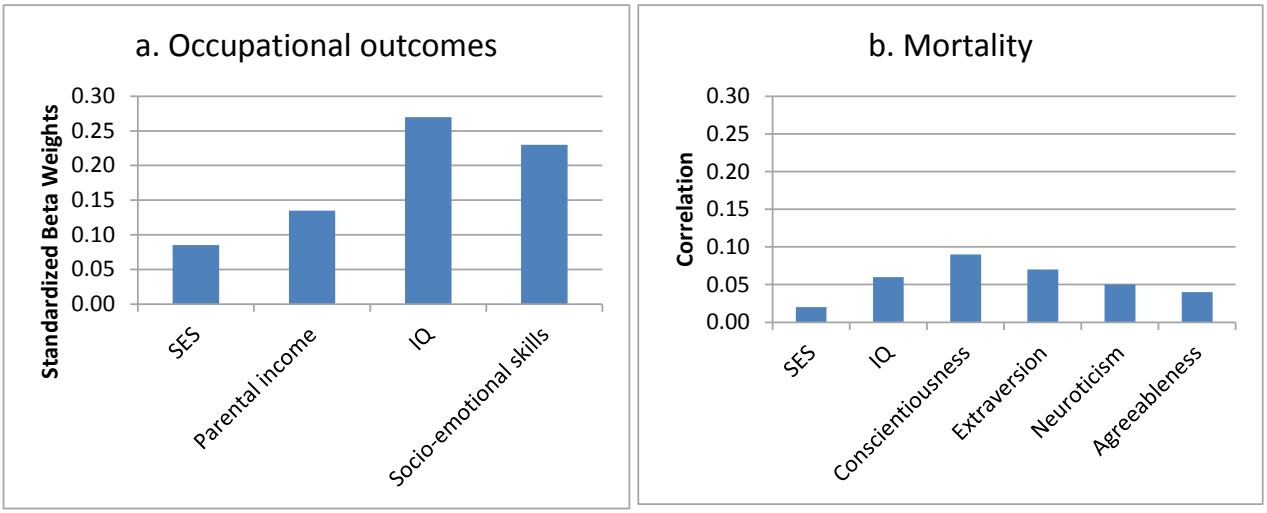
- **Learning to learn** – key elements include self-discipline, perseverance and motivation.
- **Social and civic competences** – key elements include communication skills, tolerance, empathy and coping with stress.
- **Sense of initiative and leadership** – key elements include ability to plan and manage projects, leadership skills, innovation, risk-taking.
- **Cultural awareness and expression** – key elements include appreciation and understanding of various cultural forms of expression of ideas, experiences and emotions.

This is in line with the evidence from the growing body of empirical research about the importance of personality characteristics for various important work and life outcomes (Roberts et al., 2007; Gutman and Schoon, 2013; Heckman and Kautz, 2012; Kautz et al, 2014). In particular, these studies indicate that various personality attributes have substantial influence on important life outcomes, such as educational attainment, occupational status, productivity, job and life satisfaction, criminality, health, and mortality. In other words, it had been found that people with specific personality attributes are more likely to experience certain life outcomes even after controlling for other factors, including their cognitive skills. Depending on the particular population group, trait and outcome being studied, the importance of personality characteristics varies both in absolute terms and in comparison with other factors. In some cases the predictive value of non-cognitive skills and personality traits rivals that of long-established measures of cognitive skills.

For example, Figure 2 compares socio-economic status (SES), parental income, measures of IQ and measures of personality traits with occupational outcomes (e.g. personal income and occupational status) and longevity/mortality (Roberts et al., 2007). It shows that personality traits are a more important predictor than SES and the scale of their effects is on a par with that of measures of general cognitive ability.

2. The other four competences refer to more traditional cognitive skills: 1) communication in the mother tongue; 2) communication in foreign languages; 3) mathematical and basic science competencies; and 4) digital competence.

Figure 2. Average effects of different personality characteristics on occupational outcomes and mortality



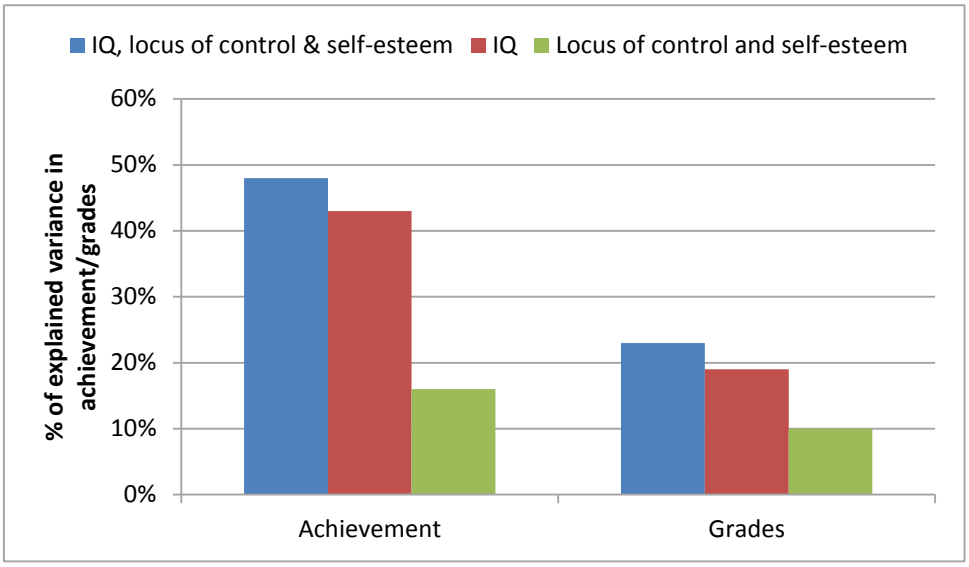
Source: Roberts et al. (2007), "The power of personality", *Perspectives on Psychological Science*, Vol. 2/4, pp. 313–345, http://doi.org/10.1111/j.1745-6916.2007.00047.x.

It is important to note that personality traits do not only influence life outcomes directly (for example, having good social intelligence helps a person successfully negotiate a job interview) but also through their persistent and cumulative effects on other personality attributes, including cognitive skills, and through other intermediate outcomes throughout life. For example, having good social competence can help children adapt better to the school environment, gain higher status among their peers and consequently achieve more in school. This greater school achievement translates later on into better occupational status, health and general well-being. Likewise, being curious and open-minded and having an active approach towards learning is an important pre-requisite for developing and improving innate cognitive skills (Cattell, 1986; Ackerman, 1996).

In their meta-analysis of the relationship between general intelligence and personality, Ackerman and Heggestad (1997) found a positive association between measures of verbal intelligence and openness to experience and extraversion, and a negative association with anxiety. Furthermore, intellectual and vocational interests are also found to have an important influence on the development of cognitive competences (Ackerman and Heggestad, 1997; Ackerman, 1996; Cattell, 1986; Holland, 1997). In fact, it is the interplay between personal interests and other personality characteristics, on the one side, and innate cognitive abilities or "fluid intelligence" on the other, that influence individuals' development of "crystallised intelligence", that is the knowledge and skills that they acquire over their lifetime (Cattell, 1986; Ackerman, 1996).

Taking this interplay between personality and cognitive skills into account, it is not surprising that scores on achievement tests, which are usually considered to be measures of cognitive competence and "crystallised" intelligence, are strongly influenced by personality characteristics. Apart from their long-term effects on the acquisition of the knowledge and skills assessed by achievement tests, personality characteristics also affect test scores at the very moment of testing. In particular, since individuals differ in factors such as their motivation, test-taking strategies and stress management, the resulting differences in test scores will reflect variations in these non-cognitive skills as well as differences in cognitive skills (Brunello and Schlotter, 2011). As Figure 3 shows, the effect of these non-cognitive skills on achievement tests can be quite substantial. Consequently, the relationships of test scores to economic performance and other life outcomes may at least in part reflect the effects of non-cognitive skills and traits.

Figure 3. Relationship of IQ and personality traits to achievement test scores and grades



Source: Adapted from Borghans, L. et al. (2011), "Identification Problems in Personality Psychology", *Personality and Individual Differences*, Special Issue on Personality and Economics, Vol. 51, pp. 315-320.

Cognitive skills remain the most important predictor of academic performance. However, school achievement is also dependent on a number of non-cognitive skills such as intellectual curiosity, perseverance, discipline, self-control, social skills and emotional stability. Some non-cognitive skills are a crucial pre-requisite for effective participation and performance in academic settings. In other words, low levels of non-cognitive skills can prevent the effective use of cognitive skills while high levels further improve their use and importance. For example, cognitive skills have quite a low impact on the probability of individuals staying at school after turning 16 if they have low non-cognitive skills, but a very high impact for individuals with high non-cognitive skills (Carneiro, Crawford and Goodman, 2007). Similarly, a study by Duckworth and Seligman (2005) based on US longitudinal data found that self-discipline measured in the beginning of the school year was more than twice as good a predictor of final grades than the standard measure of IQ. Among the Big Five dimensions, openness to experience and conscientiousness are found to be positively related with educational attainment (van Eijck and de Graaf, 2001; Goldberg et al., 1998; Poropat, 2009).

While being important for all individuals, personality characteristics may be particularly important for people with low levels of cognitive skills. In a study on the cognitive and non-cognitive predictors of labour market earnings later in life, Lindquist and Vestman (2011) find that although both sets of skills are important, for people with the lowest income, non-cognitive skills are 2.5 to 4 times more important than cognitive ability. Among the reasons for this trend is the fact that people with low non-cognitive skills are much more likely to become unemployed than those with low cognitive skills. By way of example, a study from 1996 in the United States found that 69% of employers were rejecting hourly-wage applicants because they lacked basic work skills, such as showing up every day, coming to work on time or having strong work ethic (Barton, 2006). In a similar survey of employers in Washington State in 2007, about 60% had experienced difficulties in hiring people, with the main difficulty being finding workers with appropriate interpersonal skills and work ethic rather than with adequate reading or maths skills (Kautz et al., 2014).

A good empirical illustration of the importance of non-cognitive skills and their likely role as a pre-requisite for the effective use of cognitive skills and overall functioning is present in the example from the

General Educational Development (GED) Programme, examined by Heckman and colleagues (Heckman and Kautz, 2012; Kautz et al., 2014). The GED was established to allow high school dropouts to obtain a high school diploma by passing the GED test, an extensive academic performance test designed to assess whether test takers have comparable skills and knowledge to regular high school graduates. The GED test is shown to correlate closely with other achievement and IQ tests. A relatively large proportion of young people obtain the equivalent of a high school diploma through this programme.

However, people who drop out from high school and then obtain a GED are fundamentally different not only from other high school dropouts, but also from regular high school graduates. GED graduates have the same level of cognitive skills as regular high school graduates and better skills than other dropouts. However, GED students were much more similar to other high school dropouts in terms of non-cognitive skills. Their relatively poor non-cognitive skills had a strong detrimental effect on a number of important academic, work and life outcomes. In particular, in comparison with regular high school graduates, GED graduates had much lower graduation rates from college, shorter spells of employment, lower hourly wages, higher divorce rates, worse health and a greater chance of being incarcerated (Heckman and Kautz, 2012).

Another striking example of the predictive power of personality traits is the Perry Preschool Program. The programme was aimed at disadvantaged three-year-olds and included weekly home visits focused on enriching children-parent interactions and pre-school education with the objective of fostering children's cognitive and socio-emotional skills. The experimental intervention lasted two years after which both treatment and control groups were followed until the age of 40 (Heckman et al., 2010). The programmed did not lead to a long-term increase of IQ but did produce significant effects for a range of academic, economic and life outcomes. Heckman, Pinto and Savelyev (2013) argue that the main reason for the effectiveness of the programme was persistent changes in certain personality characteristics.

These results indicate that skills such as self-control, persistence, social competence and emotional stability are important for later life as well as school performance and that their absence cannot be completely compensated for with higher cognitive skills. They also illustrate the important role non-cognitive skills have as a pre-requisite for individuals to realise the full potential of their cognitive skills.

The malleability of non-cognitive skills

Although definitions of personality usually emphasise the stability over time of individual characteristics, personality traits develop and change with age, and are affected by a wide range of internal and external factors. Studies indicate that the Big Five traits are influenced by both heritability and environmental circumstances, with heritability in some cases estimated to range from 40% for agreeableness to 57% for openness to experience (Jang, Livesley and Vemon, 1996; Bouchard and McGue, 2003; Specht, Egloff and Schmukle, 2011). However, changes in these traits during people's lifetimes are also related to the effects of various interactions with their environment and important life events (Specht et al., 2011; Roberts and Mroczek, 2008; Roberts, Walton and Viechtbauer, 2006).

At the average, group level, conscientiousness, emotional stability, social dominance (a facet of extraversion) and agreeableness tend to increase with age while openness to experience increases before decreasing in old age (Figure 4). The direction of change in adulthood is found to be the opposite of the direction of changes in the late childhood and adolescence, when individuals on average have lower levels of agreeableness, conscientiousness and openness to experience, and higher levels of neuroticism (Soto, John, Gosling and Potter, 2011). One theoretical perspective attributes these developmental changes to intrinsic maturation, i.e. they are considered to be caused by biological maturing rather than by life experience (McCrae and Costa, 2006). However, a large number of studies indicate that even these established general trajectories of change are subject to the influence of both genes and the environment

(Bleidorn et al., 2009; Specht et al., 2011; Roberts and Mroczek, 2008). For example, a longitudinal study of adult twins (Bleidorn et al., 2009) revealed substantial differences in the etiology (causal mechanism) of their personality trait changes during their lifespans. In particular, changes in agreeableness, conscientiousness and neuroticism showed relatively strong genetic effects, whereas changes in extraversion and openness to experience were almost entirely environmentally induced.

An alternative model of person-environment transactions suggests that both personality characteristics and external influences interact to influence stability and change in personality through several specific mechanisms (Roberts and Mroczek, 2008). For example, individuals differ in their choice of environments, in the way they perceive their environments and the ways in which they are perceived and treated by others. They also change aspects of their environments to match their personalities better. And while this contributes to stability, personality changes are evoked by changing roles, self-perceptions and reactions of others. Thus, this model attributes changes in personality over time to the influence of social roles, normative changes and major life events rather than intrinsic maturation (Specht et al., 2011; Roberts, Wood and Smith, 2005).

Figure 4. Cumulative mean-level changes in personality through life

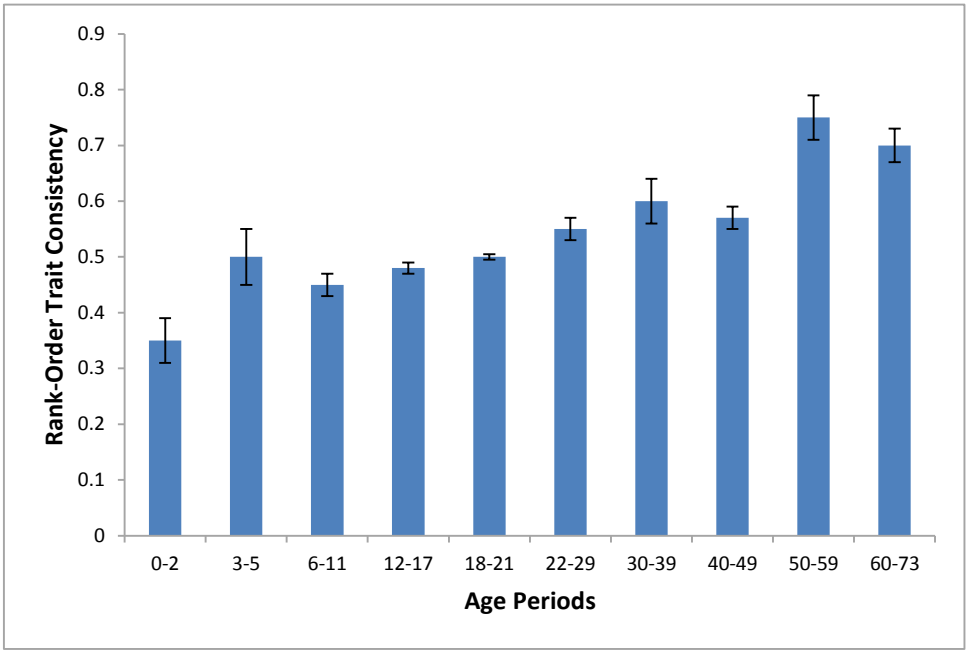
Note: Social vitality and social dominance are aspects of the extraversion dimension. Cumulative d values represent total lifetime change in units of standard deviation.

Source: Roberts, Walton and Viechtbauer (2006), "Patterns of mean-level change in personality traits across the life course: A meta-analysis of longitudinal studies", http://doi.org/10.1037/0033-2909.132.1.1.

Mean-level changes in personality depict trends at group level, hiding a substantial degree of individual variation. In particular, individuals have unique patterns of change throughout their lives that do not necessary follow these general trends and that themselves represent an individual characteristic (Roberts, Walton and Viechtbauer, 2006; Bleidorn et al., 2009; Roberts and Mroczek, 2008). In this sense, the propensity to personality change is an individual difference variable in its own right (Roberts and Mroczek, 2008).

The results of programmes aimed at developing various personality characteristics indicate that the malleability of personality attributes and non-cognitive skills is to a certain extent age-related; the findings are mixed and inconclusive about the malleability of these traits in later life (Brunello and Schlotter, 2011; Heckman and Kautz, 2012). As with cognitive skills, personality characteristics tend to be somewhat more susceptible to interventions and changes in the earlier stages of life. In a meta-analysis of longitudinal studies tracking individual levels of personality traits Roberts and DelVecchio (2000) found that the rank-order stability[3] in measured personality traits slightly increased over the lifespan. In particular, seven-year test-retest stability estimates (the correlation between the same measures measured seven years apart) plateau at r=0.74 for personality traits, about the same level of stability as for IQ. However, measured personality traits did not reach this level of stability until at least the age of 50 (see Figure 5), whereas for IQ the plateau is reached by the age of six to eight (Hopkins and Bracht, 1975). Furthermore, the susceptibility to change over a lifetime is not the same for all personality traits. In their longitudinal study of German adults, Specht and colleagues (2011) have found that while the rank-order stability of conscientiousness increased throughout adulthood, the rank-order stability of neuroticism, extraversion, openness and agreeableness followed an inverted U-shaped function, peaking at around 40-60 years old and then decreasing.

Figure 5. Rank-order consistency of personality traits through life



Note: Population estimates of mean consistency across age categories with 95% confidence level estimates.

Source: Roberts, B.W. and W.F. DelVecchio (2000), "The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies", http://doi.org/10.1037/0033-2909.126.1.3.

3. Rank-order stability indicates the degree to which individuals retain their relative position to each other on a given trait dimension over time.

Due to the lack of relevant intervention programmes with adults it is difficult to infer the exact extent to which these skills are malleable at later stages of life (Brunello and Schlotter, 2011). However, the evidence indicates that learning after school, including learning in the workplace, can have a significant influence on a person's personality (Brunello and Schlotter, 2011; Heckman and Kautz, 2012).

Furthermore, recent studies on the effectiveness of cognitive and clinical interventions indicate that rather substantial changes in personality traits are possible, even after relatively short treatment periods and equally across lifespans (Jackson, Hill, Payne, Roberts and Stine-Morrow, 2012; Piedmont, 2001; Roberts, Luo, Chow, Su and Hill, 2015). For example, Jackson and colleagues (2012) found that a relatively short, 16-week programme aimed at increasing the cognitive ability of older adults (ranging from 60 to 94 years old) promoted substantial and relatively lasting increases in openness to experience compared to the control group. Likewise, Roberts and colleagues (2015) found that a very short, 2-week clinical intervention led to significant improvement of participants' emotional stability. Importantly, the induced changes in emotional stability were not affected by age, indicating that people of different ages are equally susceptible to these kinds of intervention.

Apart from intrinsic maturation and intervention programmes, important life events such as marriage, the birth of a child, first job, death of a family member or unemployment are also found to have a substantial influence on personality (Specht et al., 2011; Roberts et al., 2006). For example, Lehnart and Neyer (2006) have found that people in stable relationships became less neurotic and more agreeable than those who ended their relationships. Likewise, they found that when a single person starts a relationship this tends to lead to increases in extraversion and decrease in neuroticism (Neyer and Lehnart, 2007).

When it comes to working life, it has been found that positive and negative emotionality both predicted different work experiences and changed as a result of them (Roberts, Caspi and Moffitt, 2003). Furthermore, conscientiousness is found to increase in individuals when they start their first job and decrease among those who have retired (Specht et al., 2011). Military training is also shown to affect personality with military recruits having lower level of agreeableness after training, which persisted five years after training (Jackson, Thoemmes, Jonkmann, Lüdtke and Trautwein, 2012).

It could be concluded that, while both genetic and environmental factors influence personality, they also influence both the stability of and changes in personality (Bleidorn et al., 2009; Roberts et al., 2006). In particular, genes can trigger the process of intrinsic maturation that can lead to substantial and lasting changes in personality. Environmental factors can further increase the stability of personality changes, for example where people select environments that fit their personality, or by the stability of social roles and work environments they are exposed to. Thus, personality is influenced by a dynamic interplay between the genetic and environmental processes and the presence of gene-environment correlations, which affect stability and induce changes in personality over a lifetime (Wood and Roberts, 2006; Bleidorn et al., 2009).

Measuring personality characteristics

There is a long tradition of measuring personality characteristics both in academic and applied settings and a wide range of instrument and assessment techniques have been developed for these purposes. However, measurement of personality characteristics has still not reached the quality levels achieved for cognitive abilities (Heckman and Kautz, 2012). Indeed, the lower quality of personality measures may be one of the main reasons for their absence from related policy discussions (Brunello and Schlotter, 2011).This is not surprising given that at personality concepts have proved to be more complex than cognitive skills at every step of the measurement process. It is more difficult to define them and differentiate them from other similar concepts, the constructs are more difficult to operationalise into reliable and valid scales or to observe from behaviour, and it is more challenging to establish the hypothesised relations with similar or related constructs and with various life outcomes.

A wide variety of measurement approaches are used to assess personality characteristics including self-, peer-, teacher- , parents- or other reports; behavioural observations; performance tasks; biographical data; lab experiments and think-aloud protocols. Most personality measures are based on self-report questionnaires in which respondents are asked to evaluate and report on their own (typical) behaviour. This section looks at the most important approaches used, while the following section presents the main instruments for each selected personality concept. They are quite heterogeneous in scope, size, measurement properties, empirical verification, cross-cultural validity and other important characteristics. While some (such as measures of the Big Five) have relatively good measurement properties and solid theoretical and empirical foundations, others have weaker measurement characteristics, theoretical coherence and empirical evidence.

Self-report questionnaires

Self-report questionnaires offer a relatively simple and efficient way of collecting important information about large groups of people and even entire nations (if representative samples are used). They are cheap and quick to administer, produce consistent results, and in many cases provide a remarkably good approximation of objective measures (Connelly and Ones, 2010; Duckworth, Tsukayama and May, 2010). Moreover, a huge body of literature in the social sciences indicates that people generally react reasonably well to questionnaires and are in general able to describe their typical behaviour in the intended way (Heine, Buchtel and Norenzayan, 2008; Krosnick, 1999). From a practical point of view, they are effectively the only feasible measurement form for use in large-scale international surveys.

Nevertheless, self-report questionnaires have numerous drawbacks that can substantially impair the quality and usability of measures based on them, discussed in more detail below. These include respondents' lacks of knowledge or misinterpretation, susceptibility to giving socially desirable answers and faking, differences in response styles, and memory biases. The situation is further complicated when these measures are used in the cross-cultural context, as additional potential measurement biases are involved, such as reference bias and measurement non-equivalence.

Short self-report scales

Large-scale surveys are almost exclusively restricted to using self-report measures of personality traits. However, the situation is even more complicated as the standard batteries of personality tests are often too long to be applied in these surveys and need to be shortened. In practice this often means that personality tests measuring multiple facets with few hundreds of questions are reduced to very short instruments in which each personality characteristic or dimension is assessed with only few questions. This situation has led to recent proliferation of numerous shortened versions of existing personality measures and their inclusion in a growing number of studies investigating the Big Five and other psychological characteristics in cross-cultural, large-scale settings, such as the World Value Survey, the International Social Survey Programme, European Social Survey and the Skills Towards Employability and Productivity (STEP) Skills Measurement Survey.

Apart from being cheaper and more efficient to administer, short scales[4] have additional advantages (Credé et al., 2012). They reduce the burden on respondents and the feeling of boredom or fatigue, which in turn may increase the quality of respondents' answers (Burisch, 1984). Short questionnaires may also seem more valid to respondents than longer questionnaires containing numerous items that may seem redundant. From a psychometric point of view, it has been found that even substantial reductions in questionnaire length do not overly impair an instrument's measurement properties in most cases. For

4. Short scales are usually defined as those scales containing between one and five items per domain scale (de Vries, 2013).

example, in his overview of personality scales, Burisch (1984) has found that short scales have comparable levels of criterion validity[5] to longer scales measuring the same construct. Similar evidence for the criterion validity of short scales was found by other studies (Robins et al., 2001; Thalmeyer et al., 2011). Other studies indicate that shorter scales are also satisfactory for properties such as test-retest reliability and convergence validity (Gosling et al., 2003; Robins et al., 2001).

However, the use of short scales comes with costs in the form of increased measurement error and reduced content validity (Credé et al., 2012). Shorter scales tend to have lower reliability and predictive validity and consequently increased rates of type 1 and type 2 errors.[6] These are the reasons short scales are not recommended for individual diagnostic use.

Credé and colleagues (2012) have found that the use of extremely short scales (one item per dimension) for measuring Big Five traits leads to a substantial increase of both type 1 and type 2 errors. Scales with two items per dimension, such as the ten-item inventory for the Big Five (BFI-10; see Annex A) have much better measurement parameters although they still perform worse than slightly longer measures with four or eight items per dimension (Credé et al., 2012). Substantial improvements in measurement parameters can be achieved by extending scales from one to two items per scale, with further extensions bringing only moderate to small improvements in these parameters (Credé et al., 2012; de Vries, 2013).

Finally, very brief measures (with only one or two items per scale) are less suitable for statistical identification of underlying (latent) structures of scales, since at least three items per construct are needed to identify latent structure (Gagné and Hancock, 2006). Investigation of latent structures is important for a number of reasons, including methodological (for example excluding measurement error from individual scores) and substantial considerations (for example identifying internal structures and relationships between constructs).

Measurement issues with self-report scales

Misinterpretation/lack of information/memory bias

Respondents answer questions based on the way they interpret them, which may not always correspond to the intended meaning of a question. This may be due to the use of difficult or ambiguous words or formulations, or to respondents' burden or fatigue. Furthermore, respondents may not have enough information to answer certain question, in which case they may decide to choose a socially desirable answer, select a neutral answer or skip the question altogether. They may also not be equally accurate reporters of their inner states (such as feelings and motives). Finally, even when respondents

5. Criterion validity refers to the extent to which a measure is related to an outcome, whether an outcome is measured at the same time (concurrent validity) or in the future (predictive validity).

6. Type 1 errors occur when a researcher falsely concludes the existence of certain effect, while type 2 errors denote the reverse situation, when a researcher wrongly concludes that certain effect does not exist. For example, situations in which researchers claim that a particular Big Five dimension does not influence behaviour or well-being using short measures are prone to type 2 errors. Similarly, asserting the discriminant validity of a certain measure based on its small correlation with extremely short measures of Big Five traits may lead to type 2 errors. On the other hand, when researchers establish the incremental validity of a particular measure over and above the Big Five dimensions by using short measures of Big Five scales, type 1 errors may be inflated. In this situation the proportion of variance accounted by the Big Five traits in an outcome criterion may be reduced due to the use of short scales, thus creating the conditions to find incremental predictive power of new scales in situations where this does not exist (Credé et al., 2012).

interpret a question correctly and have sufficient information, they may still be susceptible to memory biases and base their answers on the kind of information that best fit with their self-image or value systems.

Social desirability

Social desirability bias represents the tendency of respondents to answer questions in a way that they believe will be viewed favourably by others. This tendency can either lead to "desirable" behaviour being overstated or "undesirable" behaviour being understated. For example, people tend to inflate their intellectual achievements or benevolent and charitable acts, and play down violent or illegal acts. They also tend to either inflate or deflate earnings, feelings of self-worth, physical appearance and so on. The direction of bias can be different for different groups. For example, men tend to over-report the number of sexual partners while women tend to under-report, in accordance with the contrasting social norms for the two groups regarding this issue. Social desirability is difficult to disentangle from the substantive interpretations of the scale. It is an especially important issue in high-stakes individual diagnostic situations, such as job selection or clinical screening, where respondents may try to present themselves in the best possible light. In order to avoid or reduce the effects of social desirability, questions need to be worded in a neutral manner, avoiding overly favourable words and balancing the desirability of opposing response options. In addition, special social desirability scales are used to explicitly measure the degree to which respondents are subjected to this bias and to control for its effects on the various personality measures. The most commonly used instrument for measuring social desirability is the Marlowe-Crowne Scale which also has a number of short forms, such as the Strahan-Gerbasi 10-item scale (Strahan and Strahan, 1972). However, the usability of these scales for controlling for the effects of social desirability tendencies is still rather limited, due to their poor reliability and their reliance on respondents' self-reports (Thompson and Phua, 2005).

Response styles

Whenever the so-called Likert scales are used – i.e. where respondents are asked to determine the level of agreement with a particular statement, mostly using five answer options from "strongly agree" to "strongly disagree" – responses are subject to various response-style biases. An "extreme response" style is the tendency to choose extreme response categories irrespective of the meaning of the question. This is found to vary according to education status, race and ethnicity (Greenleaf, 1992; Kankaraš and Moors, 2011). Likewise, an "acquiescence" response style – the tendency to agree with statements irrespective of their content – is found to have substantial effects on people's responses to questionnaire items and a consequential detrimental impact on the detectability and clarity of the five-factor structure (Rammstedt, Goldberg and Borg, 2010; Rammstedt and Kemper, 2011). The acquiescence response style can be controlled by using equal number of positively and negatively worded statements in a scale, so that the total effects of the agreeing tendency balance out over the scale (e.g. Rammsted, Goldberg and Borg, 2010).

Reference bias

Reference bias denotes a situation in which people from different countries answer the same question using different reference standards. In particular, a question such as: "I see myself as someone who tends to be lazy" (a question from the conscientiousness scale of a Big Five questionnaire) may be answered differently depending on a person's standards or reference points regarding what it means to be lazy. Possibly as a consequence of this, national rankings on the Big Five scale of conscientiousness do not correlate with factual measures such as average working hours (Schmitt et al., 2007). Reference bias is a problem when comparing aggregate data between cultures, but not when comparing individual scores within the same culture. Analysis of data from the Programme for International Student Assessment (PISA) shows the expected positive association between self-reported academic performance and

conscientiousness within countries, but between-country results indicate a negative association, with countries with higher scores on conscientiousness actually performing worse in maths and reading (Kyllonen and Bertling, 2013).

Measurement equivalence/invariance

In order for results to be comparable across cultures and countries, as well as an absence of reference bias, they need to be measurement equivalent, i.e. they need to measure the same construct or trait in each group. It is not sufficient to accurately translate questions into each local language; the people responding to them must understand them in the same way (Hui and Triandis, 1985; van de Vijver and Leung, 2001; Kankaraš and Moors, 2010). For example, in the European Value Survey, the question: "To which degree you are concerned about the members of your immediate family?" measuring solidarity values, is understood differently by people in Turkey compared to respondents from other European countries (Kankaraš and Moors, 2009). This may be due to the fact that the concept of "family" has rather a different meaning in Turkish society and this difference may affect the results for solidarity attitudes in that country.

Other assessment approaches

Others' ratings

Many of the constructs that can be measured through self-rating can also be assessed through ratings by others. The advantage of this approach is that other people may be more objective and reliable evaluators of some characteristics of an individual than the individuals themselves. In fact, some research suggests that for certain behavioural characteristics such as academic achievement or job performance others' ratings may be more accurate, unbiased and predictive than self-ratings (Connelly and Ones, 2010). The important factor is the degree to which raters know the person they are rating, but even in situations where trained raters have only known the subject for a short time the predictive value of these ratings may be higher than those obtained from self-rating (Lindqvist and Vestman, 2011). Ratings by teachers are especially valuable for younger students, whose self-ratings tend to be less reliable, but teachers' ratings have good predictive validity for a number of behavioural markers for school children of all ages (Segal, 2012).

Others' ratings are also useful when combined with self-ratings, since they provide complementary information that not only means a more comprehensive assessment but can also be used to identify and correct for certain types of measurement issues, such as social desirability or memory bias. In addition, others' ratings from different sources are found to add predictive validity to each other (Connelly and Ones, 2010). For example, self-, parent- and teacher-ratings of pupils are all used in school settings, and both parents' and teachers' ratings add predictive validity to self-ratings for various student outcomes (MacCann et al., 2010).

Others' ratings are also subject to some of the same measurement issues as self-ratings, such as lack of knowledge, memory bias, social desirability (especially when raters are close to the individual they are rating) and response-style bias (Connelly and Ones, 2010). Others' ratings are also less appropriate when personal experience and inner feelings and thoughts are the focus of research interests.

Observation/performance tasks

The numerous drawbacks of self-report measures have led psychologists to devise more objective measures of non-cognitive skills. Various observational and performance measures exist such as assessment of collaborative problem solving or the Consensual Assessment Technique (CAT; Amabile, 1982) used to evaluate creative products. For example, the CAT asks respondents to produce some creative artefact, such as a poem, drawing or composition. Experts in a particular domain are then asked to evaluate

the creative capacity of those artefacts (Amabile, 1982). Another well-known example of performance task is the so-called "marshmallow experiment" (Mischel, Shoda and Rodriguez, 1989) in which children are monitored to see how long they are ready to wait in order to obtain a larger treat (usually multiple marshmallows but also Oreos, chocolate candies, etc.) while a smaller treat is available for their immediate gratification. The test is found to be positively correlated with self-control scores and is shown to predict numerous life events decades later (Tsukayama, Duckworth and Kim, 2013).

Although these measures have benefits in terms of the objectivity of their results and the avoidance of the measurement pitfalls of self-report scales, they have their own limitations that largely prevent their widespread use (Duckworth and Yeager, 2015). Their biggest drawback is that overt behaviour may be caused by different factors, and that although the performance itself is objective its interpretation is based on researchers' assumptions and as such subjective.[7] Given that they usually only yield a single score, they are more susceptible to situational influences and the effects of irrelevant factors, which can increase measurement error or create bias. Questions about the accuracy and objectivity of the assessment process are also often raised. Observation and performance task are also often more costly and difficult to implement.

Situational judgement tests

Situational judgement tests consists of items in which a particular situation is presented and a respondent is asked to provide the best or typical answer to the situation, usually among multiple response options (e.g. MacCann and Roberts, 2008). Two examples are the Situational Test of Emotional Understanding (STEU) and the Situational Test of Emotional Management (STEM), which are designed to measure complementary aspects of emotional intelligence (see examples in Annex I; MacCann and Roberts, 2008). The idea behind this test format is to avoid some of the limitations of self-reports such as having a different reference point/standard or misunderstanding the question. This technique also overcomes the biggest drawback of the observational approach since it invokes the relevant test situations (and related response) directly, rather than waiting for it to happen in reality, which can often be impractical and/or costly.

The situational judgement test technique also suffers from some of the same limitations as self-reports, such as respondents' tendency to provide socially desirable answers, or given test situations which are less appropriate for different populations or cultural groups and settings. In addition, they are usually lengthier than self-report tests since each situation needs to be presented and described separately.

Biodata

Biodata represent the collection of biographical activities that are relevant to the assessed skill, competence or characteristic of a given person. These data typically represent information found on a curriculum vitae but can also include more specific details. Biodata can be captured in a standardised format, so that they can be summarised and compared across individuals and groups (Kyllonen, 2012). Biographical inventories, such as the Creative Achievement Questionnaire (Carson, Peterson and Higgins, 2005) or the Biographical Inventory of Creative Behaviours (Batey, 2007) are used to assess creativity by identifying respondents' creative achievements in various life domains.

7. For example, although the initial interpretation of the marshmallow experiment was that self-control was the critical factor distinguishing between children who went for immediate gratification and those who waited for a larger reward, recent research indicates that the degree to which children believe the experimentator will return as promised also has a large effect on their behaviour in this situation (Kidd, Palmeri and Aslin, 2013).

The main obstacle to using biodata is that it is not straightforward to find valid and reliable biographical markers of specific personal qualities, and biographical data are the product of multiple interactions of personal and situational factors. In addition, privacy concerns and other ethical considerations restrict the scope of potential research topics and applications using these information sources.

Conceptual and measurement overlap between skills and scales

One important issue regarding the utility of personality scales, especially when they are to be applied as a part of a wider battery of tests, is the potential overlap between the concepts that different scales are assumed to measure. In methodological terms, this concerns the issue of discriminant validity, i.e. the degree to which measures which are supposed to assess distinct attributes are indeed unrelated (Campbell and Fiske, 1959). This is important not only for analytical clarity but also to avoid redundancies across personality scales and increase testing efficiency.

In psychological research it is quite common to find small to moderate-sized correlations between scales that are measuring unrelated constructs. In many cases, researchers are able to offer a theoretical justification for these correlations since personality attributes are often conceptually related with one another or are influenced by a common cause. However, when the inter-correlations between theoretically distinct constructs become too large, or when they exist in the absence of a theoretical rationale, this calls into question the validity and practical usefulness of the particular measure and/or construct.

One example is the concept of grit, defined as “perseverance and pursuit of long-term goals” (Duckworth et al., 2007). The measure of grit is found to be highly correlated with the Big Five subscale of conscientiousness (r=0.77). After correction for attenuation (excluding measurement errors in the two scales) this correlation reaches 0.91, indicating that 82% of variation in the scores across the two scales is shared. Thus, the grit scale provides only a limited amount of extra information about respondents on top of that already provided by one of the Big Five scales.

The conceptual and operational broadness of the Big Five or HEXACO dimensions makes it highly likely that any measure of personality will be related to at least some of its subscales. Some personality attributes are also often conceptually related and frequently (partly) overlap which raises the question of the discriminant validity of their individual measures. For example, McClelland’s “achievement motivation” is similar to Schwartz’s “achievement value” and to “achievement seeking”, a facet of the Big Five’s conscientiousness dimension. Similarly, the concepts of self-control, emotional intelligence, social competence, are related to the Big Five dimensions emotional stability and agreeableness. It is thus important to examine to what degree the measures of these personality constructs are related with other personality scales.

Table 1 presents the inter-correlations between some of the scales discussed in this report. These indicate that a number of scales discriminate quite well from the Big Five (HEXACO) measures. On the other hand, a number of scales, such as the Unified Motives Scale or the Trait Emotional Intelligence Questionnaire-Short Form, have moderate to strong correlations with one or more Big Five dimensions. Such high correlations raise the issue of incremental validity and practical usefulness of these scales in situation when they are administered as a part of a battery that already contains a Big Five measure.

Table 1. Inter-correlations between some of the scales presented in this report[8]

		Achievement Motivation scale [1]	The Basic Psychological Needs scale [2]	Unified Motive scales [3]	Schwartz's Value scale [4]	General Self-Efficacy Short scale[5]	General Self-Efficacy scale (GSE)[6]	Grasmick self-control scale[7]	Tangney self-control scale[8]	Interpersonal Competence Questionnaire[9]	The Tromsø Social Intelligence scale[10]	Situational Test of Emotional Understanding (STEU-B)[11]	Situational Test of Emotional management (STEM-B)[12]	The Trait Emotional Intelligence Questionnaire -Short Form[13]
Big Five	Agreeableness	.14	**.43**	.31	.35	.04	.38	.30	.06	.01-34	.27	.06	.20	.40-.45
	Conscientiousness	.28	**.40**	.34	.30	.32	.39	**.53**	**.59**	.26-38	.23	.01	.08	.34-.47
	Extraversion	.15	**.45**	**.64**	.39	.36	.36	.01	-.03	.21-60	.50	.02	.00	.51-.52
	Neuroticism	-.06	**-.42**	**.62**	.22	-.31	**-.52**	-.13	-.37	.25-37	-.38	.00	.02	.55-.67
	Openness to experience	.24	.25	.32	**.42**	.29	.33	**.43**	.32	.07-21	.14	.12	.05	.27-.32

Note: 3. Figures represent the highest correlations between individual subscales and the Big Five dimensions.

Source: 1. Komarraju, M., S.J. Karau and R.R. Schmeck (2009), "Role of the Big Five personality traits in predicting college students' academic motivation and achievement", http://doi.org/10.1016/j.lindif.2008.07.001; 2. Philippe, F.L. et al. (2011), "The role of need satisfaction as a distinct and basic psychological component of autobiographical memories: a look at well-being", http://doi.org/10.1111/j.1467-6494.2010.00710.x; 3. Schönbrodt, F.D. and F.X.R. Gerstenberg (2012), "An IRT analysis of motive questionnaires: the Unified Motive Scales", http://doi.org/10.1016/j.jrp.2012.08.010; 4. Haslam, N., J. Whelan and B. Bastian (2009), "Big Five traits mediate associations between values and subjective well-being", http://doi.org/10.1016/j.paid.2008.09.001; 5. Beierlein, C. et al. (2013), "Short scale for measuring general self-efficacy beliefs (ASKU)", http://doi.org/10.12758/mda.2013.014; 6. Wang, Y. et al. (2014), "The mediating role of self-efficacy in the relationship between Big Five personality and depressive symptoms among Chinese unemployed population: a cross-sectional study", http://doi.org/10.1186/1471-244X-14-61; 7-8. de Vries R. E. and J.L. Gelder (2013), "Tales of Two Self-control Scales: Relations with Five-Factor and HEXACO Traits", http://doi.org/10.1016/j.paid.2012.12.023; 7. Riggio, R.E. (1986), "Assessment of basic social skills", http://doi.org/10.1037/0022-3514.51.3.649; 9. Coroiu, A. et al. (2015), "Brief form of the interpersonal competence questionnaire (ICQ-15): development and preliminary validation with a German population sample", http://doi:10.1027/1015-5759/a000234; 10. Silvera, D.H., M. Martinussen and T.I. Dahl (2001), "The Tromso Social Intelligence Scale, a self-report measure of social intelligence", http://doi.org/10.1111/1467-9450.00242; 11. Allen, V.D. et al. (2014), "Development of the situational test of emotional understanding - Brief (STEU-B) using item response theory", http://doi.org/10.1016/j.paid.2014.01.051; 12. Allen, V.D. et al. (2015), "The situational test of emotional management - Brief (STEM-B): development and validation using item response theory and latent class analysis", http://doi.org/10.1016/j.paid.2015.01.053; 13. Petrides, K.V. and A. Furnham (2001), "Trait emotional intelligence: psychometric investigation with reference to established trait taxonomies", http://doi.org/10.1002/per.416.

It also needs to be acknowledged that a number of studies have found that individual facet scales measuring narrower concepts than the broad dimensions of the Big Five may have greater explanatory potential and predictive validity than the Big Five scale measures alone (e.g. Paunonen and Ashton, 2001; Mershon and Gorsuch, 1988). It is therefore important to find the right balance between increasing the analytical potential achieved by including additional scales and the decreasing amount of new information provided with each additional scale. Section 3 discusses the criteria for selecting measures in more detail.

8. Please note that these values are taken from some of the available studies and that they do not aim to provide a comprehensive overview of the results of relevant studies but rather to roughly indicate the range of values of relevant correlation coefficients.

SELECTED PERSONALITY CHARACTERISTICS

Personality traits and basic dimensions of personality

In psychological research, as well as in everyday life and culture, a wide variety of psychological traits are used to explain human behaviour and characterise individual personalities. Using a so-called "lexical approach", personality psychologists have tried to reduce this variety and come up with a small number of basic personality dimensions. The lexical approach assumes that the most important characteristics of personality will be encoded in language and so the first step in the comprehensive analysis of personality is to look at the vocabulary used to describe people. This is then followed by using the statistical technique of factor analysis to group together similar personality attributes and thus identify a few more general and basic dimensions of personality. Using this type of analysis personality psychologists have developed a number of theoretical models of personality structure. The most prominent of these is the Big Five model. Recently, the HEXACO model has been proposed, postulating an additional, sixth dimension.

The Big Five model

Conceptual framework

The so-called "Big Five" model distinguishes five distinct personality dimensions: agreeableness, conscientiousness, extraversion, neuroticism (also called emotional stability) and openness to experience. Each of these five dimensions represents a cluster of mutually related personality traits or facets. For example, conscientiousness includes the traits of self-discipline, perseverance, dutifulness, and achievement seeking (see Table 2 for a more detailed overview).

The Big Five personality model has been extensively researched and has accumulated a substantial empirical foundation (John, Naumann and Soto, 2008). Numerous research teams have found a similar five-factor structure of personality traits and this consistency in results has contributed to the widespread acceptance of this model (John, Naumann and Soto, 2008). In fact, the model itself is a product of independent research streams that came up with the same results using somewhat different variants of the lexical approach (Tupes and Christal, 1958; Norman, 1963; Goldberg, 1982; McCrae and Costa, 1985). Similar personality structures have been identified in numerous other countries around the world, not just in Western societies (e.g. McCrae and Costa, 2006).

In spite of their widespread acceptance and use, or maybe because of it, the Big Five and other similar models based on the application of the lexical approach have attracted substantial criticism (e.g. Block, 1995; McAdams, 1992). First, from the conceptual point of view it is not clear to what degree the dimensions are related to each other and how to interpret their empirical inter-correlations. In addition, although these models claim to offer a comprehensive representation of the entirety of human personality, they do not include important attributes such as motivation, masculinity/femininity, egotism, humorousness, risk-taking, and – in the case of Big Five – honesty and manipulativeness (Block, 2010). The usefulness of the dimensions is also questioned, due to their relatively low correlations with various life outcomes. From the methodological point of view, the model has been critiqued as atheoretical, data-driven and overly dependent on the application of factor analysis that is itself subject to criticism for its lack of objective criteria of selection and interpretation of factors.

Table 2. Descriptions of the Big Five domains

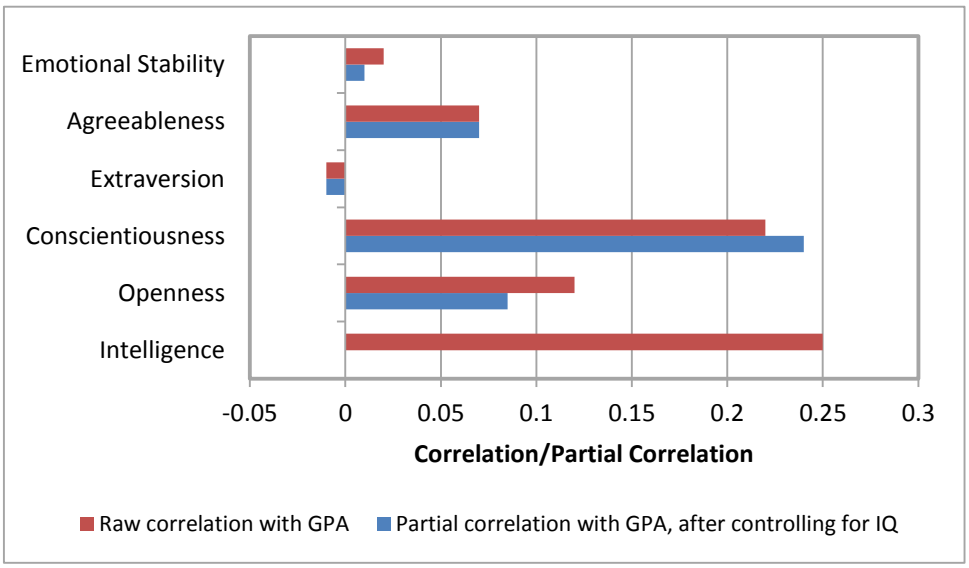
Big Five domains					
Factors	**Extraversion**	**Agreeableness**	**Conscientiousness**	**Neuroticism**	**Openness to experience**
Main sub-domains (facets)	Energy Sociability Assertiveness	Empathy/warmth Altruism Trust	Self-control Responsibility Achievement orientation	Anxiety/nervousness Negative emotionality Emotional volatility	Curiosity Originality Open-mindedness
Conceptual definition	Indicates drive towards others and ambition for dominance/withdrawal in social situations.	Determines the quality of relationship with others, with warmth, benevolence and co-operation on one side and hostility, coldness and mistrust on the other.	Represents degree to which individuals control and channel their impulses in socially prescribed way.	Describes the typical emotional responses to reality, i.e. their quality and quantity of their changes.	Indicates the degree to which person appreciates new experiences as opposed to which he/she values old routines.
Behavioural examples	Loves to go to social gatherings; is leader of informal groups; is withdrawn in a school class or in a meeting (R); gets easily tired (R).	Trust people even when do not know them well; finds faults with everyone (R); tends to agree with people; wants to help people in trouble; sympathise with people in need.	Organise their day and living space; is never late on appointments; persist in tasks until they are finished; is ambitious and determined; tends to follow school or company's rules.	Is worried about most of daily tasks, even those less important; has hard time dealing with critic; tend to fall into darker mood; is optimistic (R).	Loves to read; enjoys art exhibitions; has many interests; enjoys philosophical discussions; does not like change of daily routines (R).
Related life outcomes	*High:* Wider circle of friends and acquaintances; more likely to occupy leadership positions. Better job satisfaction in fast-paced work environments. *Low:* Can easier adjust to school environment, social network is constrained to selected few; have poorer health.	*High:* More likely to work in customer care industries and in larger teams. Higher life satisfaction. Prone to disappointments. *Low*: Delinquency, anti-social behaviours, more likely to have higher income.	*High*: Better educational achievement and job performance; more likely to live longer. *Low:* Difficulties at school and work; delinquency and substance abuse; more creative.	*High*: Lower school and work achievements; more likely to suffer from depression and other emotional problems; problems in relationships; lower life satisfaction. *Low*: Better quality of life; more fulfilling relationships; improved health.	*High*: Better educational attainment; more likely to create original and artistic works, broader knowledge of different fields; more likely to learn foreign languages. *Low*: Tends to vote conservative; has fewer out-of-group friends; less likely to consume recreational drugs.

Note: (R) denotes that the behaviours that are inversely related to the Big Five domain.

The Big Five dimensions and important life outcomes

Numerous studies and meta-analyses have found that the Big Five personality dimensions are associated with academic and job performance, health and criminality, although in many cases correlations tend to be relatively small (Almlund et al., 2011; Roberts et al., 2007; Heckman and Kautz, 2012). Of the individual dimensions, conscientiousness – the tendency to be diligent, prudent and organised – seems to have the greatest predictive power (Hogan and Holland, 2003). In one study the Big Five dimensions accounted for 14% of the variation in school grades (Komarraju et al., 2011). After conscientiousness, openness to experience and agreeableness seem to be the most important personality traits for academic success (Figure 6). Their effect on academic achievement is both direct and indirect, through their influence on learning styles, teachers' perceptions, etc.

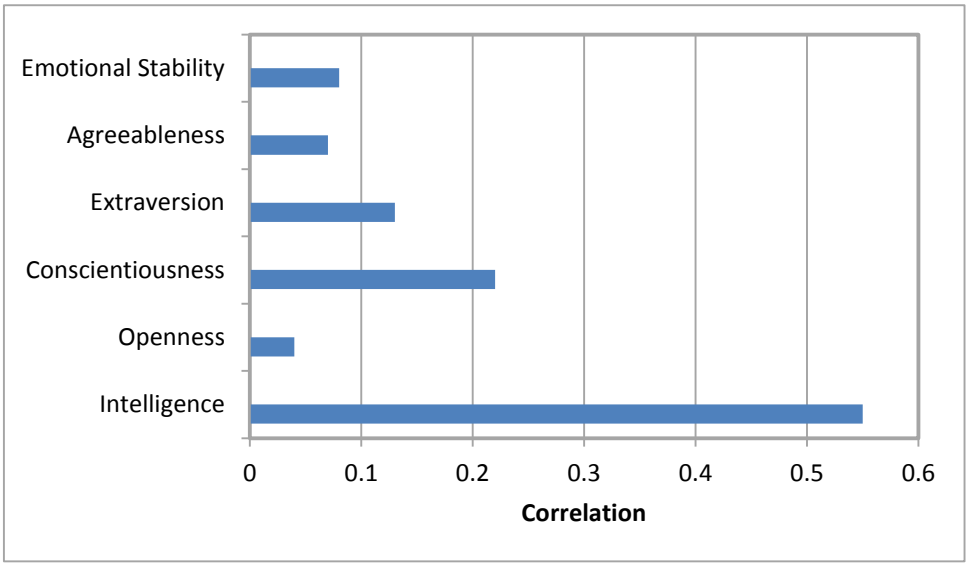
Figure 6. Correlations of the Big Five and intelligence with course grades



Source: Poropat (2009), "A meta-analysis of the five-factor model of personality and academic performance", http://doi.org/10.1037/a0014996.

Figure 7 presents the relationship between the Big Five dimensions and job performance (representing a combination of job proficiency, training proficiency and personnel data), while controlling for intelligence. As can be seen, conscientiousness is the most important predictor of job performance. Agreeableness and neuroticism predict work performance in groups or teams, extraversion is important for managerial positions, openness to experience for creative professions, and conscientiousness is important for most conventional jobs (John et al., 2008).

Figure 7. Correlations of the Big Five and intelligence with job performance

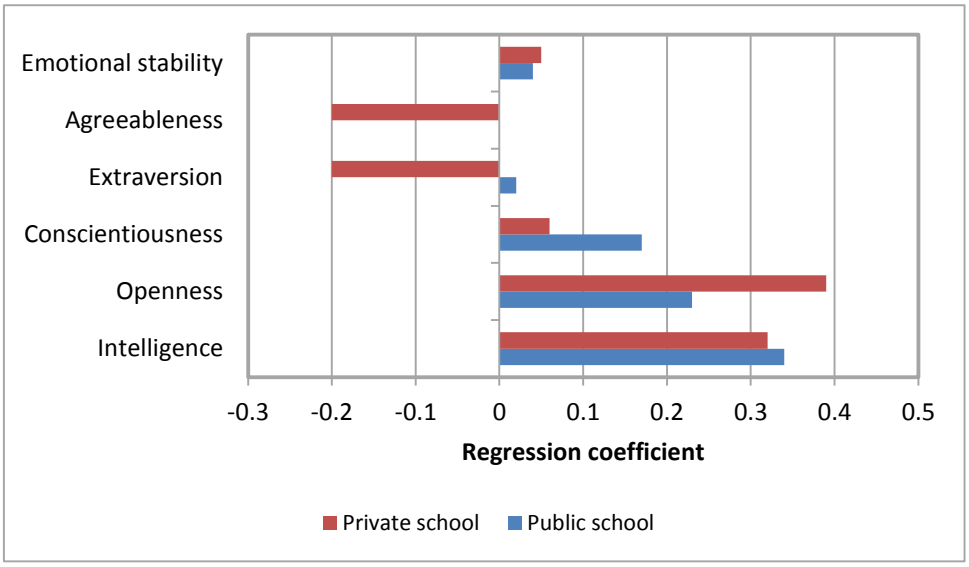


Source: Adapted from Barrick, M.R. and M.K. Mount (1991), "The Big Five personality dimensions and job performance: a meta-analysis", *Personnel Psychology*, Vol. 44, pp. 1-26 and Schmidt, F.L. and J.E. Hunter (1998), "The validity and utility of selection methods in personnel psychology: practical and theoretical implications of 85 years of research findings", *Psychological Bulletin*, Vol. 124(2), pp. 262–274, http://doi.org/10.1037/0033-2909.124.2.262.

However, the relationships are not always straightforward. For example, data from Dutch surveys found a positive association between emotional stability (the other end of the neuroticism dimension) and earnings, but a negative relationship with extraversion and agreeableness (Nyhus and Pons, 2005). This may be due to the fact that agreeable people are more likely to select service and nursing occupations where the average income is lower. However, the relationship between agreeableness and income seems to be affected by gender as well, with high agreeableness negatively affecting men's income much more than for women (Judge, Livingston and Hurst, 2012).

Figure 8 presents similar results from a meta-analysis of the relationship between Big Five traits and standardised test scores, where agreeableness and extraversion are negatively correlated with these scores among private school students (Almlund et al., 2011).

Figure 8. Associations of the Big Five and intelligence with standardised achievement test scores



Source: Adapted from Almund et al. (2011), "Personality psychology and economics", http://doi.org/10.1016/B978-0-444-53444-6.00001-8.

In addition to job performance, a meta-analysis of the relationship of the Big Five dimensions with job satisfaction has found that job satisfaction is positively correlated with conscientiousness (0.26), extraversion (0.25) and agreeableness (0.17) and negatively correlated with neuroticism (-0.29) (Judge, Heller and Mount, 2002). The five dimensions are also found to be one of the most important correlates of occupational outcomes, more important than parental income and socio-economic status (Roberts et al., 2007).

The Big Five personality dimensions are also related to other important life outcomes such as health status, criminality and longevity. A meta-analysis of the predictive value of the Big Five model found that, even when controlling for the effects of gender and the severity of disease, the effects of the Big Five traits on longevity are stronger than those of cognitive skills and socio-economic status (Roberts et al., 2007). Conscientiousness, for example, is related with good health habits, better health status, and lower risk of smoking, substance abuse and poor diet (Hampson and Friedman, 2008). Low agreeableness predicts cardiovascular disease, and high neuroticism predicts poorer coping skills (John et al., 2008).

The Big Five traits also have a stronger impact on divorce than socio-economic status. Extraversion, conscientiousness and low neuroticism are related with greater relationship satisfaction and less conflict and abuse (John et al., 2008). Low conscientiousness and agreeableness also have the strongest relationships with criminality, with people committing severe crimes having substantially lower scores for these two personality dimensions (John et al., 1994).

Measurement of the Big Five dimensions

The most popular of the various measures of the Big Five are the Big Five Inventory (BFI),[9] the Neuroticism-Extraversion-Openness Personality Inventory NEO-PI-R (revised version of NEO personality inventory), the International Personality Item Pool (IPIP) and Trait Descriptive Adjectives (TDA). These are all mostly based on the use of self-descriptive sentences or adjectives; respondents rate the degree to

9. A new 60-item form of this inventory has been recently published (BFI-2; Soto and John, 2016).

which they apply to themselves or to their peers. For example, one of the statements from the BFI is: "I see myself as somebody who is reserved". Respondents have the choice of five response categories from 1 (disagree strongly) to 5 (agree strongly).

Due to the length of the original versions of these inventories, shorter versions have been designed and validated (the BFI was originally designed as a relatively short version with 44 items). These forms are especially useful in applied research settings such as large-scale surveys with nationally representative samples, where testing time is severely constrained. Compared to the original 200 or so items, the shortened version of NEO-PI-R contains 60 items (NEO-FFI). An abbreviated version of the TDA contains 40 rather than the original 100 (Saucier, 1994). These shorter versions take up much less testing time – the BFI is estimated to take about 5 minutes and the NEO-FFI and TDA around 15 minutes to complete (John and Srivastava, 1999; John et al., 2008). In recent years even shorter versions of these scales have been developed. Among these are the BFI-10 (10 items; Rammstedt and John, 2007), the BFI-S (15 items; Lang et al., 2011), the Ten Item Personality Inventory (10 items; Gosling et al., 2003) and the Mini International Personality Item Pool (Mini-IPIP, 20 items; Donnellan et al., 2006).[10] The first three of these can be found in Annex A. The longer and more comprehensive questionnaires usually provide more precise and reliable estimates of measured personality traits and dimensions (e.g. Credé et al., 2012). However, the shorter scales still provide relatively satisfactory measurement properties even with a drastic reduction in the number of items (Thalmayer et al., 2011; de Vries, 2013). In some studies, the BFI-10 has shown particularly good predictive power: at the same level and in some instances even better than that of the other longer versions of inventories, including the longer version of the same BFI inventory (Thalmayer and Saucier, 2014). However, the majority of studies still indicate that the reliability and validity of the scores from shorter scales are less than those from longer ones (Credé et al., 2012; Rammstedt and John, 2007; de Vries, 2013).

A range of approaches can be used to shorten scales. The number of items per dimension can be varied in line with the relative analytical value (for example Rammstedt and John, 2007 proposed using three items for the agreeableness dimension and two items for the other dimensions in a short BFI). It is also possible to combine the Big Five with the HEXACO measure (see below) by adding extra items to measure the additional factor of honesty-humility. One such combined measure, using HEXACO items for the honesty and agreeableness dimensions and BFI items for the remaining four dimensions has shown better predictive validity than standard Big Five measures (Thalmayer et al., 2011). Another promising development is the use of adaptive testing using computers or online modes. This approach adjusts the questions asked based on the answers to previous questions, increasing efficiency by achieving the same level of precision with smaller number of items. It is now routinely applied in the assessment of cognitive skills (for example, see the PIAAC technical report; OECD, 2013) but the procedure is also starting to be increasingly used in personality testing (for example Drasgow and Chuah, 2006).

These measures of personality dimensions represent some of the most extensively tested and used instruments and as such have relatively solid measurement attributes and empirical basis. Their reliability is relatively good, with internal consistency and test-retest reliability values of 0.80-0.90 for longer versions and 0.70-0.80 for shorter versions (McCrae and Costa, 2010; Rammstedt and John, 2007; John et al., 2008; Gosling et al., 2003; de Vries, 2013). Due to its shortness, the internal consistency values for the BFI-S scale (15 items, 3 per dimension) are 0.50-0.65 (Lang et al., 2011).[11] The results for validity are

10. Some of other short personality scales are the abridged Big Five (Langford, 2003), the Single-Item Measures of Personality (SIMP, Woods and Hampson, 2005), the Domain Self Ratings scale (DSR, Bernard, Walsh and Mills, 2005; Donnellan, Oswald, Baird Lucas, 2006), and the Five-Item Measure of the Big Five (Aronson, Reilly and Lynn, 2006).

11. Internal consistency is a measure based on the intercorrelations between the items of a scale. The higher these item correlations the higher the internal consistency of a measure. Short-scale measures are often

more ambiguous. Convergent validity (correlation with instruments that measure the same constructs) is relatively high – ranging between 0.60 and 0.90 for the BFI, NEO-FFI and the shorter version of the TDA (John et al., 2008). On the other hand, criterion validity (correlations with various outcomes such as school achievement, occupational status, divorce and mortality) typically varies between 0.20 and 0.40 (Roberts et al., 2007). These inventories have been translated and tested in a wide range of cultural settings with relatively encouraging results. In particular, although the five-factor structure is clearest in Western societies, researchers have been able to identify similar structures in numerous other, quite distinct cultures, although certain differences were still observed (e.g. McCrae and Costa, 2006).

In spite of their overwhelming acceptance and use, these measures are, nevertheless, subject to criticism. First of all, as they mostly rely on self-reporting, they are susceptible to tacit biases and social desirability effects, discussed in more detail in section 1. They are also susceptible to intentional falsification of responses, all of which are difficult to detect in the analysis of results (Donaldson and Grant-Vallone, 2002; Paulhus and John, 1998). These instruments are even more problematic when results are used to compare average scores across groups. It can be difficult to know whether the observed differences represent true underlying differences in personality traits or differences in tendencies towards faking, desirability and self-reporting biases. Peer reports and reports on others somewhat improve this situation although they by no means eliminate these issues. In cross-cultural comparisons, reference bias (the tendency to use different standards/reference systems when deciding to what degree a person is characterised by a certain attribute) represents an additional cause of concern that can severely influence results and reduce the comparability of data (Heine, Buchtel and Norenzayan, 2008). As with other questionnaires that use Likert rating scales, answers are also prone to various response-style biases. The effects of the acquiescence response style (see section 1) are detectable in the NEO-FFI, and are especially large in the TDA (John et al., 2008).

Finally, as mentioned earlier, the Big Five measures are not equally relevant in all cultures. Some research indicates that openness to experience is especially difficult to identify in Asian cultures (Cheung, van den Vijver and Leong, 2011). In other cultures, different variants of the lexical approach have led to modified or completely new factors (Szirmak and De Raad, 1994). The HEXACO model may have somewhat better cross-cultural validity since it has a wider cultural and lexical foundation, given that it was simultaneously developed in several European and Asian languages as opposed to the English-based Big Five model (Ashton and Lee, 2007). However, in a recent study, Thalmayer and Saucier (2014) found the level of cross-cultural comparability of the HEXACO scales to be similar to those of the Big Five scales.

The HEXACO model

Conceptual framework

The HEXACO model has attracted increasing attention in recent years (Ashton and Lee, 2008). Based on a similar lexical approach to that of the Big Five, but this time involving several European and Asian languages, rather than just English as was the case in the Big Five model, HEXACO proposes a

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intended to provide the maximum amount of information about the underlying construct with a minimum set of items. Therefore the items in short scales are selected to reflect more than one aspect of that construct. This inevitably leads to lower inter-correlations of items and lower internal consistency for a scale. In addition, Cronbach's alpha (the most popular measure of internal consistency) is also directly dependent on the number of items in a scale, with shorter scales having lower alpha values even with the same average inter-correlations. For these reasons, internal consistency coefficients usually underestimate the reliability of short scales.

six-dimensional structure of human personality.[12] Three of its dimensions – conscientiousness, extraversion and openness to experience – are very similar to those in the Big Five model, while a further two – agreeableness and emotionality – greatly overlap with the agreeableness and neuroticism dimensions in the Big Five model.[13] The sixth dimension of honesty-humility is unique to this model.

The honesty-humility dimension represents the tendency to be fair and genuine in dealing with others, by co-operating even when it is possible to exploit others without suffering consequences. As such, it can be seen an aspect of reciprocal altruism, i.e. the tendency to not exploit the other party in spite of possible opportunities (Ashton and Lee, 2007). High levels of honesty-humility lead to increased co-operation with others (mutual help and nonaggression) but also to reduced opportunities for personal gain from the exploitation of others. On the other hand, those with low levels of honesty-humility will be prone to opportunism, defecting from co-operation in situations where defection would not be punished. In addition, low levels on this dimension lead to greed and slyness, where the extra benefits of unilateral non-co-operation over mutual co-operation are exploited for personal gain. Thus, the honesty-humility dimension represents the tendency for ethical and pro-social altruistic behaviour (Ashton and Lee, 2008; Thalmayer et al., 2011).

The honesty-humility dimension consists of four personality traits or facets: sincerity and fairness (two aspects of honesty) and greed avoidance and modesty (two aspects of humility). Sincerity denotes a tendency to be genuine in interpersonal relations, to abstain from flattering or manipulating others in order to benefit oneself. Fairness represents a tendency to avoid fraud and corruption, the unwillingness to take advantage of others or of society at large by cheating or stealing. Greed avoidance is the absence of affinity towards possessions and displays of lavish wealth and social-status symbols. Modesty is a tendency to be unpretentious and unassuming, to see oneself as an ordinary person rather than as superior or entitled to privileges.

The importance of the honesty-humility dimension

The honesty-humility personality dimension has been found to be relevant for a wide range of personal, work and social aspects of people's lives. Lower levels of honesty-humility are associated with more materialistic attitudes, unethical business practices (Ashton and Lee, 2008; Lee et al., 2008) and a propensity to take risks with health and safety (Weller and Tikir, 2011). Honesty-humility, and especially its fairness facet, is a strong predictor of delinquency, even after taking into account the effects of self-control (de Vries and van Gelder, 2013). A strong negative correlation was found between the honesty-humility factor and personality constructs based on exploitation and entitlement, such as primary psychopathy, Machiavellianism, narcissism and manipulativeness (Lee and Ashton, 2005; Lee et al., 2008). This is not surprising given that conceptually, the "dark triad" of personality traits – namely psychopathy, Machiavellianism and narcissism – are seen as the opposite pole to honesty-humility (Ashton and Lee, 2005).

Low levels of honesty-humility are found to be strongly related with anti-social behaviour directed at organisations (Lee, Ashton and Shin, 2005), workplace delinquency (Lee, Ashton and de Vries, 2005), counterproductive behaviours (Zettler and Hilbig, 2010), sensation seeking and egoism (de Vries et al., 2009). On the other hand, employees with high levels of honesty-humility have higher overt integrity (Lee, Ashton and de Vries, 2005; Marcus, Lee and Ashton, 2007; Lee et al., 2008) and better overall job performance as rated by their supervisors (Johnson, Rowatt and Petrini, 2011). Honesty-humility is also

12. In particular, lexical studies that resulted in the same six-factor HEXACO model were conducted in seven languages: Dutch, French, German, Hungarian, Italian, Korean and Polish.

13. In the HEXACO model, some of the traits representing neuroticism in the Big Five model (e.g. choleric temper) are now related to the low end of the agreeableness dimension, etc.

related to how decision makers allocate valued goods, with those low in honesty-humility making more selfish decisions unless facing punishment and those high in honesty-humility making fairer allocations even when not facing negative consequences (Hilbig and Zettler, 2009).

Furthermore, honesty-humility is found to be predictive of academic success, both in terms of grades and of counterproductive academic behaviour (de Vries, de Vries and Born, 2011). It is also an important predictor of values and socio-political attitudes. In particular, it is found to be negatively related to hierarchy orientation (Lee et al., 2008) and social dominance orientation (Leone, Chirumbolo and Desimoni, 2012). In addition, recent studies have found that the HEXACO model has substantial overlap with Holland's RIASEC model (see below; McKay and Tokar, 2012). Interestingly, those lower in honesty-humility have higher scores in self-described creativity, a result that is in line with prior findings on the higher arrogance and pretentiousness (or lower modesty) of creative people (Silvia et al., 2011).

Measurement of the HEXACO dimensions

The most used measure of the HEXACO model is the HEXACO Personality Inventory (HEXACO-PI; Lee and Ashton, 2004) part of which is included in Annex B. The scale assesses the six dimensions of the HEXACO model, each divided into four separate facets that capture related but distinguishable behaviours (24 facets in total). Its original version consisted of 192 items (8 items per facet) for the full-length version and 96 items (4 items per facet) in the half-length version. All items are rated using a 5-point scale, ranging from strongly disagree to strongly agree. Two versions of the scale are constructed, one in the form of a self-report and the other in the form of an observer report. The original inventory has since been slightly modified (two facets scales have been changed) and the revised version currently in use – the HEXACO Personality Inventory-Revised (HEXACO-PI-R) – contains 200 items in the full version and 100 items in the half-length version (Lee and Ashton, 2016).

The scale has relatively good psychometric properties, with high specificity (unique variation) of individual factors (ranging from .45 to .69) and relatively low inter-correlations between factors (the highest being r=.28 between honesty-humility and agreeableness). Each of the six dimensions is also found to have relatively high convergent validity with alternative measures of respective personality traits (correlations varied from .41-.86 to .50-.75 for the four facets of honesty-humility).

The scale is found to outperform Big Five measures in relation to a number of criteria, and especially those concerning anti-social or self-serving behaviours like workplace delinquency, criminal choices, sexual harassment, egoism, narcissism, risk-taking and pathology (Ashton and Lee, 2008; Ashton et al., 2010; Lee et al., 2008; de Vries, de Vries and Born, 2011; Lee, Ashton and de Vries, 2005; de Vries et al., 2009).

More recently, authors have developed a shorter version of the HEXACO-PI-R, containing 60 items from the original 200 (HECAXO-60; Ashton and Lee, 2009), part of which is also in Annex B. In this version, each of the 6 subscales contains 10 items. Internal reliabilities range between .73 and .80 for college and community samples, and the factor structure was in line with theoretical expectations. Convergent validity with the Big Five scale was relatively high as well. This scale can be completed in less than 10 minutes.

Another scale for measuring the HEXACO model has been developed using an existing depository of questionnaire items – the International Personality Item Pool (IPIP; Goldberg, 1999). The IPIP was developed to provide a freely available, public-domain item pool with brief and contextualised items that would allow the rapid construction of personality scales and efficient assessment of various personality characteristics. Using relevant items from this pool, authors have constructed a 60-item scale (10 items per dimension) that measures the HEXACO model (IPIP-HEXACO; Ashton, Lee and Goldberg, 2007),

included in Annex B. The internal reliability of the scale is very high, ranging from .88 to .92 (honesty-humility facets range from .76 to .80). Convergent correlations with HEXACO-PI-R ranged from .76 to .98 after correction for attenuation (.87 in the case of the honesty-humility dimension). The factor loadings of the scale are ranging from .52 to .86 (.57-.80 for the four honesty-humility traits) and are similar to those obtained by HEXACO-PI from the same sample. However, one downside of this scale is the relatively substantial inter-correlation between honesty-humility and agreeableness (r=.41) which is higher than for the HEXACO-PI (R=.30).

The Brief HEXACO Inventory (BHI; de Vries, 2013) is a 24-item scale derived from a recent operationalisation of the HEXACO model, the HEXACO Simplified Personality Inventory (HEXACO-SPI; de Vries and Born, 2013). It is the first short questionnaire-based on the HEXACO model. The HEXACO-SPI (only available in Dutch) and BHI items are similar to the HEXACO-PI-R items but not exactly the same – they are simplified and shortened in order to make them more suitable for children and people with lower levels of education (de Vries, 2013). The 24 items cover all 6 HEXACO dimensions and each is related to one of its 24 individual facets. Its alpha reliability ranges between .44 and .72 (.57 for humility-honesty), while test-retest and inter-rater reliabilities vary between .71-.78 and .39-.58 respectively (.78 and .46 for honesty-humility). It also has relatively good convergent (.59-.83) and divergent validity (.15-.32). In terms of criterion validity, the BHI has shown very similar correlations to those obtained by HEXACO-PI-R in relation to a range of personality characteristics. The BHI is included in Annex B.

Motivation

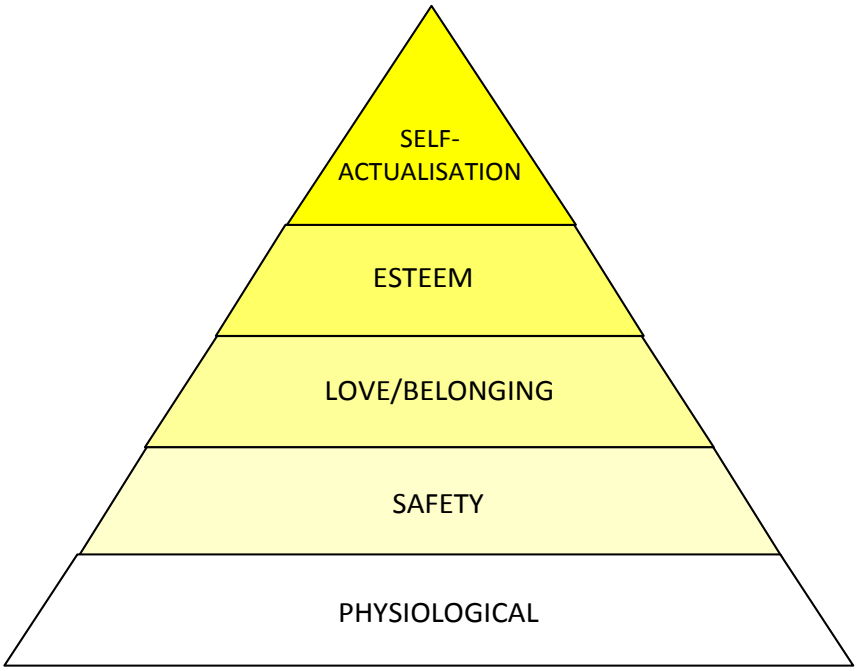
Motivation is defined as the internal condition that stimulates, directs and maintains behaviour (Kleinginna and Kleinginna, 1981). It is considered to be key determinant of human behaviour, representing the reasons behind people's actions, their drives, needs and inclinations. Motives drive people to act in a certain way and with a certain goal. There is a wide variety of motives, from those based on natural needs, such as hunger, thirst, sex, violence or fear, to those based on some rationality, such as self-control, risk avoidance, instrumentality and self-actualisation. In this section we present some of the most influential theoretical frameworks for the investigation of human motivation.

Hierarchy of needs

Conceptual framework

Abraham Maslow (1989) developed a very influential conceptualisation of human motivation in which different sets of basic human needs are hierarchically structured in a way that those at higher levels can be acted upon only when those at lower levels are already satisfied. For this reason his theory of motivation is often graphically presented in a shape of pyramid, with largest and most fundamental needs at the bottom and the ultimate need for self-actualisation at the top (Figure 9).

Figure 9. Maslow's hierarchical model of basic human needs



At the lower levels of the hierarchical structure are the basic human needs, which Maslow also called "deficiency needs" as when they are not met people feel anxious and stressed. Above those are the "growth" needs, such as the need for autonomy, achievement and self-actualisation. Physiological needs are those that are essential for human survival, such as sleep, food, water, sex, physical health and a suitable temperature. Once these are relatively satisfied, safety needs take a more dominant role. Apart from physical safety, these also include economic safety and general health and well-being, and safety from possible accidents. Once physiological and safety needs have been met, people shift their focus to interpersonal needs and feeling of belonging. This represents the human tendency to form emotionally significant relationships with individuals but also in their desire to be accepted and well-regarded members of wider social groups. This need is manifested in people's friendships, intimate relationships, family formation and wider community participation. Need for esteem represents the human desire to be valued and respected by oneself and others. It may be represented as a need for status, recognition or fame (what Maslow calls the "lower" version of this need) but also as a need for mastery, competence, independence and freedom (the "higher" version). Finally, at the very top of the pyramid is the need for self-actualisation which signifies humans' desire to realise their full potential. Each individual may achieve this need in a different way, depending on their particular values, talents and interests. Although the initial conceptualisation of this need was individualistic in its focus, Maslow later proposed a more outward-oriented formulation of self-actualisation as a form of "self-transcendence" where an individual can find his or her actualisation only through goals outside oneself, in altruism or spirituality.

Individuals usually have many different motives at the same time which they prioritise depending on each one's current state of fulfilment and their place on the hierarchy. For example, people may strive for relationships only when their safety and physiological needs are already met. Thus, rather than acting due to one particular motive at any given point of time, Maslow's theory postulates that different motives "dominate" human behaviour at different times depending on the general state of satisfaction of the entire motivational structure.

Maslow's theory of motivation is an influential conceptual model in a number of social science disciplines, such as sociology, pedagogy and management training. However, it has also drawn substantial criticism about some of its key aspects. There is little empirical evidence supporting the hierarchical aspects of the theoretical structure, instead suggesting that the hierarchy of prioritisation of motives is situationally dependent and person specific (Wahba and Bridwell, 1976). For example, children's need for belonging can overpower their need for safety in the case of abusive parents, while people have different needs for safety during wartime than in peacetime. In addition, the model is also seen as culturally biased, based on the individualistic worldview characteristic of Western societies but less appropriate for describing the motivation structure of members of collectivistic societies in which social motives play a more central role (e.g. Hofstede, 1984).

Measurement of the needs hierarchy

There are only a few self-report instruments specifically designed to measure the five needs postulated by Maslow's theory. The most prominent of these are the Need Satisfaction Inventory (Lester, 1990; see Annex C), an inventory developed by Strong and Fiebert (1987) and the Five Need Satisfaction Measures recently developed by Taormina and Gao (2013).

The Need Satisfaction Inventory consists of 50 statements, 10 for each type of need, with respondents indicating their level of agreement using a 5-point Likert scale. Respondents with higher levels of need satisfaction had lower levels of neuroticism, especially in the case of physiological (r=-0.47), safety (r=-0.48), and esteem (r=-0.52) needs. Extraverted respondents also had higher need satisfaction scores for belonging (r=0.29) and esteem needs (r=0.41), while those believing in internal locus of control had higher need satisfaction for all five need types compared to those believing in chance causes or control by others (Lester, Hvezda, Sullivan and Plourde, 1983). Other research found the level of need satisfaction to be even more strongly inversely related with neuroticism (around r=0.60 for physiological and safety needs, and around 0.40 for the other three need types) while extraversion is found to be related with the three highest need types (correlations between r=0.40 and r=0.50). In addition, the level of satisfaction of the need for belonging is negatively correlated with psychoticism (r=-30).

Strong and Fiebert's Needs Inventory consists of 20 items, 4 for each need level. The inventory uses a modified paired-comparison format in which respondents compare two statements and indicate not only their preferred need but also a degree of preference, using a scale from 0 to 100. Since four items for each need are paired with items from the other four need levels, respondents make 16 comparisons in total. The internal consistency of the inventory varied from 0.52 for physiological needs to 0.65 for esteem needs. Mean potencies (measures of relative importance) for each need type were 0.70 for physiological, 0.98 for safety, 1.03 for belongingness, 1.19 for esteem and 1.15 for self-actualisation, which is a close match with Maslow's framework.

The Five Need Satisfaction Measures is a much more rigorously tested scale designed to measure all five need types (Taormina and Gao, 2013). Based on careful operationalisation of Maslow's theoretical premises, the authors constructed a scale consisting of 72 items, with 15 statements for each of the first 4 need types and 12 for self-actualisation. Statements assessing the first four needs were formulating as measures of need satisfaction, using a 5-point Likert scale ranging from 1 (completely unsatisfied) to 5 (completely satisfied). Questions assessing self-actualisation needs were formulated as agreement type statements using a 5-point agreement scale ranging from 1 (completely disagree) to 5 (completely agree). The scale is found to have a good fit to a theoretically presumed 5-factor model. Internal consistency of the five subscales is relatively high, ranging from .81 for physiological needs to .91 for esteem.

The construct validity of scale has been indicated by substantial differences in scores in all five need types across two groups – people with high levels of personal and professional achievement (such as

doctors, lawyers and professors) and those with unstable life situations (such as the unemployed, underemployed and migrants). In accordance with Maslow's theory, all five need types are positively correlated, with correlations being highest among the adjacent types. In addition, higher levels of needs satisfaction were positively correlated with the level of family support (from .26 to .57), traditional values (from .19 to .35), and life satisfaction (from .30 to .58) and negatively correlated with levels of anxiety/worry (from -.16 to -.24).

Achievement Motivation Theory

Conceptual framework

Achievement Motivation Theory explains human behaviour on the basis of a person's need for achievement, power and affiliation (McClelland, Atkinson Clark and Lowell, 1953; McClelland, 1961; Daft, 2008). McClelland argues that people are motivated by their need for achievement, a need for power and a need for affiliation and that these needs are learned or acquired rather than being innate (McClelland, 1961). People differ in the degree to which these individual needs are important determinants of their behaviour but most people exhibit varying combinations of these three basic needs.

From this theoretical perspective, a wide range of personality attributes are engaged in the motivation to perform. Thus, the need for achievement, defined as "the goal of individual to be successful in terms of competition with some standard of excellence" (McClelland et al., 1953:181), implies other personality attributes such as dominance, perseverance, risk aversion and emotional stability as well as motivation. The need for power refers to "the desire to influence or control others, be responsible for others, and have authority over others" (Daft, 2008:233).The need for affiliation represents the unconscious concern for building and maintaining close personal relationships (McClelland, 1961; Lussier and Achua, 2010; Daft, 2008).

Individual differences in motivation to achieve predict academic performance, career choice and job performance (McClelland, 1965, 1985). People with high levels of motivation to achieve are more likely to choose occupations that allow more control over outcomes, offer more direct and immediate performance feedback, and are of moderate risk level. The need for achievement and power are also shown to be important determinants of managerial performance, irrespective of the cultural context (Schultz and Schultz, 2010). In a meta-analysis of its relationship with entrepreneurship, the need for achievement is found to be an important predictor of both the probability of starting an entrepreneurial career as well as performance during this career (Collins, Hanges and Locke, 2004). High levels of such motivation are not necessarily beneficial in all situations. For example, people with high need for power can be self-destructive and aggressive towards others even if such motivation leads them to perform well at managerial functions. Positive or negative outcomes seem to depend on a person's level of responsibility and empathy.

Measurement of achievement motives

In terms of measurement, McClelland insisted on the use of the Thematic Apperception Test (TAT) – a type of projective test[14] designed to measure unconscious thoughts and attributes – rather than questionnaires using self-reports. McClelland preferred to use projective tests because he argued that the needs for achievement, power and affiliation are subconscious and not suited for measurement with self-reported scales (McClelland, 1961). For the same reasons, in spite of the generally lower reliabilities of projection tests, he assumed that they had better validity than questionnaires. Although initial meta-

14. Projective tests are personality tests that use ambiguous stimuli (such as inkblots in Rorschach's test or ambiguous images of people in TATs) that respondents interpret, presumably projecting their hidden traits, conflicts or emotions onto the test.

analyses found that the TAT had somewhat higher predictive power than questionnaires, a more recent overview of the measurement properties of these two types of motivational measures found that self-report questionnaires are at least as good predictors as TAT scores (Collins et al., 2004; Spangler, 1992). However, numerous studies show that the correlation between TAT and questionnaire scores is very low, indicating that the two types of tests assess different layers of a person's motivation. Projective tests capture more implicit, subconscious motives whereas questionnaires assess self-attributed, conscious motives (Lang and Fries, 2006; Collins et al., 2004; Spangler, 1992).

Use of projective techniques is not conceivable in large-scale international surveys such as PIAAC. The Achievement Motivation Scale (AMS) may offer the best questionnaire-based measure of the achievement motive as it explicitly distinguishes between two sub-dimensions of this motive – achieving success and avoiding failure – which is not the case with many other scales. In addition, it also assess both positive and negative affects towards an achievement activity in accordance with concept that it intent to measure (McClelland, 1961). The AMS consists of 30 items, 15 for each of the two sub-dimensions. It was originally developed in Norwegian and later translated into a variety of other languages (Hagtvet and Zuo, 2000). Although studies using AMS have reported satisfactory reliability and validity values, its internal two-dimensional structure has not been empirically confirmed.

In response to these concerns and in an attempt to further shorten the scale, Lang and Fries (2006) have developed a short, 10-item version of the scale (AMS-revised) that retains relatively good measurement parameters. Internal consistency coefficients are around 0.80 for both subscales and it actually has somewhat higher predictive power in some criteria (in a study conducted using a German sample). At the same time, it was successful in empirically replicating the theoretical two-dimensional structure (Lang and Fries, 2006; the scale is presented in Annex C).

Theory of self-determination

Conceptual framework

Self-determination theory (SDT, Deci and Ryan, 1985) is primarily concerned with those aspects of human behaviour that are governed by inner psychological needs rather than external factors. It was developed on the basis of research into differences between intrinsic and extrinsic motivation that pointed to the important and even dominant role that intrinsic motivation play in people's behaviour. SDT postulates that human nature is based on "inherent growth tendencies" that drive individuals to be active, inquisitive, curious and playful, with a pervasive readiness to learn and explore. This capacity for growth is inherent but can be thwarted if basic human needs are not satisfied. To fulfil their potential, people need nurturing and stimulation from their social environment.

In contrast to extrinsic motivation, which is initiated by external prods, rewards and pressures, intrinsic motivation is the inherent drive to do an activity for its own sake, because a person finds it interesting and satisfying in itself. Individuals' experience and performance in certain activities varies considerably depending on whether they are behaving for intrinsic or extrinsic reasons.

Deci and Ryan expanded the basic distinction between intrinsic and extrinsic motivation by proposing three main intrinsic needs that are the foundation of self-determination and essential for psychological health and well-being:

- **A need for competence** – seeking control of the outcome and experience of mastery.
- **A need for autonomy** – the drive to determine one's own life and act in accordance with integrated self.

- **A need for relatedness** – the urge to interact and be connected with others.

These needs are assumed to be innate rather than learned and universal, present in people of all cultures and periods (Chirkov et al., 2003). Some of them will be more relevant than others depending on the particular situation, time and culture.

Intrinsic motivation is primarily based on the need for competence and autonomy. The feeling of competence is a necessary factor behind any intrinsic motivation and it can be substantially affected by positive or negative feedback from (important) others. However, in order for the feeling of competence to enhance internal motivation, it is has to be accompanied by a sense of autonomy. In other words, in order to be internally motivated, people need to have high level of self-efficacy (experience perceived competence) and an internal locus of causality. Since external rewards shift the focus from the internal to the external locus of causality they are found to diminish intrinsic motivation while choice and opportunity for self-direction enhance it by offering sense of autonomy. Intrinsic motivation is further supported if a person is meaningfully connected to their social context thus fulfilling their needs for relatedness.

However, intrinsic motivation will exist only for those activities that are inherently interesting to people, due to their novelty, challenging nature or aesthetic value. Activities without such characteristics need extrinsic motivation. SDT classifies extrinsic motivation into four different types, varying in the degree to which they are internalised and integrated into one's sense of self. From the least to the most fully internalised they are: externally regulated behaviour, introverted regulation of behaviour; regulation through identification and integrated regulation. External motivation can thus become a valued goal or even integrated into a person's self-evaluations and system of beliefs thus obtaining many of the characteristics of intrinsic motivation. The degree to which extrinsic motivations become integrated largely depends on a person's sense of relatedness with a given social context. Internalisation will also be facilitated by a feeling of competence at externally motivated activities. Finally, a sense of autonomy is very important for integrating externally motivating regulation into one's sense of self, especially in terms of relating it with other goals.

The importance of intrinsic motivation and self-determination as well as properly introduced external motivation has been confirmed in many areas of life such as school, teaching, occupation, job performance, sport, health and well-being. There is large body of evidence about the importance of relying on pupils' intrinsic motivation in order to promote learning and improve academic achievement (Deci and Ryan, 1994; Ryan and Deci, 2000). Other studies indicate the importance of providing rationales to enhance externally motivated activity in school settings (Jang, 2008). One example of the application of SDT in education is offered by the Sudburry Model schools in which students themselves decide how they spend their time. In accordance with SDT, the basic premise of the school is that student are curious by nature and that the best and most lasting learning occurs when initiated and led by the learner (Greenberg, 1995).

People with higher levels of self-determination and intrinsic motivation are found to be less likely to succumb to peer pressure and more likely to lead activities than to follow others. Likewise, higher levels of autonomous extrinsic motivation are associated with greater engagement, better performance, lower rates of school drop-out, greater psychological well-being and so on (Ryan and Deci, 2000). Intrinsic aspirations are found to be positively associated with mental health indicators and well-being while aspirations for extrinsic outcomes such as wealth, fame and attractiveness either have no correlation with or are negatively correlated with important life outcomes (Kasser and Ryan, 1993, 1996).

Measurement of self-determination

A large number of self-report questionnaires assess general and domain-specific individual differences in constructs related to the SDT theory. One such measure is the Basic Psychological Needs

(BPN) scale, which is designed to assess each of the three basic human needs proposed by the theory: competence, autonomy and relatedness (Gagné, 2003; Ilardi et al., 1993; see Annex C). Different versions of this scale assess general need satisfaction, and need satisfaction in specific domains, such as work or interpersonal life. The original scale had 21 items rated using a 7-point Likert scale (8 items for competence, 6 for relatedness and 7 for autonomy). In some studies, the scale is shortened to nine items (three per need). The most commonly used versions of the BPN scale are the one for work and the general version (Ilardi et al., 1993; Baard, Deci and Ryan, 2004; Kasser, Davey and Ryan, 1992; Gagné, 2003; Kashdan et al., 2006).

The work version is found to have the expected three-factor structure, relatively high reliability of around 0.90 and is positively correlated with work engagement, job satisfaction and psychological adjustment (Baard et al., 2004). Outside the United States, it has been tested in a Bulgarian sample with satisfactory results (Deci et al., 2001). The general need satisfaction version of the scale has 0.90 reliability coefficient for the entire scale. The levels of reliability of the three subscales vary between 0.69 and 086 (Gagné, 2003).

Unified motive scales

One recurring issue regarding the existing motivational scales is their relatively low convergent validity. For example, measures of the three most important motivational aspects – achievement, power and affiliation – have average correlations between different measures of the same aspect of 0.53 (Engeser and Langens, 2010).

In response to these findings, Schönbrodt and Gerstenberg (2012) conducted an empirical analysis of the internal structure of 21 motivational scales, identifying the common latent structure that best represents the conceptual framework of human motivation. They identified a five-factor structure encompassing motives related to achievement, power, affiliation, intimacy and fear.

Using item response theory (IRT) statistical methods, researchers have constructed the Unified Motive Scale (UMS) based on this analysis. This represents a blend of the different inventories and assesses the five explicit motives at a very general level (Schönbrodt and Gerstenberg, 2012). Three different versions of the scale were tested, with 10, 6 and only 3 items per subscale (50, 30 and 15 items in total). The 15-item version of the scale, presented in Annex C, consists of 7 items formulated as statements with a 6-point agreement rating scale, and 8 items formulated as goals that require importance rating also using a 6-point scale. The German-language version of the UMS scale has been found to have better score precision and comparatively higher convergent validity than any of the other motivation scales. Moreover, both the short and very short versions, with six and three items per subscale respectively, have satisfactory measurement parameters. Specifically, the shortest scale has a reliability of 0.60-0.82 while retaining considerable amount of test information (Schönbrodt and Gerstenberg, 2012). This ultra-short version is by far the most efficient measure of motivation, judged by the amount of information provided per individual item or per unit of time.

Thus, the UMS represents an empirically verified integrated inventory designed to provide a broad and general assessment of the five major motivational factors. It uses a short scale with satisfactory measurement properties. However, it has not been tested in other samples or studies and the stability of its measurement properties across different (cultural) groups is unknown.

Finally, similar to other motivational scales, the UMS subscales are correlated with the related dimensions of the Big Five mode (Engeser and Langens, 2010). In particular, neuroticism has a strong correlation with the fear factor (0.62), extraversion with affiliation (0.64) and conscientiousness with achievement (0.34). In addition, agreeableness is positively related with affiliation and intimacy (0.30 and

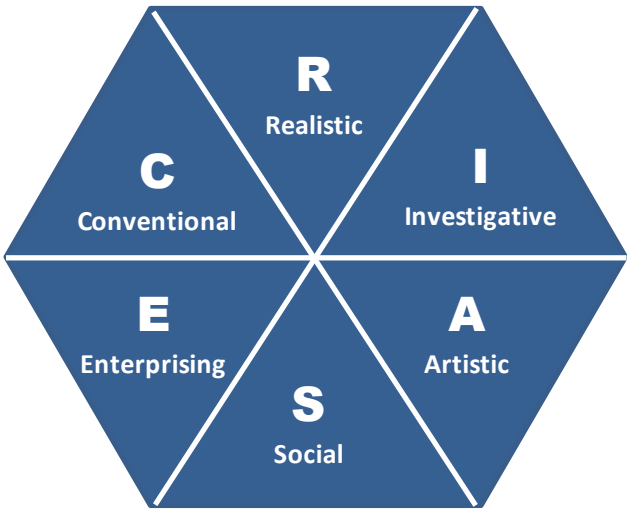
0.31). These correlations (especially with the fear and affiliation scales) raise the question of construct overlap and discriminant validity between measures of Big Five and some subscales of UMS. One practical alternative in this regard, especially when a Big Five questionnaire is used, is to assess only those subscales of UMS that are sufficiently discriminant from the Big Five traits. For example, instead of all five UMS subscales, only the achievement, power and intimacy subscales could be assessed.

Interests

Conceptual framework

Vocational interests can be defined as "relatively stable psychological characteristics of people that identify the personal evaluation … attached to particular groups of occupational or leisure activity clusters" (Lowman, 2003). The most prominent theory of vocational interests is the one proposed by John L. Holland (1959, 1997). The main premise of his theory is that people seek and enter those environments that allow them to express their interests and values and exercise their abilities and skills. The degree to which educational and occupational choices lead to the congruence between people's interests and characteristics of their environment will have profound effect on their satisfaction and productivity as well as on their general well-being. Holland's theory assumes that both individuals and environments can be classified into six types: realistic (R), investigative (I), artistic (A), social (S), enterprising (E) and conventional (C), making up his well-known RIASEC model. Each type is characterised by its own set of interests, values, skills and life goals. The realistic type of individual is interested in manual types of jobs, the investigative type is curious and scientifically oriented, the artistic type prefers creative activities through different art forms, the social type is interested in working with people, the enterprising type leads and influences people, and the conventional type prefers well-structured situations. The six interest types are arranged in a hexagon depending on the degree of similarity between them (Figure 10). Adjustment types (e.g. realistic and conventional) are most similar, alternate types (e.g. realistic and entrepreneurial) are moderately related; while opposite types (e.g. realistic and social) are the least related. This model has been widely used both in academic research and in career counselling. It has accumulated a lot of empirical support and been generalised across gender and age (Pässler, Beinicke and Hell, 2014). It has also been found to be relatively applicable in international contexts, although the exact properties of its hexagonal structural model are not completely replicated in several cross-cultural samples (Bullock et al., 2009). Holland's theoretical framework is considered to still be relevant in the new reality of a globalised economy and the structural and technological changes of the 21st century which increasingly affect and alter the world of work (Coutinho, Dam and Blustein, 2008; Blustein, 2008).

Figure 10. Holland's RIASEC model of vocational interests



Another influential theoretical framework on interests is Cattell's investment theory (1963, 1987). Based on his theory of fluid (innate) and crystallised (acquired) intelligence, Cattell postulates that while fluid intelligence is the main determinant of performance in early childhood, over people's lifespan it is invested in the development of skills and knowledge that represent crystallised intelligence. According to Cattell, this development of crystallised intelligence is shaped not only by the personal and social resources at people's disposal, but also by their interests. In particular, while cognitive abilities determine what a person "can do", interests influence where this intellectual potential will be used.

Ackerman (1996) developed a third influential theoretical framework of interests: process, personality, interests and knowledge (PPIK) theory. According to him, the development of intelligence, i.e. the transition from intelligence-as-a-process to intelligence-as-a-knowledge (which is the core of adult intelligence), is led by motivation, personality and interests. His model proposes that interests provide general direction and motivation for the selection of certain activities while personality and abilities determine the outcomes of those actions (Acherman and Heggestad, 1997).

In support of Cattell's and Ackerman's theories, interests have been found to be related to intelligence and the development of cognitive capacities (DeYoung, 2014; Pässler, Hell and Beinicke, 2015). Furthermore, they are also associated with personality traits in ways predicted by Holland's and Ackerman's theories (Staggs, Larson and Borgen, 2007; Ackerman and Heggestad, 1997; DeYoung, 2014). In particular, it is found that social and enterprising interest types are correlated with extraversion, investigative and artistic interests were correlated with openness to experience, and conventional interests were associated with conscientiousness (Gottfredson, Jones and Holland, 1993; Barrick, Mount and Gupta, 2003; Staggs et al., 2007). On the other hand, neither agreeableness nor neuroticism are found to substantially correlate with any of Holland's six interest orientations.

Aside from the more specific, vocational or academic interests there are broader interests that are relevant for a wider range of contexts. Maybe the most general interest of all is interest in learning or knowledge acquisition (Schmidt, 2014). This is sometimes called intellectual curiosity, epistemic curiosity or the need for cognition (Mussel, 2010). It represents a broad interest in general learning in a wide variety of domains. The most prominent operationalisation of this general intellectual interest is Ackerman's Typical Intellectual Engagement (TIE) scale (Goff and Ackerman, 1992). Although the scale has substantial correlations with measures of general intellectual abilities (usually around .20-.40), substantial variation remains after controlling for these measures (von Stumm, Hell and Chamorro-Premuzic, 2011).

Similarly, although the scale is similar to the openness to experience factor of the Big Five model, it is shown to be both conceptually and empirically distinct from it (Ackerman and Goff, 1994; Mussel, 2010; von Stumm et al., 2011). In particular, typical intellectual engagement has substantial incremental validity in terms of academic achievement even after controlling for openness to experience, while the reverse is not the case (von Stumm et al., 2011). Analysis of similar operationalisations of this general intellectual curiosity, such as Ackerman's TIE scale, Cacioppo's Need for Cognition Scale (1982), Litman's Epistemic Curiosity Scale (Litman and Spielberger, 2003) and the openness to ideas facet of the Big Five scale have found that all measure one underlying construct of intellectual curiosity (Mussel, 2010).

Importance of interests

In accordance with several investment theories, interests are found to be are one of the most important drivers of the development of cognitive abilities and general knowledge acquisition (Cattell, 1963; Ackerman, 1996; Pässler et al., 2015). They help people to select the most interesting learning environments and improve their motivation for learning, resulting in increased knowledge accumulation and skill development. Gender differences in interests are thought to be one of the main determinants of differences in various aptitude tests and varying rates of male and female employees in science, technology, engineering and mathematics compared with service-sector occupations (Schmidt, 2014; Valla and Ceci, 2011). As well as their influence on the development of abilities in the first place, interests are also critical for maintaining cognitive abilities throughout life. For example, intellectual curiosity is found to substantially alleviate the effects of ageing on numeracy proficiency (Bruin et al., 2014).

Furthermore, both general and vocational interests are predictors of a wide range of performance criteria in work and academic settings (Schmidt, 2014). They are associated with occupational choice job and training performance and job satisfaction (Holland, 1997; Van Iddekinge et al., 2011; Nye, Su, Rounds and Drasgow, 2012. For example, a meta-analysis (Nye et al., 2012) has shown that interest in specific occupational types from Holland's model have a small to moderate correlation with job performance and tenure in these occupations, and also with academic performance and persistence in study in areas related to those occupations. Even more importantly, they show that the fit (congruence) between people's strongest interests and their environment is a better predictor of academic and job performance than the interests themselves. This is in line with a broader person-environment fit theory that has been very influential in the areas of personality, social, industrial and organisational psychology (for example Roberts and Robins, 2004; Schneider, 1987). In this framework, interests represent one of the most important aspects of people's fit to their environment (Nye et al., 2012).

Interests are also associated with educational choice and educational attainment (Nye et al., 2012; von Stumm et al., 2011; Webb, Lubinski and Benbow, 2002). It has been found that general intellectual curiosity represents a "third pillar" of academic achievement, i.e. that it has incremental validity with academic performance while controlling for the intelligence and the Big Five personality traits (von Stumm et al., 2011; Chamorro-Premuzic, Furnham and Ackerman, 2006; Furnham, Monsen and Ahmetoglu, 2009). Intellectual curiosity is also associated with creativity as a trait and the production of creative products, especially in the field of science (DeYoung, 2014).

Measurement of interests

Measures of interest fall into two distinct groups, one focusing on assessing general interests and intellectual curiosity, and the other evaluating more specific, vocational interests.

Measures of general interests

The most prominent scales for the measurement of general intellectual interests are the TIE scale (Ackerman and Goff, 1994) and Cacioppo's Need for Cognition scale (NCS); (Cacioppo and Petty, 1982; Cacioppo, Petty and Kao, 1984).[15] The Epistemic Curiosity Scale (ECS); Litman and Spielberger, 2003) is also used as an alternative measure of general intellectual curiosity. Finally, a number of scales measuring the openness to ideas facet of the Big Five or HEXACO models have been found to be good operationalisations of this construct (Mussel, 2010).

The Need for Cognition scale (NCS) is a self-report scale that measures "the tendency for an individual to engage in and enjoy thinking" (Cacioppo and Petty, 1982:116). The original version consisted of 34 questions, but a shorter, 18-item version of the scale was introduced two years later and is used more often (Cacioppo, Petty and Kao, 1984; see Annex D). Items are rated on a 9-point scale ranging from +4 (very strong agreement) to -4 (very strong disagreement). An alternative, 5-point answer scale, ranging from 1 (extremely uncharacteristic) to 5 (extremely characteristic) is also frequently used. The scale has high internal consistency (alpha=.90) and a unidimensional factor structure with the first factor accounting for 37% of the variance (Cacioppo, Petty and Kao, 1984; Sadowski, 1993). It is shown to be positively related with academic achievement and the conscientiousness and openness to experience dimensions of the Big Five (Sadowski and Gulgoz, 1996; Sadowski and Cogburn, 1997). However, apart from the measured construct, the scale is also found to contain response bias effects associated with positively and negatively worded items (Hevey et al., 2012).

Litman and Spielberger's (2003) Epistemic Curiosity Scale (ECS); see Annex D) is designed to assess the desire for knowledge evoked by conceptual puzzles and gaps in knowledge. Respondents are asked to rate how they "generally feel" in regard to 10 different statements using a 4-point scale ranging from 1 (almost never) to 4 (almost always). The scale measures two related aspects of epistemic curiosity (five items each): diversive (interested in a range of topics) and specific curiosity (interested in particular stimulus). The Cronbach's alpha coefficients of internal consistency (reliability) were .80 or greater for the entire scale and both of the two subscales. The ECS scale has relatively high convergent validity, with median positive correlations of r=.54 with scales measuring perceptive curiosity and trait curiosity, and internal and external cognition.

The Big Five Aspect Scale (BFAS; DeYoung, Quilty and Peterson, 2007) is a 100-item measure of 10 factors or aspects, with pairs of correlated factors/aspects representing the five dimensions of the Big Five model. The scale uses items from the International Personality Item Pool (Goldberg, 1999). The two related factors or aspects of the openness to experience dimension are openness and intellect. While the former represents the aesthetic, imagination, feelings and fantasy facets of the broader openness to experience dimension, the latter reflects the ideas and ingenuity facets. The intellect subscale of the BFAS is shown to have high internal consistency varying between .79 and .84 across different samples as well as high test-retest reliability (r=.86). Correlations of the intellect subscale with the openness to experience scales of the NEO-PI-R and Mini-Markers scales range between .56 and .78, indicating satisfactory convergent validity.

Many other measures of the Big Five or HEXACO personality models, such as NEO-PI-R, HEXACO-PI-R, BFI and the Abridged Big Five Circumplex from the International Personality Item Pool (AB5C-IPIP), include subscales for assessing the ideas/intellect facets of the openness to experience dimension. These can be regarded as alternative measures of the general intellectual curiosity (Mussel, 2010; DeYoung, 2014). PISA 2015 will also use five items from the AB5C-IPIP scale to measure the

15. The TIE scale is not in the public domain and is available for use only under commercial conditions, while the NCS scale, although copyrighted by authors, is available for non-commercial use.

related construct of "openness to problem solving". The relevant items from these scales are presented in Annex D.

Measures of vocational interests

Among the large number of measures of vocational interests the most prominent are the General Interest Structure Test, Holland Occupations Checklist, the Self-Directed Search, the Strong Interest Inventory, the Strong Vocational Interest Blank-Strong Campbell Interest Inventory, the Unisex Edition of the American College Testing and the Vocational Preference Inventory. However, these instruments are all only available for use under commercial conditions and often within strict assessment frameworks that severely restrict any modifications of a scale or the way it is used. However, in recent years a number of inventories assessing vocational interests have been developed specifically for the public domain (Rounds et al., 2010; Liao, Armstrong and Rounds, 2008; Armstrong, Allison and Rounds, 2008).

O*NET's Interest Profiler (Lewis and Rivkin, 1999) is a public-domain instrument designed to assess Holland's (1997) six types of occupational interests. Its purpose is to help individuals identify their vocational interests and select occupations that match these interests. However, the scale is comprised of 180 self-report items, making it quite long and intensive instrument. In order to address these practical limitations, a short-form version of this scale has been constructed recently, comprising 60 items, 10 for each of the 6 types (Rounds et al., 2010; see Annex E). The items describe different work activities and respondents rate them using a 3-point scale (like/unsure/dislike) in the paper-and-pencil version or a 5-point scale (from "strongly dislike" to "strongly like") in the computer-based one.[16] Cronbach's alpha coefficients for the six subscales vary between .78 and .90, showing good internal consistency. Test-retest correlations range from .78 to .86. Correlations with the corresponding subscales of two similar measures of Holland's types (the Interest Profiler and the Interest Finder) ranged from .74 to .82 while the correlations with other subscales ranged from .12 to .48 indicating relatively good convergent and divergent validity (Rounds et al., 2010). The inter-correlations of the short-form subscales confirmed the order pattern (the hexagon in Figure 10) implied by Holland's model.

RIASEC Marker Scales (Armstrong et al., 2008) are a public-domain measure also designed to assess the six interest types of Holland's model. The scales have two parallel test forms, each comprising 48 items – 8 items for each of the 6 vocational interests (see Annex E).[17] Each set of 8 items are selected from the 30-item scales of the Interest Profiler, which was already in the public domain. The items were selected to include broad work content areas. The measure's reliability, validity and structural fit with Holland's model have been confirmed in a number of studies (Rounds et al., 1999a; Rounds et al., 1999b). RIASEC Marker Scales are found to have a reliability of .79-.94 (mean .87), which is only slightly lower than that of the much longer Interest Profiler scale (mean reliability .95). The scale's convergent validity is also satisfactory, with correlations with interests in corresponding occupation types ranging from .72 to .87 and correlations with Strong Interest Inventory scales with a range of .56 to .72. In addition, the scale is found to produce inter-correlations in line with the Holland's model, thus providing evidence of its structural validity (Armstrong et al., 2008).

16. The authors recommend the 5-point scale due to its improved reliability and precision.

17. Apart from the two forms with 48 items each describing different activities (activity scales), the instrument also has additional two forms with 48 items, describing different occupations (occupation-based scales). We only present the activity scales here.

Self-concepts

Self-concepts represent a diverse set of beliefs and notions about the self as well as self-regulation processes that strongly influence people's actions and accomplishments in a positive and negative way. These include self-control, self-efficacy, self-monitoring and self-esteem. In this section we will present the two concepts from this group – self-efficacy and self-control – that so far have the strongest empirical foundations, predictive capacity and analytical relevance.

Self-control

Conceptual framework

Self-control (also called self-regulation) is the ability to control one's emotions, thoughts and behaviour in the face of external demands. The capacity to exercise self-control is arguably one of the most critical abilities of the human psyche (Tangney, Baumeister and Boon, 2004). The capacity to inhibit anti-social behaviour and to shape behaviour in socially acceptable and desirable ways is judged as hallmark of civilised life (Freud, 1987). In the same way, many social and personal problems are thought to be related to deficient self-control (Baumeister, Heatherton and Tice, 1993). Consequently, self-control represents an important adaptive capacity that helps people achieve a better fit with their social environment and live healthier and happier lives. There are four major domains of self-control: the control of thoughts, emotions, impulses and performance (Baumeister et al., 1993).

People have substantive differences in their capacity for self-control, with some people being more able than others to manage their lives, curb their temper, follow through with their plans, avoid temptations, persevere at work, save money, keep secrets and so on. Individuals with low self-control are more likely to be impulsive and unable to delay gratification, lack persistence and diligence, take higher risks, not value intellectual activity, be self-centred, and have a volatile temper (Gottfredson and Hirschi, 1990). These individual differences have important consequences for a wide range of life outcomes. They are also found to be relatively stable over our lifetimes and highly correlated with scores on the conscientiousness dimension of the Big Five model and the honesty-humility dimension of the HEXACO models (Gottfredson and Hirschi, 1990; de Vries and van Gelder, 2013).

The importance of self-control

In his seminal study of differences in self-control in children and their consequences (the so-called "marshmallow experiment"), Walter Mischel found that individual differences in children's ability to control their desires as 3-5 year-olds had significant influence on their outcomes in later life. In particular, participants with good self-control as children had better grades and educational attainment, and fewer problems in areas such as relationships, stress and drug abuse in their adult life. Their life expectancy was more closely correlated with their level of self-control than any other personality attribute (Mischel, Ebbesen and Raskoff Zeiss, 1972; Shoda, Mischel and Peake, 1990).

Numerous studies have shown some evidence for the beneficial effects of self-control on academic performance. Students with better self-control have better grades and overall academic achievement (Feldman, Martinez-Pons and Shaham, 1995; Zimmerman and Martinez-Pons, 1988; Flynn, 1985). In one such study, self-control was found to be the only variable out of 32 personality attributes that significantly correlated with grades in a sample of university students (Wolfe and Johnson, 1995).

Self-control is also found to be of critical importance in regulating impulsive behaviours (Tangney et al., 2004). In particular, people with low levels of self-control are more prone to eating disorders or alcohol abuse (Baumeister et al., 1993). Low self-control is also related to poor health, financial problems, drug abuse, teen pregnancy, etc. Likewise, lack or misuse of the capacity for self-control is critical element

in a wide range of psychological disorders such as anxiety, anger and obsessive-compulsive disorders (Tangney et al., 2004).

Self-control is also critically important for interpersonal relationships. A number of studies have suggested that children with good self-control skills are better at getting along with others. These children form more functional relationships with their peers and others, are perceived in better light by others, and respond more competently in social situations. A large body of research also indicates that the absence of self-control skills increases the likelihood of outbursts of temper and aggression. In fact, some researchers have singled out low self-control as the major cause of violent and criminal activity (Gottfredson and Hirschi, 1990). A meta-analysis of studies examining the relationship of self-control with criminality has found that self-control is one of the strongest predictors of crime (Pratt and Cullen, 2000).

Measurement of self-control

Self-control is mostly assessed by the use of self-report questionnaires although numerous behavioural measures have also been developed (Gutman and Schoon, 2013; Sharma, Markon and Clark, 2013). There are a large number of self-control and impulsivity scales streaming from diverse research areas, such as personality psychology, criminology and clinical psychology. However, they all measure similar concepts and in many cases use very similar items. Among the most commonly used measures are Grasmick's Self-Control Scale (Grasmick et al., 1993), Tangney's Self-Control Scale (Tangney, Baumeister and Boone, 2004) and the Urgency, Premeditation, Perseverance and Sensation Seeking (UPPS) Impulsivity scale (Whiteside and Lynam, 2001; Whiteside, Lynam, Miller and Reynolds, 2005).

Grasmick's Self-Control Scale, contains 24 rating items, 4 for each of the 6 dimensions of self-control described in Gottfredson and Hirschi's (1990) theoretical framework. The items use a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). This scale is used extensively in criminology, mostly due to its foundation in Gottfredson and Hirschi's general theory of crime, which has become one of the most important theoretical models in this field. It is found to have predictive validity, being correlated with various types of deviant behaviour, delinquency or occupational deviance. However, many studies have found that the scale does not have the internal structure theoretically predicted and that some elements of it are not good predictors (Delisi, Hochstetler and Murphy, 2003; Wood, Pfefferbaum and Arneklev, 1993; Cochran et al., 1998). In addition, Delisi and colleagues (2003) found that the scale does not fit the data well. Furthermore, only one of the six dimensions directly predicted criminal offending. Another study has found the scale has poor construct validity, with the empirical structure not matching theoretical one and items functioning differently for males and females (Higgins, 2007).

Tangney's Self-Control Scale (SCS) is rooted in psychological research and is based on a somewhat different conceptualisation of self-control, in which individuals are able to override their impulses and alter moods and behaviour. This is in contrast to the more static notion of stable traits or dispositions to engage in irresponsible behaviour postulated in Gottfredson and Hirschi's theory and operationalised in Grasmick's scale (Tangney, Baumeister and Boone, 2004). Tangney's scale includes 36 items that respondents rate on a 5-point scale ranging from 1 (not at all like me) to 5 (very much like me). The same authors have constructed a shorter version of this scale consisting of 13 items, the Brief Self-Control Scale (BSCS), which is included in Annex F.

Both scales have shown relatively good measurement parameters. The internal consistency of both scales is high – 0.89 for the full and 0.83 and 0.85 for the shorter scale in two separate studies. In addition, test-retest reliabilities of the two scales were also satisfactory – 0.89 for the full scale and 0.87 for the short scale (the retest took place after 3 weeks).

In general, the BSCS had very similar predictive validity to the full version of the scale. In particular, both scales are found to be associated with measures of task performance (college grades), impulse control (negative relationship with eating disorders and alcohol abuse), psychological adjustment (negative correlation with all measures of psychological disorders), and self-esteem (positively related with self-control). The scales were also positively correlated with the conscientiousness and emotional stability dimensions of the Big Five model and with indicators of good interpersonal relations such as family cohesion, while they were negatively related with avoidant, secure and anxious attachment styles, and aggressive tendencies.

Although both scales were developed as measures of a single construct, a later study using the BSCS found that a two-factor structure indicating restraint and impulsivity could be distinguished (although they are still moderately correlated). The two-factor structure was also found to better fit the data and have greater predictive validity in relation to a number of affective and behavioural outcomes (Maloney, Grawitch and Barber, 2012).

In a study examining the measurement properties of the scale in more detail, it was found that it offered an adequate measure of its latent concept but that it might not measure very high or low levels of self-control precisely (Hasford and Bradley, 2011). The authors found moderate correlations between these scales and scales measuring social desirability tendencies (ranging between 0.50 and 0.60). However, the correlations of the two scales with criterion variables were largely unchanged when controls were included to counter the effects of socially desirable answering. In addition, the scales are correlated with some objective measures of self-control (Cox, 2000; Smith, 2001). In summary, the SCS and the BSCS have been used in a number of studies and the shorter version seems to offer an efficient instrument for assessing self-control in the context of large-scale international surveys.

The UPPS Impulsivity scale developed by Lynam and colleagues (Whiteside and Lynam, 2001; Lynam and Miller, 2004; Whiteside, Lynam, Miller and Reynolds, 2005) is based on their four-factor model of impulsive behaviour: urgency (associated with neuroticism), (lack of) premeditation and perseverance (both associated with conscientiousness) and sensation seeking (associated with extraversion) (Whiteside and Lynam, 2001). It is considered to be one of the most differentiated and empirically verified operationalisations of impulse control (Sharma et al., 2013). These four traits are found to be differentially related with a variety of outcomes such as aggression (urgency), substance use (premeditation), anti-social behaviour (sensation seeking, premeditation), eating problems (urgency), and attention deficit (premeditation) (Miller, Flory, Lynam and Leukefeld, 2003). The UPPS scale consists of 46 items using a 4-point response scale ranging from 1 (strongly agree) to 4 (strongly disagree), designed to measure 4 related concepts or pathways to impulsive behaviour. The internal consistencies of the scale are found to range between 0.82 and 0.91 (Whiteside and Lynam, 2001). The divergent validity of the four subscales is confirmed by their differing relationship with a number of other impulsivity scales as well as with specific dimensions and facets of the Big Five model (Whiteside and Lynam, 2001; Whiteside et al., 2005). The scale's criterion validity is confirmed in its relationship with various psychopathology groups such as alcoholism, pathological gambling and borderline personality disorder.

Recently, Lynam and colleagues (Lynam et al., 2006; Cyders and Smith, 2008; Cyders et al., 2007) proposed a fifth impulsivity component to their conceptual model: positive urgency, which represents the tendency to act rashly when in an intense positive affective state (as opposed to negative urgency which represents the same tendency to rash reactions but occurring in negative affective states). Based on this reconceptualisation of the model, Cyders et al. (2008) developed a scale to assess this additional dimension and Lynam et al. (2006) included this subscale to their original UPPS scale, creating a new 59-item measure of 5 impulsivity components called the UPPS-P.

Lynam (2013) also developed a short-form version of the UPPS-P scale (SUPPS-P; see Annex F) containing 4 items per dimension, i.e. 20 items in total. The subscales of this short measure are found to have high correlations with original subscales, ranging between r=0.63 and r=0.83 (Cyders et al., 2014). The estimated loss of shared variance was in between 0% (premeditation) and 6.4% (sensation seeking) while the savings achieved in administration time were around 66%, indicating that the short version of the UPPS-P scale is the more efficient measure. Furthermore, the internal structure and criterion validity of the SUPPS-P scale was similar to those found previously with the original UPPS-P scale (Cyders et al., 2014).

Self-efficacy

Conceptual framework

Self-efficacy is defined as "beliefs in one's capabilities to mobilize the motivation, cognitive resources, and courses of action needed to meet given situational demands" (Wood and Bandura, 1989:408). In other words, self-efficacy represents the strength of individuals' belief in their ability to execute tasks and achieve goals. Beliefs concerning self-efficacy are related to the extent to which they choose to undertake challenging tasks as well as the dedication and effort they devote to them and, through this, to the success of the outcome.

The concept of self-efficacy is based on the view that people's performance in various life situations is influenced not only by their capacities but also by their belief in the strength and relevance of those capacities (Bandura, 1993). In fact, people's beliefs in their capabilities can often be a better predictor of their performance than the actual level of their capabilities, since these beliefs determine how and to what degree they use their knowledge and skills.

Differences in beliefs about self-efficacy help explain why people with the same level of skills sometimes differ greatly in their performance. For example, many capable individuals underachieve due to self-doubt, whereas others with modest skills accomplish more than could be expected due to their stronger belief in their own abilities. In principle, neither underestimating nor excessively overestimating one's abilities is desirable. Research indicates that the optimal level of self-efficacy is slightly above actual ability, thus allowing individuals to choose challenging but still manageable tasks that promote learning and further development.

Beliefs about self-efficacy are determined by four broad factors: individuals' own successful efforts, learning from successful examples (modelling), social persuasion and physiological factors. Self-efficacy is especially influenced by the main social actors in childhood – parents, peers and important others – and continues to be shaped by experiences and social influences throughout life.

In accordance with Bandura's reference to "given situational demands", the construct of self-efficacy has mostly been conceptualised and studied in task-specific situations as a state-like concept (Chen, Gully and Eden, 2001). However, over the years a growing number of measures and studies have focused on the more trait-like notion of general self-efficacy (GSE) that is stable and consistent across wider range of situations. GSE is defined as "individuals' perception of their ability to perform across a variety of different situations" (Judge, Erez and Bono, 1998:170) and as such captures individual differences in the way people perceive their capabilities to meet the demands of a broad range of tasks rather than in specific contexts. Thus, situational self-efficacy (SSE) can be seen as motivational state while GSE is a motivational trait, with both denoting individuals' beliefs in their ability to accomplish tasks but differing in the scope to which this belief applies (Eden, 1988; Judge, Locke and Durham, 1997). While GSE and SSE share similar antecedents, GSE is much less prone to situational influences than SSE and in fact acts as an important determinant of SSE (Eden, 1988). The most important antecedent of GSE is the lifelong

accumulation of successes and failures across different situations. Important mastery experiences are especially significant in this area, as they can transform efficacy beliefs across a wide range of contexts.

There is considerable debate in the self-efficacy literature about the utility of GSE both for theory and practice (Bandura, 1986, Stajkovic and Luthans, 1998; Eden, 1988). It is often questioned whether GSE is a distinct construct from self-esteem and related self-concepts (e.g. Stanley and Murphy, 1997). Also, measures of GSE are criticised for their lower predictive validity than the SSE instruments for a range of domain-specific outcomes (Bandura, 1986). However, although GSE is related to other self-evaluation constructs, including self-esteem, locus of control and neuroticism, it has still been found to be sufficiently conceptually distinct from these and other constructs (Brockner, 1988; Eden, 1988; Gardner and Pierce, 1998; Chen et al., 2001). In addition, its measures are extensively used in a wide range of research areas and are found to have relatively solid measurement properties (see below). Furthermore, although Bandura himself argued for the administration of domain-specific self-efficacy scales, he also admitted that the correlations between self-efficacy in different domains could justify a more general measure of self-efficacy.

The importance of self-efficacy

There is considerable empirical evidence indicating that beliefs about self-efficacy influence all aspects of a person's life. They are critical for human motivation, personal accomplishment and well-being as they influence people's capacity to deal adequately and competently with challenges and their motivation to initiate actions and persist in the face of difficulty. Moreover, they have a strong influence on people's life choices and the way they interpret the outcomes of their actions and efforts. In particular, people with high self-efficacy will tend to attribute failure to external factors whereas individuals with low self-efficacy will relate it to their own inadequate capacities.

Self-efficacy is found to influence students' academic efforts and performance, since those with high self-efficacy are more likely to take the initiative on their own learning, actively participate in classes and take a hands-on approach to learning (Bandura et al., 1996; Andrew, 1998). Likewise, parents' belief regarding the academic self-efficacy of their children affects students' self-efficacy and consequently their academic achievement. Teachers' beliefs in their own self-efficacy influence the kind of learning environment they create for students (Bandura, 1993).

Self-efficacy is also an important determinant of career choice (Betz and Hackett, 2006; Betz, 2000), job attitudes (Saks, 1993), training proficiency (Martocchio and Judge, 1997) and job performance (Stajkovic and Luthans, 1998; Lunenburg, 2011). It influences workers' learning and goal-setting as well as their level of effort and persistence in performing or learning tasks. High self-efficacy is related to higher job satisfaction and reduced workforce turnover (Cherian and Jacob, 2013; Bradley and Roberts, 2004). However, a meta-analysis of the effect of self-efficacy on work-related performance when controlling for personality traits (the Big Five dimensions), general mental ability, and job or task experience has found that the overall predictive power of self-efficacy is relatively small (Judge et al., 2007). In particular, self-efficacy better predicted performance in low-complexity jobs or tasks than in those of medium or high complexity.

Self-efficacy beliefs are also found to be important determinants of the observed under-representation of women in certain occupations such as in the fields of science, technology, engineering and mathematics. In particular, gender differences in self-efficacy expectations influence the career choices of young women, with women who are highly competent in maths or science often choosing other career track due to low self-efficacy perceptions about their competence (Zeldin and Pajares, 2000; Herbert and Stipek, 2005).

Self-efficacy affects a wide range of health-related behaviour, such as smoking, exercise, diet, hygiene and self-examination (Conner, 1996). It contributes to the initiation of health improvement or prevention behaviour, the establishment of more ambitious health goals, and persistence in overcoming obstacles.

Measurement of self-efficacy

Most of the measures or self-efficacy are domain-specific and designed to be used in certain contexts and with certain population groups (for example, there are scales for teachers' self-efficacy, self-efficacy at regulating eating habits, driving self-efficacy and mathematics self-efficacy). However, there are a number of scales designed to measure GSE that are widely used in a range of areas such as education, organisational studies, personality and clinical psychology. This section details four self-report scales intended to measure general self-efficacy beliefs, the two most frequently used scales for assessing GSE and two which were developed quite recently. All four can be found in Annex G.

Sherer and Maddux (1982) have developed a General Self-Efficacy Scale (GSES) designed to measure "a general set of expectations that the individual carries into new situations" (p.664). The SGSE scale consists of 17 items with 5-point answer categories ranging from completely disagree to completely agree.[18] It has been one of the most popular GSE measures. Its internal consistency has been moderate to high in a number of studies (α=.76-.89; e.g. Cable and Judge, 1994; Gardner and Pierce, 1998; Schaubroeck and Merritt, 1997; Smith and Foti, 1998). However, its test-retest reliability is found to be much lower – r=0.23, estimated across only three weeks (Chen and Gully, 1997), which is especially troubling given that as a measure of a trait-like construct it is expected to be more stable over time. The SGSE is found to be positively correlated with factors such as educational level, military rank, job search decisions and number of training courses (Sherer et al., 1982; Cable and Judge, 1994; Smith and Foti, 1998). On the other hand, its relationship with SSE is inconsistent and in one case even negative (Stanley and Murphy, 1997). Furthermore, although GSE is conceptualised as a single dimensional construct, the SGSE scale has been found to be multidimensional, with a three-factor structure reflecting behavioural intentions, effort and persistence (Woodruff and Cashman, 1993; Chen and Gully, 1997). Conceptually, these factors do not measure self-efficacy but rather its consequences or behavioural implications (Bandura, 1986). This conceptual incoherence makes it less distinct from the related construct of general self-esteem (Chen et al., 2001). As a consequence, the SGSE scale correlates highly with the Rosenberg (1965) Self-Esteem Scale (r=.75-.91) (Chen and Gully, 1997; Eden and Aviram, 1993). Its items are also found to statistically overlap with the Rosenberg self-esteem items (Chen and Gully, 1997). In summary, although the scale has a relatively good internal consistency and predictive validity, it has low construct and discriminant validity and test-retest reliability, significantly reducing its value and usability.

The General Perceived Self-Efficacy Scale (GPSES) is designed to assess a general sense of self-efficacy, i.e. the level of global confidence in one's ability to cope with challenging and novel situations in a variety of different domains. It originally contained 20 items but has been reduced to 10 items rated on a 4-point scale (from "not at all true" to "exactly true") and adapted for use in 28 languages (Schwarzer and Jerusalem, 1995). It is used especially often by researchers outside the United States and has reliabilities of between 0.75 and 0.91 (Scholz et al., 2002). Its test-retest reliability varies between 0.47 and 0.75. It is also correlated positively with optimism (0.49), perceptions of challenge in stressful situations (0.45), proactive coping (0.55) and self-regulation (0.58) and negatively correlated (as expected) with procrastination (-0.56), emotional exhaustion (-0.47), depersonalisation (-0.44) and with lack of accomplishment (-0.75), well-being (0.28), health behaviour (0.14) and coping (0.28) (Schwarzer, Schmitz and Tang, 2000; Luszczynska, Scholz and Schwarzer, 2005). Its discriminant validity is somewhat lower as the scales correlate moderately with all Big Five dimensions, especially with neuroticism (r=-.52) (Wang et al.,

18. Initially, a 14-point response scale was used, with the same anchoring categories (Sherer et al., 1982).

2014). The cross-cultural validity of the scale has been examined in a number of studies involving up to 25 countries and a unidimensional internal structure was found in each of the countries involved (Scholz et al., 2002; Luszczynska et al., 2005).

Recently, an even shorter version of this scale has been developed, consisting of only six items (GSE-6; Romppel et al., 2013). It has a good internal consistency (between 0.79 and 0.88) and is negatively associated with symptoms of depression (-0.35 and -0.45), anxiety (-0.35) and vital exhaustion (-0.38) and positively associated with social support (0.30), mental health (0.36), active problem-focused coping (0.26), and self-encouragement (0.25). The GSE-6 score also predicted mental and physical health after 28 months. The test-retest stability of the score ranged between 0.50 and 0.60. Both scales are easy to administer and consist of items with a low cognitive burden.

The New General Self-Efficacy Scale (NGSE) was developed to address some of the issues found in the SGSE scale, in particular its multidimensionality and low construct and discriminant validity (Chen et al., 2001). The measure is based on Eden's (2001) conceptualisation of GSE as "one's belief in one's overall competence to effect requisite performance across a wide variety of achievement situations" (p.75). It is much shorter than the SGSE, consisting of eight items using a 5-point scale with the anchors "strongly disagree" and "strongly agree". Initial evidence points to the unidimensional structure of the scale (Chen et al., 2001, 2004). The internal consistency of the scale ranges between .85 and .90, which is above the usual cut-off of .70 for exploratory research (Henson, 2001; Nunnally and Bernstein, 1994). Test-retest reliability varied from r=.62 to r=.67 (Chen et al., 2001, 2004). It is also found to have better predictive validity in relation to a number of SSE measures, such as exam performance and various occupational self-efficacy beliefs (Chen et al., 2001). Although it still has relatively high correlation with the Rosenberg Self-Esteem scale (r=.75), the content validity of its items is substantially improved in comparison to the SGSE scale. This scale is also found to have slightly better capacity to discriminate between respondents with different levels of self-efficacy than the SGSE and GPSE scales (Scherbaum, Cohen-Charash and Kern, 2006). In addition, comparing the three scales found that the NGSE provides most information with the least number of items, thus being the most efficient of the three (Scherbaum et al., 2008). All three scales work better for individuals with average or below-average levels of GSE and are less precise for those with above-average levels of GSE.

The General Self-Efficacy Short Scale (GSESS) has been recently developed and empirically tested in three studies in Germany (Beierlein et al., 2013). Although it consists of only three items (using a 5-point answer scale) it appears to provide relatively reliable and valid measure of general self-efficacy in a nationally representative sample of German adults. In this sample it has been shown to have good measurement properties, with satisfactory validity and convergent validity. It also showed relatively low discriminant coefficients with the Big Five and locus of control measures, indicating that it may have good incremental validity. The main drawback of this scale is that, due to its novelty, it has not yet been used in other national contexts, making it difficult to assess its cross-cultural validity. On the other hand, being such a short and efficient measure of an important non-cognitive skill it offers an interesting and practical scale that is especially applicable for use in settings with greatly restricted time and high respondent burdens, such as large-scale international surveys.

Socio-emotional competences

Social competence

Conceptual framework

The ability to understand others and social situations, and to draw on this capacity in social interaction form the core of constructs such as social competence, social intelligence, interpersonal sensitivity and social skills. Terms such as empathy, self-monitoring, sociability and interpersonal communication are used to describe more specific aspects of these constructs. Although they cover similar and often overlapping content, these constructs have been developed independently and have rarely been examined from a comparative perspective (Ferris, Perrewé and Douglas, 2002).

Social competence refers to a complex set of related skills that determine a person's ability to interact effectively with others in social situations. It encompasses social, emotional, cognitive and behavioural skills that are employed to understand social situations, regulate action, choose socially appropriate behaviour and evaluate the effects of actions. It includes social skills such as co-operation, empathy, sharing, helping, encouraging and general interpersonal understanding but also encompasses self-perceptions about these social abilities (Nowicki, 2003). The broadness of the concept of social competence means that it includes other related but more narrow concepts such as social skills, communication skills and interpersonal skills (Gutman and Schoon, 2013).

Social intelligence is a psychological construct with a long history and is broadly synonymous with social competence (Thorndike, 1920; Marlowe, 1986). It is defined as "the ability to understand the feelings, thoughts, and behaviours of persons, including oneself, in interpersonal situations and to act appropriately upon that understanding" (Marlowe, 1986:52). Social intelligence has been divided into knowledge of the social world and the ability to perceive and adapt to social contexts (Jones and Day, 1997). In a more recent conceptualisation, Goleman (2006) defined social intelligence as a combination of two related skills: social awareness – what one perceives about others – and social facility – what one does with this awareness.

Interpersonal sensitivity is another construct that refers to the similar set of skills. Like Goleman's concept of social intelligence, it is conceptualised as having two facets: the ability to perceive others accurately and the ability to engage in interpersonally appropriate behaviour (Hall and Berniery, 2001). At the same time, it represents a narrower concept than social intelligence since it primarily refers to processing others' states or characteristics based on audio-visual cues (Murphy and Hall, 2011). The facet of judging others' emotions from non-verbal cues is one of the key elements of the emotional intelligence construct (Mayer, Salovey, Caruso and Sitarenios, 2003).

Social competence, social intelligence and interpersonal sensitivity inherently entail the possession of the information-processing skills needed to perceive social situations accurately, read behavioural cues and learn from past experiences, and choose the most appropriate course of action. Nevertheless, numerous studies have found that these skills are distinct from general intelligence (Jones and Day, 1997; Weis and Süß, 2007; Marlowe, 1986; Murphy and Hall, 2011). For example, autistic people can be very intelligent in terms of core information-processing skills and yet have low social competence or social intelligence (e.g. Gardner, 1985). Likewise, a person can have highly developed social skills in spite of having only average general cognitive abilities. However, the two sets of skills are found to be positively correlated, with the size of the correlation depending on the particular conceptualisations and measures of the skills involved (Murphy and Hall, 2011).

The importance of social competence

Social competences are key determinants of good social functioning. They are repeatedly placed at the top of the list of characteristics that employers state to be the most important in job applicants. Interpersonal skills have been found to be almost as important as professional expertise and their absence cannot be compensated by even the highest levels of relevant educational attainment (van der Velden and Humburg, 2013). Individuals who are socially competent are more likely to adapt to their social environment, creating the conditions for greater achievement in school and at work, and richer and more fulfilling lives (Marlowe, 1986). Aspects of social intelligence are found to be associated with better social problem-solving skills (Jones and Day, 1997) and leadership (Kobe, Reiter-Palmon and Rickers, 2001).

Many studies have found students' social skills to be positively related to their school performance and psychological well-being (Gutman and Schoon, 2013). For example, a longitudinal study with students aged 6 to 16 (Teo et al., 1996) found that early socio-emotional adjustment in school was significant predictor of their later achievement test scores at each point in time. In addition to subsequent school performance, students' social skills are also found to be positively related with psychological health in later life (Greenberg et al., 2003). Early manifestations of assertive and extraverted behaviours are also shown to be better predictors of subsequent entrepreneurial activity than academic ability both in Germany and the United Kingdom (Schoon and Duckworth, 2012; Obschonka et al., 2012). In a meta-analysis of the effects of school programmes to promote the development of personal and social skills, Durlak, Weissberg and Pachan (2010) found that positive changes occurred in youths' self-perceptions, bonding to school, positive social behaviours, school grades and achievement test results. For example, the increase in achievement test scores of students in programmes to develop social skills was over two times larger than for students in academically oriented after-school programmes.

Social competences are important predictors of job-related success (Kanning and Horenburg, 2014). A recent meta-analysis has found that these skills have incremental validity on top of general intelligence and the Big Five dimensions (O'Boyle et al., 2010). Individuals with good social skills have higher job satisfaction and job performance. They also report lower levels of job-related stress (Kanning and Horenburg, 2014). Social competence is especially important for people in managerial and executive positions. Among managers, these skills are important for gaining employees' trust and improving their job performance and job satisfaction. Likewise, they were positively related to executives' efficiency, reputation and career progression. For example, in one empirical study, more than 30% of variation in the job satisfaction of employees could be explained by their perceptions of the social competence of their managers (Walter and Kanning, 2003). A similar relationship is found between executives' social competences and employees' commitment and self-perceived performance. Likewise, clients' satisfaction with service delivery is more closely related to the perceived social competence of service personnel than to product quality or personnel expertise (Kanning and Horenburg, 2014).

Social competences are also found to have a wide range of beneficial effects in settings other than school and work (Kanning and Horenburg, 2014). They are positively related to higher life satisfaction, optimistic life orientation, health, better social integration and wider social networks (Kanning and Horenburg, 2014). Individuals with deficiencies in social competence are more likely to exhibit aggressive and hostile behaviour, and experience issues such as stress, cardiovascular disease, loneliness, anxiety or mental disorders (Spitzberg, 2008). However, it is important to point out that highly developed social skills, such as emphatic accuracy, persuasion, self-presentation and influence can be used in ways that are not beneficial or are even sometimes detrimental for other people or a group as a whole. For example, psychopaths are found to be able to master high levels of social competence which they then use to achieve higher status and advance their careers, often using manipulative and ruthless tactics (Babiak, Neumann and Hare, 2010).

Measurement of social competence

A wide range of methods have been designed to assess social competence, such as self-reports; observations; peer-, parent- or teacher-reports; sociometric measures; interviews; and performance measures. Different measurement approaches are often used to measure different constructs. For example, social intelligence is most often measured using performance tests designed to assess the cognitive ability to correctly perceive and interpret social situations. Since they are focused on the cognitive aspects of these skills, most of these measures are highly correlated with general intelligence scores, raising questions of the discriminant validity of these measures. In contrast, social competence is often assessed using sociometric and other reports on individuals' status and prestige in certain groups.

Among the self-report scales designed to measure these skills, some of the more prominent are the Social Skills Inventory (SSI), the Interpersonal Competence Questionnaire (ICQ) and the Tromsø Social Intelligence Scale (TSIS). The SSI, also called the Self-Description Inventory (Riggio, 1986) evaluates a set of basic social skills that comprise a person's social competence. It consists of 90 items designed to assess 6 specific skills, i.e. 3 pairs of social and emotional skills – expressivity, sensitivity and control. Respondents indicate the extent to which a statement applies to them using a 5-point Likert scale. The test-retest reliability of the scale over a two-week period varied between 0.81-0.96 for the different SSI subscales (Riggio, 1986).

The SSI scale has generally produced the expected convergent and divergent validity coefficients with such measures as personality scales, attractiveness, non-verbal skills, social anxiety, empathy and perspective taking (Riggio, 1986; Riggio, Tucker and Coffaro, 1989). It is also found to be positively related with employment experience, communicative motivation and knowledge and negatively related with psychosocial and academic problems over time (Segrin and Flora, 2000). There is no shorter version of this scale. However, it might be possible to use one or two of its subscales.

The ICQ (Buhmester et al., 1988) consists of 40 items (30 in a revised German version) that describe common interpersonal situations and are designed to assess 5 domains of social competence: 1) initiation of relationships; 2) negative assertion; 3) disclosure of personal information; 4) emotional support; and 5) conflict management. Respondents rate their perceived performance in each situation using a 5-point scale ranging from 1 ("I am poor at this; I'd feel so uncomfortable and unable to handle this situation, I'd avoid it if possible") to 5 ("I'm extremely good at this; I'd feel very comfortable and could handle this situation well"). The internal 5-factor structure of the scale has been confirmed in a study of university students. The internal consistency of the subscales ranged from 0.77 (conflict management) to 0.87 (initiation). Test-retest reliability over a four-week period ranged from 0.69 (Conflict management) to 0.89 (initiation). The scale was found to be positively related to well-being, dating skills, assertiveness and perceived popularity and negatively related with self-reported depression, anxiety, loneliness and social reticence (Buhmester et al., 1988). Correlations with the SSI ranged from 0.42 and 0.70 across different ICQ domains. The scale has been used in diverse population groups, such as gifted college students; depressed female adolescents; adults with personality disorders, social anxiety disorders, schizophrenia and chronic stress; and young professionals (Coroiu et al., 2015). Scores on this scale are found to be related with attachment styles, personality traits, use of social media, psychopathology, interpersonal relationships, job satisfaction, etc.

A short 15-item version of this scale has been developed very recently on a representative sample of the German general population (Coroiu et al., 2015; see Annex H). The five-factor internal structure of the new scale is verified in this sample. In addition, its internal consistency reliability is relatively satisfactory, varying between .61 (disclosure) and .75 (negative assertion).

The Tromsø Social Intelligence Scale (Silvera, Martinussen and Dahl, 2001; see Annex H) aims to provide a brief, easy to administer, and comprehensive self-report measure of social intelligence. The scale assesses three related domains of social intelligence – social information processing, social skills and social awareness. It consists of 21 items, 7 in each of the 3 scale domains. The items are rated on a 7-point scale in which 1 means "describes me extremely poorly" and 7 means "describes me extremely well". The internal reliabilities of the three subscales range from 0.79 to 0.86. The test scores and individual items do not appear to be related to the measure of social desirability. The three-dimensional factor structure is replicated in independent samples. The scale has been translated and verified in languages other than the original Norwegian: English (Grieve and Mahar, 2013), Italian (Gini, 2006) and Slovakian (Vasilova and Baumgartner, 2005), and has been shown to have a stable three-factor structure and adequate internal reliability. In addition, in the English and Italian speaking samples it has been shown to be relatively resistant to social desirability influences. The TSIS is positively related to self-reported measures of political skills, emotional intelligence and empathy (Grieve and Mahar, 2013). It constitutes a practical and efficient self-report instrument for assessing a broad and multifaceted construct of social intelligence. The scale appears to have a robust internal structure and adequate measurement properties for application in large-scale international surveys.

The convergent and divergent validities of the brief ICQ and the TSIS have yet to be examined. Moreover, the very important issue of the incremental predictive validity of these scales, over the information provided by measures of personality traits such as the Big Five and cognitive abilities has not yet been answered. This issue is discussed in more detail in the following section in the context of various measures of emotional intelligence, but in principle, the concerns raised there are equally applicable for these measures (e.g. Cherniss, 2010; Harms and Credé, 2010).

Finally, a word of warning is necessary. The content of social competence and social intelligence is heavily influenced by cultural context. What may be considered to be socially intelligent in one culture may not be in another. For example, while Chinese people view acts aimed at supporting harmony and restoring balance between people as important aspects of socially intelligence, Germans judge obtaining one's goals and being able to influence others as key aspects of social intelligence (Willmann, Fedlt and Amelang, 1997). Likewise, adjusting one's behaviour in accordance with what is believed to be deemed socially acceptable or desirable may be interpreted as socially intelligent behaviour in one culture but considered undesirable behaviour in another. Thus, the meaning of social intelligence and its manifestation in specific situations are culture-dependent and any assessment needs to take these differences into account (Willmann et al., 1997). Any measure of social competence or intelligence that is to be used in cross-cultural studies would need to be operationalised or adapted in a way that it properly reflects culture-specific understandings of the concept.

Emotional intelligence

Conceptual framework

In few recent decades the concept of emotional intelligence (EI) has become popular in psychology and more broadly. Although there is general agreement that emotions play an important role in life and that people differ in their ability to manage emotions, there is not much agreement about the construct of emotional intelligence and its value. For example, Spector and Johnson (2006) claim that "there is perhaps no construct in the social sciences that has produced more controversy in recent years than emotional intelligence" (p. 325). On one side, there have been exaggerated claims about EI being more important than IQ and other personality traits. On the other, critics have argued that it is just a new catchphrase referring to an old construct, with little or no validity and practical relevance (Cherniss, 2010).

Among the many conceptualisations of EI, four models are currently dominant in the field of EI research (Cherniss, 2010). The first is Bar-On's (1988) model of "emotional and social intelligence" which identifies five main sub-domains: 1) intrapersonal skills; 2) interpersonal skills; 3) adaptability; 4) stress management; and 5) general mood. Based on his theory of EI, Bar-On has developed a popular self-report measure called the Emotional Quotient Inventory (EQ-i).

The second major model of EI was developed by Mayer, Salovey and Caruso (Mayer, Salovey and Caruso, 2000; Mayer and Salovey, 1997). Their "ability" model of EI is based on the view of EI as information-processing capacity, divided into the abilities to perceive, use, understand and manage emotions. The most recent test designed on the basis of this theory is the Mayer-Salovey-Caruso emotional intelligence test (MSCEIT) that evaluates actual performance on a range of tasks.

The third "mixed model" is mostly based on the work of Boyatzis and Goleman (Boyatzis and Sala, 2004). It comprises a number of social and emotional competences that are found to be linked with good job performance. These competences are divided into four basic domains: self-awareness, self-management, social awareness and relationship management. The Emotional Competence Inventory (ECI) and Emotional and Social Competence Inventory (ESCI) are the main measures of this model.

The fourth and most recent conceptualisation of EI considers it as a personality trait and attempts to encompass all "personality facets that are specifically related to affect" (Petrides, Pita and Kokkinaki, 2007:274). This model identifies four main domains of EI: well-being, sociability, self-control and emotionality. The self-report instrument based on this model is called the Trait Emotional Intelligence Questionnaire (TEIQue) (Mikolajczak et al., 2007).

These four approaches offer different views of what EI is and how it should be measured. There is broad agreement that EI is "the ability to perceive and express emotion, assimilate emotion in thought, understand and reason with emotion, and regulate emotion in the self and others" (Mayer, Salovey and Caruso, 2000:396). However, other models are broader than Mayer and colleagues', and include other related personality traits and characteristics. This is why Cherniss (2010) suggested distinguishing between actual models of EI, which describe a set of related abilities involving reasoning, problem solving and information processing ("ability" models such as those of Mayer et al.) and models of emotional and social competence (ESC), or "trait" models, such as the other three EI models, which assume competences to be any "characteristic of the person that leads to or causes effective or superior performance" (Boyatzis, 1982). In this latter view, core EI abilities such as the perception or understanding of emotions provide the basis for emotional and social competences such as "influence", "empathy", or "social tolerance" (Cherniss, 2010).

This proposed distinction between EI and ESC provides a much-needed conceptual clarification and allows for better understanding of the roles of and the relations between the sets of abilities, traits and attributes that the four theoretical frameworks identify. It is also important to note that ESC overlaps with the concepts of social competence and social intelligence discussed in previous section. For example, Goleman (2006) has recently separated the EI and social intelligence concepts and postulated that the last two domains of the "mixed model" approach actually belong to the concept of social intelligence. This is by no means a coincidence as the two terms are intimately related and are often treated as synonymous. Indeed, a historical overview of the relevant research suggests that the research on social intelligence that started in the beginning of the 20th century included most of what is now considered to be EI (Landy, 2005).

The importance of emotional intelligence

There is a great deal of divergence in the empirical findings (or their interpretation) concerning the predictive value of the currently available measures of EI (Cherniss, 2010; Landy, 2005). On the one side, authors with vested commercial interests in the concept of EI and its measures have made excessive claims. For example, Goleman (1998) argued that "nearly 90% of the difference" between good and bad performers at work is due to EI or that "EI is sine qua non of leadership" (p.94). The copyright holders of EI scales often provide inflated estimates of their predictive validity. Almost all of the major instruments for testing EI are proprietary, including the MCSEIT, the EQ-i and the ECI, with the one exception being the TEIQue scale. In addition, it is often the case that the data on which these claims are made is also proprietary and not available for independent scientific verification, thus raising questions about their scientific basis (Landy, 2005).

Research on the relationship between EI and job performance has provided inconclusive evidence with some studies indicating a positive association and others finding no significant relationships (Joseph, Jin, Newman and O'Boyle, 2015). EI has been found to predict job performance better in jobs that involve higher degrees of emotional labour and vice versa (Joseph and Newman, 2010). EI is also found to have a small predictive value for entrepreneurial behaviour (Ahmetoglu, Leutner and Chamorro-Premuzic, 2011). Two meta-analyses of research on this subject have found that when controls are not added for intelligence and personality traits, EI has a small positive correlation with job performance that varies between 0.10 and 0.20 depending on whether an ability or trait measure of EI is used (Harms and Crede, 2010a; Van Rooy, Viswesvaran and Pluta, 2005). In response to these ambiguous findings, some researchers proposed a more detailed compensatory model of EI, where EI becomes more important (i.e. compensatory) as cognitive intelligence decreases.

Many researchers argue that the research on EI and its effects on workplace performance and leadership has rarely used robust research designs (Antonakis, Ashkanasy and Dasborough, 2009; Landy, 2005; Harms and Credé, 2010). For example, Landy (2005) claims that the reason some studies have found small but still statistically significant predictive value of EI measures is due to the methodological error of not including important control variables such as general intelligence or other personality traits. With the inclusion of these control variables the predictive value of EI measures further drops, usually to insubstantial values. For example, in their meta-analysis of the relationship between EI and job performance Harms and Credé (2010) find small but statistically significant effects. However, in their follow-up study in which they controlled for the effects of general cognitive ability and the Big Five measures, they found that no EI measure had any incremental predictive validity above general intelligence and the Big Five traits (Harms and Credé, 2010).

Likewise, although the relationship between EI and effective leadership was at the core of some ESC models, a meta-analytic review of empirical studies examining this relationship has found that EI, measured either as traits or abilities, does not provide any incremental predictive validity over and above the Big Five traits, even without controlling for general ability (Harms and Credé, 2010; Antonakis et al., 2009). Furthermore, it appears that the studies which found relationships between these variables are based on self-report measures of EI and leadership while the studies that do not find significant correlations have used information from different sources. On this basis, Harms and Credé, (2010b) conclude that the common method bias[19] may be responsible for some positive results.

Two recent meta-analyses of the predictive value of EI measures in relation to health have found that EI is positively related to mental (r=0.36), psychosomatic (r=0.33) and physical health (0.27) (Martins,

19. The common method bias is a spurious covariation between two measures that is the result of the same methodology being used in their assessment rather than the similarity of constructs they are measuring.

Ramalho and Morin, 2010; Schutte et al., 2007). They also found that trait measures of EI (such as TEIQue and EQ-i) showed stronger predictive power than EI ability measures. Although they controlled for the possible moderating effects of socio-demographic variables, the analyses did not account for the possible influence of cognitive abilities and personality traits (e.g. the Big Five) due to the absence of these variables in the reviewed studies.

EI is found to have a small and not statistically significant correlation with academic achievement (Bastian, Burns and Nettelbeck, 2005; Brackett and Mayer, 2003). In another study which controlled for the influence of the Big Five traits and intelligence on student grades, the EI measure did not have any incremental predictive value (Barchard, 2003). Although it was positively related with life satisfaction, copying, perceived problem solving and lower anxiety, the relationship was non-significant or small when personality and cognitive abilities were controlled for (Bastian et al., 2005). Personality traits are also found to be more strongly associated with life satisfaction, alcohol consumption and health status than EI (Austin, Saklofske and Egan, 2005).

Taken together, empirical research suggests that the conceptual independence of EI models and the incremental predictive validity of EI measures have still not been established. In other words, the unique contribution of EI or ESC to the prediction and explanation of a wide range of important life outcomes, over and above existing personality and intelligence measures, is for the most part still not confirmed (Landy, 2005; Harms and Credé, 2010).

Measurement of emotional intelligence

In accordance with the conceptual distinction introduced by Cherniss (2010), there are two main types of EI measurement instruments. The first group is based on the more narrow understanding of EI as an ability that is strictly in line with the definition of Mayer et al. (2000). The second group comprises instruments from all three other theoretical models of EI, as they all conceptualise EI as emotional and social competence (ESC). These instruments are much broader in scope, and try to assess social skills and other related attributes such as self-awareness and motivation as well as strictly personal capacities to manage emotions. The results of numerous empirical studies and meta-analyses indicate that the ESC measures consistently outperform the EI measures in terms of predictive validity when personality and intelligence are not controlled for (Martins, Ramalho and Morin, 2010; Harms and Credé, 2010; Schutte et al., 2007). This finding might be expected given that they are assessing a broader set of personal attributes, and that the influence of the skills assessed by the EI measures on life outcomes is often mediated through attributes evaluated by ESC scales (Cherniss, 2010).

However, the ESC measures are themselves subject to the same type of criticism that is directed to their theoretical frameworks – in short, that they are measuring personality attributes that do not necessary represent EI. Indeed, many studies indicate that the discriminant validity of ESC measures is low, i.e. that these measures are tapping into concepts/attributes measured by other instruments. For example, Bar-On's EQ-i is correlated -0.57 with neuroticism and 0.48 with conscientiousness (Dawda and Hart, 2000), while TEIQue has correlations as high as -0.70 with neuroticism and 0.68 with extraversion, on top of correlations of 0.44 with openness and 0.34 with conscientiousness (Petrides and Furnham, 2003). In comparison, the correlation with individual dimensions of the Big Five questionnaire for the MSCEIT (a measure of EI in the narrow sense) is no more than 0.3 (Brackett and Mayer, 2003), In fact, as Mayer and colleagues point out (2008) some of the ESC scales correlate with the Big Five as much as the various measures of the Big Five correlate with each other. Moderate to high correlations with cognitive intelligence tests are often reported for the EI measure (MSCEIT) but rarely for ESC scales (Cherniss, 2010; Van Rooy et al., 2005). However, only moderate correlations between measures of different forms of intelligence are to be expected (Mayer et al., 2008; Cherniss, 2010).

In the following paragraphs we present the most interesting from each of the two general classes of EI measures, from the perspective of possible application in a large-scale international survey. Since the MSCEIT is based on consensus scoring and is quite extensive, with 141 items in its latest version (Mayer, Salovey, Caruso and Sitarenios, 2003), it would not be appropriate for use in PIAAC. However, two newly developed EI tests – the Situational Test of Emotional Understanding (STEU) and the Situational Test of Emotional Management (STEM) – provide an interesting alternative ability-based EI measure (MacCann and Roberts, 2008).

The STEU contains 42 multiple-choice items, 14 of which are "context reduced", 14 with a personal-life context and 14 with a workplace context. Respondents are presented with scenarios and asked to choose which of five emotions is most likely to be expressed by the subject of the scenario (there is only one correct answer). The STEM is based on two parallel versions. The multiple-choice version (STEMa) requires respondents to choose the most effective response (among four offered alternatives) to a given situation. The rate-the-extent version (STEMb) requires respondents to rate the extent to which they think each of the offered alternatives represents an appropriate course of action. The multiple-choice version is scored based on expert weightings and the rate-the-extent version is scored according to the distance from expert ratings.

Both the STEU and the STEM are shown to have adequate measurement properties (MacCann and Roberts, 2008). The STEU and STEMa have internal reliabilities of 0.71 and 0.68 respectively while the STEMb is a highly reliable measure, at 0.92. Their divergent validity is satisfactory, indicating moderate correlations with cognitive intelligence tests and university grades and only small correlations with measures of personality. In addition, both the STEU and the STEM incrementally predicted students' psychology grades (after controlling for personality and intelligence) while the STEU also incrementally predicted overall grades. Both tests are correlated more highly with verbal intelligence measures than some other EI measures.

Given that the two scales are still quite long, with more than 40 items each, Allen and colleagues constructed shortened versions of both instruments: STEU-B and STEM-B (Allen et al., 2014; Allen et al., 2015), both included in Annex I. The STEU-B has 19 items and the STEM-B includes 18 items from the original STEM 44. The internal reliability of the STEU-B falls from 0.74 to 0.63 and the IRT reliability from 0.80 to 0.70, whereas the internal and IRT (Item response theory) reliability of the STEM-B is much the same as that of the longer STEM – 0.84 and 0.87 respectively – making this instrument a much more efficient measure of emotional management than the STEM. One issue regarding these tests is that they are not particularly strongly correlated (around 0.25), a correlation that is lower than would be expected from tests of two domains of the same construct.

As relatively new instruments which were developed using samples of university students and white collar workers in Australia and United States, neither of the two scales has been verified using samples from the general population or tested in different cultural contexts. From a practical standpoint it should be noted that these tests are quite complicated and extensive and, unlike standard questionnaires, present different answer categories for each item. Even in their shorter forms, they are quite time consuming to complete and involve a reasonably heavy reading load, limiting their appropriateness for use in large-scale international surveys.

Among the measures flowing from the ESC models, the most interesting is the short form of the TEIQue instrument – TEIQue-SF (Petrides and Furnham, 2006; see Annex I). This consists of 30 items designed to measure global trait emotional intelligence. It uses 2 items from the original scale for each of the 15 facets of the construct. Respondents are asked to rate the degree to which they agree with a particular statement (e.g. "I'm usually able to influence the way other people feel") using a 7-point scale ranging from 1 (completely disagree) to 7 (completely agree). The internal reliability of the instrument has

been found to be adequate, ranging between 0.87 and 0.89 with satisfactory measurement precision across the entire range of individual variation in EI (Cooper and Petrides, 2010). However, a number of the items in the scale have been shown to have low discriminatory value, meaning that they do not contribute to the distinction between individuals with high and low trait EI.

The predictive and incremental validity of TEIQue-SF has been evaluated in a number of studies. The amount of explained variation this scale in criterion variables (measure of its predictive validity) ranges between 1% and 8% and was significant in 13 out of 16 analyses (Andrei, Siegling, Baldaro and Petrides, 2015). In most analyses, some form of additional personality measure was present. In a recent study using a Canadian sample, the scale was found to have small to moderate incremental validity over the measure of the Big Five. In particular, the test explained between 0.8% and 3.6% of variance in stress, anxiety and motivation (controlling for the Big Five traits and coping strategies) and between 10% and 33% in depression, anxiety, stress and life satisfaction (controlling only for the Big Five) (Siegling et al., 2015). The incremental validity of the test was higher when its subscales were treated individually than when they were aggregated into one overall score. As the authors note, this is probably due to the fact that some of the items/subscales had poor predictive validity and were diminishing the test's overall predictive power when combined with other subscales. The TEIQue-SF takes about 5 minutes to complete and has been translated into more than 10 languages.

Attitudes and values

Conceptual framework

Attitude is defined as the "psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour" (Eagly and Chaiken, 1993:1). Attitudes are considered to have a tripartite "ABC" structure with separate **A**ffective (emotions linked to the object), **B**ehavioural (past behaviour regarding the object) and **C**ognitive (beliefs, thoughts and judgements regarding the object) components (Rosenberg and Hovland, 1960). This is one of the most important concepts in social psychology since it is found to be both susceptible to the influence of social context and rather influential in terms of its effects on human behaviour.

Attitudes serve various types of functions for individuals. These are utilitarian (they provide a general preference framework towards people, objects and situations), cognitive (they assist in organising and interpreting new information), ego-defensive (they help in protecting self-esteem) and value-expressive (they are used to express important values or beliefs). Attitudes are more malleable characteristics of personality than personality traits and are shaped by experience and learning. Change in attitudes can be the product of social influence or inner dynamics such as reflection or cognitive dissonance.

Personal values represent an individual's conceptions that influence the evaluation of events and the choice of action. Values represent the criteria and standards for evaluating actions and outcomes providing a general framework people use to decide what is good or bad, right or wrong, desirable, useful, beautiful, etc. They are more general than norms and attitudes as they refer to conceptions that apply across situations and individual objects. For example, altruism or hedonism are relevant at work, home, with family and friends, strangers, in leisure activities and in political actions.

There are ethical or moral values (such as honesty, altruism or hedonism), ideological values (conservatism, liberalism and secularism), social values (conformism, individualism, solidarity, social order) and aesthetic values. According to the most prominent value theory, there are ten basic human values that are present across cultures, which can be distinguished according to their underlying motivation (Schwartz, 2005). These are: 1) self-direction (independent thought and action); 2) stimulation (excitement, novelty and challenge); 3) hedonism (pleasure or sensuous satisfaction); 4) achievement (realising socially

valued goals); 5) power (social status and prestige); 6) security (safety, stability, harmony); 7) conformity (adherence to authority figures); 8) tradition (respect for the customs and ideas of one's culture or religion); 9) benevolence (preserving the well-being of important others); and 10) universalism (promoting well-being for all people and nature). Values tend to be hierarchically structured with some having more importance for particular individuals than others. In most cases, human actions and attitudes will represent a compromise and trade-off between various competing values.

Although values vary across individuals and cultures, members of any one culture tend to share a similar set of values which characterise that culture (Hofstede, 1984; Schwartz, 2005). Cultures can be defined as social systems based on a set of common values providing the basis for social expectations and collective understanding. These cultural values are related to, but broader than, social norms as they provide a more general framework for evaluating what is important and right. According to one influential conceptual framework, societies or cultures differ along four fundamental value dimensions (Hofstede, 1984, 2001): 1) power distance (acceptance of unequal power distribution); 2) individualism/collectivism (the degree to which individuals are integrated into groups); 3) uncertainty avoidance (tolerance for ambiguity in life); and 4) masculinity/femininity (division of emotional roles between genders).[20] Another prominent theoretical framework divides cultures along two fundamental dimensions: traditional versus secular/rational values and survival versus self-expression values (Inglehart, 1997).

The importance of attitudes and values

Attitudes are found to influence behaviour and cognition. For example, attitudes towards solidarity influence actions towards socially vulnerable categories of people such as the disabled, elderly or immigrants, while gender equality attitudes determine the way people treat individuals of the same and opposite sex. Attitudes towards academic subjects, school and teachers are found to influence academic performance and drop-out rates (Galbraith and Haines, 1998). Similarly, attitudes related to work influence a wide range of employee and company outcomes. The stronger the attitude, the stronger its effect on perception, reasoning, affective states and behaviour.

The predictive value of general attitudes such as religiosity or racial attitudes is relatively small in the case of specific individual actions and much stronger when evaluating people's behaviour across a range of related actions (Ajzen and Fishbein, 2005).The effects of attitudes on behaviour are assumed to be mediated by behavioural intentions, which in turn are determined not only by attitudes but also by subjective norms (expectations of approval of important others) and perceived behavioural control (degree of individual autonomy and control over actions) (Ajzen, 1991).

Values are found to influence attention, as well as the perception and interpretation of situations (Schwartz, 2005). They are also a source of motivation, providing general goals and guidance for action (Feather, 1995; Schwartz, Sagiv and Boehnke, 2000). They influence actions in everyday life (such as shopping choices or living arrangements), in interpersonal relationships (such as with spouses, colleagues, friends and foreigners), in work (such as work organisation, dealing with responsibility, autonomy and remuneration) and in civil life (such as political activism, voting preferences and social trust) (Schwartz, 1992, 2006).

As a more general conception than attitudes, values tend to influence behaviour not only directly but also through their effects on related and more specific attitudes and beliefs. Thus, given their broad nature and the multiple avenues of potential influence, it is difficult to quantify their influence on any particular

20. Based on new findings, in recent years Hofstede has expanded his theoretical framework with two additional dimensions: long-term orientation (importance of future), and indulgence/restraint (degree of control of desires and impulses).

individual behaviour. At the same time, representing some of the most intimate and central personality attributes, their influence is persistent and cumulative in a wide variety of situations and for a wide range of life outcomes.

Measurement of attitudes and values

Both attitudes and values are usually measured using self-rating scales. These are often designed to assess attitudes related to specific topics such as mathematics, formal education, immigration, citizen involvement, gender roles, environment protection, teamwork and employee involvement. These scales are applied to various groups from students to workers, voters and nationally representative samples.

One important development regarding the measurement of values and attitudes is the recent proliferation of large-scale international surveys, such as the European Social Survey (ESS), the European Value Survey (EVS), the World Value Survey and the International Social Survey Programme, which collect information on various attitudes and values on a regular basis. In fact, the International Social Science Council has identified 18 international comparative surveys on attitudes, values and beliefs compared to only 7 international surveys assessing literacy and cognitive skills.

Thanks to this activity, a large number of attitudinal and value scales have been developed and implemented. An important feature of these scales is that they have been translated into many different languages and adapted for use in a large number of cultures. As a consequence, most of them have accumulated a rich base of information about their measurement properties.

The post-materialism scale is probably the most widely used value scale in international surveys. It is based on Inglehart's influential theory of dominant cultural values (Inglehart, 1997). In its original form, included in Annex J, it is a very short measure in which respondents are asked to choose the most important goal for their country over the next ten or fifteen years among four options: 1) maintaining order in the nation; 2) giving the people more say in important government decisions; 3) fighting rising prices; or 4) protecting freedom of speech (Inglehart, 1971, 1997). After choosing the most important goal, respondents are asked to choose the second most important goal. This scale is used in almost all of the international surveys mentioned above and is often used in academic research.

Social trust represents the degree to which an individual trusts other people or belief that others will perform in a way that is beneficial to us, or at least not detrimental (Gambetta, 1988). It is usually measured by self-report instruments that ask respondents to indicate the degree to which other people can be trusted or to which degree one should be careful when dealing with other people. One such scale with two items designed to measure social trust was used in the first cycle of PIAAC.[21] While social trust concerns interpersonal or horizontal trust between citizens, political trust refers to vertical trust between citizens and political elites or citizen's confidence in political institutions, and is also often measured. Just as social trust is regarded as a key indicator of social capital, political trust is considered to be best indicator of political capital or a scientific equivalent of "fraternity" which, together with liberty and equality, represents a key pillar of a democratic society. Political trust is usually assessed by asking respondents to indicate the degree to which they personally trust different political institutions. For example, the ESS measures people's trust in their country's parliament, the legal system, the police, politicians, political parties, the European Parliament and the United Nations using Likert-type 11-point items with answers ranging from 0 (not trusting an institution at all) to 10 (having complete trust).

21. In terms of attitudes and beliefs, as well as the two items on social trust, the first cycle of PIAAC also assessed political efficacy (one item), civic participation (one item) and learning disposition (six items).

Schwatz's Value Survey is another frequently used scale for studying individual differences in values (Schwartz, 1992, 2006). The instrument is based on Schwartz's theory of ten universal human values described above. Respondents rate 57 items describing potentially desirable outcomes or ways of acting on a 9-point scale from "supreme importance" to "opposed to my values". The scale is used in a large number of research studies with different populations and across different nations. The reliability coefficients of individual subscales range from 0.61 to 0.75 (Schwartz, 2005).

A shorter version of this scale, consisting of 21 items (3 items assessing the "universalism" value and 2 items for each of the other 9 values) has been used in the ESS (see Annex J). A study by Davidov, Schmidt and Schwartz (2008) found that not all of the individual values can be separated in the results and that three pairs of values need to be merged to create a 7-factor structure. However, subsequent research indicated that this finding was due to the suboptimal selection of items from the original scale and did not represent a problem with the original theory (Knoppen and Sarris, 2009). This is one of the few non-cognitive scales for which this type of empirical cross-cultural validity estimates are available.

Job preferences

Conceptual framework

Job value orientations (also called job preference orientations or job attitude preferences) denote the extent to which individuals value specific qualities or outcomes of their job. The key distinction in job preferences is between extrinsic preferences (or value orientations), where jobs are valued for their material rewards, and intrinsic preferences, where jobs are valued for the chance to use one's own abilities. People with high intrinsic orientations towards work see their work as an opportunity to experience fulfilment and a sense of achievement, while those with high external orientations see it as an opportunity for material gain and social status. Job preference orientations thus focus on workers' expectations about their job, rather than on their actual job experiences (i.e. job satisfaction) or their concrete work situation (i.e. job quality) (Clarke, 1996; Green, 2011).

Job preferences are found to differ across numerous socio-demographic groups. Better-educated people are more likely to prioritise intrinsic job attributes (Gallie et al., 1998; Gallie, Felstead and Green, 2012). Likewise, individuals whose parents have higher educational qualifications are more likely to value intrinsic job characteristics (Johnson and Schlenker, 2007). Higher levels of economic security and higher earnings lead to greater focus on the intrinsic aspects of jobs while lower levels tend to shift focus to extrinsic aspects (Gallie, 2007). Working in supervisory positions and with access to learning opportunities are also conductive to higher levels of intrinsic job preference (Gallie et al., 2012).

Job preference orientations are found to be related to certain country characteristics. For example, in countries with stronger social welfare state respondents feel more secure about safeguarding their basic needs and are more inclined to value intrinsic aspects of their jobs (Gallie, 2007; Van Oorschot and Arts, 2005). In contrast, high levels of income inequality and unemployment increase the importance of job security and extrinsic job characteristics. Countries also differ in the quality of jobs they offer to their residents, the extent of job employee autonomy and learning opportunities, and these differences in turn are found to be related to the job preferences of their citizens (Gesthuizen and Verbakel, 2011).

The importance of job preferences

The significance of job preferences derives from their influence on both work performance and employee well-being (Gallie, 2007). Workers whose job preferences match the characteristics of their job are more involved and productive and are more satisfied with their job (Kalleberg, 1977). Moreover, given

the central role of work in people's lives, intrinsic orientation to one's work can be seen as an essential condition for self-development and self-fulfilment (Gallie et al., 2012).

Job preferences are shown to moderate the relationship between work conditions and job satisfaction and personal well-being (Sutherland, 2011; Gallie et al., 1998). For example, the influence of wages on job satisfaction is smaller for employees with intrinsic job preferences than those with extrinsic preferences (Malka and Chatman, 2003). On the other hand, job preferences are affected by the work context as the quality of people's jobs influences the importance they attach to different work characteristics (Gallie et al., 2012).

Intrinsic job preferences are found to be increasingly important for workers (Ester et al., 2006; Gallie et al., 2012). This trend is expected to continue due to new cohorts' increasing levels of educational attainment and parental socio-economic status, falling numbers of routine jobs and the growth of higher-skilled occupations, increase in learning opportunities, etc. (Gallie et al., 2012).

Measurement of job preferences

Job preference orientations are measured in a number of large-scale national and cross-national surveys. Job preference scales are relatively short and easy-to-administer instruments with good content and face validity. Although the full range of their measurement properties is not well known (they are often modified between survey waves by the addition of new items and removal of some old ones), their factor structure reflects the theoretical distinction between intrinsic and extrinsic aspects of job preferences. In addition, the scales are found to be related to socio-demographic and other individual characteristics, job characteristics, and wider national contexts in theoretically predictable ways (Gallie et al., 1998, 2012; Gesthuizen and Verbakel, 2011; Baslevent and Kirmanoğlu, 2013; Gallie, 2007).

Job preferences were measured in the two most recent waves of the European Value Survey (EVS), in 1999 and 2008. In the 1999 wave (33 countries), the module included 15 items on intrinsic, extrinsic and social aspects of job. Two of these items were dropped and four new added in the 2008 wave (47 countries/regions) – see Annex K for details. The initial question to respondents was "Here are some aspects of a job that people say are important. Please look at them and tell me which ones you personally think are important in a job". Items are scored as dichotomies, with the answer categories 1(mentioned) and 0 (not mentioned). Of the 17 items, researchers agreed that 5 of them (good pay, not too much pressure, good job security, good hours and generous holidays) were measuring extrinsic preferences, while another 5 (an opportunity to use initiative, feel you can achieve something, a responsible job, a job that is interesting and a job that meets one's abilities) were assessing intrinsic preferences (Ester et al., 2006).

In their recent analysis of the 1999 EVS data, Gesthuizen and Verbakel (2011) confirmed the 2-factor structure of these 10 items and have found it to be scalar equivalent (cross-culturally comparable) across 22 of the original 31 countries. In accordance with theoretical expectations, they found that at the individual level, educational attainment, income, occupational class and autonomy positively influence intrinsic job preferences, while educational attainment and autonomy negatively influence extrinsic preferences. At the national level, their analysis found that stronger social protection systems increase intrinsic preferences, while the availability of better-quality jobs diminishes extrinsic job preferences. They also found that the two factors were moderately correlated (r=.54).

Job preferences were also assessed in the two waves of the British Skills Survey in 1992 and 2006 (see Annex K). The module was conceptualised by Gallie and colleagues (Gallie et al., 1998). Respondents rated the importance of 15 job characteristics/aspects on a 4-point scale ranging from 1 (essential) to 4 (not very important). A factor analysis on the pooled data from both waves revealed 4 factors among the 15

items. Five items were measuring intrinsic preference (e.g. can use your own initiative), five were assessing extrinsic preferences (e.g. a secure job), three were related to work-life balance aspects (e.g. choice of your work hours) and two were related to social aspects of a job (e.g. friendly people to work with) (Gallie et al., 2012). The results obtained from this scale were in agreement with theoretical predictions in terms of their relationship with other individual and wider contextual characteristics (Gallie, 2007).

A module on job preferences was also included in a survey organised by European Commission (DG Employment) in 1996 and 2001 in 15 EU countries (included in Annex K). Respondents rated the importance of 12 different job characteristics using a 5-point scale ranging from very important to not at all important. Factor analysis of the pooled data from both waves and five EU countries revealed factors representing intrinsic and extrinsic preferences but it also found that a number of items were equally related to both factors (e.g. promotion opportunities), while another group of items were not related to the two factors (e.g. allows working at home). The items with the highest relationship with intrinsic preference factors were use of initiative, use of abilities and independence. Secure job and high income were by far the items with the strongest loadings on the extrinsic preference factor (Gallie, 2007).

The fifth round of the European Social Survey (ESS, 2010) administered a module on job preference orientations in 28 countries in Europe (included in Annex K). It consisted of three questions measuring intrinsic (opportunity to use own initiative) and extrinsic (secure job, high income) orientations, and two additional questions on work-life balance orientation (possible to combine work and family responsibilities) and preference for continuous learning (offers good training opportunities). The module was developed and operationalised by Duncan Gallie, Martina Dieckhoff, Helen Russell, Nadia Steiber and Michael Tahlin. The items were formulated to measure the degree of importance respondents give to various job characteristics if they are choosing jobs. A 5-point response scale is used, ranging from “not at all important” to “very important”. The results were shown to be in accordance with theoretical predictions, with female workers valuing work-life balance more, younger workers valuing training opportunities, recently unemployed people placing more emphasis on job security and those with high income being more intrinsically motivated (Baslevent and Kirmanoğlu, 2013).

Integrity

Conceptual framework

Integrity has a myriad of meanings, depending on domain and perspective (Palanski and Yammarino, 2007). In a general sense, it can be defined as “the extent to which our various commitments form a harmonious, intact whole” (Furrow, 2005:136). In the organisational behaviour literature personal integrity is often associated with honesty and so-called “integrity tests” are designed with the goal to “attempt to assess an employee’s overall honesty or predict and employee’s likelihood of stealing from his or her employer” (Rieke and Guastello, 1995:172). However, in its original meaning in the ethics literature, integrity is a much broader concept, involving the entire life of a person, all actions and events, rather than just one aspect of it, i.e. whether or not one is telling lies or is being truthful (Puka, 2005). Personal integrity implies coherence of values and behaviour across contexts while moral integrity also implies coherence between an individual’s conception of good and the socially constructed conception of the good. From a more comprehensive perspective, integrity represent the coherence across a set of moral values, between this set of moral values and a set of social values, and between person’s behaviour and these moral/social values across social contexts and time (Dunn, 2009). This definition implies five dimensions of integrity:

- **External consistency**: moral values are in accordance with wider social values; this is the source of the terms ethical and moral in the integrity literature. This normative aspect of integrity assures

that peoples' actions are in tune with their society and as such is one of the main reasons why integrity is so highly valued and rewarded in societies.

- **Internal consistency**: this is one of the key aspects of personal identity, indicating the coherence and consistency between a set of person's values and convictions. It implies the existence of multiple values and principles rather than one overarching basic principle. Internal consistency refers to the degree to which a person is able to simultaneously follow different moral principles in a balanced and coherent way.

- **Value-behaviour congruence**: the most often mentioned dimension of integrity, denoting the unity of the self and its acts.

- **Temporal stability**: integrity, as with character and value systems, is expected to be stable across time and as such to shape people's actions during their lifetimes.

- **Permanence across roles**: there is some disagreement about whether integrity requires consistency across all the roles and domains of person's life (Musschenga, 2001). It is especially difficult to act according a coherent set of principles in work and personal roles as the two may (and usually do) involve different priorities and ultimate objectives. However, given the central notion of the integrity is the sense of the unity as expressed in an individual's life, it is difficult to argue that different identities can exist across different roles. Thus, basic permanence across roles is a necessary condition of integrity (Schlenker, 2008; Dunn, 2009).

In the organisational sciences the concept of organisational integrity is prevalent (Dunn, 2009). In general, this is defined as a confluence of personal behaviour and organisational values, i.e. the extent to which organisational values are reflected in person's values and/or behaviour. (Simons, 1999; Dunn, 2009). Thus, this concept is rather distinct from the concepts of personal and moral integrity and a person with high personal integrity may have low organisational integrity to the extent that organisational values are not in tune with her or his moral and wider social values.

The importance of integrity

Integrity is promoted and rewarded in all societies as it is of critical importance for common well-being (Schlenker, 2008). In order to function properly, members of a society need to be able to rely on one another, to act in accordance to what they say, to be consistent across roles and time, and to subscribe to general group values. Without these characteristics, people become unpredictable, unreliable, and threatening to the group's well-being. In this regard, integrity can be viewed as a factor that channels people's behaviour towards socially valued directions (Schlenker, 2008). As an indication of its personal and societal importance, integrity-related constructs are found to be among the most desirable of all personality traits among American and British people. In particular, among the 555 personality adjectives, "sincere" and "honest" are the two highest rated, while "liar" and "phony" are the two least desirable (Anderson, 1968; Dumas, Johnson and Lynch, 2002).

At the individual level, integrity is important in all spheres of one's life, constantly influencing actions and choices in life. It is associated with a positive outlook towards life, greater sense of purpose and less alienation and narcissism, higher self-esteem and internal control, greater authenticity, and a stronger sense of identity and inner direction. Integrity is also related with positive orientations towards others, greater empathy and spirituality, more agreeableness and trust, but less cynicism, Machiavellianism and materialism (Schlenker, 2008). People with higher integrity are less likely to rationalise illegal, anti-social and immoral behaviour and show more moral engagement. Integrity is inversely related with a wide variety of anti-social and illegal behaviour such as theft, lying, cheating, stealing, fraud, and alcohol and

drug abuse in private, academic or work settings (Schlenker, 2008). On the other hand, it is positively related to volunteering, helping behaviour, job performance, academic performance, mental health, psychological well-being, effective social functioning, etc. Furthermore, analysis of job requirements have found that integrity, along with dependability, is the most important personality attribute irrespective of the degree of job complexity (Sackett and Walmsley, 2014).

Measurement of integrity

Integrity tests, also sometimes referred as honesty scales, are used extensively in personnel selection as a means to screen out potentially counterproductive employees (Ones, Viswesvaran and Schmidt, 2003; Hakstian, Farrel and Tweed, 2002). They are shown to predict dishonest or counterproductive work behaviour (such as theft, property damage, obstructiveness and absenteeism), as well as overall job performance. In fact, although it was not their primary objective, integrity tests are found to have the greatest incremental validity in predicting job performance after taking into account cognitive ability (Schmidt and Hunter, 1998; Ones et al., 2003).

Measures of integrity in organisational context are generally divided into the two broad categories: overt integrity tests and personality-based measures (Sackett, Burris and Callahan, 1989). Overt integrity test have direct and transparent test items that ask respondents about their attitude towards theft or deviant work behaviour and admissions of past illegal or dishonest behaviour. On the other hand, personality-based integrity measures were developed to assess a broader range of behaviour and traits, such as general dishonesty, aggression, absenteeism, tardiness, substance abuse, laziness and disruptiveness. Their items are less transparent for respondents and cover greater breadth of traits and contexts.

Meta-analyses of the criterion validity of integrity tests (Ones et al., 1993, 2003) found that such tests predict counterproductive behaviour and overall job performance with mean validities varying between .34 and .47. They found similar validity levels for both overt and personality-based integrity tests in predicting overall job performance. Integrity tests have only moderate inter-correlations: .45 among overt tests (.32 uncorrected for attenuation), .70 among personality-based tests (.43 uncorrected) and .39 between overt and personality-based tests (.25 uncorrected) (Ones et al., 1993). An analysis of the internal structure of the items pooled from seven different intelligence tests revealed four main dimensions of these tests: anti-social behaviour, socialisation, positive outlook and orderliness/diligence (Wanek, Sackett and Ones, 2003).

Integrity tests are found to be mostly related to the conscientiousness dimension of the Big Five model, although the two constructs are not thought to be identical or interchangeable (Ones, 1993; Wanek et al., 2003, Berry, Sackett and Wiemann, 2007). However, separating out the effects of conscientiousness from integrity measures has little effect on the validity of integrity tests, while separating integrity out of conscientiousness measures reduces the criterion validity of conscientiousness scales to almost zero (Murphy and Lee, 1994; Ones, 1993). Apart from conscientiousness, agreeableness and emotional stability also have small to moderate correlations with integrity scales (Ones et al., 1993, 2003; Berry et al., 2007).

The honesty-humility factor of the HEXACO personality model is found to substantially correlate with integrity tests, especially the overt type (Ashton and Lee, 2005; Marcus, Lee and Ashton, 2007; Lee, Ashton and de Vries, 2005). Lee and colleagues (2005) argue that the high correlations between the honesty-humility factor and overt integrity tests explain the relatively good validity of integrity tests for various organisational criteria. In particular, the key component of overt integrity tests is not the task-related conscience that is related to the conscientiousness factor but rather the moral conscience that is accounted by the honesty-humility dimension. On the other hand, the incremental validity of the honesty-humility factor compared with the Big Five measures is somewhat smaller in the case of personality-based integrity measures, as these cover a much wider spectrum of personality traits (such as even temper, self-

control, dependability and reliability) than those directly relevant to this factor (Ashton et al., 2005). The relationship between humility-honesty and integrity tests is found to hold across various criteria, samples and countries (Marcus et al., 2007).

Since they are primarily used in personnel selection, most of the integrity scales are designed for commercial use, copyrighted and not freely available for research purposes. Here we present two personality-based scales that are freely available in the public domain.

The Integrity Scale (Schlenker, 2008; Schlenker, Weigold and Schlenker, 2008, see Annex L) is one of the most prominent instruments for measuring integrity in organisational research. This personality-based integrity scale is designed to "measure the inherent value of principled conduct, the steadfast commitment to principles despite temptations or costs, and the unwillingness to rationalize unprincipled behaviour" (Schlenker, 2008:1084-85). The scale consists of 18 items scored on a 5-point Likert scale ranging from "strongly disagree" to "strongly agree". The items themselves are quite long and involved, presenting relatively complex arguments for respondents to evaluate. This can substantially limit the applicability of the scale both across subpopulation categories within countries and across different countries. However, the scale has relatively good psychometric properties in the investigated samples (Johnson and Schlenker, 2007). Cronbach's alpha ranged between .84 and .90 across five independent samples. Apart from a method effect (an acquiescence response bias that could be neutralised by using reverse-scored items), factor analysis revealed a single global factor behind the scale. The correlations with the Crowne-Marlowe social desirability scale (measuring respondents tendency to provide socially desirable answers irrespective of their true opinion) ranged from .05 to .17, indicating relatively low tendency towards socially desirable answering. The scale is found to be inversely related to the propensity to lying (egoistic and pro-social lies), stealing, cheating, fraud, infidelity and alcohol and drug use (Schlenker, 2008). On the other hand, the integrity scale was positively related to helping behaviour and volunteering frequency even after controlling for empathy.

The California Psychological Inventory – Counterproductive Tendencies scale (Hakstian, Farrel and Tweed, 2002) is designed to measure counterproductive tendencies using a selection of items from the California Psychological Inventory, Form 434. It consists of 80 dichotomous items (true/false) that are related to 9 underlying dimensions. Internal consistency and test-retest reliability vary between .80 and .90 across different samples. Criterion validity in relation with self-reported counterproductive behaviour was .60 while in relation with counterproductive job behaviour was .35. The scale is also found to have moderate correlations with a number of other job-performance measures.

Creativity

Conceptual framework

Creativity is one of the most important human abilities (Runco, 2004; Sternberg, 2011; Simonton, 2000). It enables the finding of efficient and adequate solutions to problems, original and functional ideas, and the development and improvement of individuals and societies alike. Creative products are all around us and are clear affirmation of the creative capacity of the human mind and its role in our lives.

However, in spite of its importance and a long history of human interest and fascination with the phenomenon of creativity, it has only relatively recently become the focus of widespread scientific research (Sternberg and Lubart, 1995). This is due to many factors, such as its historical roots in studies of mysticism and spirituality that were antagonistic to the scientific method, but also due to the complexity of the phenomenon and the related difficulty in conceptualising and assessing it. Today, scholarly interest in creativity spans many disciplines such as psychology, education, philosophy, linguistics, technology and economics. Creativity is also the topic of numerous commercial approaches that are often characterised by

a lack of scientific methodology and a focus on the possibilities of developing and enhancing this capacity (e.g. De Bono, 1970; Osborn, 1957).

Although the definition of creativity has been the subject of a long and intensive debate, in recent years a broad consensus seems to have been reached. In particular, there is a general agreement that creativity involves the production of novel or original products that are at the same time useful or worthwhile (Mumford, 2003; Sternberg, 2011; Mayer, 1999; Gruber and Wallace, 1999; Feist, 1999; Lubart, 2000). The products can be abstract, intangible phenomena, such as an idea, musical composition or story, or concrete physical objects, such as a machine, painting or building. Apart from the creative product, this definition also assumes the existence of a creative person making the product, a creative process forming the product, and a creative place, which represents a particular setting conductive to creativity (the "four Ps"). This definition also implies that originality alone cannot be the only criterion since then it would not be possible to distinguish between an eccentric or psychotic idea from a creative one. In order to be creative, a product must be useful or adaptive, but not exclusively in a pragmatic sense but in a broader sense, for example using purely intellectual or aesthetic criteria.

Depending on their emphasis on one of the four Ps (Rhodes, 1961), approaches to the analysis of creativity can be divided into those that focus on process, on product, on person and on place. Theories that focus on process stipulate different stages of creative processes. One of the most popular and influential theories distinguishes four stages: preparation, incubation, illumination and verification (Wallas, 1926). Recent theories of the creative process have modified this initial model primarily by recognising the influence of knowledge and expertise, on the one side, and the influence of motivation, especially intrinsic ones, on the other (Runco and Chand, 1995; Amabile, 1996). Creative processes are also the focus of cognitive theories of creativity which primarily consider the role of cognitive mechanisms as building blocks of creativity. They are quite varied and emphasise different aspects of cognition, such as associative processes, generative and exploratory thinking, individual differences in divergent thinking, use of heuristics and tactics, the role of expertise, and problem-solving skills and the importance of problem finding (Mednick, 1962; Smith, Ward and Finke, 1995; Guilford, 1968; Ericsson, 1999; Simon, 1988; Weisberg, 2006).

The psychometric approach to creativity is characterised by a focus on creative products and creative people, with creativity usually associated with the ability to produce more (quantity) original (quality) products. It is characterised by extensive use of psychometric tests and an attempt to quantify creative people or products using batteries of so-called "divergent tests". Apart from these psychometric tests of creativity, psychometric approaches also apply other personality tests in order to identify the personality characteristics that distinguish between more or less creative people. Another approach to the examination of creative people relies on more qualitative methodologies, such as in-depth case studies or identifying commonalities between small groups of widely recognised creative individuals.

Research on creative people and personality correlates of creativity have established a wide range of personality characteristics that are conductive to creativity (Barron, 1988; Feist, 1998). Openness to experiences, a dimension of the Big Five model, is often found to correlate with psychometric measures of creativity (Moutafi, Furnham and Crump, 2006). Facets of openness to experiences, such as intellectual curiosity and imaginativeness, are also found to be related to scientific and artistic creativity. Intellectual fluency or idea generation and tolerance of ambiguity are other intellectual characteristics conductive for creativity. Creative people also tend to be more self-confident, driven, hostile, impulsive and ambitious than less creative individuals (Zhang, Sternberg and Rayner, 2012; Feist, 1998). Knowledge and domain expertise are also important prerequisites of the creative process as they allow individuals to build on and diverge from the existing state of the art (Christiaans and Venselaar, 2005; Weisberg, 2006). Motivation is another important determinant of creativity (Amabile, 1996). Hard work, perseverance and effort are important factors in the creative process and are the distinguishing characteristics between people who

finalise their initial idea from those who do not. Intrinsic motivation is an especially important determinant of creativity, while extrinsic motivators like money or fame may often (but not always) impede creativity (Amabile, 1996; Prabhu, Sutton and Sauser, 2008). Beliefs, attitudes and values can also affect the creative process with more tolerant and open-minded attitudes towards other cultures or belief systems often found to be more conductive to creativity (Collins and Amabile, 1999).

Theories that focus on "place" investigate the wider circumstances in which creativity occurs, such as the particular situation in the given domain, the amount of support and resources available, access to information, and the role of "gatekeepers" (Simonton, 2000; Amabile, 1996; Csikszentmihalyi, 1999; Sternberg and Lubart, 1991). "Systems" theories take an even wider approach, in which creativity is not represented as a single entity but rather as a complex system of interacting subcomponents, such as the evolving systems approach of Gruber and Wallace (1999) or Csikszentmihalyi's influential systems view that reframes the central question from "What is creativity?" to "Where is creativity?" (Csikszentmihalyi, 1999). In other words, an idea or product that is seen as creative in one society, domain or field, may be seen as a mediocre in another society, domain or field. People's views on what creativity is and who is a creative person reflect current social norms and are relative to a particular time and place. From this perspective, the occurrence of creativity depends on the interplay between a person, a particular domain of activity and a wider social context, with each of the three aspects being a necessary but insufficient element of the creative system.

The importance of creativity

Creativity is fundamental for being successful today. At the individual level, it creates value, brings material benefits, increases professional and social status, allows for the fulfilment of individual potential, and improves general well-being. Creativity improves problem-solving abilities and skill mastery, and enables people to positively affect the lives of others, develop confidence and self-reliance, and have an overall sense of purpose and satisfaction in life.

At a wider, societal level, creativity is critical for cultural development, scientific advancement, economic growth and productivity, technological progress, and overall social well-being. It occurs and affects outcomes in all domains of life (Treffinger, Solomon and Woythal, 2012). It is a driving force behind novel and innovative forms of cultural artefacts, business products and technological innovations. As such, it is a highly valued and desirable phenomenon across cultures (Kankaraš, 2009).

Assessing individual creative ability

Creativity assessment can be divided into few broad measurement categories: assessment of creative cognition, creative personality traits, creative products, and creative behaviour and accomplishments.

Assessment of creative cognition mostly relies on tests designed to measure divergent thinking. These tests usually consist of figural or textual tasks to which respondents were asked to provide as many answers as possible, which were then scored, based on their fluency (total number of answers), originality (statistical rarity) and elaboration (amount of detail in responses) (e.g. Guilford, 1956).

The Torrance Tests of Creative Thinking are the most popular psychometric test of creativity (Torrance, 1962, 1974). Based on Guilford's theory, especially the conceptualisation of divergent thinking, the tests consist of four subscales measuring:

- Fluency: the total number of interpretable, meaningful and relevant ideas generated in response to the stimulus

- Flexibility: the number of different categories of relevant responses
- Originality: the statistical rarity of the responses
- Elaboration: the amount of detail in the responses.

The test includes both verbal and non-verbal/figural tasks and stimuli. It has been applied in a wide range of contexts including several longitudinal studies (Cramond et al., 2005; Runco et al, 2010).

These "divergent thinking" tests have drawn lots of criticism mainly due to the fact that their quantitative approach reduces the focus on the relevance and quality of individual responses, thus leading to questions about their validity and practical usefulness (Nusbaum and Silvia, 2011).

Alternative personality approaches to measuring creativity focus on identifying and assessing personality attributes that are conducive to creative process and characteristic of creative individuals. Various personality scales measure those constructs that are found to correlate or be conducive to creativity, such as openness to experience, intellectual curiosity, artistic interests, intrinsic motivation and achievement orientation (for an example of one such approach see Lucas, Claxon and Spencer, 2013).

Biographical inventories, such as the Creative Achievement Questionnaire (Carson, Peterson and Higgins, 2005), are also used to assess individual creativity. This questionnaire evaluates creative achievements in ten domains: music, dance, humour, inventions, creative writing, scientific discovery, theatre, film, visual arts and architectural design. The scale focuses on significant accomplishments in at least one domain and as a result produces low scores for most of the general population. This is the reason why it is mostly used to assess so-called Big-C creativity, i.e. creativity that is considered important in the given field. Each domain is assessed by eight items that indicate increasing levels of creative achievement. A more appropriate scale for assessing everyday creativity is the Biographical Inventory of Creative Behaviours (Batey, 2007). The inventory consists of 34 forced-choice yes/no items representing various creative activities. Respondents are asked to indicate whether they have been actively involved in each of these during the past 12 months. The scale is found to have solid measurement properties (Silvia et al., 2012).

An alternative way to measure creativity uses different achievement measures evaluated by varying criteria (Mumford and Gustafson, 1988). For example, creativity can be assessed by overt production criteria such as number of works or patents, professional recognition criteria such as awards or prizes in a given domain, or social recognition criteria based on judgements of peers or experts. In the area of assessing creative products, the most prominent test is the Consensual Assessment Technique (CAT; Amabile, 1982). The CAT is based on a fairly straightforward approach to assessing the creativity of any idea or product by asking experts in the field and combining their evaluations. In other words, it applies the same principles used by award committees in different fields – taking into account only the opinion of few experts – to assess creativity of everyday creations. The test procedure is rather simple – respondents are asked to produce something (such as a poem, short story, drawing or composition) and experts in the domain are asked to independently evaluate the creativity of the resulting artefact. The creativity of artefacts is assessed in relation to one another. In other words, the ratings can be compared only within the pool of artefacts that are being evaluated by a particular expert panel, which means that a drawing can be judged as highly creative in one group and only moderately creative in another group that includes better pool of drawings. As a consequence, the CAT does not have any kind of standardised scoring and is not appropriate for comparisons across different groups. It is mostly used in research settings but can be also applied in a number of other settings such as education. Inter-rater reliability of the CAT is usually found to be in between .70 and .90 (Amabile, 1983, 1996; Baer, 1993). The number of expert judges ranges between 2 and 40 with the average being just over 10 (Amabile, 1996).

Metacognition

Conceptual framework

Metacognition is "cognition about cognition" or thinking about thinking. In addition to knowledge about cognition, it includes the ability to control and direct cognition (Flavell, 1979). It involves a wide range of forms including knowledge and control of memory processes, learning processes, thoughts, emotions and affective states. It covers the processes of self-monitoring, self-representation and self-regulation. Metacognition is usually divided into three components: metacognitive knowledge (declarative, procedural and strategic knowledge), metacognitive regulation (planning, monitoring and evaluating skills) and metacognitive experiences (Kankaraš, 2004). Metacognition not only regulates actions but also helps to maintain motivation; improve effort, persistence and resilience; avoid distraction and alleviate obstacles. People with good metacognitive skills are aware of their strong and weak points, better able to evaluate their capacity in relation to the task at hand, and have a better set of mental "tools" that can be deployed to achieve goals.

Metacognitive processes are especially important for developing self-regulated learning. Metacognitive strategies focus awareness on thinking and the selection, monitoring and planning of the strategies most conductive to learning (Zimmerman, 2002). These strategies help in setting learning goals, planning and problem solving, monitoring the learning process, understanding difficulties and ways of dealing with them, evaluating outcomes, and adjusting approaches.

Metacognitive skills and strategies have attracted lots of attention in the fields of education and educational psychology due to this role in the development of self-regulated learning. As noted previously, learning to learn is considered to be one of the key competences for effective functioning in the modern age (in fact, it is listed as a first competence in the European Union list of key competences for the 21st century). A large number of studies have found a positive relationship between the use of metacognitive strategies and academic performance (e.g. Pintrich and DeGroot, 1990; Kuhn, 1999; Steinberg, 2005). In addition, several meta-analyses have shown that teaching metacognitive strategies has medium to large effects on school performance (Gutman and Schoon, 2013). One such meta-analysis of 51 studies found that the average weighted effect sizes of training in metacognitive and cognitive learning skills were 0.57 on performance, 0.16 on study skills expertise, and 0.48 on positive affect (Hattie, Biggs and Purdie, 1996).

Metacognition is also assessed within the PISA framework, where the focus is mainly on students' strategic knowledge about learning. Metacognitive knowledge about text comprehension was assessed in students who took part in PISA 2000 study in Germany and was found to correlate r=0.51 with the scores on the reading scale (Arteld, Schiefele and Schneider, 2001). A similar approach was used in PISA 2003 and similar associations between metacognitive knowledge and reading literacy were found. PISA 2009 implemented a similar measurement instrument assessing metacognitive knowledge concerning reading strategies.

Measurement of metacognition

The measurement of metacognitive skills is highly fragmented and skill- or domain-specific (Desoete, 2008; Sperling et al., 2002). They usually involve self-report questionnaire although other methods such as "think aloud" protocols or behavioural observation are also used (Veenman and Elshout, 1999). Many of the measures have been developed to assess metacognitive skills in particular applied settings, such as mathematical problem solving or reading comprehension. Among the self-report scales designed to comprehensively assess metacognitive skills the most prominent is the Metacognitive Awareness Inventory (Schraw and Dennison, 1994). This uses 52 rating items designed to measure 2 sub-dimensions of

metacognition: knowledge of cognition and regulation of cognition. It has been shown to be a reliable measure of metacognition (for a particular sample) related to academic performance (Schraw and Dennison, 1994).

Another measurement approach is to use scenario-based tests that present several situations/scenarios followed by a list of possible responses that differ in their appropriateness, as judged by experts. Respondents are asked to evaluate the appropriateness of each strategy for a given situation using multiple-choice answer categories. This approach has been applied in PISA 2009 and has been found to have adequate reliability (0.84) and the expected correlations with reading proficiency scales. However, these tests have usually been developed for children or adolescent populations, referring mostly to school-related situations, and are usually domain-specific (Händel, Artelt and Weinert, 2013). Even the general metacognitive knowledge tests still need to be considered to be specific with respect to the situations they refer to (Neuenhaus et al., 2011).

Apart from their diversity in scope, topic, type and approach, measures of metacognition have low correlations with each other. Even measures designed to measure the same metacognitive skills (such as metacognitive knowledge) but which assess metacognition retrospectively or prospectively are only moderately correlated (Veenman, 2003). Each of the various facets of metacognition seem to be best assessed with different techniques, making it difficult to design one valid measure for the entire range of metacognitive skills. Most importantly, metacognition is by definition knowledge of our cognitive functioning. When self-report measures ask respondents to assess their metacognitive skills they are actually asking them to assess the very skills they need to use for this assessment (Desoete, 2007). This creates the classic measurement problem of a measurement process changing or influencing the object of measurement. Hence, although the concept of metacognition and related wide range of metacognitive skills refer to important personal capacities and characteristics, the current lack of conceptual clarity and especially the lack of an adequate instrument limit the possibility of assessing these skills in the next cycle of PIAAC.

Grit

Although it can be traced to Galton (1889) and similar traits were well-regarded even in Ancient Greece, the concept of “grit” has received renewed attention in research and policy fields in recent years. Grit is defined as perseverance and passion for long-term goals (Duckworth et al., 2007). It is the personality trait that determines the degree to which people will persevere in the face of challenges, and maintain effort and interest over the years when encountering failures and adversity. It is considered to be critical to success “no matter the domain”, although success is defined in somewhat vague and narrow terms of “vocational and avocational achievements that are recognized by other people” (Duckworth et al., 2007:1087). It is distinguished from other similar traits such as hardiness, resilience or ambition by its long-term orientation.

Grit has been found to predict important life outcomes such as job retention, academic achievement and school graduation (Eskreis-Winkler et al., 2014). In addition, it remains a significant predictor of life success even after controlling for the main personality factors, although it then offers only minor incremental validity (Duckworth, 2013; Duckworth et al., 2007; Eskreis-Winkler et al., 2014).

Duckworth and colleagues (2007) distinguished between two aspects or facets of grit: perseverance of effort and consistency of interests or motive over time. They developed a grit scale with 12 items designed to measure these 2 domains (Duckworth et al., 2007). This scale was later revised and reduced to an 8-item scale that retains the 2-factor structure, the Short Grit Scale (Grit-S; Duckworth and Quinn, 2009). In four different samples, the new scale had an internal reliability of 0.73-0.83. One-year test-retest reliability was found to be 0.68. The scale correlates positively with educational attainment, grades, outcomes of cadets’

military training and US National Spelling Bee finalists while they correlated negatively with number of hours spent watching television and number of different jobs. The correlation with future grades, although positive, was very small – 0.06. The scale has rather low discriminant validity as it has substantial correlations with the conscientiousness (.70), agreeableness (0.47) and neuroticism (0.40) dimensions of the Big Five measures.

Apart from its predictive capacity, some researchers also suggested that grit has higher level of malleability than intellectual ability, socio-economic status and other important predictors of academic achievement (Duckworth and Gross, 2014). They assume that grit is mostly influenced by family values and thus more susceptible to training. This dual claim of high predictive value for important life goals and greater malleability than other important personality factors have resulted in a rather swift and overwhelming shift of policy focus onto the concept of grit and its promotion. Despite the lack of empirical evidence on the malleability of grit and the relative shortage of studies that would confirm and extend the initial findings of its predictive and incremental validity, both the US and UK Departments of Education have made training on grit a priority, while large-scale implementation programmes are already being conducted in a number of US school districts (see for example Shechtman et al., 2013; Tough, 2013).

However, a number of recent studies have put most of the key assumptions behind these programmes into question. One strong rebuttal of these claims has come from a recently published large-scale study of twins (Rimfeld et al., 2016). The study found no evidence for the claim of grit's greater malleability. Instead, it found that the heritability of grit is 37%, which is in line with other personality traits, including conscientiousness. Even more importantly, it showed that apart from genetic influences, almost all of the rest of the variability in grit scores across individuals comes from non-shared environmental factors, with shared environmental factors only accounting for a trivial part of grit's scale variability. Given that shared environmental factors are the ones that contribute to similarities between twins when they grow in the same family or attend the same schools, these results indicate that, contrary to initial claims, grit is not influenced by these factors and as such, is much less susceptible to training or intervention.

Regarding the issue of incremental validity, the study of Rimfeld and colleagues (2016) confirmed the relatively high correlation between conscientiousness and grit, which was previously found to range between .70 and .77 for different samples (Duckworth and Quinn, 2009). Furthermore, it found a genetic correlation of .86 between the two concepts, indicating that they basically share the same genetic influences. These high correlations raise the issue of grit's incremental validity, a question that is also posed in regards to its relationship with other related concepts, such as perseverance or need for achievement. In relation to the issue of conceptual overlap (i.e. incremental validity), Duckworth et al. (2007) claim that grit is more relevant than these constructs for longer-term goals such as education. However, Rimfeld and colleagues found grit had only a minor influence on academic achievement (accounting for 2% of variance in academic achievement) and, more importantly, only negligible incremental validity (.5% of variance) once the Big Five dimensions are controlled for (Rimfeld et al., 2016).

Additional evidence on grit's lack of incremental validity and its questionable status as a separate construct altogether has come from a newly published meta-analysis that provided a comprehensive overview of research on grit, based on the results from 88 studies with a combined 66 807 participants (Credé, Tynan and Harms, 2016). This study also found a very high average correlation between grit and conscientiousness (r=.84)[22] which not only limits the incremental value of grit but also indicates that grit is to a large degree redundant and may represent a different formulation of conscientiousness or of one of its

22. It should be noted that a typical correlation found between scores on two different measures of conscientiousness is r=.63, indicating that grit may be better measure of conscientiousness than some measures of conscientiousness themselves (Pace and Brannick, 2010).

facets (Credé et al., 2016). This conclusion is further supported by a similar correlation between persistence and conscientiousness (r=.89) and similar interrelations of grit and conscientiousness with other relevant concepts. Furthermore, this study finds no evidence for the proposed two-factor structure of grit, showing instead that while the persistence of effort aspect of grit has moderate predictive validity with performance, consistency of interest has no such effect. Likewise, overall, grit has only a modest relationship with academic performance and retention (r=.16 with grades in high school and r=.17 with GPA in college). These relations are much lower than other well-known predictors of academic performance such as cognitive ability (Sackett et al., 2012), study habits and skills (Credé and Kuncel, 2008), and academic adjustment (Credé and Niehorster, 2012).

This recently presented evidence thus indicates that grit is most likely not a separate construct but that it is rather synonymous with persistence, which is already an established facet of conscientiousness. The new results also indicate that is has small effect on some life outcomes like academic achievement and school retention but that this effect is smaller than the effect of cognitive ability and some other non-cognitive attributes. Finally, the new genetic study (Rimfeld et al. 2016) indicates that a substantial portion of individual difference in grit is inherited and that there are no indications of family or school effects on its development. Taken together, these results are in sharp contrast with current enthusiasm and attention grit is receiving in policy community and is a good example of dangers presented by premature and uncritical implementation of new scientific concepts into policy settings. This situation is also a warning for individual scientist to be more cautious when propagating their ideas based on limited evidence.[23]

Other personality characteristics

There are many other personality attributes that are considered to be important for individual and societal outcomes. However, many of these do not demonstrate incremental validity on top of the constructs are already presented here. For example, locus of control and self-esteem, which attracted lots of research attention in the last few decades of the 20th century, are found to highly correlate with general self-efficacy and the neuroticism dimension of the Big Five model (Judge, Locke and Durham, 1997). In particular, the relatively high inter-correlations and conceptual similarity of the constructs of self-efficacy, self-esteem, locus of control and emotional stability (i.e. low neuroticism) have led a group of authors to treat them as dimensions of one higher-order construct called “core self-evaluations” [24](Judge et al., 2002; Judge, Locke and Durham, 1997).

Thus, although these constructs represent important personality attributes on their own, measures of them can hardly be expected to provide enough additional information (on top of that obtained by a number of scales measuring related characteristics) to justify the cost of their use. This is especially so in the context of a large-scale international survey, with very limited testing time and large respondent burden, all of which will increase measurement error and further reduce the possibilities of incremental validity.

23. In a number of instances, both in her scientific works and especially in her public speeches or interviews, Angela Duckworth has been overly optimistic about the importance of grit and its malleability. In some cases there was no empirical evidence for her claims while in other cases they were in direct contradiction with her own empirical results (Credé et al., 2016).

24. Judge, Erez, Bono and Thoresen (2003) have also constructed a relatively short scale (12 items) designed to measure this broad construct (core self-evaluation).

PERSONALITY CHARACTERISTICS: CHOOSING WHAT AND HOW TO MEASURE

The importance of personality characteristics

Personality characteristics are one of the key determinants of human behaviour and, as such, they have a critical influence on a multitude of life events and outcomes and on overall personal and social well-being. Although they are generally harder to assess and their influences are more difficult to disentangle than cognitive competences, there is a large body of empirical evidence confirming their role and relative importance in relation to other factors. In other words, people with particular personality characteristics are more likely to experience certain life outcomes even after taking into account other factors, including their cognitive abilities. Individuals who are more disciplined, persistent and intellectually curious will be better off in school, while those who are more reliable, hard-working and organised will be more likely to find employment and make progress at work. Those who are better able to regulate their emotions and stress will have healthier and longer lives. People with higher self-efficacy and social skills will be better leaders, while those who are more empathetic, agreeable and warm will be better professional or informal caregivers. At the same time, people with lower self-control and integrity will be more likely to commit criminal acts or engage in counterproductive behaviour at work. Workers whose vocational interests do not match their job position will be less productive and satisfied. Furthermore, as we have seen, the influence of personality characteristics on life events also occurs indirectly, through their accumulated effects on other personality characteristics and intermediate life events. Academic achievement, long established as one of the primary determinants of many important life outcomes, is highly influenced by a range of personality characteristics. This is also true of cognitive ability itself. Being curious and open-minded and having an active approach to learning is a critical requirement for the development and continuous improvement of a person's innate cognitive skills.

Although they have been the object of extensive research by social scientists, personality characteristics were long overlooked in social and education policy. However, this has changed in the last few decades with policy attention expanding from its traditional focus on cognitive and academic competences to consideration of the role of various personality characteristics. This trend has gained impetus from the proliferation of new assessment instruments in recent years, both in the form of new or modified self-report scales and other innovative forms. These include situational judgement tests or anchoring vignettes that are designed to overcome some of the well-documented limitations of self-reports. This has stimulated thinking about policy settings and intervention programmes designed to better prepare and equip people for the challenges they face in different life situations.

Schools could incorporate into teaching practices knowledge about the influence of various personality characteristics on the acquisition of knowledge and development of skills. Intellectual curiosity and intrinsic motivations for learning should be critical elements of any pedagogic effort. They could pay more attention to developing students' self-regulating behaviour and their capacity to organise and direct their own learning activities. Employers could redesign workplaces to stimulate their employees to use their existing capacities and develop new ones. They could better promote individual initiative and allow more learning and growth opportunities. There is a large body of evidence showing that such changes in work organisation practices could substantially improve both organisations' productivity and employee well-being (e.g. Eurofound, 2015). Policy makers can promote characteristics and skills that would enhance civic life, social cohesion and general social well-being, such as collaboration, conflict resolution, tolerance, empathy, solidarity, personal integrity and fairness.

However, it is important to be aware of the complexity of the relationships between personality attributes and outcomes when considering the policy relevance of personality traits. First of all, the rationale for intervening to influence personality characteristics in a particular direction is less clear-cut than in the case of cognitive skills. While it is hard to argue against the beneficial effects of improving general cognitive or specific academic skills and knowledge, the situation is much more complex in the case of many personality characteristics. Even the apparently most desirable attributes from an individual and social point of view, such as agreeableness, conscientiousness or self-control, have potentially negative effects in some circumstances. For example, more agreeable people tend to have lower earnings, a fact that is often contributed to by the tendency of agreeable persons to work in the customer service industry, which is generally characterised by lower pay (Nyhus and Pons, 2005). Likewise, conscientiousness, especially some of its facets such as rule following, risk aversion and dutifulness, are found to be negatively correlated with creativity (Barron and Harrington, 1981; Reiter-Palmon, Illies and Kobe-Cross, 2009). Creative individuals are also often found to be more impulsive, hostile and less agreeable that less creative people (Zhang, Sternberg and Rayner, 2012; Feist, 1998). Likewise, excessive self-control can lead to less spontaneity, flatter emotions and in, some cases, even to serious psychological problems (Halse, Honey and Boughtwood, 2007; Weinberger and Schwartz, 1990; Dickman, 1990; Block, Gjerde and Block, 1991). On the other hand, characteristics that are usually considered less socially desirable may be critically important for some goals. For example, risk-taking, which is a negative facet of conscientiousness and self-control, is one of the primary personality correlates of entrepreneurship (e.g. Palich and Bagby, 1995).

Another important issue related to the selection and promotion of certain personality characteristics is the fact that none are appropriate in all situations, and all may be detrimental on certain occasions. For example, grit, i.e. the maintenance of effort and interest over years in the face of adversities, may well be a beneficial trait for military cadets during their long training programmes or in any other situations where the task is well-defined and requires long-term dedication (MacNamara, Hambrick and Oswald, 2014). However, these kind of situations may bear little resemblance to the reality that the majority of people face in their daily lives, in which both the goals and the means for achieving them are ill-defined and constantly changing (Simonton, 2016). Grit may be an irrelevant or even counterproductive trait in situations where tasks are novel or ambiguous and require creativity, flexibility and a readiness to give up on the wrong approaches (Credé et al., 2016). The value of certain personality characteristics can also differ across occupations or even across job positions. For instance, agreeableness is found to be negatively correlated with leadership capabilities but is found to be beneficial in service-sector occupations and in teamwork settings (e.g. Graziano et al., 2007). In fact, desirable personal characteristics may be to a certain extent moving targets, not only because peoples' changing goals and preferences but also because of the constantly changing social context around them (Schoon, 2009).

In considering the value of various personality characteristics it is also essential to examine the choice of the criteria that are used to judge their importance. Academic achievement and income are most often used as such benchmarks.[25] However, studies on the quality of life and life satisfaction have advanced a much more nuanced view of the variety of factors that affect personal well-being. In particular, they indicate that individuals' general state of health; positive and negative affect; senses of purpose, mastery and autonomy; personal growth; connectedness with important others; social acceptance; social integration and other factors are all important determinants of their overall well-being (Keyes, 2007; Gallagher, Lopez and Preacher, 2009). Hence, it is important to take this broader perspective into account when assessing the value of individual personality characteristics (Pfeffer, 2016). This is especially true as the relationship between a particular personality attribute and different life outcomes can vary considerably in both strength and direction. For example, recent studies have found that so-called "externalising" behaviour,

25. Apart from their importance for individual well-being, their frequent use is motivated by the fact that they are relatively easy to measure and quantify.

characterised by hyperactivity, aggression and delinquency, has a negative influence on school achievement but positive influence on earnings (Papageorge, Ronda and Zheng, 2015). Based on these results, the authors argue that schools should stop punishing such behaviour, a solution that raises certain ethical dilemmas.

Clearly, judgements concerning the value of personality characteristics and the criteria used to evaluate them are inevitably dependent on the broader ideology and values promoted in a given society. What are the measures of success in a given society? Are economic outcomes more important than social ones? Placing an excessive focus on the role of personality characteristics also implicitly emphasises individual responsibility for life outcomes and may lead to the role of broader economic, social and political contexts and existing structural constraints that influence individual success being overlooked (e.g. Camfield, 2015). For example working conditions that promote employee autonomy, learning opportunities, involvement in decision making, performance-based reward schemes, etc. are commonly found to have a considerable influence on employee performance and behaviour. In particular, employees in organisations that promote these work schemes tend to be more enthusiastic, involved, collaborative, productive, satisfied, are less prone to absenteeism and counterproductive work behaviours, have longer tenures, etc. (e.g. Eurofound, 2015). When seen from this perspective, the results of numerous employers' surveys in which employers commonly state that they need more reliable, communicative, engaged employees with better social and teamwork skills and abilities to work independently, can be seen as ambiguous. They do not necessarily just indicate insufficiencies on the part of employees but may also point to inadequacies in the existing work arrangements in those employers' organisations.

Cross-cultural differences are another important issue to consider. What is important and valued in one culture is not necessary equally respected and promoted in another. In collectivistic cultures, personality characteristics such as agreeableness, modesty and good manners are more highly regarded than in individualistic societies which are more likely to encourage self-esteem, independence and assertiveness (e.g. Markus and Kitayama, 1991). Cultural and social contexts consequently modify the effects of individual traits on life outcomes. For example, while in Germany, the United Kingdom and the United States, entrepreneurs score high on extraversion and conscientiousness and low on agreeableness, entrepreneurs in South Africa and Uganda have lower scores on extraversion and conscientiousness, and higher scores on agreeableness (Obschonka et al., 2013; Camfield, 2015). Likewise, the influence of self-control is found to differ depending on socio-economic status. While self-control has clear beneficial effects on children with high socio-economic status, its effects on children with low status are found to be conflicting, increasing academic achievement at the expense of adverse health effects (Miller et al., 2015; Brody et al., 2013).

Hence, personality characteristics are only one of the factors determining human behaviour. Many other personal and situational factors play an important role as well. This is not to say that programmes designed to promote certain personality characteristics are not suitable or that they are destined to fail. It just means that a wider range of issues needs to be considered when designing and implementing policy interventions in this field. Some of these will be straightforward to deal with while others require more careful consideration. But they should not be overlooked or disregarded as they represent, implicitly or explicitly, a core part of the rationale behind any policy intervention.

Exaggerations of importance

Recent history has demonstrated that the area of personality characteristics is one that is subject to fads and excessive claims regarding the role of particular characteristics in contributing to particular life outcomes and in terms of associated programmes and interventions. Examples include constructs such as emotional intelligence and, recently, grit.

For example, policy attention concerning the concept of grit has led to a large number of affirmative studies, various school intervention programmes and its inclusion in the assessment frameworks of certain school districts in the United States (Shechtman et al., 2013). However, recent research has found that the actual importance of grit may be very limited, especially when taking into account other personal characteristics (Rimfeld et al., 2016; Credé et al., 2016). Emotional intelligence offers an even more striking example, a controversial concept that has gain tremendous popularity in public discourse and various applied settings since its introduction to popular discourse some twenty years ago. However, although it may have intuitive appeal, empirical research on the concept has never succeeded in confirming its actual relevance or even its existence as a separate capacity of the human mind (Harms and Credé, 2010; Joseph and Newman, 2010; Antonakis et al., 2009). Unfortunately, this lack of empirical validation has not stopped its propagation in policy and business settings and various exaggerated claims of its importance (Landy, 2005).

There are many reasons behind such cases of exaggerated claims and uncritical acceptance and the consequent effects on public discourse and related policy initiatives. Researchers are often eager to promote their research findings and emphasise the policy implications of it, sometimes going a step further than is justified by their empirical findings. There is considerable pressure to publish and it is hard to publish results that show the absence of statistically significant effects between variables of interest. This leads to the so-called "publication bias" towards results that indicate the existence of significant relationships, some of which are later hard to replicate (Song et al., 2010). The results of any individual study should be treated with caution, especially when they are unexpected or not in line with similar studies. Instead, more importance should be placed on the results of meta-analyses which are much more robust to various measurement errors or biases in single studies and are more reliable in estimating the existence and size of effects.

Commercial interests are another important factor behind many instances of exaggerated claims. For example, most of the measures of emotional intelligence are proprietary and can be used only under strict conditions and pricing regimes. This inevitably raises the question of the objectivity of these companies and experts that they endorse in their stances on the importance of emotional intelligence.

Apart from overzealous researchers and profit-driven companies or authors, the uncritical acceptance of such exaggerated claims is also down to the willingness of people to accept such claims. Both policy makers and society seem prepared to accept and embrace the key importance of a personality characteristic if its promoters claim it possesses the following three characteristics: that it is critical factor for many life outcomes, that it is as important (or even more important) than cognitive skills or technical knowledge, and that it is entirely learnable.

It is not hard to understand why individuals, businesses and policy makers are ready to embrace such a quality. It provides a message that substantial and widespread improvements at personal, company or societal level are possible and within reach of practically everybody. However, the examples presented above show how important it is for policy makers to make sure that any kind of policy drive is based on a solid and cross-verified body of empirical evidence (Landy, 2005; Credé et al., 2016).

Criteria for evaluation of personality scales

As we have seen, a wide variety of measures in both academic and applied settings have been devised to assess a broad range of personality characteristics. This situation represents a challenge when it comes to selecting a set of personality scales for inclusion in a study. The following sections will briefly outline some of the main considerations and criteria that could be used to assess the relevance and added value of various scales in these situations.

The criteria for scale selection can be divided into a two broad groups. Substantive criteria represent those based on the relative importance of a particular personality characteristic for life outcomes and its relationship with other important factors that are present in a study. Measurement criteria refer to the various measurement properties and considerations that need to be taken into account when evaluating a particular scale in terms of its appropriateness for use in a study.

Substantive criteria

Analytical importance

The analytical importance of a particular personality characteristic refers to its contribution to the types of analysis that a study is intended to facilitate, either as an independent, control or outcome variable. In particular, while some personality characteristics are of primary importance because they moderate the effects of cognitive skills on outcomes, others are characteristics that influence a wider range of personality attributes and have direct relevance for important life outcomes. For example, the relevance of personal values is mostly based on their indirect influence on behaviour, while the Big Five traits are important both as control variables – because they influence the acquisition of cognitive skills – and as variables that directly determine important life outcomes. Likewise, while attitudes towards teachers may have an important influence on students' academic achievement, their intellectual curiosity has a much wider set of influences, both in and outside of school settings.

Analytical importance will directly depend on the particular objectives of a study and on the other measures available in the study, which means that a particular characteristic may have more analytical importance in one study and less in other. For example, when studying criminal behaviour, self-control represents one of the key personality traits, while in a study of creativity its analytical value would be limited.

Policy relevance

The policy relevance of different personal attributes is linked but still somewhat different to analytical importance. From the perspective of policy relevance, the focus is mostly on the degree to which a personality characteristic is important for key life outcomes, such as employment, income, health, mortality, divorce, life satisfaction or educational attainment. As well as their direct influence on work and life outcomes, policy makers are also interested in personality characteristics that can contribute to the development of cognitive skills and other important competences and thus affect life outcomes indirectly. For example, the policy relevance of intellectual curiosity lays mostly in its influence on the development and maintenance of "crystallised intelligence", that is the intellectual competences and knowledge that can improve personal and social well-being in myriad of ways. Finally, the malleability of personal characteristics is important consideration from a policy point of view. While some personality attributes are relatively stable, especially once a person reaches adulthood, other characteristics, such as self-control, motivation or social competences are more flexible and actionable. Individual personal characteristics –and even entire sets of characteristics – are often claimed not to be malleable enough to warrant policy relevance. However, cognitive capacities also have a strong genetic component and can require years of individual effort and focused policy intervention to develop or improve them. In fact, in comparison with cognitive abilities, most personality characteristics may be more malleable rather than less (e.g. Roberts et al., 2015). Furthermore, even in those cases where a particular characteristic is not considered to be a potential target for policy intervention, its assessment can still be useful as it may influence the effectiveness of other policy interventions. For example, whether a person is introverted or extraverted may not be of immediate policy concern, but may be a relevant factor to consider when deciding on the format of an academic evaluation or when designing the most productive work environment.

Empirical evidence

All of the concepts discussed above are based on a substantial body of research. However, we have seen that the theoretical coherence of this work and especially the extent of the empirical evidence vary considerably. In particular, while the most impressive and extensive body of work relates to the Big Five model, the research evidence supporting theories of social competence and especially emotional intelligence is much weaker (e.g. Landy, 2005). As a consequence, there is less agreement in the research community about the importance and role of these constructs and their supposed relationship to other attributes – often in sharp contrast with the extent to which these constructs are accepted and promoted in policy and other applied settings. In addition, instruments designed to measure these constructs tend to be less developed and verified, with poorer measurement parameters and a larger number of possible issues and limitations. It is of paramount importance to take into account the amount of empirical evidence behind claims about the importance of a certain construct. Failing to do so may result in obtaining unpredictable and unusable findings and risks wasting substantial resources. Thus, all other things being equal, it is preferable to select those personality characteristics with a better scientific basis and whose nature and relevance is better known.

Measurement criteria

Assessment format

Depending on the particulars of a given study, a researcher needs to choose from different assessment options, such as self-reports, others' reports, performance tests or biodata. The choice of assessment format will depend on the research topic and objectives of study, the type of respondents, sample size, available measures and measurement options, budgetary constraints, etc.

Due to their efficiency and relatively low cost and ease of use, self-report measures are the preferred choice in most of situations. They are also the usual option in large-scale international surveys, where constraints on testing time and the need to standardise the testing situation are more acute. In addition, self-report measures are available for almost all personality characteristics, and are in many cases the only standardised instruments for some constructs.

Other assessment formats should be considered in situations where alternative measures exist and where they could lead to information of better quality. For example, in school settings, teachers' and parents' ratings are often more objective and revealing sources of information on students' behaviour and academic achievement than student self-reports. Likewise, performance tests or, where possible, observation may be much more valid techniques for assessing communication, teamwork or negotiation skills than self-reports. Biographical data may represent the most objective and straightforward method of evaluating leadership or people's creative capacity, especially where so-called Big-C creativity is being investigated, i.e. creativity regarded as great in a certain field.

Length of assessment instruments

Instrument length is an important consideration for any study and especially critical for large-scale assessments, which need to be as efficient in the use of testing time as possible. Short self-report scales represent the most efficient form of assessment (providing the greatest amount of information per unit of time) and are also easiest to administer. Shorter scales also reduce the burden on respondents and thus potentially improve quality of data, which can be important consideration in the case of extensive

assessment frameworks, like the one used in the PIAAC study.[26] However, shorter scales have worse measurement properties than longer scales, as having fewer questions makes them less reliable and consequently less valid instruments. In addition, where scales use only one or two items per domain it would not be possible to identify any internal structures, which would prevent assumed latent structures and their relations with other constructs from being examined.[27] On the other hand, in studies with smaller sample sizes and with fewer measured variables, more extensive instruments can be applied, allowing for in-depth analysis of certain characteristics and better reliability of the measures obtained. Thus, the particular characteristics and objectives of a study will determine the right balance between efficiency on the one side, and the quality and scope of information on the other.

Respondent burden

Even if two scales have the same or similar number of items, they may still differ in terms of their cognitive load or the time, effort and knowledge needed to answer them. The cognitive load imposed by test instruments should be appropriate to the target population, particularly in those cases where it includes children or adults with low literacy. For example, the questions used in the STEU-B and STEM-B instruments are quite long and complex, as are the possible answers. Thus, it is important to evaluate the response burden of a particular scale, giving preference to those scales that will be easier for respondents to answer. This would reduce not only the testing time but also the non-response rate, reduce the likelihood of various response biases and improve the overall quality of data.

Scale reliability

The reliability of an instrument denotes the degree to which it produces stable and consistent results. There are four main forms of reliability: test-retest reliability (consistency of scores across tests administered at two different times), inter-rater reliability (agreement between two or more raters), parallel-forms reliability (consistency of score across different forms of the test), and internal consistency or alpha reliability (consistency of scores across items within a test). Internal consistency coefficients are most often used to indicate reliability of a personality questionnaire,[28] followed by test-retest reliability (with varying time intervals between the two administrations of the test). Inter-rater reliability is used for observation measures or others' ratings. The higher an instrument's reliability, the smaller its measurement error or the better its estimation of a person's true score for a certain characteristic. Reliability estimates range between 0 and 1, with higher levels indicating better reliability. A satisfactory level of reliability depends on how a measure is to be used. When test results are used for important decisions at individual level (e.g. job selection) a reliability of 0.90 is preferable and a minimum reliability coefficient of 0.80 is required (Nunnally and Bernstein, 1994). However, when the interest is in comparing groups using large representative samples (as in the PIAAC study), reliability coefficients of at least 0.60 used to be considered acceptable (Hudson, 1982). However, nowadays reliability coefficients below 0.70 would be problematic even in these kinds of research settings (Abell, Spriner and Kamata, 2009).

26. In PIAAC, assessment of literacy, numeracy and problem solving takes around 1 hour of testing time. On top of this, respondents are interviewed for additional 30-45 minutes with questions from the background questionnaire.

27. In the case of multidimensional scales, such as those assessing the Big Five model, latent structures could be assessed already with two items per construct.

28. As noted earlier, internal consistency coefficients are not appropriate to indicate the reliability of short scales.

Convergent and discriminant validity

The validity of a measurement instrument is the degree to which it measures what it is supposed to measure. A measure may be reliable but not valid (i.e. consistently measuring an unintended construct) or valid but nor reliable (i.e. inconsistently measuring the intended construct).[29] There are many different types of validity. Construct validity indicates the degree to which a given measure actually corresponds to the theoretical construct. Content validity refers to the extent to which the entire content of given construct is represented in a test. Convergent validity denotes the degree to which a measure correlates with other measures with which it is theoretically predicted to be associated. Discriminant validity represents the degree to which an instrument discriminates or is unrelated to measures with which it is expected to be unrelated. As with reliability, validity coefficients represent correlation coefficients with a maximum value of 1.0. Higher values of validity coefficients are desirable for convergent and criterion/predictive validity, while lower levels are needed in case of discriminant validity. As a rule of thumb, discriminant validity coefficients should be less than 0.85 (after correction for attenuation) in order for a measure to be assumed to test something different from another construct.

Criterion validity

Criterion validity refers to the degree to which a measure is correlated with (or can predict) certain outcomes (criteria). There are two types of criterion validity, congruent and predictive. When the correlations of a measure with outcome variables are assessed at the same time, it is called congruent validity, and when outcomes are measured later it is called predictive validity. Although higher levels of criterion validity are always preferred, there are no set standards on which these can be evaluated, as is the case with reliability coefficients. This is because correlations of a measure with outcomes will vary depending on a particular outcome, the reliability of its measurement, the time that passes between initial and outcome measurement, and so on. One rule of thumb that might be used in this regards is Cohen's gradation of the strength of correlation coefficients (Cohen, 1988), where those in the range 0.10-0.30 are considered to be small, 0.30-0.50 are considered medium and those over 0.50 as large. In psychology, most predictive coefficients range between 0.10 and 0.40 and only in very rare instances exceed 0.50 (Meyer et al., 2001). However, it is important to take into account that even small effects on important life outcomes can have significant consequences because of their cumulative effects throughout life (Roberts et al., 2007).

Incremental validity

Incremental validity represents the degree to which a measure predicts a certain outcome over and above other measure(s) or after controlling for other measures. Incremental validity is related to discriminant validity in that high discriminant validity (i.e. low correlation between measures of distinct constructs) improves the chance of incremental validity. In personality research, incremental validity is usually tested in relation with the Big Five scales, in order to confirm the practical and theoretical relevance of a new measure (for example, see the discussion of emotional intelligence tests in section 2). Incremental validity is especially important in those cases where a broader range of personality scales is to be used and where the primary focus is on explaining individual variations in outcome measures. Incremental validity is usually represented in R^2 units, i.e. as a percentage of the total variance in the outcome that is "accounted for" by given measure, after controlling for the effects of other measures. Even a small percentage such as 5% can be considered important in this regard, in line with the discussion presented earlier (Roberts et al., 2007).

29. In the case of criterion validity, reliability represent a necessary (but insufficient) condition for validity, i.e. it is not possible to have valid but unreliable test in terms of criterion validity.

Generalisability/representativeness

Generalisability or representativeness refers to the degree to which the results and measurement parameters of a test or questionnaire can be generalised to other people and to populations as a whole. Personality research is usually based on rather homogeneous samples, often consisting of university students. These samples are different from the general population in a number of important ways – for example being younger, better-educated, more skilled and more socially homogeneous. These differences are shown to have substantial effects on the way they respond to personality questionnaires (e.g. Rammstedt and Kemper, 2011). For example, Rammstedt, Goldberg and Borg (2010) have shown that the factor structure of the Big Five questionnaire differs depending on the level of education of respondents. Thus, it is important to consider which kind of sample was used to construct and validate a particular measure, with preference given to those scales that have used nationally representative samples of the general adult population.

Cross-cultural validity

Even when a test is confirmed to be adequate for residents of a particular country it does not necessary mean that it is (equally) adequate for residents of any other country. Countries represent different cultural settings that differ from each other along a number of dimensions (e.g. Hofstede, 2001). These differences influence the way people in these countries understand and interpret the same questionnaire items (measurement equivalence) as well as the way they answer these questions (reference bias). This may obscure or prevent the meaningful comparison of results across countries. In general, the more culturally similar countries are, the more valid will be measures designed in one country and applied in another (e.g. Kankaraš and Moors, 2012). Obviously, this criterion is especially relevant in cross-national studies, but cultural bias can also be an issue within a single national setting, for example where ethnic minorities are part of the target population. Thus, it is desirable that any given measure has been adapted and verified in different countries, but also that these countries come from as different cultural, linguistic and geo-political contexts as possible.

Conclusions

Personality characteristics shape human behaviour and influence a wide range of life events or outcomes. They do so not only through their immediate effects on life outcomes, but also through their indirect effects on other important personal factors and intermediate life events, such as the development of cognitive capacities, the attainment of educational qualifications or the formation of a family. As such, personality characteristics have a demonstrated relevance for a wide range of policy issues and represent an important subject of policy interest.

Although the assessment of these characteristics is complex, a wide range of measurement instruments has been developed and tested, with relatively solid measurement properties and a range of applications. What is more, these instruments more efficient than those designed to measure cognitive skills, with some of them being able to provide a broad assessment of basic personality dimensions in just one minute of testing time. Thus, the inclusion of some of these measures in various policy-oriented assessment programmes, such as PIAAC, would add valuable information about the ways in which these characteristics interact with other personal and external factors and influence important life events.

However, it is important to be aware of the complexity of the relationships between personality characteristics and other personal and situational factors in their influence on important life outcomes. This dynamic interplay between complex task requirements, constantly changing contexts and often conflicting individual and social goals and preferences makes it less likely that any single personality characteristic will be appropriate or influential across different situations, cultures or eras. Thus, care is needed when evaluating the relative importance of personality characteristics, both in relation with one another or when compared to other personal or external factors.

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ANNEXES – SELECTED PERSONALITY SCALES

Annexes A to L listed below are available online only. The individual titles below are hyperlinked to the corresponding file.

Annex A. Measures of the Big Five dimensions

Annex B. Measures of honesty-humility

Annex C. Measures of motivation

Annex D. Measures of general interests

Annex E. Measures of vocational interests

Annex F. Measures of self-control

Annex G. Measures of self-efficacy

Annex H. Measures of social competences

Annex I. Measures of emotional intelligence

Annex J. Measures of attitudes and values

Annex K. Measures of job preferences

Annex L. Measures of integrity