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Social and emotional skills for student success and well-being: Conceptual framework for the OECD study on social and emotional skills

Oleksandr S. Chernyshenko,

Miloš Kankaraš,

Fritz Drasgow

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SOCIAL AND EMOTIONAL SKILLS FOR STUDENT SUCCESS AND WELL-BEING: CONCEPTUAL FRAMEWORK FOR THE OECD STUDY ON SOCIAL AND EMOTIONAL SKILLS

OECD Education Working Paper No. 173

Oleksandr S. Chernyshenko, University of Western Australia; Miloš Kankaraš, OECD; Fritz Drasgow, Drasgow Consulting Group

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

Rowena Phair, Project Leader, Rowena.PHAIR@oecd.org
Miloš Kankaraš, Analyst, Milos.KANKARAS@oecd.org

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Abstract

In an increasingly fast-changing, complex and diverse world, social and emotional skills are becoming ever more important. In this paper we present an overview of literature on social and emotional skills, describing the nature and structure of these skills, their development, malleability and factors that influence them, their cross-cultural comparability and their relevance for a wide range of educational, economic and life outcomes. The paper also represents a conceptual framework for the OECD's new Study on Social and Emotional Skills, an international survey that assesses 10- and 15-year-old students in a number of cities and countries around the world.

We focus on the underlying skills within and outside of the widely researched Big Five model that are found to be more predictive and policy relevant. We examine the relationships of these skills with a variety of indicators of individual and societal well-being such as education, employment and income, health, and personal well-being. The paper discusses the structure of child's social and emotional skills and the developmental trajectories of these skills across a lifetime. It presents the evidence of malleability of these skills as well as their relevance across a wide range of cultural contexts.

Résumé

Dans un monde complexe, multiple et en constante mutation, les compétences sociales et émotionnelles deviennent de plus en plus importantes. Dans ce document de travail, nous présentons un aperçu de la documentation existante sur les compétences sociales et émotionnelles. Ainsi, nous y décrivons la nature et la structure de ces compétences, leur développement, la malléabilité et les facteurs qui les influencent, leur comparabilité interculturelle mais aussi leur impact sur de nombreux aspects de nos vies. Le document constitue également le cadre conceptuel de la nouvelle étude de l'OCDE sur les compétences sociales et émotionnelles, une étude internationale qui évalue les élèves de 10 et 15 ans dans un certain nombre de villes et de pays à travers le monde.

Nous nous concentrons sur les compétences, pour la plupart décrites par le modèle des Big Five, qui sont les plus prédictives et pertinentes pour les politiques. Nous examinons les relations entre ces compétences et de nombreux indicateurs de bien-être au niveau individuel et sociétal tels que l'éducation, l'emploi et le revenu, la santé et le bien-être personnel. Le document discute la structure des compétences sociales et émotionnelles de l'enfant et leur développement tout au long de la vie. Il témoigne de la malléabilité de ces compétences ainsi que de leur pertinence dans des contextes culturels variés.

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Introduction

Social and emotional skills influence how well people adjust to their environment and how much they achieve in their lives. The development of social and emotional skills is important not only for the well-being of individuals, but also for wider communities and societies as a whole. The ability of citizens to adapt, be resourceful, respect and work well with others, and to take personal and collective responsibility is increasingly becoming the hallmark of a well-functioning society. Coupled with increasing awareness of the malleability of social and emotional skills, and their growing relevance for the future world, this has attracted renewed interest from policy makers and researchers.

In an increasingly fast-changing and diverse world, the role of social and emotional skills is becoming more important. Rising complexity and the increasing pace of technological change, call for the ability to act independently and to adjust to changes on-the-go. A faster pace of living and a shift to urban environments means people need to engage with new ways of thinking and working and diverse groups of people. Growing automatisation means that future jobs will be less routine and will be placing additional premiums on innovation, creativity and imagination – skills that are difficult to automate. Ageing and more diverse populations and the dismantling of traditional social networks place additional emphasis on people's sense of trust, co-operation and compassion.

Interest in social and emotional skills has a long history in psychological and educational research. The large body of accumulated evidence shows that social and emotional skills have powerful consequences for many important life outcomes (OECD, 2015[1]; Kankaraš, 2017[2]; Kautz et al., 2014[3]). Social and emotional skills have also been referred to as a key component of *21st century* and *employability skills* (Trilling and Fadel, 2009[4]), because they are considered increasingly crucial for individuals' development, employment, and healthy functioning in society, both now and in the future (National Academy of Sciences, 2012[5]). Examples of 21st century skills include altruism, engagement, enthusiasm, innovation, self-discipline and stability.

Despite their importance, large-scale international efforts to assess and promote the development of students' social and emotional skills are scarce. OECD studies such as the Programme for International Student Assessment (PISA) and the Programme for the International Assessment of Adult Competencies (PIAAC) are covering a growing range of social and emotional skills and have shown not only that these skills are related to important life outcomes, but also that they can be assessed meaningfully within and across cultural and linguistic boundaries. The OECD is now taking this work further with a comprehensive international assessment of the social and emotional skills of school-age children, through the Study on Social and Emotional Skills (SSES).

The OECD Study on Social and Emotional Skills is a new international survey that assesses 10- and 15-year-old students in a number of cities and countries around the

world.[1] As well as examining the level of children's socio-emotional skills, the study will gather information on their family, school, and community learning contexts, thus aiming to provide information about the conditions and practices that foster or hinder the development of these critical skills. The study began in mid-2017 and will be carried out over a three-year period, with the main fieldwork taking place in 2019 and the findings being released later in 2020.

This paper presents the SSES's framework of social and emotional skills among school-age children and adolescents. It is an overview of the most relevant literature on social and emotional skills and focuses on answering questions on the nature and structure of social and emotional skills, their development, malleability, cross-cultural comparability and their relevance for a wide range of school, work and life outcomes. In addition, this framework presents the criteria used for selecting the social and emotional skills in the SSES, along with the list of skills that are included in the study at this point.

The SSES draws on a well-known framework in the field of social and emotional skills – the Big Five model – to provide a general outline of how these skills are organised. The "Big Five" or "Five Factor Model" has a strong empirical foundation and has received extensive support across different cultural settings. The facets underlying the Big Five, which are equally significant, will also be discussed and reviewed. The objectives of this paper are twofold. First, it describes the main characteristics of social and emotional skills, particularly those selected for inclusion in the SSES. Secondly, it presents findings that facilitated the decision-making on which social and emotional skills to include in the SSES.

The paper represents a continuation of the OECD work on related topics (John and De Fruyt, 2015[6]; Kankaraš, 2017[2]; OECD, 2015[1]). In this sense, information presented in this report is complementary and in some ways goes a step further in respect of that work.

The paper is organised as follows:

- Section 1 introduces the Big Five model along with the distinction between broad, narrow and compound skills, which forms the overarching framework of the social and emotional skills used in the SSES.
- Section 2 provides a detailed review of the predictive value, i.e. it shows the relevance of the Big Five skills for various life outcomes.
- Section 3 presents the structure and development of children's social and emotional skills.
- Section 4 reviews the malleability of social and emotional skills, i.e. the degree to which these skills are susceptible to change during the life course, and summarises key research on the effectiveness of interventions.
- Section 5 presents research on the cross-cultural comparability of the Big Five concepts and the comparability of its measures.
- Section 6 details a number of lower-order taxonomies of skills/facets underlying the broad Big Five domains. It identifies individual skills grouped within each of the Big Five domains and examines their predictive validity and developmental trajectories.
- The paper finishes with an outline of the social and emotional skills that are included in the SSES, along with the criteria used to select this set of skills.

[1] See *The Study on Social and Emotional Skills* webpage of the Centre for Educational Research and Innovation website: www.oecd.org/edu/ceri/thestudyonsocialandemotionalskills.htm

1. The "Big Five" model: Framework for social and emotional skills

The Big Five model has been extensively researched and has accumulated a substantial empirical foundation (John, Naumann and Soto, 2008[7]). Numerous research teams have found a similar five-factor structure of personality characteristics and this consistency in results has contributed to the widespread acceptance of this model (John, Naumann and Soto, 2008[7]). 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[8]; Norman, 1963[9]; Goldberg, 1982[10]; Costa and McCrae, 1985[11]). Similar personality structures have been identified in numerous other countries around the world, not just in Western societies (McCrae and Costa Jr., 2006[12]).

The Big Five model does not represent a particular theoretical perspective. Rather, it is derived from analyses of the natural language terms (i.e. adjectives describing personal characteristics, such as "shy", "ambitious", "hardworking", "talkative", etc.) that people use to describe themselves and others. Thus, the Big Five taxonomy represents a parsimonious and comprehensive way of summarising individual differences in all personality characteristics that are coded in natural language. As such, it offers an integrative function, outlining a common, empirically-based framework to a myriad of otherwise disjointed social and emotional constructs and frameworks (John and De Fruyt, 2015[6]). Furthermore, personality characteristics comprising the Big Five have been shown to be measurable and predictive of a wide range of outcomes including educational success, well-being, health, and work performance (Roberts et al., 2007[13]).

John and De Fruyt (2015[6]) reviewed a large number of existing frameworks for social and emotional skills and concluded that the Big Five structure of personality characteristics was the best suited for the purposes of the OECD's Study on Social and Emotional Skills (SSES). In particular, the Big Five framework offers:

- A strong empirical foundation;
- A comprehensive, parsimonious and highly efficient summary of individual differences in social and emotional skills;
- The high predictive power of the Big Five domains, and especially sub-domains/individual skills;
- Malleability and temporal stability of individual skills of the Big Five model.

The "Big Five" model (Borkenau and Ostendorf, 1990[14]; Digman, 1990[15]; Goldberg, 1990[16]; McCrae and Costa Jr., 1987[17]; Christal, 1992[18]; Tupes and Christal, 1961[19]) comprises five broad personality dimensions: *Conscientiousness*, *Extraversion*, *Agreeableness*, *Emotional Stability* (also called *Neuroticism*), and *Openness to Experience*. Each represents a cluster of related thoughts, feelings, and behaviours. For example, in the framework shown in Table 1.1, conscientiousness includes self-discipline, organisation, dependability, and goal orientation.

Conscientiousness refers to, on the one side, the tendency of individuals for self-controlled, organised, and cautiously planned behaviour; and on the other, ambitious, persistent and dedicated effort in achieving personal goals.

Extraversion represents the tendency to seek the company of others, to initiate and maintain connections, and to feel comfortable in the presence of others. Extroverted individuals are also more likely to show assertiveness in social situations and provide leadership. They are often characterised by high levels of energy and zest for life.

If extraversion partly refers to the quantity of interpersonal relations, *agreeableness* refers to their quality. Agreeable individuals tend to be more co-operative, maintaining positive relations and minimising interpersonal conflict. They are more likely to show active concern for the well-being of others and to hold positive beliefs about people in general (Soto and John, 2017[20]).

Emotional stability represents the degree to which individuals are able to control their emotional responses and moods as well as the quality of their emotional states in general. Persons with high degrees of emotional stability will show more resilience in stressful situations, will be less likely to experience anger, irritation or sudden changes of mood, and will tend to have a better view of the world and outlook of the future.

Openness to experience is reflected in two main aspects. One involves the degree to which people are open to intellectual stimulation in general, as reflected in their intellectual curiosity, imagination, creativity, preference for novelty and variation. The other aspect is shown in the degree to which persons prefer experiential stimulation, as represented in their appreciation of art, aesthetic experiences, self-reflection and self-exploration.

Table 1.1. Descriptions of the Big Five domains

Factor initial (number)	Big Five domains				
	E (Factor I)	**A (Factor II)**	**C (Factor III)**	**N (Factor IV)**	**O (Factor V)**
Verbal labels	Extraversion Energy Enthusiasm	Agreeableness Altruism Affection	Conscientiousness Constraint Control of impulse	Neuroticism Negative emotionality Nervousness	Openness Originality Open-mindedness
Conceptual definition	Implies an *energetic approach* towards the social and material world, including skills such as sociability, activity, assertiveness and positive emotionality.	Contrasts a *prosocial and communal orientation* to others, and includes skills such as altruism, tender-mindedness, trust and modesty.	Describes *socially prescribed impulse control* that facilitates task and goal-directed behaviour, such as thinking before acting, delaying gratification, following norms and rules, and planning, organising and prioritising tasks.	Contrasts emotional stability and even-temperedness with *negative emotionality*, such as feeling anxious, nervous, sad and tense.	Describes the breadth, depth and complexity of an individual's *mental and experiential life*.
Behavioural examples	Approach strangers at a party and introduce myself; take the lead in organising a project; keep quiet when I disagree with others (R).	Emphasise the good qualities of other people when I talk about them; lend things to people I know (e.g. class notes, books, milk); console a friend who is upset.	Arrive early or on time for appointments; study hard in order to get the highest grade in class; double-check a term paper for typing and spelling errors; let dirty dishes stack up for more than one day (R).	Accept the good and the bad in my life without complaining or bragging (R); get upset when somebody is angry with me; take it easy and relax (R).	Take the time to learn something simply for the joy of learning; watch documentaries or educational TV; come up with novel setups for my living space; look for stimulating activities that break up my routine.
Examples of external criteria predicted	*High pole*: Social status in groups and leadership positions; selection as jury foreperson; positive emotion expression; number of friends and sex partners. *Low pole*: Poorer relationships with parents; rejection by peers.	*High pole*: Better performance in work groups. *Low pole*: Risk for cardiovascular disease, juvenile delinquency, interpersonal problems.	*High pole*: Higher academic grade-point averages; better job performance; adherence to treatment regimens; longer lives. *Low pole*: Smoking, substance abuse, poor diet and exercise habits; attention-deficit/hyperactivity disorder.	*High pole*: Poorer coping and reactions to illness; experience of burnout and job changes. *Low pole*: Feeling committed to work organisations; greater relationship satisfaction.	*High pole*: Years of education completed; better performance on creativity tests; success in artistic jobs; create distinctive-looking work and home environments. *Low pole*: Conservative attitudes and political party preferences.

Note: Conceptual definitions are based on John and Srivastava (1999[21]). Behavioural examples are based on significant correlations between Big Five Inventory scales and self-reported act frequencies in an undergraduate sample (N='375') (John and Naumann, 2007[22]). (R) denotes that the act was a reverse-keyed item (i.e. correlated negatively with the Big Five domain). *Source:* Reproduced from John, Naumann and Soto (2008[7]) "Paradigm shift to the integrative Big-Five trait taxonomy: History, measurement, and conceptual issues".

1.1. The suitability of the Big Five model as a framework for social and emotional skills

Most of the empirical research on the development and longer-term impact of socio-emotional characteristics has been conducted with Big Five measures. For example, in Kautz et al.'s (2014[3]) report "Fostering and measuring skills: Improving cognitive and non-cognitive skills to promote lifetime success", five economists from three countries concluded:

> *Although non-cognitive skills are overlooked in most contemporary policy discussions and in economic models of choice behaviour, personality psychologists have studied these skills for the past century.*
>
> *…*
>
> *They have arrived at a relatively well-accepted taxonomy of non-cognitive skills called the Big Five, with the acronym OCEAN, which stands for: Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism.*

Similarly, the report by the National Academy of Sciences (2012[5]) in the United States, entitled *Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century* observes: *"For the past two decades, the "big five" model of personality has been widely accepted as a way to characterize competencies in the interpersonal and intrapersonal domains"* (p. 28).

Reviewing the available research evidence, the report also concludes (p. 30):

> *"The five major factors provided a small number of research-based constructs onto which various terms for 21st century skills could be mapped. The facets helped to define the range of skills and behaviors encompassed within each major factor to serve as a point of comparison with the various 21st century skills."*

To show empirically the links between existing 21st century socio-emotional skills frameworks and the Big Five model, John and Mauskopf (2015[23]) conducted an online study involving 452 volunteers who self-rated themselves on 21st century socio-emotional skill items and items from the standard Big Five Inventory. Correlational and factor analyses of these self-ratings showed that the 21st century socio-emotional skill list the Big Five dimensions (see Table 1.2 below).

Table 1.2. Socio-emotional elaboration of the Big Five: Examples of self-reported 21st century skills

Factor I: Collaboration (related to Big Five Agreebleness)	Factor II: Task Performance (related to Big Five Conscientiousness)	Factor III: Emotion Regulation (related to Big Five Emotional Stability)	Factor IV: Engagement with Others (related to Big Five Extraversion)	Factor V: Open-mindedness (related to Big Five Openness to Experience)
Compassion, care, co-operation, kindness	Self-discipline, focus, perseverance, self-control at school, grit	Self-confidence, self-esteem, decisiveness, tackling tough problems	Social connection, teamwork, social awareness, public speaking	Curiosity, inquisitiveness, willingness to try new ideas, receptivity
Respect for others, empathy, tolerance, fairness	Organisation, diligence, precision	Cheerfulness, happiness, optimism	Assertiveness, leadership, courage, charisma, speaking out/taking a stand, bravery	Innovation, vision, insight, tinkering (inventing), learning from mistakes and failures, excitement of creating something new
Trust, forgiveness, gratitude, appreciation of others	Dependability, reliability, consistency, trustworthiness	Tranquillity, balance, stability, equanimity (composure and even-temper in difficult situations)	Enthusiasm, passion, zest, inspiration, spunk, spontaneity, playfulness, humour	Appreciating beauty in the world, living in harmony with nature, spirituality, mindfulness, existentiality, awe, wonder, reverence
Living in harmony with others, interconnectedness, inclusiveness	Goal orientation, motivation, work ethic, effort, productivity	Self-compassion, self-kindness (being positive and understanding towards yourself when you suffer, fail, or feel inadequate)		Self-reflection, self-awareness, consciousness, self-actualisation, authenticity

Source: Adapted from John and De Fruyt (2015[6]), "Framework for the Longitudinal Study of Social and Emotional Skills in Cities", EDU/CERI/CD(2015)13.

Results show that the largest group of 21st century skills was dealing with the quality of interpersonal relations, which is related to the Big Five domain of *Collaboration* (*Agreeableness*). These skills especially focused on genuine mutuality and reciprocal exchange in individuals' relations with other people.

The second 21st century skill factor may be described as *Task Performance*, as it was defined by a large number of attributes and was conceptually similar to the Big Five domain of conscientiousness. Here again, the strength-based, positive-psychology origin of the 21st century skills items is predominant in the content of this Big Five factor.

The third factor, *Emotion Regulation*, also highlights positive strengths. This differs from traditional personality literature which focused on the negative, distressing emotions defining the low pole of this dimension. In particular, instead of anxiety, depression and anger, emphasis is placed on self-confidence, optimism, and emotional balance.

The fourth socio-emotional factor emphasised skills that allow the individual to constructively and joyfully engage with others in their social world. Interestingly, the cluster of items related to the assertiveness facet is enriched by items highlighting proactive strengths, such as leadership and charisma, courage, and the willingness to take a stand.

The fifth socio-emotional domain, *Open-Mindedness*, is defined by the smallest number of socio-emotional skill items, even though theoretical writings on 21st century skills

greatly emphasise the importance of intellectual curiosity and exploration as well as innovation and creativity. Nonetheless, the items in this factor include novel aspects such as, having vision and insight, tinkering and learning from mistakes, the excitement of creating something new, self-reflection and awareness of self and inner experiences.

These broad domains defined by socio-emotional skill characteristics bear enough similarity to the familiar and well-studied Big Five model to give us confidence about their likely replication and generalisability. At the same time, the content of these five socio-emotional skill factors emphasises their unique origin in 21st century skills and positive-psychology whose approaches are based on strengths and virtues (Seligman et al., 2005[24]); and can thus advance our understanding beyond the hierarchical personality taxonomy of the Big Five model. The socio-emotional characteristics summarised in Table 1.2 provide a starting place for a new, integrative, and operational definition of socio-emotional characteristics that can be implemented in the SSES. More generally, socio-emotional skills are best defined as *"individual characteristics that (a) originate in the reciprocal interaction between biological predispositions and environmental factors; (b) are manifested in consistent patterns of thoughts, feelings and behaviors; (c) continue to develop through formal and informal learning experiences; and (d) influence important socioeconomic outcomes throughout the individual's life"* (De Fruyt, Wille and John, 2015[25]).

In summary, both conceptual and empirical evidence point to the promise of a framework that has an empirical foundation in the insights and three decades of research accumulated for the Big Five. However, the framework for SSES will *go beyond the Big Five model*, in two ways. First, in contrast to the two previous OECD reports (Kautz et al., 2014[3]; OECD, 2015[1]), which examined only the broad, domain-level of the Big Five model, the SSES framework will focus on the facet level, i.e. on more specific socio-emotional skills at the lower level (see below). Second, other frameworks and skills will be reviewed and those skills that are deemed important but that currently fall outside of the Big Five framework were considered for inclusion in the SSES.

1.2. Defining social and emotional skills

Roberts (2009[26]) defined personality traits as *"relatively enduring patterns of thoughts, feelings, and behaviours that reflect the tendency to respond in certain ways under certain circumstances". "Relatively enduring patterns"* means that personality traits tend to be consistent characteristics of an individual, but it is important to note that they are not set in stone and, in fact, are susceptible to change. *"Tendency to respond in certain ways under certain circumstances"* means that a trait's influence on behaviour is not definite, but rather that it increases or decreases the likelihood that certain actions will occur in particular situations. In other words, personality characteristics represent habitual responses to everyday situations.

Temperament is the term used by developmental psychologists to describe personality characteristics of infants and children. Because individual differences in temperament characteristics emerge very early in life, these personality characteristics are assumed to be, at least partly, biological in nature. Historically, temperament was studied primarily by child and developmental psychologists, while personality was studied by personality, social, and organisational psychologists. The main reason for the divide is the difference in assessment methodologies, as children are assessed via information collected from parents and teachers or by using games or stories. In recent years, the two research traditions have begun to converge as studies have shown that temperamental differences

observed during the preschool years are substantially correlated with adult personality and interpersonal functioning decades later (see section 3 of this paper). Several taxonomies linking children's temperament characteristics to the Big Five have also been proposed (John et al., 1994[27]; Putnam, Ellis and Rothbart, 2001[28]; Shiner and Caspi, 2003[29]).

Personality characteristics are also sometimes referred to as "non-cognitive skills" to contrast them with cognitive knowledge, skills, and abilities. And, research has shown that non-cognitive skills scores rarely have any significant linear relationship with cognitive ability measures such as intelligence quotient (IQ); the highest correlation is between "openness to experience" and "verbal ability", and that correlation is only about .30 which statistically is a weak level (John et al., 1994[27]; Loehlin et al., 1998[30]). However, even though "non-cognitive skills" are considered "too broad to be useful" and incomplete, the term is an obvious misnomer as it indicates the absence of cognitive activities, despite the fact that some form of information processing is the basis of any aspect of mental functioning (Duckworth and Yeager, 2015[31]). For example, social competences that are often seen as the paradigmatic example of "non-cognitive skills" are so fundamentally ingrained into the processes of perception, memory and reasoning that they are often conceptualised as a form of intelligence – a paradigmatic example of cognitive skills (Marlowe, 1986[32]; Murphy and Hall, 2011[33]).

Alternatively, personality characteristics are sometimes called "character", "character skills" or "virtues" (Berkowitz, 2012[34]; Tough, 2013[35]; Kristjánsson, 2013[36]). One objection to these terms is that they imply certain moral connotations. In the economic literature, personality characteristics are often called "soft skills" in contrast to cognitive abilities and technical knowledge that are called "hard skills" (Brunello and Schlotter, 2011[37]; Kautz et al., 2014[3]; Heckman and Kautz, 2012[38]).

Finally, to add to conceptual confusion, these skills have also been referred to as a key component of *21st century* and *employability skills*, because they are considered increasingly crucial for individuals' development, employment, and healthy functioning in society, both now and in the future (Trilling and Fadel, 2009[4]; National Academy of Sciences, 2012[5]). A growing number of studies have referred to many personality characteristics as "21st-century skills" or "new basic skills" (Kyllonen, 2012[39]; Autor, Levy and Murnane, 2003[40]; Soland, Hamilton and Stecher, 2013[41]), thus stressing their relevance to modern life.

The term "social and emotional skills" is increasingly used in policy settings as it emphasises the importance of the social and emotional aspects of these skills and highlights their malleability and their potential to intervene and effect improvements (Brunello and Schlotter, 2011[37]; Kautz et al., 2014[3]; Heckman and Kautz, 2012[38]). The term "trait", on the other hand, which has often been used, seems to connote a false sense of immutability (Duckworth and Yeager, 2015[31]; Heckman and Kautz, 2012[38]).

Although seemingly disparate, the terminology 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[31]).

For the remainder of the paper, the terms "skills", "sub-domains" and "facets" will be used interchangeably. For broader skills that involve groups of facets/skills, we will use the terms "dimensions" or "domains", as borrowed from the Big Five terminology.

1.3. Broad personality characteristics: The Big Five dimensions

In the early days of personality research, there was little agreement concerning the basic dimensions of normal personality. This resulted in a proliferation of instruments that conceptualised personality dimensions in unique ways and with idiosyncratic names. Fortunately, a wide consensus has since emerged among personality researchers that the Big Five personality constructs (or a closely related structure such as Ashton and Lee's (2007[42]) HEXACO model) are sufficient to describe the basic dimensions of normal personality (Borkenau and Ostendorf, 1990[14]; Costa and McCrae, 1988[43]; Digman, 1990[15]; Goldberg, 1990[16]; Goldberg, 1993[44]; McCrae and Costa Jr., 1987[17]). Importantly, several studies have mapped earlier personality inventories to the Big Five constructs (McCrae, Costa and Piedmont, 1993[45]; Chernyshenko, Stark and Chan, 2001[46]), which enables diverse measures to be integrated. Many personality measures currently provide Big Five scores or indicate how their scales relate to the Big Five (Conn and Reike, 1994[47]).

Two key points of consensus have surfaced from research examining the personality structure of adults. First, adults' personality characteristics are organised hierarchically, with broad, higher-order characteristics that can be split into narrower, lower-order ones (Markon, 2009[48]). Second, the Big Five dimensions constitute a particularly valuable foundational level for the adult personality hierarchy (John, Naumann and Soto, 2008[7]). The Big Five characteristics are widely regarded as providing an optimal balance between bandwidth (conceptual breadth), fidelity (descriptive specificity), and generalisability (across samples and measures).

The origins of the Big Five model lie in analyses of the language people use to describe themselves and others. Building on the lexical work of Allport and Odbert (1936[49]), who identified thousands of personality-describing words, several different psychologists working independently and on different samples concluded that personality characteristics can be organised into five superordinate factors. In other words, the Big Five model emerged as a product of several research streams conducted by a variety of researchers (Digman, 1990[15]; Goldberg, 1982[10]; Costa and McCrae, 1985[11]; Norman, 1963[9]; Tupes and Christal, 1961[19]). These research streams varied from the semantic approach to clusters of personality characteristics but all were based on self- or other-ratings and consequent use of factor analysis. Importantly, similar personality structures have been found in many countries around the world (McCrae and Costa Jr., 2006[12]).

Table 1.1 above, which was adopted from John, Naumann, and Soto (2008[7]) describes the Big Five domains in more detail by giving conceptual definitions and behavioural examples of each dimension.

Of course, perfect agreement has not been reached about the fundamental structure of personality. Ashton and Lee (2007[42]; Ashton et al., 2004[50]) for example, proposed a 6-factor solution with the acronym HEXACO. More elaborate 7-factor structures have been suggested by Almagor, Tellegen and Waller (1995[51]) and Saucier (2003[52]). Each of these models included one or two additional evaluative dimensions (e.g. positive evaluation, negative evaluation, honesty) to the Big Five. Cross-cultural researchers have also suggested further dimensions (Cheung, F. M. et al., 2001[53]) even though the Big Five model has been replicated across countries and cultures. This lack of consensus should probably be expected given the very large and heterogeneous nature of social and emotional behaviours and feelings. Moreover, researchers predominantly rely on a type of statistical analysis (factor analysis), where results depend heavily on the particular

measures included in the analysis and on researchers' decisions on the type of factor-analytic technique and criteria used for identifying number of factors. Given the hierarchical nature of social and emotional skills, researchers can extract numerous additional factors, but each factor slices the broad Big Five dimensions into a narrower part.

1.4. Narrow sub-domains: individual skills or facets

The Big Five theory and its supporting empirical research is a major contribution to personality theory. The Big Five was also instrumental in establishing the validity of personality characteristics, because the majority of meta-analyses used this model to pool empirical studies. However, such a parsimonious model with few concepts can only be a very broad approximation of the universe of social and emotional skills (Hampson, John and Goldberg, 1986[54]). Paunonen and Ashton (2001[55]), Roberts et al. (2005[56]) and many others have argued that constituent sub-dimensions of the Big Five, termed *lower-order personality characteristics* or *facets*, are in some situations more useful than the broad factors. Further, measures of facets have been found to have higher predictive validities than the broad factors in many recent studies. Paunonen (1998[57]), for example, correlated Big Five scales and narrower facet measures with several criterion variables and concluded that *"aggregating personality characteristics into their underlying personality factors could result in decreased predictive accuracy due to the loss of skill-specific but criterion-valid variance"* (p. 538); similar conclusions have been reached in other studies (Ashton, 1998[58]; Mershon and Gorsuch, 1988[59]; Paunonen and Ashton, 2001[55]; Roberts et al., 2005[56]).

Aside from gains in predictive ability, Saucier and Ostendorf (1999[60]) suggested other advantages to a facet approach. For example, models incorporating facets facilitate theory development, because they refer to more nuanced social and emotional skills (Briggs, 1989[61]). Narrow facets also provide higher fidelity personality descriptions, thereby enhancing the description of characteristic thoughts, feelings, and behaviours. This is particularly true for individuals with intermediate scores on measures of broad factors, because such scores can be obtained in many different ways. Unlike extreme scores on a broad factor, which are obtained when an individual is high or low on all sub-dimensions, intermediate scores can be attained by being average on all constituent facets or by being high on some and low on others. Looking only at broad factor scores can therefore lead to ambiguity in score interpretation, a lack of clarity in theory development, and possibly diminished predictive usefulness.

In sum, we concur with John and De Fruyt's (2015[6]) suggestion that there may be important advantages to assessing facets rather than broad personality dimensions. As noted above, facets can increase predictive accuracy of important outcomes compared to the Big Five dimension scores. Facets also point the way to effective interventions. For example, the finding that conscientiousness scores predict some important outcomes may leave teachers and parents in a quandary. What might be the underlying driving influence? Self-discipline? Organisation? Goal orientation? The focus of an intervention for improvement remains unclear. Because facets are much narrower, teachers and parents are much better informed about what specifically should be the target of the intervention.

1.5. Compound personality characteristics

In addition to the Big Five dimensions and their component sub-dimensions, there has also been considerable research on a number of other personality characteristics that are not directly identifiable in the Big Five model. These are sometimes called "compound" personality characteristics as they represent *combinations* of multiple homogeneous skills. Examples of these compound skills include self-efficacy (Bandura, 1977[62]), meta-cognition (Flavell, 1979[63]), critical thinking (Glaser, 1941[64]), core self-evaluations (Erez and Judge, 2001[65]), integrity (Ones, Viswesvaran and Schmidt, 1993[66]), emotional intelligence (Goleman, 1995[67]), self-esteem (Rosenberg, 1965[68]), locus of control (Rotter, 1954[69]), etc. The importance of compound skills lies in their ability to predict important outcomes as they combine several useful characteristics into an overall composite. On the other hand, it is often unclear which part of the composite measure is driving validity, and this lack of specificity complicates the development of possible interventions in the same way as the broad Big Five dimensions.

2. The predictive value of the Big Five personality characteristics: Relationships with important life outcomes

There is a large body of empirical evidence about the importance of social and emotional skills for successfully navigating one's life. They have been shown to influence experiences and achievements in all spheres of people's lives, whether it is academic achievement, job performance, occupational attainment, health and longevity, or personal and societal well-being.[2] Depending on the particular population group, dimension and outcome being studied, the importance of social and emotional skills varies both in absolute terms and in comparison with other factors. In some cases the predictive value of the Big Five dimensions rivals that of long-established measures of cognitive skills.

To provide a metric for interpreting the strength of the relationship of the Big Five dimensions with life outcomes, researchers sometimes include intelligence as an additional predictor because its importance has been documented in numerous empirical studies. We will highlight such studies if available. Finally, for some key outcomes, we will draw particular attention to longitudinal studies involving school children (e.g. OECD, 2015[1] report).

After a brief discussion on the interplay between social and emotional skills and cognitive skills, the rest of this section is arranged around four groups of interrelated outcomes that we believe are particularly relevant to children and younger adults. The first group involves educational attainment (i.e. total years of schooling and highest earned degree) and educational success (grade point average). The second group focuses on employment outcomes such as income and job performance. The third group focuses on quality of life outcomes such as life satisfaction, happiness, and health. Finally, the fourth group examines outcomes that are of direct societal relevance, such as civil participation, social cohesion, crime and safety, and environmental awareness. We will highlight the key findings on the relevance of different social and emotional skills as predictors of important life outcomes.

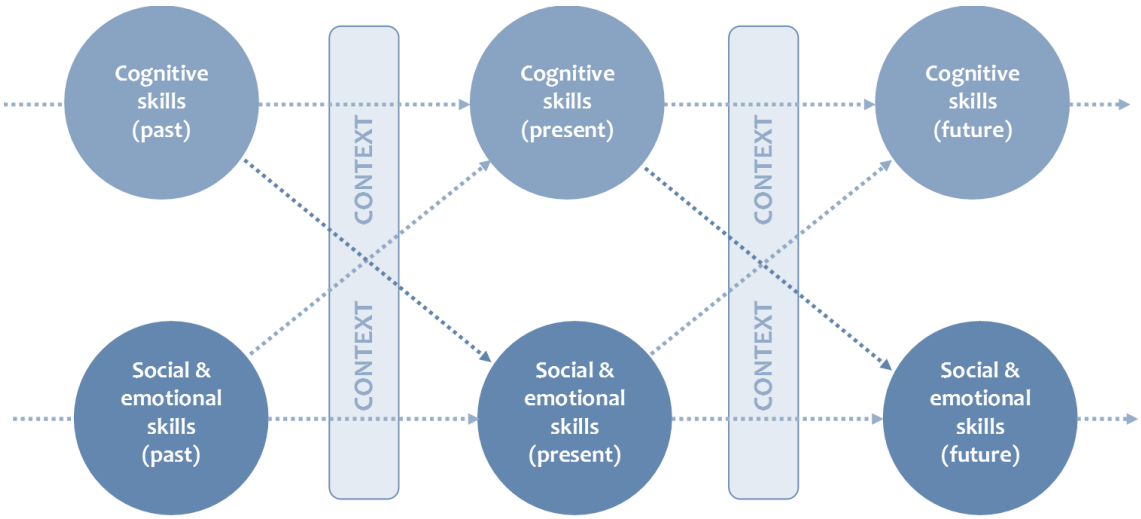
2.1. Interplay between social and emotional skills and cognitive skills

Social and emotional skills not only influence life outcomes directly (for example, good social competence helps people successfully negotiate job interviews), but they also have persistent and cumulative effects on other attributes, including cognitive skills. For example, 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 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 capacities (Cattell, 1987[70]; Ackerman, 1996[71]). On the other

[2] See OECD (2015[1]) and Kankaraš (2017[2]) for extensive overviews of this evidence.

hand, social and emotional skills are fundamentally dependent on cognitive skills such as perception, memory, and reasoning, that they are often conceptualised as a form of social or emotional intelligence (Marlowe, 1986[32]; Murphy and Hall, 2011[33]). Cognitive and social and emotional skills are thus tightly interconnected in a dynamic interaction that allows individuals with higher skills in one domain to be able to better influence the development of their skills in other domains (Figure 2.1).

Figure 2.1. Dynamic interactions between cognitive and social and emotional skills



In their meta-analysis of the relationship between general intelligence and social and emotional skills, Ackerman and Heggestad (1997[72]) 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[72]; Ackerman, 1996[71]; Cattell, 1973[73]; Holland, 1997[74]). 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, 1973[73]; Ackerman, 1996[71]).

Taking this interplay between social and emotional skills with 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 social and emotional skills (Heckman and Kautz, 2012[38]). Apart from their long-term effects on the acquisition of the knowledge and skills assessed by achievement tests, social and emotional skills 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 social and emotional skills as well as differences in cognitive skills (Brunello and Schlotter, 2011[37]). As Figure 2.2 shows, the relationship between social and emotional skills and achievement tests can be quite substantial. Consequently, the relationships of achievement test scores to economic performance and other life

outcomes, which are often attributed solely to the influence of cognitive skills, may at least in part reflect the effects of social and emotional skills.

Figure 2.2. Relationship of IQ and social and emotional skills to achievement test scores and grades

Source: Adapted from Borghans et al, (2015[75]), "The Economics and Psychology of Personality Traits", https://doi.org/10.1353/jhr.2008.0017.

Some social and emotional skills are a crucial pre-requisite for effective participation and performance in academic and work settings. In other words, low levels of social and emotional skills can prevent the effective use of cognitive skills while high levels further improve their use and importance (Kankaraš, 2017[2]). For example, cognitive skills have quite a low impact on the probability of individuals staying at school after turning 16 years old if they have low social and emotional skills, but a very high impact for individuals with high social and emotional skills (Carneiro, Crawford and Goodman, 2007[76]).

On the other hand, higher levels of social and emotional skills can 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, Lindqvist and Vestman (2011[77]) find that although both sets of skills are important, for people with the lowest income, social and emotional 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 social and emotional 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 a strong work ethic (Barton, 2006[78]). 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[3]).

Another good illustration of this interplay between personality and cognitive skills is shown in an example from the General Educational Development (GED) programme (Heckman and Kautz, 2012[38]). The GED was established to allow high-school dropouts in the United States 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 in the United States (around 12% in 2011) obtain the equivalent of a high school diploma through this programme (Heckman and Kautz, 2012[38]).

It was found that these GED graduates - students who drop out from high school and then pass the GED test to obtain a high school diploma - are fundamentally different not only from other high school dropouts, but also from regular high school graduates. In particular, when compared to regular high school graduates, GED graduates have very similar levels of cognitive skills but poorer social and emotional skills. On the other hand, they have better cognitive skills than other high school dropouts, but social and emotional skills are equally poor among both groups of high school dropouts.

However, the most important finding was that GED graduates' relatively poor social and emotional 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; a higher propensity for smoking, drinking, violent and criminal behaviour; and a greater chance of being imprisoned (Heckman and Kautz, 2012[38]). Obviously, cognitive skills cannot compensate for a lack of social and emotional skills, and both are needed for people to prosper in life. In other words, social and emotional skills are the necessary ingredient of the skill set needed for effective functioning in different spheres of life.

Table 2.1. Skills and outcomes of the three groups of high school students in the United States

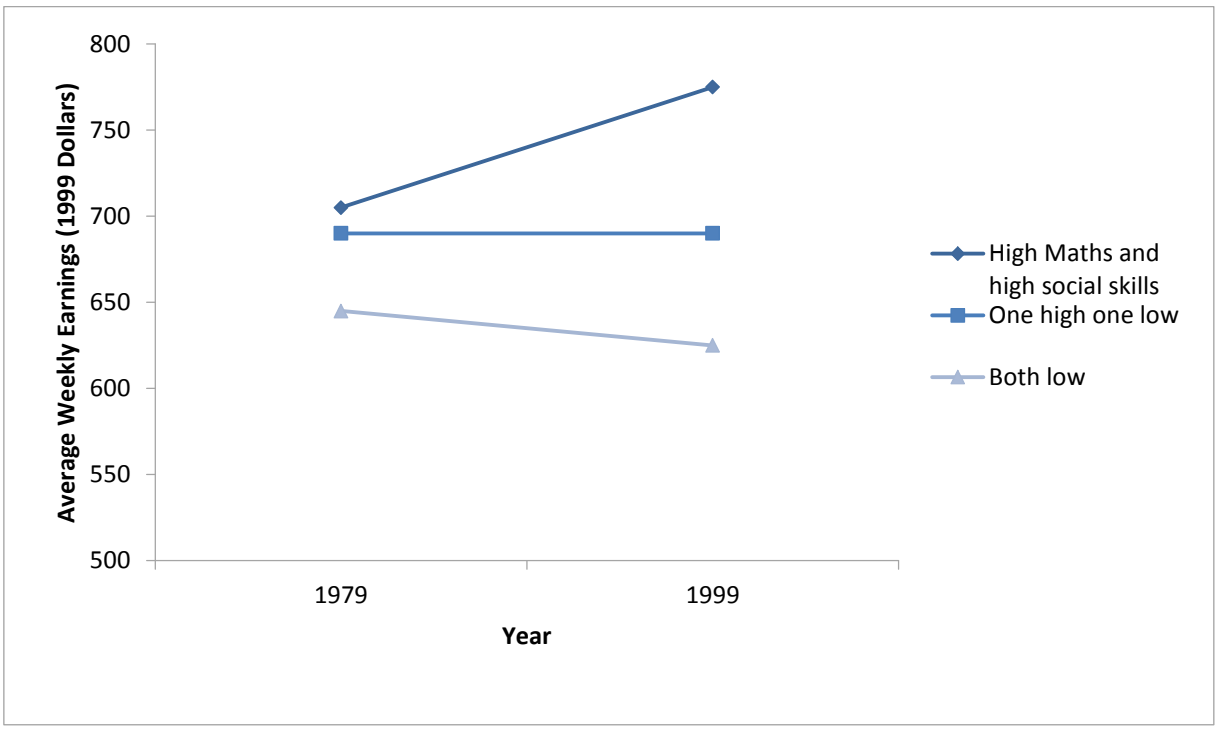
	Social and emotional skills*	Cognitive skills	Outcomes
High school dropouts (without GED diploma)	Low	Low	**Negative**
GED graduates	Low	High	**Negative**
Regular high school graduates	High	High	**Positive**

Note: * Estimates of social and emotional skills are inferred from students' behaviour.

In another similar study, Weinberger (2014[79]) examined the joint effects of cognitive and social skills on future earnings using data from two National Center for Education

Statistics (NCES) longitudinal studies of high school students (N > 3 000). Both surveys included senior year maths scores, and questions about extracurricular participation and leadership roles (a combination of extraversion and conscientiousness dimensions), and earnings 7 years after the senior year of high school. Weinberger found increasing complementarity between cognitive and social skills, such that the highest earnings were observed for those with both high social and high cognitive skills (see Figure 2.3).

Figure 2.3. Average weekly earnings seven years after high school, 1979 and 1999 as a function of cognitive and social skills



Note: "High Maths" = Senior year maths score above median. "High Social" = Participated in sports or leadership roles during senior year of high school. Bars around point estimates indicate 90 percent confidence intervals.
Source: Adapted from Weinberger (2014[79]), "The increasing complementarity between cognitive and social skills", https://doi.org/10.1162/REST_a_00449.

2.2. Educational attainment and economic success

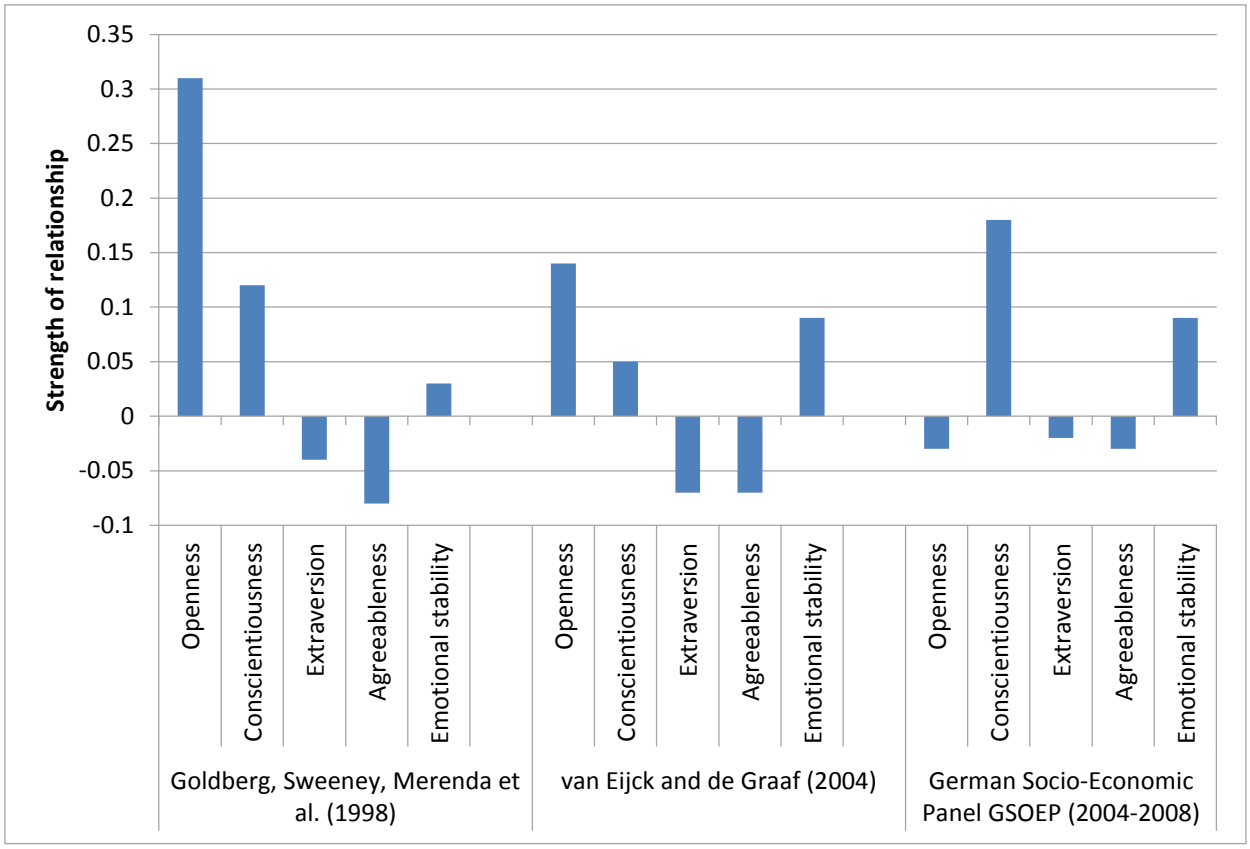
Educational attainment (i.e. school grades or completion) is considered one of the most important outcomes in developed societies. For example, a target set by the European Council in adopting "Europe 2020" is that *"… the share of early school leavers should be under 10% and at least 40% of the younger generation should have a tertiary degree…"* (European Commission, 2010[80]).

The existing empirical literature suggests that the contribution of social and emotional skills to school attainment is an important one. Heckman, Stixrud and Urzua (2006[81]) analysed data from the 1979 United States National Longitudinal Survey of Youth which included measures of social and emotional skills, specifically, indicators of loss of control and self-esteem. Heckman et al. (2006[81]) found that an increase in the non-cognitive score from the 25th to the 75th percentile of its distribution was associated with a close to

25 percentage point increase in the probability of being a four-year college graduate at age 30 (importantly, this analysis held a cognitive skills constant). Deke and Haimson (2006[82]) found that doing more homework in school (an indicator of conscientiousness) increased the chance of completing some form of post-secondary education programme in the future by 25%.

Almlund et al. (2011[83]) highlighted three studies that used nationally representative samples to investigate the relationships between the Big Five dimensions and years of schooling. Although each study had somewhat different control variables, conscientiousness and openness to experience emerged as significant and positive predictors of years of schooling (see Figure 2.4 below).

Figure 2.4. The relationship between years of schooling and the Big Five dimensions

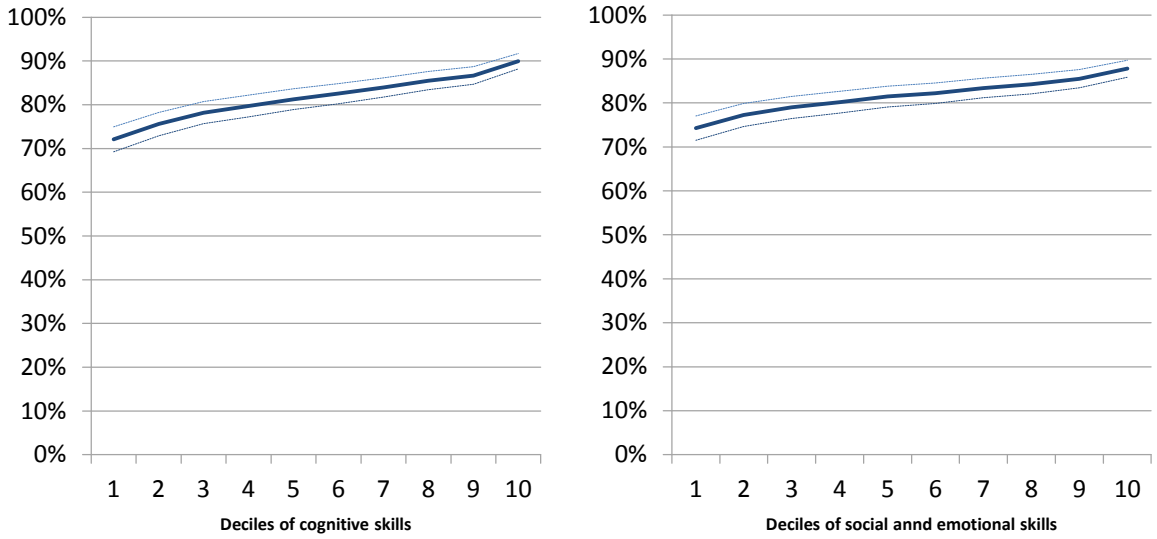


Note: Strength of relationship is represented in form of standardised regression coefficients varying between -1 and 1, with 0 indicating absence of the relationship.
Source: Adapted from Almlund et al. (2011[83]), "Personality psychology and economics", http://dx.doi.org/10.1016/B978-0-444-53444-6.00001-8.

The OECD (2015[1]) used data from the Flemish Longitudinal Research in Secondary Education Sample to estimate the effects of cognitive, and social and emotional skills at age 12 (6th grade) on the probability of attending some form of college. Cognitive skills were assessed by numerical, spatial, and verbal intelligence tests, while social and emotional skills were assessed by measures of extraversion, self-esteem (an indicator of emotional stability) and conscientiousness. As can be seen in Figure 2.5 below, both cognitive ability and social and emotional skills are positively related to college

attendance. The OECD (2015[1]) report contains many other graphs showing strong relations between social and emotional skills and tertiary education, income and unemployment, depression, and conduct problems.

Figure 2.5. Probability of tertiary education attendance by skill deciles (Flemish Longitudinal Research in Secondary Education Sample)



Note: Solid lines depict probability of self-reported college attendance, and dotted lines, 2.5-97.5% confidence intervals.
Source: OECD (2015[1]), *Skills for Social Progress: The Power of Social and Emotional Skills*, http://dx.doi.org/10.1787/9789264226159-en.

Another important educational outcome is school grades, and numerous studies have been conducted to investigate the relationships between social and emotional skills and grades. For example, Noftle and Robbins (2007[84]) utilised a large, multi-sample study of University of California students, who completed various Big Five personality measures and reported their college entrance exam scores (verbal and maths SAT), high school grade point average (GPA), and college GPA. The authors found that, even after controlling for gender and IQ, conscientiousness was a consistent predictor of grades (see Table 2.2 below). In several cases, the standardised regression coefficient for conscientiousness actually exceeded those observed for verbal and maths SAT scores.

Table 2.2. Independent effects of Big Five and SAT scores on GPA

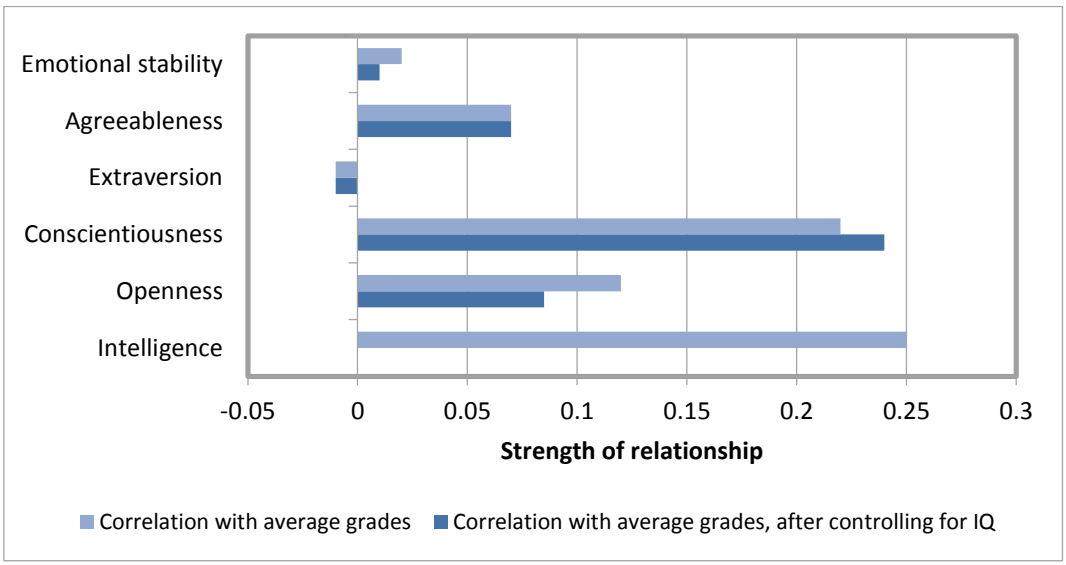
	College GPA			High school GPA		
	Sample 1 (BFI)	Sample 2 (NEO-FFI)	Sample 3 (HEXACO)	Sample 1 (BFI)	Sample 2 (NEO-FFI)	Sample 3 (HEXACO)
SAT verbal	0.19*	0.28*	0.18*	0.10*	0.16*	0.12
SAT math	0.16*	0.28*	0.18*	0.13*	0.16*	0.12
Extraversion	-0.05*	0.01	-0.14*	0.00	-0.05	0.00
Agreeableness	-0.02	0.04	-0.04	0.05*	0.08	0.07
Conscientiousness	0.24*	0.18*	0.22*	0.21*	0.12*	0.24*
Neuroticism	0.06*	-0.07	0.07	0.07*	0.04	-0.03
Openness to Experience	0.01	0.06	0.03	-0.05*	-0.01	-0.06

Note: BFI = Big Five Inventory; NEO-FFI = NEO Five Factor Inventory; GPA = Grade Point Average; Values in the table represent standardised regression coefficients. * = $p < 0.01$.
Source: Adapted from Noftle and Robins (2007[84]), "Personality predictors of academic outcomes: Big Five correlates of GPA and SAT scores", https://doi.org/10.1037/0022-3514.93.1.116.

In a recent longitudinal study of 197 Swedish high school students, Rosander and Backstrom (2014[85]) also found conscientiousness scores to correlate with academic grades 3 years later (r = .27). Further, this relationship did not diminish after controlling for cognitive ability scores.

Poropat (2009[86]) conducted a meta-analysis of studies that reported correlations between self-rated Big Five scores, intelligence scores, and course grades. The number of studies was very large and ranged between 47 (for intelligence) to 138 (for conscientiousness). Figure 2.6 summarises key findings from Poropat's (2009[86]) meta-analysis by showing (uncorrected) predictor-criterion correlations as well as partial-correlations after controlling for IQ scores (note: a partial correlation is a correlation that is adjusted for the effect of some third variable – here IQ). Importantly, conscientiousness predicted course grades nearly as well as cognitive ability *and* this association did not diminish when cognitive ability was controlled for. Openness to experience and agreeableness were also related to grades although the magnitude of these relationships was smaller.

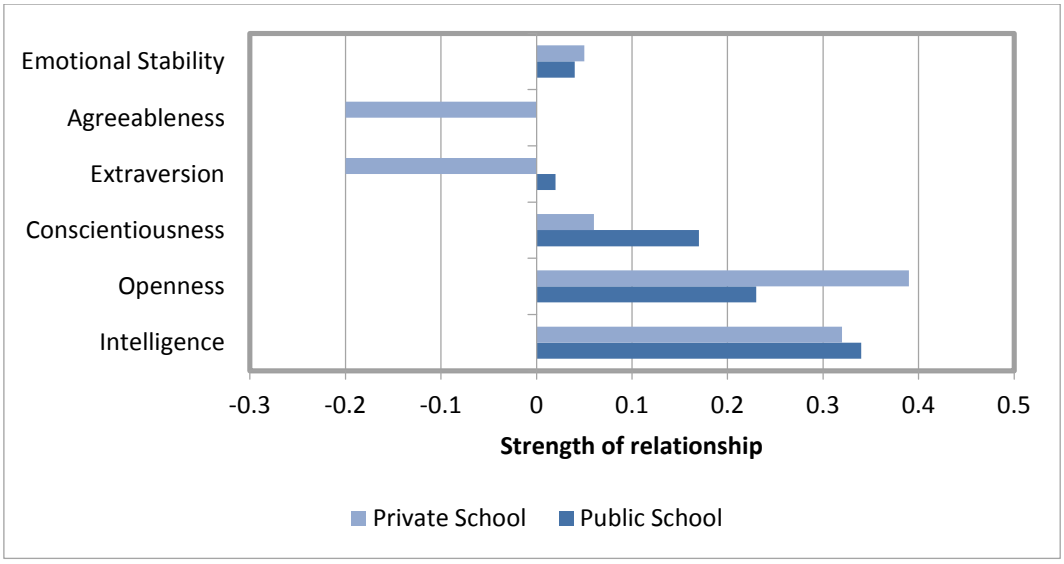
Figure 2.6. Correlations of the Big Five dimensions and intelligence with course grades



Note: Strength of relationship represents average correlation coefficients across studies. The correlations are corrected for scale reliability.
Source: Adapted from Poropat (2009[86]), "A meta-analysis of the Five-Factor model of personality and academic performance", http://dx.doi.org/10.1037/a0014996.

Similar results from a meta-analysis of the relationship between Big Five dimensions and standardised test scores are presented in Figure 2.7. Openness to experience and conscientiousness are positively related with these scores while, in the case of private school students, extraversion and agreeableness are negatively correlated with the scores (Almlund et al., 2011[83]).

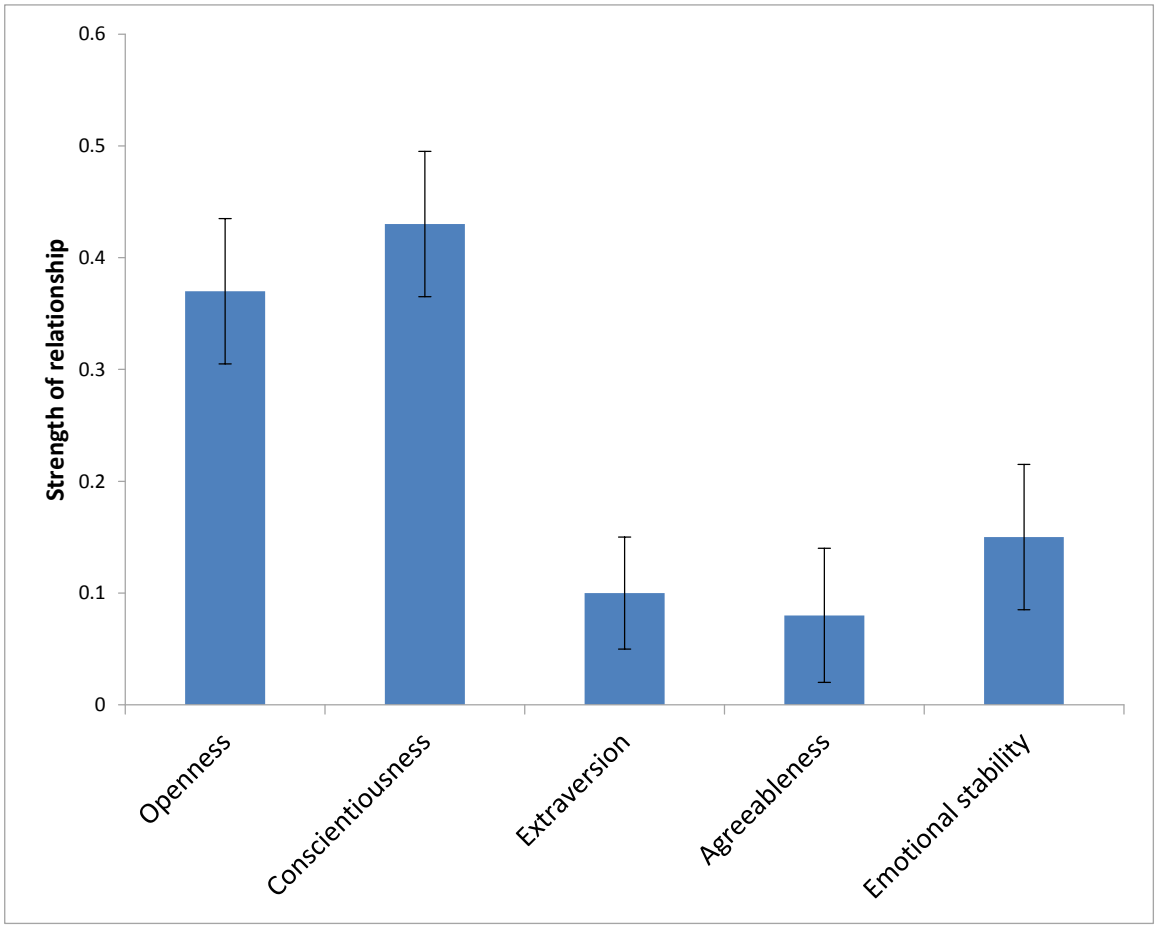
Figure 2.7. Associations of the Big Five and intelligence with standardised achievement test scores



Source: Adapted from Almlund et al. (2011[83]), "Personality Psychology and Economics", http://dx.doi.org/10.1016/B978-0-444-53444-6.00001-8.

In a recent follow-up study, Poropat (2014[87]) examined 12 studies that reported relationships between personality scores of primary and middle school children that had been provided by a parent or caregiver, and these children's school grades. The results are shown in Figure 2.8 and largely replicated Poropat's (2009[86]) findings for self-ratings. Conscientiousness and openness to experience had the highest relationships with school grades, with raw correlation estimates of .43 and .37, respectively.

Figure 2.8. Meta-analysis of adult other-rated Big Five measures and academic performance



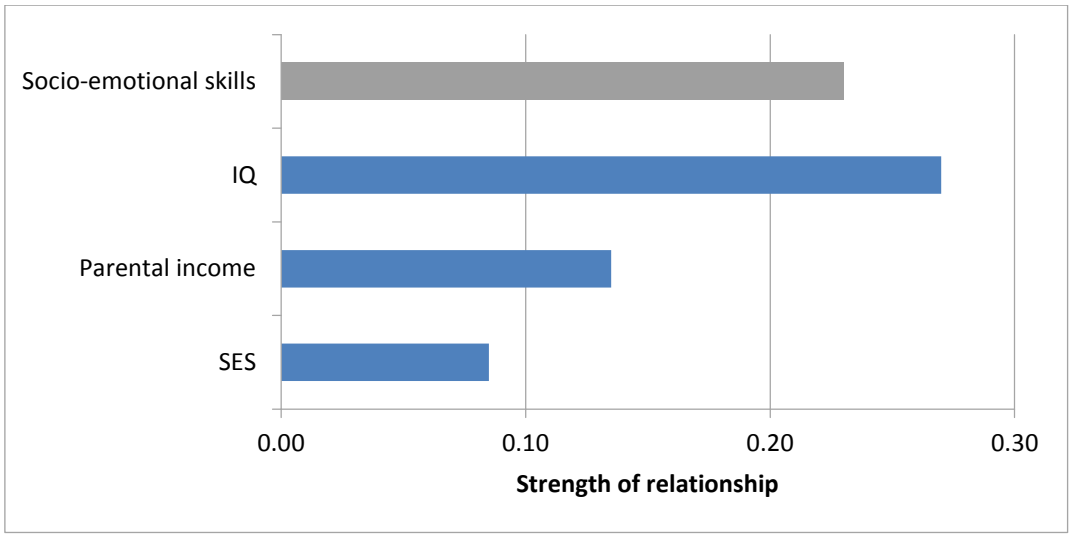
Note: Strength of relationship represents average correlation coefficients across studies. Vertical bars represent 95% confidence intervals. The correlations are corrected for scale reliability.
Source: Adapted from Poropat (2014[87]), "Other-rated personality and academic performance: Evidence and implications", https://doi.org/10.1016/j.lindif.2014.05.013.

2.3. Employment outcomes: Income and job performance

Naturally following educational outcomes are employment outcomes: Higher levels of education and grades typically translate into lower chances of unemployment and higher levels of income. Empirical economics literature has long considered cognitive skills, such as IQ, to be the most important determinants of employment success (for example, (Herrnstein and Murray, 1995[88])). More recently, however, a number of studies have shown that social and emotional skills can be as important as cognitive skills in determining employment outcomes. For example, in a longitudinal study conducted in the

United Kingdom, males who were more extroverted at age 10 had lower levels of unemployment at the ages of 16 to 29, after controlling for cognitive ability (MacMillan, 2013[89]). Indicators of extraversion (being outgoing and sociable) at age 10 were also found to be associated with becoming an entrepreneur by age 34 after controlling for general cognitive ability, locus of control and self-esteem (Schoon and Duckworth, 2012[90]). Likewise, a meta-analysis of Roberts and colleagues (2007[13]) on the personality factors related to occupational outcomes (e.g. personal income and occupational status) has found that social and emotional skills are almost as influential as cognitive skills (Figure 2.9).

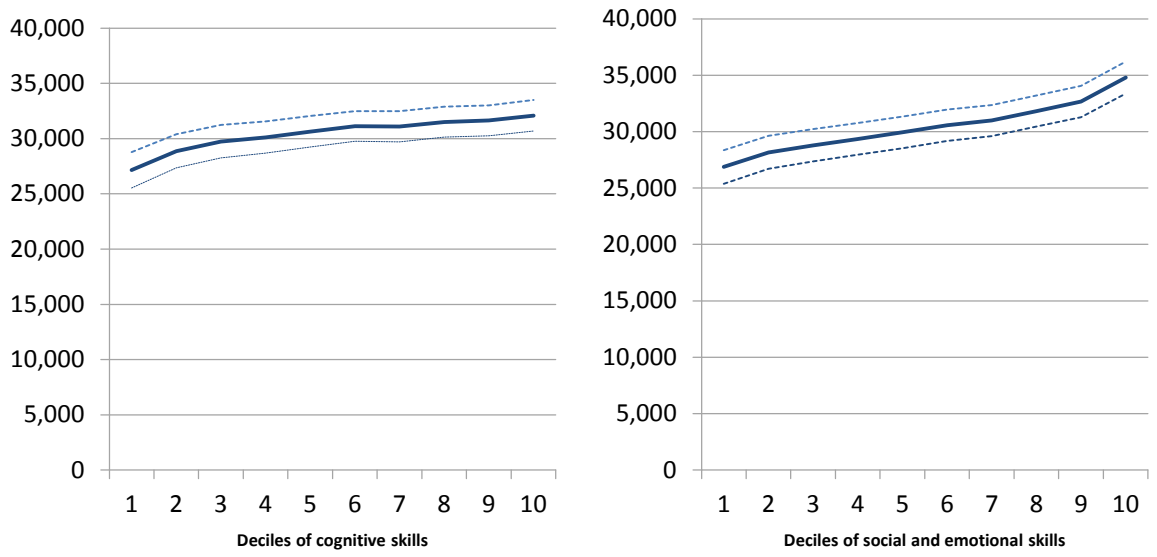
Figure 2.9. Average effects of social and emotional skills on occupational outcomes



Note: Effect sizes are in form of standardised regression coefficients varying between -1 and 1, with 0 indicating absence of the effect; SES – socio-economic status; IQ – measure of general intelligence.
Source: Adapted from Roberts et al. (2007[13]), "The power of personality: The comparative validity of personality traits, socioeconomic status, and cognitive ability for predicting life outcomes", https://doi.org/10.1111/j.1745-6916.2007.00047.x.

Similar findings were reported in the OECD's *Skills for Social Progress* report (2015[1]) for the Canadian Longitudinal Youth in Transition Study (YITS). There, income levels for 25-year-olds were better predicted by self-efficacy, mastery, and self-esteem (all are compound skills representing a combination of emotional stability, conscientiousness, and extraversion) than by cognitive skills as measured by PISA reading, maths, and science test scores – all assessed at age 15. This is shown graphically in Figure 2.10 below where the income curve for social and emotional skills is steeper than that for cognitive skills.

Figure 2.10. Income as a function of cognitive or social and emotional skills (Canada's Longitudinal Youth in Transition Study)



Note: Solid lines depict self-reported income at age 25, and dotted lines, 2.5-97.5% confidence intervals.
Source: OECD (2015[1]), *Skills for Social Progress: The Power of Social and Emotional Skills*, http://dx.doi.org/10.1787/9789264226159-en.

Relationships between personality characteristics and employment outcomes have also been extensively studied by industrial and organisational psychologists. However, instead of focusing on employability and income as outcomes, psychologists have historically focused on various aspects of an individual's job performance for which social and emotional skills are more relevant. This is because job performance is largely under the direct control of an individual, while income and employability are more influenced by demographic and background effects. Nevertheless, the two types of outcomes are intertwined, because high levels of job performance are often seen as a pre-requisite for job tenure, promotion, bonuses, and pay rises.

Barrick and Mount's (1991[91]) meta-analysis galvanised research on personality in the field of industrial and organisational psychology. Their key finding, replicated by a number of subsequent meta-analyses, was that conscientiousness predicted job performance across jobs and organisations. Recently, Sackett and Walmsley (2014[92]) examined key meta-analyses that summarised empirical relationships between Big Five personality factors and job performance. Early studies focused primarily on overall job performance, but more current literature expanded the notion of a singular index of overall job performance into three conceptually and empirically distinguishable categories, which can be drawn from other performance models (Campbell, 1990[93]; Campbell, 2012[94]). These categories of employee behaviour are typically labelled task performance, organisational citizenship behaviour, and counterproductive work behaviour (Rotundo and Sackett, 2002[95]).

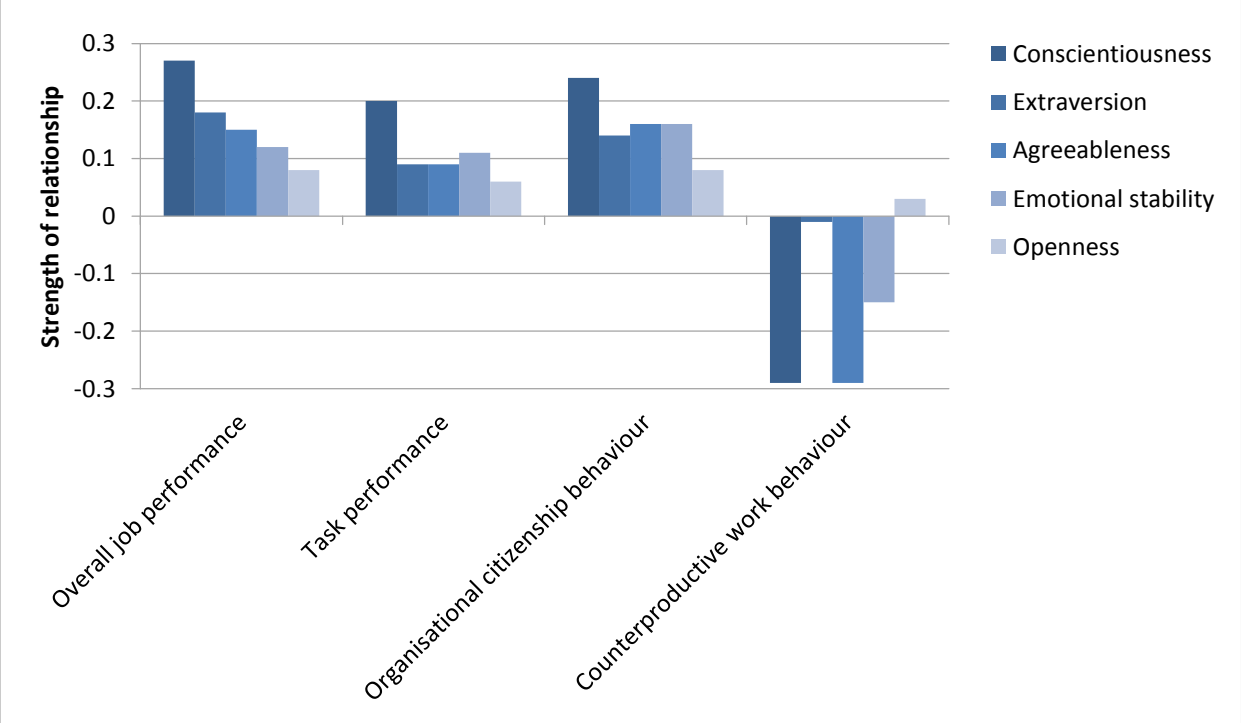
Task performance refers to behaviours that contribute to the production of a good or provision of a service (Borman, Bryant and Dorio, 2010[96]). *Organisational citizenship behaviour* refers to behaviour that benefits an organisation such as persisting to complete a time-consuming job, providing personal support to co-workers, or representing one's

organisation in a professional manner (Borman et al., 2001[97]; Borman and Motowidlo, 1993[98]; Organ, 1997[99]). *Counterproductive work behaviour* refers to intentional behaviour that is counter to the legitimate interests of the organisation such as absenteeism, insulting co-workers, stealing or engaging in alcohol or drug use (Gruys and Sackett, 2003[100]).

In their review, Sackett and Walmsley (2014[92]) identified key meta-analyses devoted to each of these performance criteria, but containing mostly non-overlapping sets of primary research studies conducted in the United States, Europe, and Asia. Within each meta-analysis, they rank-ordered the Big Five in terms of the strength of their attribute-criterion correlations and then averaged these ranks across meta-analyses.

Figure 2.11 shows Sackett and Walmsley's (2014[92]) mean observed and corrected validity coefficients drawn from the published meta-analyses and the respective ranks of the Big Five dimensions. As can be seen, conscientiousness, with the highest correlation coefficients, was top-ranked for all work performance criteria. In addition, extraversion seemed to be mostly important for task performance, while agreeableness and emotional stability were predictive of citizenship and counter-productivity.

Figure 2.11. Average correlation between Big Five dimensions and job performance dimensions



Note: Strength of relationship represents average correlation across studies. Correlations are corrected for scale reliability.
Source: Adapted from Sackett and Walmsley (2014[92]), "Which personality attributes are most important in the workplace?", https://doi.org/10.1177/1745691614543972.

One limitation of the meta-analyses presented above is that they combined primary studies from a wide variety of occupations. While the case can certainly be made for conscientiousness to be relevant across most jobs, the effect of other personality

characteristics is likely to be more nuanced. For example, extraversion characteristics may be more relevant to sales or managerial jobs than for technical/professional jobs – an idea supported by Hogan and Holland's (2003[101]) meta-analysis. Rather than including every correlation between a personality measure and job performance that was ever computed, it only included correlations for which the personality measure and the job performance dimension were theoretically aligned. So, for example, a correlation between extraversion and sales performance would be included, but a correlation of extraversion with performance as an accountant would not. When the personality dimension was aligned with the criterion measure, Hogan and Holland obtained much higher meta-analytic estimates for all Big Five dimensions, ranging from .22 to .43.

Apart from further dividing outcome measures, investigations at the level of more specific sub-domains have usually provided higher predictive validity scores to studies that have remained at the level of the broad Big Five domains. In fact, analysis at the level of individual skills offers a better opportunity for a more meaningful theoretical alignment between predictors and outcomes, and consequently for increased understanding of predictive values and mechanisms of actions of individual skills and particular predictors (Hurtz and Donovan, 2000[102]).

Another approach that can increase predictive value of skill measures is their better contextual fit to the specific research context. In particular, rather than asking for a description of one's personality "overall" or "in general", the more specific and relevant work context is included as the frame-of-reference for the personality description (Lievens, De Corte and Schollaert, 2008[103]), e.g. by adding a tag "at work" to items. Not surprisingly, these more contextualised personality assessments are better aligned with the work criteria they are supposed to predict and thus show generally better predictive validities. De Fruyt and Rolland (2013[104]) illustrated the combined effects of aligning predictors and criteria and using a work frame-of-reference, showing that self-rated conscientiousness at work correlated .36 with colleague-rated task performance (relative to a correlation of .27 using a general personality conscientiousness scale). Self-rated neuroticism and openness to experience correlated -.21 and .26 with adaptive performance rated by colleagues (relative to correlations of -.16 and .12, respectively, for non-contextualised general measures).

2.4. Quality of life outcomes

Notions of personal well-being and life satisfaction as key elements of quality of life have long been the subject of research, but these concepts were usually overlooked in policy considerations due to perceptions of difficulty in assessing their validity. However, over the last two decades, the concepts have drawn increasing attention from policy makers due to the growing realisation that traditional economic indicators do not provide a complete picture of the general status of individuals and societies.

One of the key objectives of the Study on Social and Emotional Skills (SSES) is to identify and examine the benefits individuals and societies gain from developing the set of skills assessed in the survey. Thus, it is fundamentally important to consider a comprehensive set of indicators for "better lives", i.e. the various aspects of personal and societal well-being. In particular, information on the individual's health and subjective well-being should be included, as well as information on broader social outcomes, such as criminality, social cohesion and civic participation.

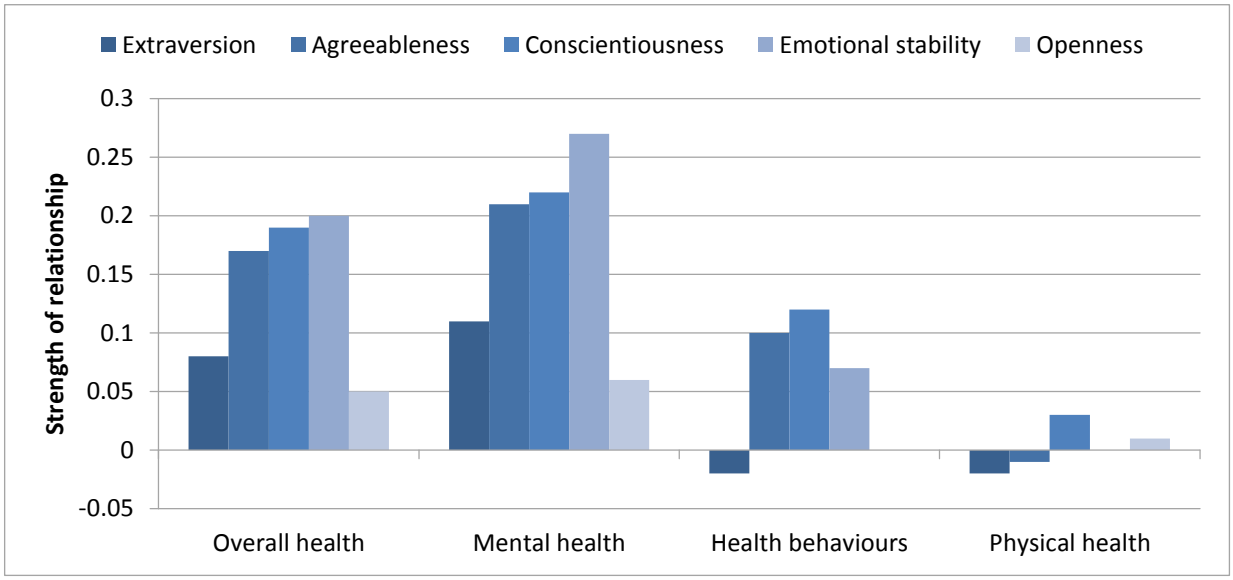
Because the field of quality of life indicators is so broad, the research literature investigating links between personality and life outcomes is vast. A recently published review by Strickhouser, Zell and Krizan (2017[105]), for example, identified over 850 empirical studies that have explored the relation between the Big Five personality characteristics and health outcomes. Dozens of meta-analyses have examined the relation between the Big Five dimensions and mortality (Jokela et al., 2013[106]), health behaviours (Bogg and Roberts, 2004[107]), smoking (Malouff, Thorsteinsson and Schutte, 2006[108]), physical activity (Wilson and Dishman, 2015[109]), depression (Hakulinen et al., 2015[110]), life satisfaction (Steel, Schmidt and Shultz, 2008[111]), and job satisfaction (Judge, Heller and Mount, 2002[112]).

2.4.1. Mental and physical health

Broadly speaking, health-related life outcomes can be classified as pertaining to mental health (e.g. depression and other psychopathologies), physical health (e.g. body fitness, diagnosed physical diseases and, ultimately, mortality), and health-related behaviours (engagement in health-related activities such as exercise and substance abuse). Today, there is a little doubt that personality characteristics are linked to a wide variety of mental health outcomes (Ozer and Benet-Martinez, 2006[113]). Some researchers have even claimed that many psychopathologies are extreme expressions of certain personality characteristics (Krueger and Tackett, 2006[114]).

Strickhouser, Zell, and Krizan's (2017[105]) study, which combined the results of 30 meta-analyses of personality and life outcomes relationships, provides perhaps the most up-to-date estimates of the associations of Big Five personality characteristics with life outcomes. This comprehensive study found important relations of the Big Five with health outcomes, particularly overall health and mental health. Agreeableness, conscientiousness, and emotional stability have particularly strong relations (Figure 2.12).

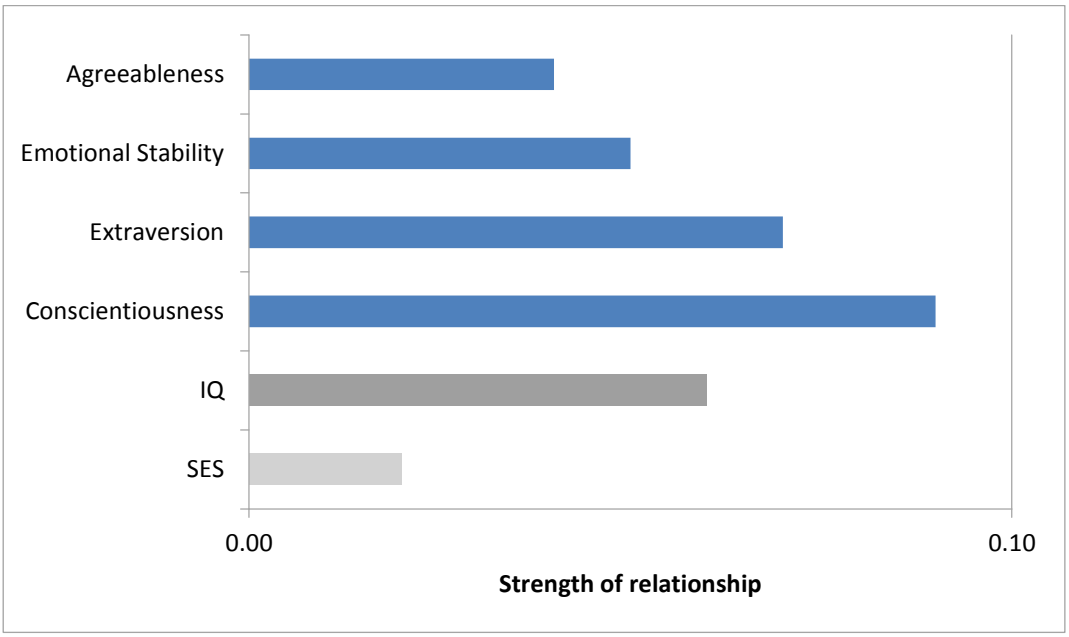
Figure 2.12. Average correlation estimates for life outcome categories and each Big Five factor



Note: Strength of relationship represents average correlation across studies.
Source: Adapted from Strickhouser, Zell and Krizan (2017[105]), "Does personality predict health and well-being? A metasynthesis", http://dx.doi.org/10.1037/hea0000475.

Given that personality characteristics have established links to mental health and health-related behaviours which in turn affect one's physical health, researchers had expected to find some relationships between Big Five characteristics and physical health outcomes. 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 dimensions on longevity are stronger than those of cognitive skills and socio-economic status (Roberts et al., 2007[13]). In particular, they found that four Big Five characteristics correlated with longevity – conscientiousness (.09), extraversion (.07), emotional stability (.05), and agreeableness (.04); openness to experience was not examined in that paper (Figure 2.13). The relatively small effect sizes could be explained by these dimensions exerting an indirect effect on physical health via other mechanisms, such as health behaviours (Ferguson, 2013[115]). The slow accumulation of such effects is likely to manifest only later in life in the form of disease or premature mortality (Hampson and Friedman, 2008[116]). Low agreeableness predicts cardiovascular disease, and high neuroticism predicts poorer coping skills (John, Naumann and Soto, 2008[7]).

Figure 2.13. Average effects of different personality characteristics on mortality



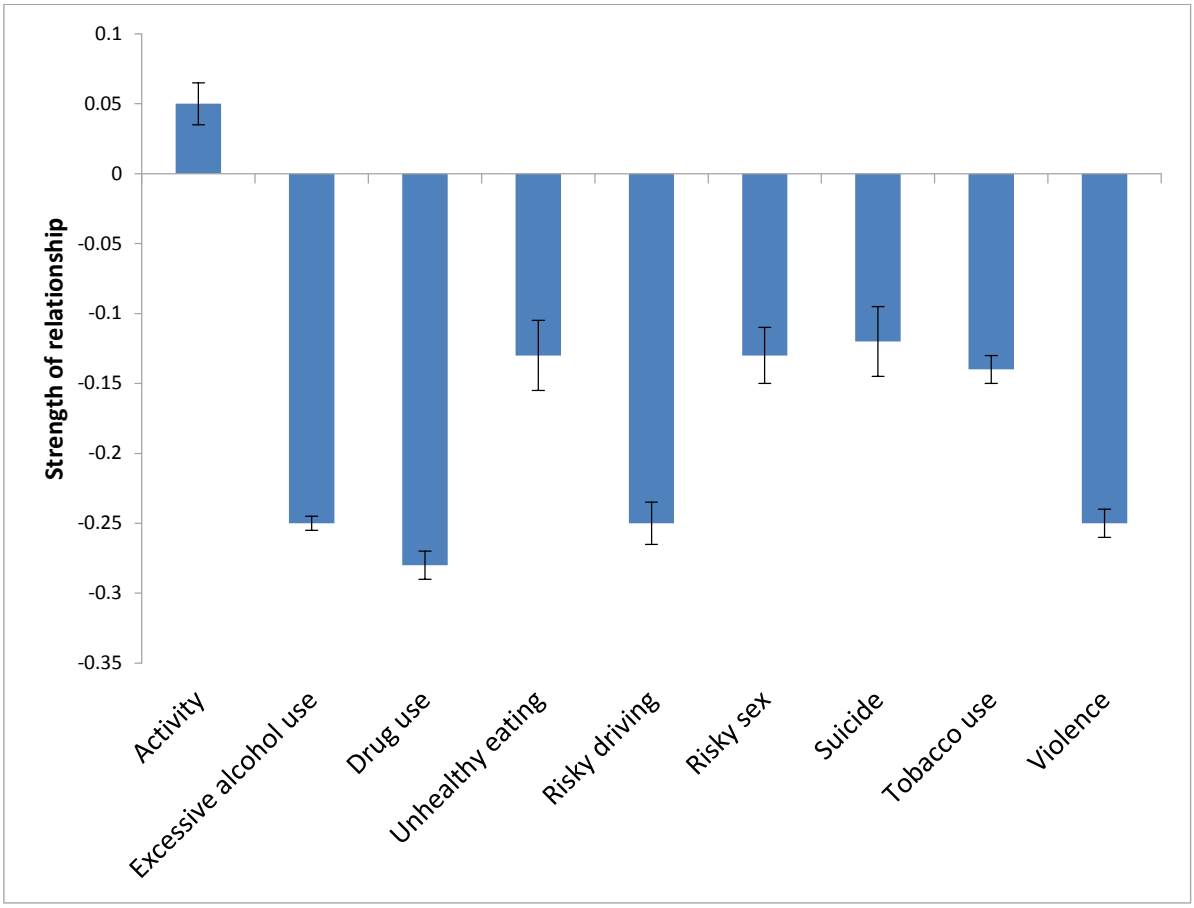
Note: Strength of relationship is represented in standardised regression coefficients.
Source: Adapted from Roberts et al. (2007[13]). "The power of personality: The comparative validity of personality traits, socioeconomic status, and cognitive ability for predicting life outcomes", https://doi.org/10.1111/j.1745-6916.2007.00047.x.

2.4.2. Health-related behaviours and conduct problems

Influence of the social and emotional skills on health-related behaviours can be seen as one of the best examples of mediated or indirect relations between social and emotional skills and important life outcomes (i.e. health). In particular, by affecting likeliness of engaging in unhealthy habits such as smoking, excessive alcohol use, risky sex or unhealthy eating, social and emotional skills ultimately influence the general state of a person's physical and mental health.

Extraversion has been found to predict physical activity (Wilson and Dishman, 2015[109]), agreeableness to predict safer sex and lack of smoking (Hoyle, Fejfar and Miller, 2000[117]; Malouff, Thorsteinsson and Schutte, 2006[108]), and conscientiousness to predict a range of health behaviours including safe driving, healthy eating, and avoidance of substance use (Bogg and Roberts, 2004[107]). Example findings from Bogg and Roberts' (2004[107]) meta-analysis for conscientiousness and health behaviours are shown in Figure 2.14 below.

Figure 2.14. Estimated meta-analytic correlations between conscientiousness and health behaviours



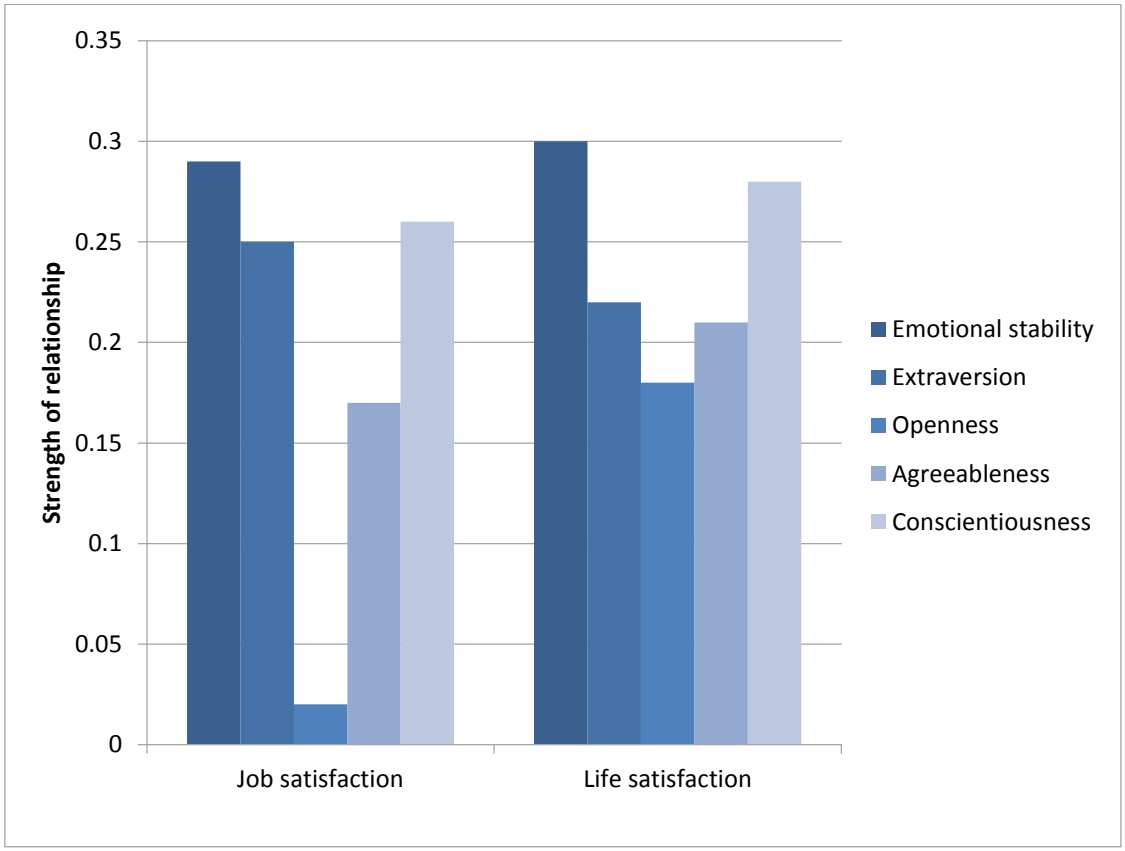
Note: Strength of relationship represents average correlation coefficients across studies. Vertical bars represent 95% confidence intervals. The correlations are corrected for scale reliability.
Source: Adapted from Bogg and Roberts (2004[107]), "Conscientiousness and health-related behaviors: A meta-analysis of the leading behavioral contributors to mortality", https://doi.org/10.1037/0033-2909.130.6.887.

2.4.3. Subjective well-being

Subjective well-being can be defined as having a good mental state, including all of the various evaluations, positive and negative, that people make of their lives (OECD, 2013[118]). There is a general consensus that subjective well-being consists of three main aspects: life evaluation, quality of emotional states, and sense of purpose and engagement (OECD, 2013[118]).

Figure 2.15, from Judge, Heller, and Mount (2002[112]), shows remarkably similar effect sizes for two quality of life outcomes (job and life satisfaction), and each of the Big Five dimensions. Most correlation estimates were between .17 and .30 with the openness-job satisfaction correlation being the only exception. Establishing exact causality for these relationships is challenging however, because high well-being has also been found to promote positive personality change (Roberts and Wood, 2006[119]; Specht, Egloff and Schmukle, 2013[120]; Soto, 2014[121]) and other variables may simultaneously promote positive personality characteristics and positive quality of life outcomes.

Figure 2.15. Average correlations of Big Five dimensions with life and job satisfaction

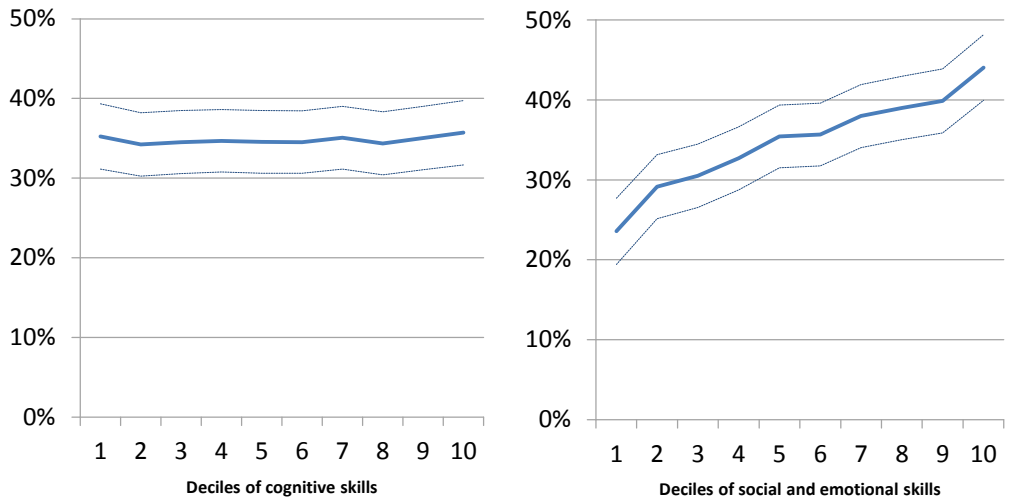


Note: Strength of relationship represents average correlation across studies. Correlations are corrected for scale reliability.
Source: Judge, Heller and Mount (2002[112]), "Five-factor model of personality and job satisfaction: A meta-analysis", https://www.ncbi.nlm.nih.gov/pubmed/12090610.

Furthermore, longitudinal analyses of the New Zealand Competent Children (CC) sample indicate social and emotional skills have a stronger relationship with life satisfaction than cognitive skills.

The relation of cognitive skills and social/emotional skills with life satisfaction is shown in Figure 2.16. Note that the horizontal line on the left shows virtually no relationship between life satisfaction and cognitive ability, but the sharp upward line on the right shows a strong relationship exists with social and emotional skills.

Figure 2.16. Probability of being very happy at age 20, based on self-reports by skill deciles (New Zealand Competent Children sample)



Note: Solid lines depict the probability of being very happy at age 20 based on self-reports, and dotted lines, 2.5-97.5% confidence intervals.
Source: OECD (2015[1]), *Skills for Social Progress: The Power of Social and Emotional Skills*, http://dx.doi.org/10.1787/9789264226159-en.

2.5. Societal outcomes

Social and emotional skills are not only important for the well-being of individuals, but are of direct relevance to the well-being of wider communities and societies as a whole. The ability of citizens to adapt, be resilient, be responsive and work well with others, to embrace differences and be innovative and resourceful is increasingly becoming the hallmark of a well-being society. As seen above, these skills are related to higher employability and productivity, which lead to higher economic output and better standards of living. But social and emotional skills are also found to decrease crime rates and increase social cohesion, institutional and social trust, civic engagement, and environmental activism, all of which represent increasingly important aspects of wider societal well-being.

2.5.1. Crime and safety

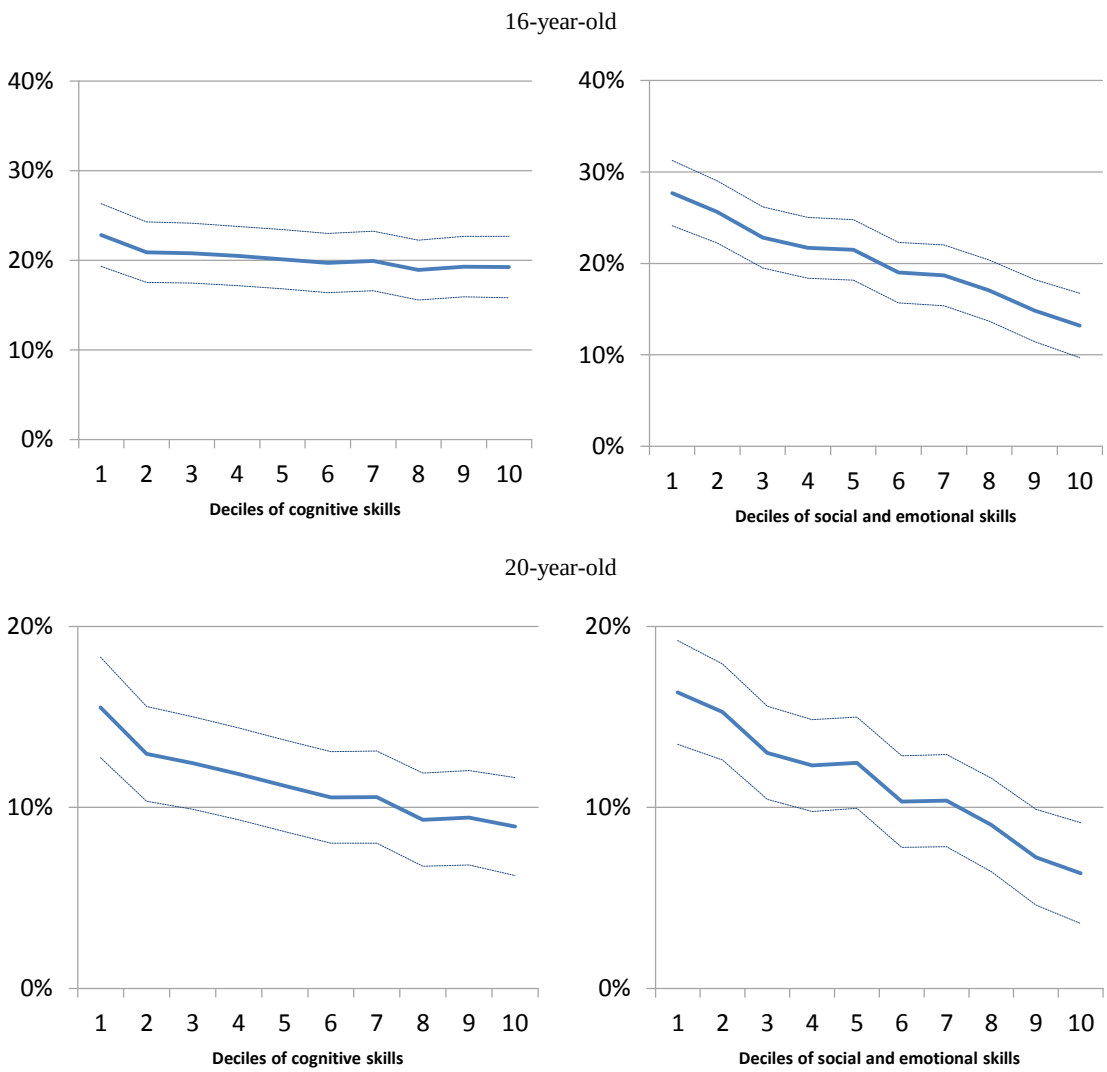
One of the most important ways in which social and emotional skills benefit both individuals and societies is in regulating behavioural problems such as aggression, violence, crimes and the use of illegal substances. Low conscientiousness and agreeableness have the strongest relationships with criminality, with people committing severe crimes having substantially lower scores for these two personality dimensions (John et al., 1994[27]).

The OECD's (2015) longitudinal analyses examining effects of social and emotional skills on future life outcomes involving middle and high school children largely mirrored findings obtained from adult samples. For example, the New Zealand Competent Children sample was used to examine the relations of cognitive and social/emotional skills with life satisfaction and conduct problems. Cognitive skills were indexed by a latent cognitive skill factor estimated from measures of achievement tests and problem-

solving tests at age 8. Social and emotional skills were assessed via an estimated latent factor based on combined measures of conscientiousness (perseverance and responsibility) and extraversion (social skills). Conduct problems included self-reported behaviours such as drinking, smoking, substance abuse, violence and fights.

Figure 2.17 shows analogous relationships for conduct problems at age 16 and age 20. Here, cognitive ability at age 8 has a relatively weak negative relationship with conduct problems at both adolescent/young adult ages, whereas social and emotional skills have a much more substantial relationship. For example, comparing an 8-year-old child at the lowest social and emotional skills decile to one at the highest, we see strong differences. Specifically, the child at the highest decile is expected to have 15% fewer conduct problems at age 16 and 10% fewer at age 20.

Figure 2.17. Conduct problems by skill decile (New Zealand Competent Children sample)



Note: Solid lines depict the probability of conduct problems at ages 16 and 20, and dotted lines, 2.5-97.5% confidence intervals.
Source: OECD (2015[1]), *Skills for Social Progress: The Power of Social and Emotional Skills*, http://dx.doi.org/10.1787/9789264226159-en.

Tackett (2006[122]) found that children who were low in agreeableness, conscientiousness, and emotional stability showed higher rates of antisocial, aggressive, and rule-breaking behaviours. There is also some evidence that personality characteristics can moderate the links between established biological factors and psychopathology. For example, the link between higher testosterone levels and more aggressive behaviour during adolescence seems to depend on youths' personalities. Specifically, Tackett et al. (2014[123]) found that the association between testosterone levels and aggressive behaviour was observed only in those low in agreeableness and conscientiousness.

Behaviours such as drug abuse, bullying, conduct problems, vandalism, criminality, etc. represent an entire spectrum of externalising disorders that also include less visible forms of deviant behaviours such as fraud, greed and corporate psychopathy (Furnham and Taylor, 2004[124]). A key difficulty in this area of research has been the co-occurrence of symptoms and specific disorders making it very complex to study associations between deficiencies in specific skills and particular disorders. The common denominator across a broad range of studies (John et al., 1994[27]; Decuyper et al., 2009[125]; Van Den Akker, Deković and Prinzie, 2010[126]; Van den Akker et al., 2014[127]; de Haan et al., 2013[128]) is that across development, the externalising spectrum is negatively related to agreeableness and conscientiousness and, depending on the type of disorder, positively with skills related to neuroticism.

2.5.2. Social connectedness

Social connectedness represents the subjective experience of interpersonal closeness with the social world as a whole (Lee and Robbins, 1995[129]). It is based on the quantity and quality of relationships a person has, their appraisals and salience (Van Bel et al., 2009[130]). These relationships enable her or him to exchange information, provide social and emotional support and material aid, to create a sense of relatedness, belonging and shared identity; and to foster personal growth and well-being.

Research suggests that in recent decades, the number of social connections is steadily decreasing, and is reflected in rising levels of loneliness and alienation in modern societies (Neal and Collas, 2000[131]). For example, one seminal study in the United States found that the median number of confidants with whom people could discuss intimate matters has dropped from around 3 in 1985, to around 2 in 2004 (McPherson, Smith-Lovin and Brashears, 2006[132]). The study also found that one in four adults did not have anyone they could confide in.

These are worrisome trends since social connections are one of the most critical factors for a person's health and overall well-being. Connectedness and social support are related with a lower risk for cancer recurrence, lower blood pressure, increased heart attack survival rates, better immune system, prolonged lives and chances for longevity, and better psychological well-being (Pressman et al., 2005[133]; Uchino, Cacioppo and Kiecolt-Glaser, 1996[134]; Brown et al., 2003[135]; Holt-Lunstad, Smith and Layton, 2010[136]; Stansfeld, 2006[137]). Greater social cohesion is associated with increased safety in low-income neighbourhoods, more physical activity and lower risk for obesity among children (De Jesus et al., 2010[138]; Franzini et al., 2009[139]).

Not all social relationships are equally beneficial and their effects depend on a number of factors. The quality of relationships depends on the level of reciprocity and mutual trust, on their diversity and intensity. However, even positive relationships can be stressful and daunting at times, while relationships that can be seen as negative and damaging can have positive aspects. For example, a relationship with a partner that is an alcoholic can still

provide safety, companionship, and support (Smyth, Goodman and Glenn, 2006[140]). Diversity of relationships matters as well, especially for children and youth that need a variety of influences and role models for optimal development (Spencer, Basualdo-Delmonico and Lewis, 2011[141]). Thus, when evaluating social connectedness it is necessary to understand the wider context, along with the diversity and depth of existing long-term relationships.

It is important to make a distinction between actual and perceived, or subjective, social connectedness, since a person may perceive their social network as small and insufficient even if it is in reality relatively large ("loneliness in a crowd"). Likewise, even relatively few relationships may make some people feel well-connected. This subjective, internal sense of relatedness is a more important determinant of an individual's well-being than her or his objective situation. In other words, if a person feels well-connected she or he will enjoy the benefits of being connected irrespective of the actual number of friends they have, and vice versa.

Connectedness and social and emotional skills are mutually-related. The ability to empathise, trust and co-operate with others, to enjoy their company and to be responsible and respectful in contact with other people, is a fundamental pre-requisite for forming and maintaining stable and fulfilling social connections. Indeed, these skills can be seen as the building blocks of any society, as human capacities that allow for functional social groupings to be established, proliferate and grow in complexity. On the other hand, social connections are important emotional buffers, lessening the impact of stress and trauma and lowering levels of anxiety and depression (Lee, Draper and Lee, 2001[142]; Chou et al., 2012[143]; Stansfeld, 2006[137]).

People are not only better off when receiving social support. Providing support is also associated with positive effects such as better self-control, greater empathy and trust, and higher self-esteem (Thoits, 2011[144]). As a consequence, other people are more likely to be trustful and co-operative thus creating a positive cycle of social, emotional and physical development and stability. On the other hand, lack of social support and social isolation are associated with a higher risk of multiple diseases, decline in physical and psychological health, and higher mortality (Baumeister and Leary, 1995[145]; Stansfeld, 2006[137]). In fact, it is found that a lack of social connections is more detrimental to health than obesity, smoking or high blood pressure (House, Landis and Umberson, 1988[146]). Social isolation also increases the likelihood for antisocial behaviour which in turn raises the risk of further isolation.

2.5.3. Civic engagement

Civic engagement refers to individual or group actions on issues of public concern, with the goal of promoting the common good. Omoto, Snyder and Hackett (2010[147]) examined motivational and personality predictors of activism and civic engagement. They showed that other-focused motivation predicted AIDS activism and civic engagement better than self-focused motivation, interpersonal orientation and personality characteristics. Schnittker and Behrman (2012[148]) examined the effects of schooling on civic engagement (participation and volunteering) and social cohesion (density of social network and quality of social relations) tempering somewhat previous optimism on the effects of education on achieving these outcomes. The effects of schooling on volunteering and participation in civic organisations disappeared almost entirely when taking into account different confounders. They concluded that increased schooling may generate some tension between navigating on the employment market and non-market

commitments, as well as between independence and interpersonal reliability, making those who invest in schooling also more apt to pursue career-orient interests, with less time left to engage in volunteering activities or civic engagement.

Developmental psychologists have paid attention to a related construct with high social significance, called generativity (Erikson, 1950[149]). During mid-adulthood, somewhere between the ages of 40 and 65, people strive to create or nurture things that will outlast them. This can be achieved by having children or by contributing to positive changes that benefit other people or society in general, especially future generations (e.g. building the Golden Gate Bridge). The generativity stage of development in Erikson's model refers to "making your mark" on the world, through caring for others, creating things and undertaking things that make the world a better place. The lack of generativity, also described as stagnation, refers to the failure of some individuals to find a way to contribute to these goals. These individuals may feel disconnected or disengaged with their community and even with the society as a whole (Van Hiel, Mervielde and De Fruyt, 2006[150]). Van Hiel and colleagues (2006[150]) showed that the "making your mark" generativity construct was related to low neuroticism (-.22), and high levels of extraversion (.36); openness (.21), and conscientiousness (.26), but not to agreeableness (.04).

Among different topics of civic activism, raising environmental awareness and engagement has been promoted as a recent major challenge to achieve in social-educational learning programmes. Milfont and Sibley (2012[151]) examined the relationships between the Big Five characteristics and different indices of "green" (environmentally sound) behaviour at both the level of the individual and countries. At the level of the individual, they examined the association with valuing protection of the environment, whereas at the level of countries, they examined the association between aggregated personality characteristics (within countries) and country-level measures of sustainability, environmental attitudes, and values. At both levels of analyses, agreeableness, conscientiousness and openness were significantly related to engagement in green behaviours.

3. The development and structure of a child's social and emotional skills

The Big Five model was initially derived from research on adults. However, considering the number of developmental changes that take place during childhood and adolescence, it raises the question: *Is it safe to assume that the ''best'' personality model for adults would be the ''best'' model for childhood?* The cumulative body of childhood research investigating this topic has largely concluded that the answer is "yes" (Caspi and Shiner, 2006[152]; De Fruyt and De Clercq, 2014[153]; Measelle et al., 2005[154]; Shiner, 1998[155]; Shiner and Caspi, 2003[29]; Tackett et al., 2008[156]; Tackett et al., 2012[157]). Several independent research streams have traced personality characteristics in children and adolescents. Using various strategies (informants, cultures, or methods of assessment), researchers have shown that most of these personality characteristics can be meaningfully linked to the Big Five among youth. Below, we highlight some of these research streams and findings.

3.1. Early temperament research

Three early childhood temperament models have had a strong impact on the child development field: the behavioural styles approach of Thomas and colleagues (Thomas, Chess and Birch, 1968[158]), the criterial approach of Buss and Plomin (1975[159]; 1984[160]), and the psychobiological approach of Rothbart (Rothbart, 1981[161]; Rothbart and Ahadi, 1994[162]). All three models were originally developed to capture characteristics of *infant temperament*, but later extended to older children.

The Thomas and Chess model was based on interviews with parents participating in the New York infant longitudinal study in the late 1950s. Nine basic temperament characteristics were rationally derived via content analysis of 22 interviews: activity (i.e. physical activity), regularity (i.e. predictability of behaviour), adaptability (i.e. response to changes in the environment), approach-withdrawal (i.e. responses to novelty), threshold of responsiveness (i.e. amount of stimulation necessary to evoke reaction), intensity of reaction (i.e. the energy level of a response), quality of mood (i.e. amount of positive and negative feelings), distractibility (i.e. effectiveness of external stimuli in altering the child's behaviour), and task persistence (i.e. length of time and maintenance of activity pursued by the child). Subsequently, several instruments were developed to measure these dimensions in infants, preschool, and school-age children (Thomas and Chess, 1977[163]; Hegvik, McDevitt and Carey, 1982[164]). Factor-analytic studies (Martin, Wisenbaker and Huttunen, 1994[165]), however, did not succeed in confirming the nine-dimensional structure. Instead only four factors were found: irritable distress, social inhibition, activity, and attention. Also, because the model was essentially based on infant behaviour, it seemed to undervalue the role of emotional and motivational components of temperament (Goldsmith, 1996[166]).

Buss and Plomin (1975[159]) modified Thomas and Chess's model and proposed four broad temperament dimensions: emotionality (i.e. intensity of emotion), activity (i.e. quantity of motor activity), sociability (i.e. closeness to others), and impulsivity (i.e.

quickness versus inhibition). Impulsivity was later dropped from the model because it did not consistently replicate (Rowe and Plomin, 1977[167]).

Finally, Rothbart and colleagues (Rothbart, 1981[161]; Rothbart and Ahadi, 1994[162]) delineated infant temperament in terms of *reactivity* and *self-regulation*. Their model was later expanded to preschool, primary school and early adolescent children (Rothbart et al., 2001[168]; Ellis and Rothbart, 2001[169]) and several age-specific assessment instruments were developed (e.g. the Child Behaviour Questionnaire). Factor analyses of these age-specific instruments showed at least three broad dimensions: negative affect and surgency that incorporated most reactivity processes, and effortful control that subsumed the proposed regulation processes.

In their review of the early temperament literature, Mervielde and Asendorpf (2000[170]) integrated the three early temperament models and proposed that four broad dimensions were needed to capture their content: emotionality, sociability/extraversion, activity, and persistence (see Table 3.1). Importantly, these broad temperamental characteristics show a clear correspondence to the adult Five-Factor Model, with childhood emotionality and persistence seen as precursors of adult emotional stability and conscientiousness, and sociability and activity predicting extraversion at a later age (De Pauw and Mervielde, 2010[171]).

Table 3.1. Common dimensions of temperament, adapted from Mervielde and Asendorpf (2000[170])

	Definition of temperament =	Emotionality	Extraversion	Activity	Persistence
Thomas and Chess	Stylistic aspects of behaviour	Negative emotionality	Social inhibition	Activity level	Task persistence
Buss and Plomin	Early-appearing, heritable aspects of personality	Emotionality	Sociability Shyness	Activity	
Rothbart	Reactive and self-regulatory aspects of behaviour	Negative affectivity	Surgency	Surgency	Effortful control

Source: Adapted from De Pauw and Mervielde (2010[171]), "Temperament, personality and developmental psychopathology: A review based on the conceptual dimensions underlying childhood traits", https://doi.org/10.1007/s10578-009-0171-8.

Because fewer than five broad personality characteristics were reliably identified in early temperament research, it has been hypothesised that these characteristics differentiate into a more complex personality structure as a young person matures (Digman and Shmelyov, 1996[172]; Rothbart, Ahadi and Evans, 2000[173]; Rothbart and Bates, 2006[174]). For example, some research has demonstrated that agreeableness becomes differentiated from conscientiousness only at around age 10 (Soto et al., 2011[175]).

More recent studies, however, have not supported the idea of developmental differentiation. De Pauw and Mervielde (2010[171]) noted that difficulties in extracting agreeableness or openness in early childhood studies could be attributed to measurement limitations (e.g. over-reliance on interviews of infants' parents) rather than some fundamental differences between personalities of children and adults. They also noted that when a broader set of personality measures was used, all Big Five personality characteristics could be reliably identified in both parent ratings and self-reports of young children. For example, De Pauw, Mervielde, and Van Leeuwen (2009[176]), and Gjerde and Cardilla (2009[177]), found that openness was salient and measurable by early childhood. Lamb et al. (2002[178]), using a longitudinal sample of 102 Swedish children,

recovered the Big Five from parent ratings in each of the five age phases (i.e. ages 2.3, 3.3, 6.7, 8.4, and 15.2).

3.2. The Big Five and broad-based child appropriate personality measures

Three studies are particularly relevant to this OECD paper. Each one used inventories developed specifically for school-aged children using the "bottom-up strategy", in which the full range of personality descriptors observed in target age groups is collected and then reduced to a subset of items applicable across multiple ages and cultures. The rationale for this approach is very similar to the one made by adult personality researchers, namely, that all important personality characteristics have already been encoded in everyday natural language.

Mervielde and DeFruyt (1999[179]) described the development of the Hierarchical Personality Inventory for Children (HiPIC) using samples of Belgian school children. The inventory was constructed using a bottom-up strategy by content analysing over 3 000 personality descriptors found in the Flemish language, and reducing it to 144 items representing the most common personality descriptions of children aged 6-12 (Kohnstamm et al., 1998[180]). HiPIC items are organised into 18 sub-scales (facets) which, in turn, have been shown to aggregate into five broad characteristics: conscientiousness, benevolence, extraversion, imagination, and emotional stability. Table 3.2 shows results of a principal component analysis (a statistical technique that can be used to discover the underlying structure of a set of measures) for the three samples of Flemish school children aged 5-7, 8-10, and 11-13. In the table, rows represent HiPIC facets, while columns represent underlying broad characteristics (factors). The values in the table are called factor loadings; they indicate correlations between respective facets and broad factors. The largest positive or negative factor loadings (appearing in bold in the table) indicate which facets belong to which broad characteristics.

Table 3.2. Big Five structure for the HiPIC inventory across three age groups

	Conscientious-ness			Benevolence			Extraversion			Imagination			Emotional stability		
Facets	**5-7**	**8-10**	**11-13**	**5-7**	**8-10**	**11-13**	**5-7**	**8-10**	**11-13**	**5-7**	**8-10**	**11-13**	**5-7**	**8-10**	**11-13**
Conscientiousness															
Achievement motivation	**.88**	**.91**	**.87**	-.03	.01	-.11	.19	.14	.13	.30	.24	.32	-.04	.01	.08
Concentration	**.85**	**.87**	**.86**	-.26	-.23	-.20	.01	-.07	-.05	.18	.15	.25	.21	.25	-.16
Orderliness	**.84**	**.82**	**.91**	-.30	-.18	-.13	.02	-.13	-.04	-.12	.01	.02	-.04	-.23	.01
Perseverance	**.83**	**.86**	**.86**	-.29	-.29	-.28	.09	.07	.04	.18	.11	.23	.10	.07	-.05
Benevolence															
Egocentrism	-.23	-.15	-.20	**.89**	**.94**	**.86**	-.12	-.06	-.11	-.05	-.02	-.18	-.10	-.09	.02
Irritability	-.24	-.16	-.25	**.86**	**.89**	**.83**	.07	.06	.08	.05	-.02	.03	-.16	-.24	.31
Dominance	.05	.07	.07	**.79**	**.77**	**.68**	.40	.41	.42	.10	.16	.23	.17	.28	-.29
Compliance	.55	.43	.51	**-.72**	**-.80**	**-.71**	.07	-.09	.08	-.03	.01	.07	-.11	-.13	.19
Altruism	/	.15	.17	/	**-.62**	**-.52**	/	.50	.37	/	.25	.50	/	-.27	.38

	Conscientious-ness			Benevolence			Extraversion			Imagination			Emotional stability		
Facets	**5-7**	**8-10**	**11-13**	**5-7**	**8-10**	**11-13**	**5-7**	**8-10**	**11-13**	**5-7**	**8-10**	**11-13**	**5-7**	**8-10**	**11-13**
Extraversion															
Shyness	-.08	-.11	.01	-.04	.01	.04	**-.86**	**-.79**	**-.74**	-.04	-.12	-.38	-.28	.40	.27
Expressiveness	.13	.11	.02	.16	.18	.01	**.81**	**.77**	**.70**	.12	.33	.44	.00	.08	.13
Optimism	.19	-.06	-.04	-.31	-.38	-.28	**.75**	**.78**	**.75**	.19	.13	.24	.13	.20	-.23
Energy	-.28	-.16	.06	.34	.36	.19	**.51**	**.72**	**.82**	.17	.01	-.17	-.08	.14	-.05
Imagination															
Creativity	.04	.11	.21	-.07	-.06	-.07	.14	.26	.18	**.88**	**.86**	**.77**	.07	.06	-.05
Curiosity	.45	.51	.44	.19	.01	-.04	.33	.22	.28	**.66**	**.68**	**.73**	.03	.29	-.04
Intellect	.50	.48	.53	.22	.02	.03	.12	.08	.03	**.56**	**.57**	**.67**	.35	.51	-.32
Emotional stability															
Anxiety	.05	.20	.03	.13	.07	.03	-.07	-.20	-.13	-.03	-.02	.00	**-.95**	**-.91**	**.95**
Self-confidence	.30	.13	.26	.11	.16	.08	.43	.51	.46	.28	.23	.38	**.72**	**.73**	**-.64**
Independence	/	.48	/	/	-.01	/	/	.26	/	/	.35	/	/	**.69**	/

Note: Largest loadings are printed in bold.
Source: Adapted from Mervielde and DeFruyt (1999[179]), "Construction of the hierarchical personality inventory for children (HiPIC)", http://hdl.handle.net/1854/LU-119616.

As can be seen, three of the HiPIC dimensions closely resemble the adult Big Five (i.e. extraversion, conscientiousness, and emotional stability). The benevolence dimension is conceptually and empirically related (De Fruyt et al., 2000[181]) to the adult agreeableness dimension, and the imagination dimension closely resembles openness. Importantly, the five-dimension structure was highly replicable across the three age groups (5-7, 8-10, and 11-13).

In a second study, Halverson et al. (2003[182]) described the development of the Inventory of Child Individual Differences (ICID) by an international team of researchers from eight countries (Belgium, People's Republic of China [China], Germany, Greece, Netherlands, Poland, Russian Federation, and the United States). The development of ICID began with over 50 000 country- and language-specific parental descriptors of children ages 3 to 12 years. Through several rounds of content and comparative analyses, this large number of descriptors was reduced to a common set of 141 culture-free items measuring 15 narrow personality characteristics. Next, Halverson et al. (2003[182]) collected 1 035 parent ratings from four samples of children (ages 3-13) from China, Greece, and the United States. Using confirmatory factor analysis (a statistical procedure that tests the "goodness of fit" of a hypothesised model), Halverson et al. (2003[182]) found a clearly identified and well-fitting Big Five structure.

Table 3.3 shows the results of their study with the Big Five factors appearing in columns (N, E, O, A, and C), and the ICID facet scales appearing in rows. The numbers in the figure are correlations (i.e. factor loadings in a factor analysis) between the facet and the respective Big Five characteristic. As can be seen, most of the facet scales correlated with only one Big Five factor (e.g. organised showed a high correlation of .80 with conscientiousness, but not with any of the other four characteristics). The Goodness of Fit Index for the model overall was .94, indicating that this Big Five model fit the data very well.

Table 3.3. Halverson et al.'s (2003) confirmatory factor analysis of three country ratings

		N	E	O	A	C
	Neuroticism					
N1	Fearful/Insecure	87				
N2	Negative emotionality	76			-54	
N3	Shy	54	-20			
	Extraversion					
E1	Positive emotionality		89		46	
E2	Sociable		87			
E3	Considerate		81		64	
E4	Activity level		67			
E5	Openness		51	38		
	Openness to experience					
O1	Intellect			87		
	Agreeableness					
A1	Antagonism				-73	
A2	Strong willed	54	49		-69	
	Conscientiousness					
C1	Organised					80
C2	Achievement orientation			40		53
C3	Distractible	38				-57

Note: O = openness, A = agreeableness, C = conscientiousness, N = neuroticism (opposite of emotional stability), and E = extraversion; decimals omitted.
Source: Adapted from Halverson et al (2003[182]), "Personality structure as derived from parental ratings of free descriptions of children: The inventory of child individual differences", http://dx.doi.org/10.1111/1467-6494.7106005.

In a follow-up study, Tackett et al. (2012[157]) analysed parent ratings of children and early adolescents recruited from five countries (Canada, China, Greece, the United States, and the Russian Federation) on 108 ICID items. Of particular interest are their results for 9-11 and 12-14 year-olds, as these are close to the ages of children comprising the study populations of the OECD Study on Social and Emotional Skills (SSES). For each age group, Tackett et al. conducted a series of principal component analyses to determine: a) which ICID items correlated with which broad Big Five factors; and b) whether the obtained component structure was similar across age groups.

Tables 3.4A and 3.4B show results for five characteristics for the 9-11 and 12-14 age groups. In each figure, the six ICID items that had the highest correlations with each component are shown. These figures show that of the Big Five, extraversion, conscientiousness, and openness consistently replicated across the two age groups. They also show that the composition of these broad characteristics is similar to that found in adult samples. Results for agreeableness and neuroticism (the opposite of emotional stability), on the other hand, were less stable. The neuroticism component showed the most difficulty in replication across ages, especially for 12-14 year-olds. This may be due, however, to difficulties involved in measuring more internal aspects of neuroticism (e.g. sadness, anxiety, insecurity) in children when relying on informant reports. Also, negative emotionality items highly correlated with aspects of (dis)agreeableness (e.g. angry, irritable, rude, hard-headed), which created a combined agreeableness/neuroticism component. This has been found in other research as well (Martel, Nigg and Lucas,

2008[183]; Tackett et al., 2008[156]). Importantly, there was a clean differentiation of conscientiousness and agreeableness characteristics.

Table 3.4. Results for the five principal components (A = ages 9-11; B = ages 12-14)

A

O	E	A/N	C	N
Thinking abilities	Energetic	Rude	Organised	Afraid of lots
Quick to learn	Always on the move	Selfish	Neat and tidy	Feeling hurt
Large vocabulary	Sociable	Irritable	Disorganised	Lacks confidence
Intelligent	Active physically	Quick tempered	Untidy	Fearful
Good concentration	Lively/enthusiastic	Angry easily	Careful	Needs help w/lots
Eager to learn	Loves to be w/people	Aggressive	Perfectionist	Easily upset

B

E	A	C	A/N	O
Energetic	Thoughtful	Organized	Angry easily	Thinking abilities
Sociable	Caring	Neat and tidy	Irritable	Good memory
Lots of friends	Sensitive	Self-disciplined	Quick tempered	Intelligent
Physically active	Loving	Good concentration	Complains	Quick to learn
Makes friends easily	Considerate	Careful	Hard-headed	Large vocabulary
Always on the move	Sweet	Responsible	Wants things own way	Quick to understand

Note: O = Openness, A = Agreeableness, C = Conscientiousness, N = Neuroticism (opposite of Emotional Stability), and E = Extraversion. N (ages 9-11) = 1,302, N (ages 12-14) = 639.
Source: Adapted from Tackett et al. (2012[157]), "The hierarchical structure of childhood personality in five countries: Continuity from early childhood to early adolescence", https://doi.org/10.1111/j.1467-6494.2011.00748.x.

HiPIC and ICID research has also shown that facets underlying the Big Five can be reliably measured across age groups. Mervielde and De Fruyt (1999[179]) developed the HiPIC instrument to have 18 facet scales each containing eight items. About 200 children in each of the three age ranges (5-7, 8-10, and 11-13) were then rated by more than one rater; raters included mothers, fathers, current teachers, and former teachers. The ratings were then averaged across raters and reliabilities were computed via coefficient alpha coefficient of reliability. Table 3.5 presents the reliabilities and average item inter-correlations for each of these 18 facets for the three age ranges, and shows that highly reliable and consistent scores were obtained. Average item inter-correlations ranged from .39 to .66 indicating that a single dimension was assessed by each facet scale across age groups.

Table 3.5. Internal consistency reliabilities and average item inter-correlations for HiPIC facets

	Age 5 to 7		Age 8 to 10		Age 11 to 13	
Facets	**Alpha**	**Mean r**	**Alpha**	**Mean r**	**Alpha**	**Mean r**
Conscientiousness						
Achievement motivation	0.92	0.61	0.93	0.63	0.93	0.63
Concentration	0.92	0.58	0.91	0.58	0.9	0.54
Orderliness	0.93	0.62	0.95	0.69	0.93	0.62
Perseverance	0.92	0.61	0.91	0.55	0.92	0.54

	Age 5 to 7		Age 8 to 10		Age 11 to 13	
Facets	**Alpha**	**Mean r**	**Alpha**	**Mean r**	**Alpha**	**Mean r**
Benevolence						
Egocentrism	0.87	0.45	0.91	0.57	0.83	0.39
Irritability	0.92	0.6	0.93	0.62	0.9	0.52
Dominance	0.88	0.47	0.94	0.65	0.85	0.41
Compliance	0.92	0.6	0.92	0.6	0.85	0.42
Altruism	/	/	0.91	0.57	0.91	0.55
Extraversion						
Shyness	0.92	0.58	0.91	0.55	0.88	0.49
Expressiveness	0.88	0.48	0.88	0.49	0.85	0.42
Optimism	0.91	0.55	0.89	0.52	0.88	0.48
Energy	0.87	0.44	0.92	0.6	0.89	0.5
Imagination						
Creativity	0.85	0.43	0.89	0.51	0.89	0.49
Curiosity	0.92	0.59	0.93	0.64	0.92	0.6
Intellect	0.94	0.66	0.93	0.62	0.94	0.65
Emotional stability						
Anxiety	0.86	0.43	0.91	0.57	0.86	0.44
Self-confidence	0.88	0.47	0.87	0.48	0.85	0.41
Independence	/	/	0.86	0.44	/	/

Source: Adapted from Mervielde and DeFruyt (1999[179]), "Construction of the hierarchical personality inventory for children (HiPIC)", http://hdl.handle.net/1854/LU-119616.

Facet-level reliabilities for Halverson et al.'s (2003[182]) ICID were obtained for samples from China, Greece, and the United States for five age ranges (3-5, 6-8, 9-11, 12-14, and 20-23). Parental ratings were obtained for all age ranges and average reliabilities (across the three countries) and item inter-correlations are shown in Table 3.6. As with the HiPIC, reliability indicators are ranging between acceptable to very high.

Table 3.6. ICID reliabilities and average item inter-correlations averaged across countries

Scale	No. of items	3–5a	6–8b	9–11c	12–14d	Adult	Average inter-item correlations
Sociability	7	0.88	0.85	0.86	0.84	0.92	0.46
Shy	7	0.75	0.72	0.72	0.74	0.85	0.36
Activity level	6	0.76	0.76	0.79	0.84	0.86	0.46
Positive emotions	6	0.86	0.84	0.84	0.83	0.9	0.53
Antagonism	9	0.83	0.83	0.83	0.84	0.93	0.45
Strong willed	8	0.77	0.73	0.78	0.78	0.79	0.33
Negative affect	6	0.8	0.76	0.74	0.74	0.9	0.43
Considerate	7	0.86	0.86	0.87	0.86	0.93	0.53
Compliant	7	0.81	0.82	0.79	0.81	0.89	0.44
Organised	7	0.78	0.83	0.84	0.86	0.89	0.34

Scale	No. of items	3–5a	6–8b	9–11c	12–14d	Adult	Average inter-item correlations
Achievement motivation	6	0.71	0.78	0.74	0.8	0.9	0.45
Distractible	7	0.76	0.78	0.77	0.79	0.91	0.41
Fearful/Insecure	7	0.75	0.73	0.78	0.79	0.88	0.33
Intellect	11	0.88	0.9	0.9	0.9	0.94	0.49
Openness	10	0.83	0.79	0.84	0.8	0.86	0.48

Note: Reliabilities are represented by alpha coefficient; for ages 3–12 years, reliability was averaged over China, Greece, and the United States. For the ratings for adult children, only United States data was used. [a]N = 349; [b]N = 274; [c]N = 282; [d]N = 339; [e]N = 108.
Source: Adapted from Halverson et al. (2003[182]), "Personality structure as derived from parental ratings of free descriptions of children: The inventory of child individual differences", https://doi.org/10.1111/1467-6494.7106005.

In their integrative reviews of the literature, Shiner (1998[155]), Shiner and Caspi (2003[29]), and Caspi and Shiner (2006[152]), proposed common taxonomies of temperament and personality characteristics (see Table 3.7 below). As can be seen in this table, Caspi and Shiner chose the Big Five labels of neuroticism, extraversion, conscientiousness, agreeableness and openness to experience to define the broad domains. The authors also offered alternative labels for these domains from the temperament literature (extraversion vs. surgency), and populated each domain with narrow personality characteristics (facets) drawn from both research traditions. For example, conscientiousness was given a broader interpretation and incorporated not only achievement motivation and orderliness, which are commonly identified in adult personality research, but also the attentional and inhibitory controls found in temperament research.

Table 3.7. Conceptual dimensions underlying temperament and personality

Domain level	Neuroticism	Extraversion	Conscientiousness	Agreeableness	Openness to experience
Alternative labels	Negative affect – Emotional stability	Positive emotionality – Surgency	Constrain – Effortful control – Disinhibition	Need for affiliation Benevolence	Intellect Imagination
Facet level	Fearfulness	Sociability	Attentional control	Antagonism	Intellect
	Anxiety	Shyness	Inhibitory control	Prosocial tendencies – Empathy	Creativity
	Sadness	Activity level	Achievement motivation	Manageability	Curiosity
	Anger – Irritability	Social inhibition	Orderliness	Wilfulness Dominance	

Source: Adapted from De Pauw and Mervielde (2010[171]), "Temperament, personality and developmental psychopathology: A review based on the conceptual dimensions underlying childhood traits", https://doi.org/10.1007/s10578-009-0171-8.

4. Malleability of social and emotional skills: Prospects for change

The previous section demonstrated the importance of social and emotional skills. But do they become "set in plaster" at some point? Or do people change as a result of ageing or life events? Or can interventions – school programmes specifically – facilitate growth and improvement?

4.1. Developmental trajectories of social and emotional skills

Social and emotional skills develop and change with age, and are affected by a combined influence of biological and environmental factors, life events, and individual actions and perceptions. These influences, however, are very complex as their interaction simultaneously affects both stability and change. For example, hereditary factors appear to determine both initial levels and stability of personality scores with heritability estimates ranging from 40% for agreeableness to 57% for openness to experience (Bouchard and McGue, 2003[184]; Jang, Livesley and Vernon, 1996[185]; Specht, Schmukle and Egloff, 2011[186]).

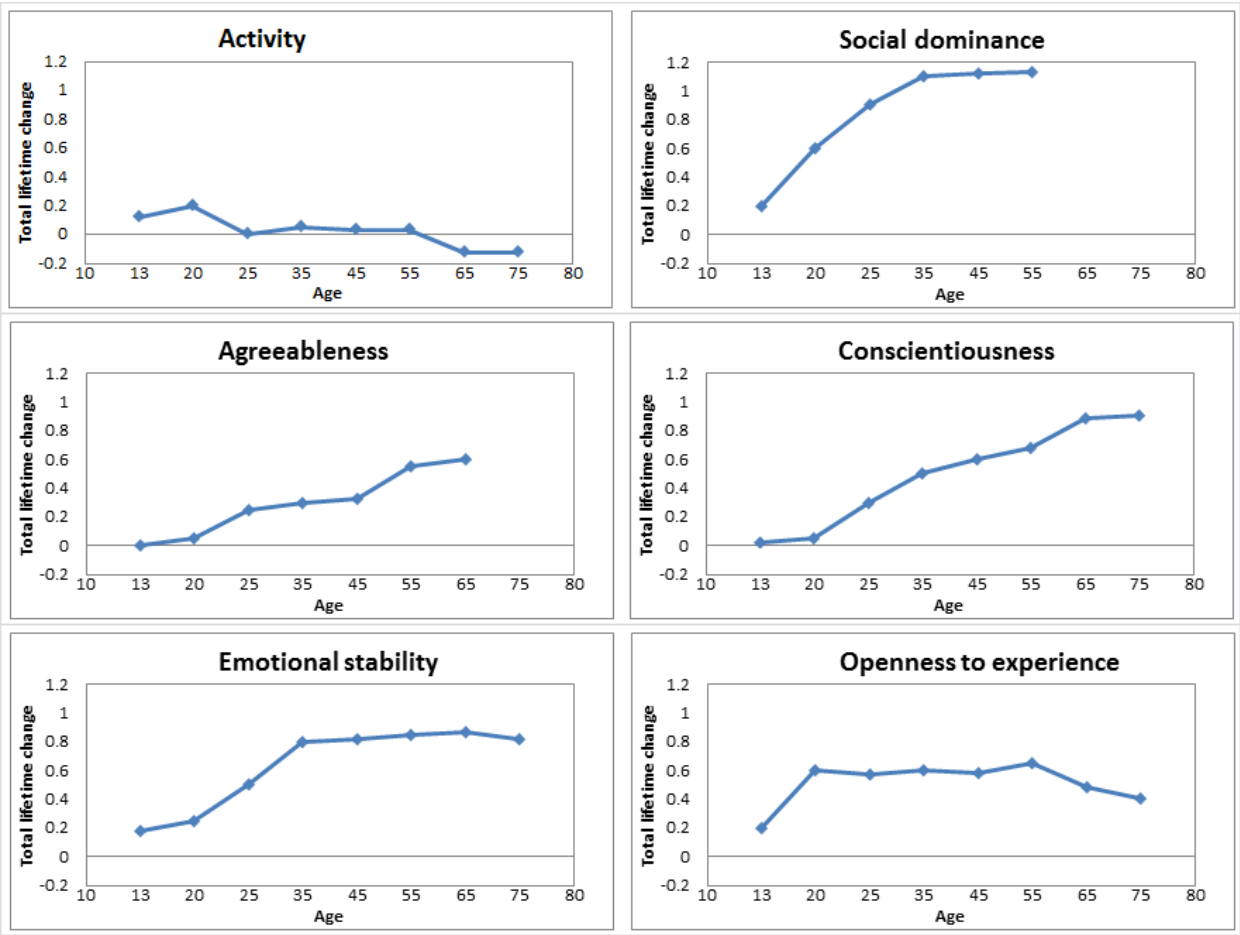
According to Soto and Tackett's (2015[187]) recent review, research examining personality development has reached three key conclusions. The first conclusion is often referred to as *the maturity principle*, and states that, in terms of the average level of a particular skill at different ages, levels of conscientiousness, emotional stability, social dominance (a facet of extraversion), and agreeableness generally increase with age. On the other hand, social vitality (i.e. activity) slowly decreases with age, while openness to experience shows an inverted U relationship with age. Figure 4.1, from Roberts, Walton and Viechtbauer (2006[188]), summarises these effects.

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 Jr., 2006[12]). 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 (Specht, Schmukle and Egloff, 2011[186]; Bleidorn et al., 2009[189]; Roberts and Mroczek, 2008[190]). For example, a longitudinal study of adult twins (Bleidorn et al., 2009[189]) revealed substantial differences in the etiology (causal mechanism) of their personality characteristic 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[190]). 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, Schmukle and Egloff, 2011[186]; Roberts, Wood and Smith, 2005[191]).

Figure 4.1. Cumulative average-level changes in personality throughout the life span



Note: Total lifetime change represents cumulative size of change over life course (represented as standardised mean-level changes).
Source: Adapted from Roberts, Walton and Viechtbauer (2006[188]), "Patterns of mean-level change in personality traits across the life course: A meta-analysis of longitudinal studies", http://dx.doi.org/10.1037/0033-2909.132.1.1.

These mean-level changes in personality depict trends at a group level, hiding a substantial degree of individual variation. In particular, individuals have unique patterns of change throughout their lives that do not necessarily follow these general trends and that themselves represent an individual characteristic (Roberts, Walton and Viechtbauer, 2006[188]; Bleidorn et al., 2009[189]; Roberts and Mroczek, 2008[190]). In this sense, the propensity to personality change is an individual difference variable in its own right (Roberts and Mroczek, 2008[190]).

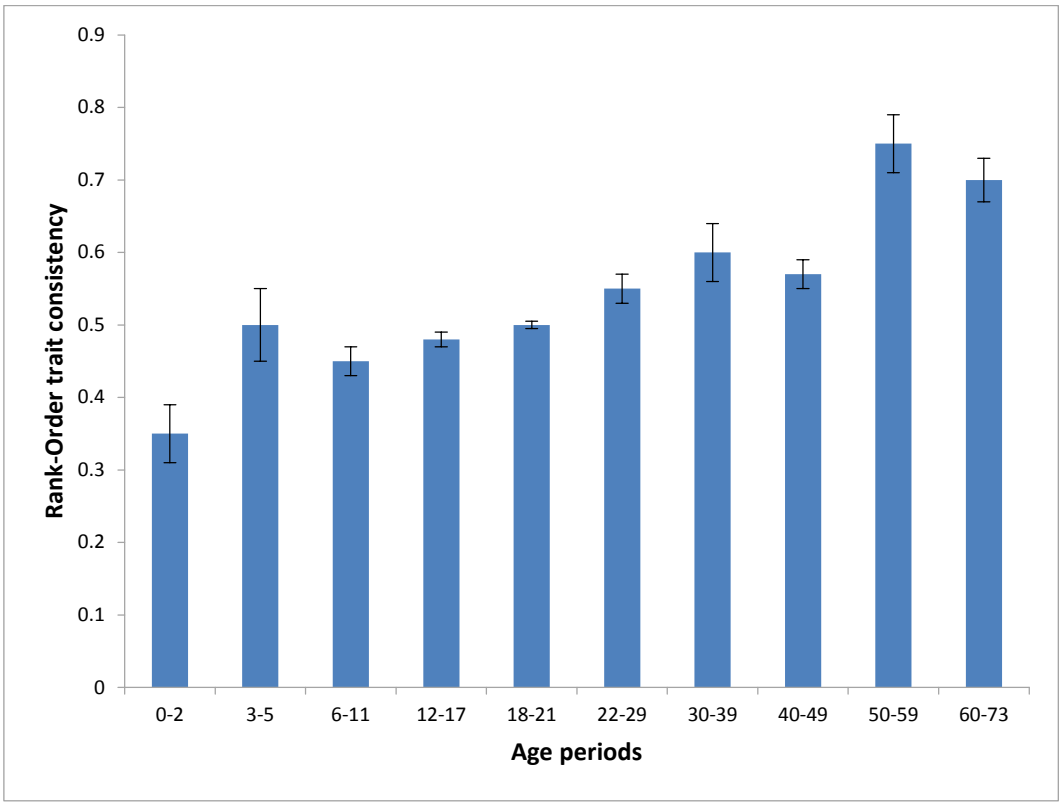
The second conclusion about the development of these personality characteristics is often referred to as *the cumulative continuity principle* and states that, in terms of rank-order stability (the ordering of individuals from highest to lowest on a particular skill over

time), personality becomes increasingly stable across adulthood (Roberts and DelVecchio, 2000[192]). In particular, seven-year test-retest stability estimates (the correlation between the same measures evaluated seven years apart) plateau at r = 0.74 for personality characteristics, about the same level of stability as for IQ. However, measured personality characteristics did not reach this level of stability until at least the age of 50 (see Figure 4.2), whereas for IQ the plateau is reached by the age of six to eight (Hopkins and Bracht, 1975[193]).

This means that, at an early age, children's personality scores may fluctuate substantially, resulting in low test-retest correlations between ages. However, in adulthood, the test-retest correlations become stronger, meaning that scores fluctuate less. For example, adults who score lower on extraversion than others will continue to have lower scores throughout their remaining lives. Figure 4.2 summarises Roberts and DelVecchio's (2000[192]) findings. Note that test-retest correlations (*p*) become higher with age.

Furthermore, the susceptibility to change over a lifetime is not the same for all social and emotional skills. In their longitudinal study of German adults, Specht and colleagues (2011[186]) 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 4.2. Rank-order consistency of social and emotional skills through life



Note: Population estimates of mean consistency across age categories with 95% confidence level estimates.
Source: Adapted from Roberts and DelVecchio (2000[192]), "The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies", http://dx.doi.org/10.1037/0033-2909.126.1.3.

Roberts and DelVecchio (2000[192]) noted that there can be substantial changes in personality, especially between ages 6 and 18, when the test-retest correlations are comparatively low. Subsequently, a number of research teams have focused on investigating this particular developmental period in more detail (Denissen et al., 2013[194]; Slobodskaya and Akhmetova, 2010[195]; Soto et al., 2011[175]; Van den Akker et al., 2014[127]) (see Haan et al., (2017[196])). Their findings led to the introduction of a third conclusion about personality development, the *adolescence disruption principle* (Soto, 2016[197]; Soto and Tackett, 2015[187]). This proposes that the biological, social, and psychological transitions from childhood to adolescence are accompanied by temporary dips and swings in personality scores. Specifically, cross-sectional and longitudinal research involving both self- and parental reports found that agreeableness, conscientiousness, and openness to experience actually declined from late childhood into early adolescence, and then inclined rapidly from late adolescence into early adulthood. Also, youths appeared to become substantially less sociable but more physically active at a younger age. Emotional stability appeared to decline in adolescence, (although more for girls than for boys), before recovering later in life (Denissen et al., 2013[194]; Soto et al., 2011[175]; Van den Akker et al., 2014[127]). Clearly, childhood and adolescence are key periods of personality development and seem to follow different patterns of stability and change than in adulthood.

Haan et al. (2017[196]) offered some insights to the likely reasons for the adolescence disruption principle. They proposed that as children get older, they orient themselves progressively towards peers (Grusec and Davidov, 2010[198]) and increasingly need to develop such skills as negotiating, resolving conflicts, taking another person's point of view, empathy, and understanding (Kerr et al., 2003[199]). This stronger orientation towards peers may also increase feelings of insecurity (Kerr et al., 2003[199]). During early adolescence, children also need to adjust to a multitude of physical, hormonal, and psychosocial changes (Galambos and Costigan, 2003[200]; Smetana, Campione-Barr and Metzger, 2006[201]) and that period is often characterised by conflicts between developmental tasks that may lead to temporary developmental regressions, particularly in the areas of self-regulation and decision-making (Blakemore and Choudhury, 2006[202]). As children progress through adolescence, they tend to seek greater autonomy from authority figures by more frequently questioning and resisting values, rules, and norms that they perceive as imposed on them by adults (Smetana, Campione-Barr and Metzger, 2006[201]). Simultaneously, however, youths must increasingly develop and internalise abstract moral and social principles that promote prosocial and responsible behaviours, as well as continue to develop self-regulatory skills that help them avoid risky behaviours in the interest of long-term goals (Gestsdottir and Lerner, 2008[203]).

The sheer magnitude of demands on social, regulatory, emotional, and moral capacities on children ages 6 to 18 inevitably leads to pronounced changes in many of their personality characteristics. This clearly demonstrates that personality is malleable during this period and leads to the key question: *Can systematic interventions change social and emotional skills of children in desired directions?*

4.2. Interventions and change

There are number of studies examining the impact of different kinds of school-based interventions to enhance students' social and emotional learning. These programmes usually aim to either increase particular socio-emotional skills (e.g. peaceful conflict resolution) or influence a specific subset of the outcomes, including positive social

behaviours, conduct problems, emotional distress, psychological well-being, physical health, and academic performance.

A number of extensive meta-analyses have been conducted examining the impact of such interventions, with special attention for the role and impact of important moderators (Durlak et al., 2011[204]; Park-Higgerson et al., 2008[205]; Sklad et al., 2012[206]). Durlak and his colleagues (2011[204]) have provided the most comprehensive answer to this question to date. They conducted a meta-analysis of 213 school-based social and emotional learning (SEL) programmes that involved more than 270,000 primary and secondary school children. Overall, Durlak et al. found a standardised effect size (i.e. the amount of change in standard deviation units) for social and emotional skill development that was moderately high (d = .57) when comparing treatment groups to controls. This demonstrates that interventions to improve the social and emotional skills of school children can be effective.

One important consideration for the effectiveness of interventions was what Durlak et al. termed the "SAFE" method, which means that the intervention programme was sequenced (i.e. used a *"connected and coordinated set of activities to achieve their objectives relative to skill development"* [p. 6]), involved active learning, was focused (i.e. the programme had *"at least one component devoted to developing personal or social skills"* [p. 6]), and explicit (i.e. "*the program targeted specific SEL skills rather than targeting skills or positive development in general terms*" [p. 6]). The social and emotional skill effect size for interventions that met the SAFE criteria was a substantial .69, in contrast to the effect size for interventions not meeting these criteria which was a mere .01 (note: an effect size is a measure of the magnitude of an effect, and .20 is usually taken to be "small", .50 is moderate and .80 is large).

For the relatively small number of studies that conducted follow-up assessments at least 6 months after the end of the training programme, Durlak et al. (2011[204]) found a significant, but reduced, effect size of .26 for SEL skills. Thus, the treatment effect persisted, but its reduced magnitude suggests that social and emotional skill development should be a continuing effort in schools.

A second major meta-analysis on the subject has been conducted by Sklad and collaborators (2012[206]), reporting effects of 75 universal school-based intervention programmes for which the data were published between 1995 and 2008 with an average reported intervention sample size of N = 543 (range 13 to 8280). Skald et al.'s meta-analysis provides an excellent follow-up on Durlak et al.'s review, because they also included 16 non-American based studies (21% of the total meta-analysis) and investigated immediate and delayed outcomes. The majority of the reviewed studies had a post-test between 0 to 6 months (73.3%), 36% of the studies had a follow-up between 7 and 18 months and for 21.3% follow-up data were available after 19 months or more. Again here, the outcome measurement relied chiefly on self-reports (60% of the programmes) and for 73.3% of the programmes, no intervention manual was available, making it difficult to really study the content of interventions.

Sklad and colleagues (2012[206]) found substantial evidence indicating an improvement but the effect sizes varied by domain targeted for intervention; *d* effect size estimates for immediate effects were .70 for socio-emotional skills, .46 for positive self-image, .46 for immediate academic achievement, -.43 for antisocial behaviour, .39 for prosocial behaviour, -.19 for mental disorders, and -.09 for substance abuse. In other words, socio-emotional skills were most malleable in intervention contexts, whereas mental disorders and substance abuse were least affected by the interventions. As one would expect, effect

sizes at a later follow-up decreased substantially for all outcomes, with effect sizes reduced to .26 for academic achievement, -.20 for antisocial behaviour, -.10 for mental disorders, .07 for positive self-image, .12 for prosocial behaviour, .07 for social-emotional skills and -.18 for substance abuse. The authors concluded from these data that, despite large immediate gains, long-term effects were small, with the average programme participant still outperforming the average non-participant by 5%.

Additional key findings were that programmes with a duration of less than a year had more impact on social skills than those that had a longer timeframe; also a smaller number of sessions (less than 20) turned out to be more effective. Intervention impact on social skills was equally large in primary and secondary school, whereas effectiveness to reduce antisocial behaviour was strongest in primary school. These findings suggest that antisocial behaviours are better tackled early on at school, whereas there is equal room for improvement of social skills across both primary and secondary school. Teachers in Sklad's (2012[206]) analysis further turned out to be as effective as non-teachers to run programmes, confirming Durlak's (2011[204]) conclusion that teachers can successfully implement these programmes. Finally, intervention impact on social skills seems to be equal in North American samples versus studies conducted outside of North America, suggesting that malleability generalises across societies.

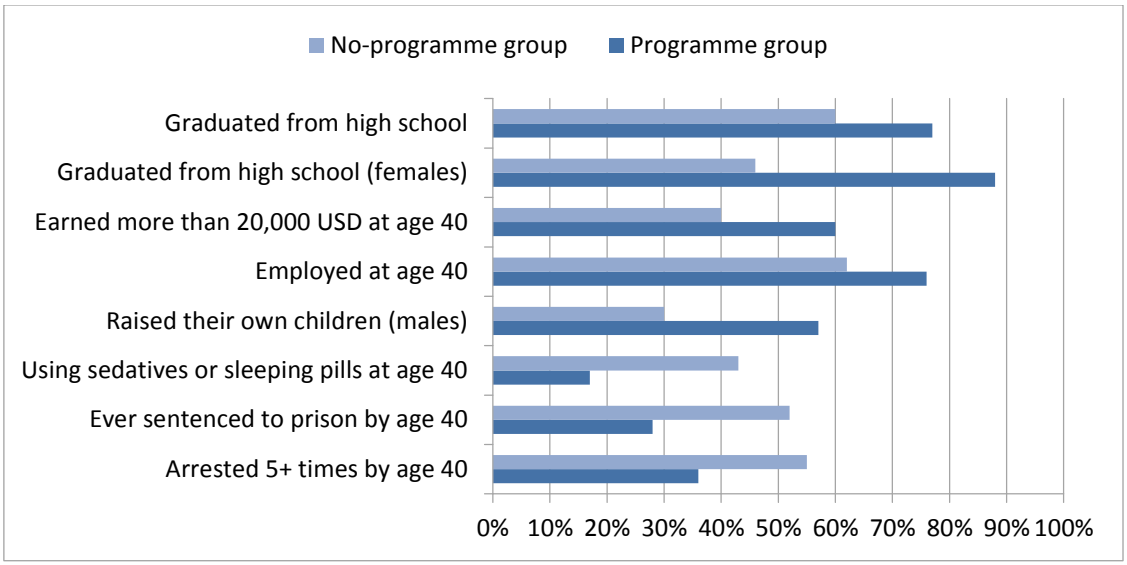
Besides these meta-analyses targeting a broad range of outcomes, there is also a wide range of studies, including randomised control trials, on reducing aggressive behaviours (e.g. Park-Higgerson, et al., (2008[205])), and focusing on antisocial personality (Scott, Briskman and O'Connor, 2014[207]), oppositional defiant disorder (Scott, Briskman and O'Connor, 2014[207]), and conduct disorder. There are effect evaluations examining broad and intensive clinical programmes, often also working with parents (Scott, Briskman and O'Connor, 2014[207]), broad and intensive community versus clinical programmes (Kolko et al., 2009[208]), short (reduced) programmes and the effect of organising booster sessions (Lochman et al., 2014[209]) to maintain long-term effects of interventions.

An often-cited example of an intervention successfully improving social and emotional skills is the Perry Preschool Programme (Heckman and Kautz, 2012[38]; Heckman, Pinto and Savelyev, 2013[210]). This was a programme for disadvantaged 3- and 4-year-olds with an intelligence quotient (IQ, a measure of general cognitive abilities) below 85 at the start of the study. The programme also included weekly home visits that focused on improving child-parent interactions. The intervention lasted two years and then both the treatment and control groups were followed until the age of 40. At age five, the average IQ of children in the experimental group had improved to about 95. Unfortunately, this gain had dissipated by the time the children were ten when the average IQ of both groups was about 85. However, Heckman, Pinto and Savelyev (2013[210]) also showed that improvements in a variety of social and emotional skill measures, especially those related to externalising behaviours (i.e. physical aggression, disobeying rules, cheating, stealing), persisted for the experimental group. As with the General Educational Development (GED) graduates and high school graduates, the treatment and control groups in the Perry Preschool Programme were comparable in cognitive ability but differed in social and emotional skills. And again, the group with better social and emotional skills – the children in the Perry Preschool Programme experimental group – had better outcomes for a variety of academic, economic and life outcomes (Figure 4.3).

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[37]). However, the evidence indicates that learning after school, including

learning in the workplace, can have a significant influence on a person's skills (Brunello and Schlotter, 2011[37]; Heckman and Kautz, 2012[38]).

Figure 4.3. Long-term consequences of participation in the Perry Preschool Programme



Source: Adapted from Schweinhart et al. (2005[211]), *Lifetime effects: The High/Scope Perry preschool study through age 40*.

Furthermore, recent studies on the effectiveness of cognitive and clinical interventions indicate that rather substantial changes in social and emotional skills are possible, even after relatively short treatment periods and equally across lifespans (Roberts et al., 2017[212]; Jackson et al., 2012[213]; Piedmont, 2001[214]). For example, Jackson and colleagues (2012[213]) 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 (2017[212]) 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 interventions.

Important life events such as marriage or one's first job can also have a substantial influence on personality (Roberts, Walton and Viechtbauer, 2006[188]; Specht, Schmukle and Egloff, 2011[186]). For example, Lehnart and Neyer (2006[215]) 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 decreases in neuroticism (Lehnart, Neyer and Eccles, 2010[216]). 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[217]). Furthermore, conscientiousness was found to increase in individuals when they started their first job and decrease when they retired (Specht, Schmukle and Egloff, 2011[186]). Military training has been shown to affect personality with military recruits becoming less agreeable after basic military training (Jackson et al., 2012[218]).

5. Cross-cultural comparability of the Big Five characteristics

5.1. Cross-cultural relevance of the Big Five skills

There is extensive evidence that the Big Five personality characteristics and their facets are generalisable across cultures and nations (Paunonen et al., 1996[219]; McCrae and Costa Jr., 1997[220]). Even though research has shown the presence of some culture-specific constructs (Cheung, F. M. et al., 2001[53]), the common Big Five dimensions and their facets are clearly present in most cultures and languages, making cross-cultural comparisons feasible.

Several large international teams of researchers have collaborated on studies involving many widely-used personality inventories. For example, the Big Five Inventory (BFI) was translated from English into 28 different languages by Schmitt and colleagues (2007[221]) and administered in 56 countries, including Belgium, Brazil, Canada, Chile, France, Germany, Greece, Italy, Netherlands, Korea, Spain, Switzerland, Turkey, Ukraine, the United Kingdom and the United States. Analyses identified the Big Five factors across both nations and languages.

In their Personality Profiles of Cultures (PPOC) project, McCrae and Terracciano (2005[222]) examined factor replicability of a widely-used adult personality measure, the NEO-PI-R, of college-aged (18-21 year-olds) and adult-aged (>40 years) individuals (N = 11 985) from 50 cultures across 50 countries and territories, including Argentina, Australia, Austria, Belgium, Botswana, Brazil, Burkina Faso, Canada, Chile, People's Republic of China (China), Croatia, Czech Republic, Denmark, Estonia, Ethiopia, France, Germany, Hong Kong (China), Iceland, India, Indonesia, Italy, Japan, Kuwait, Lebanon, Malaysia, Malta, Mexico, Morocco, New Zealand, Nigeria, Peru, Philippines, Poland, Portugal, Puerto Rico, Russian Federation (Russia), Serbia, Slovakia, Slovenia, Korea, Spain, Switzerland, Thailand, Turkey, Uganda, United Kingdom: England, United Kingdom: Northern Ireland, and the United States. The factor structure was clearly replicated in most cultures and was recognisable in all (McCrae and Terracciano, 2005[222]). Ashton et al. (2004[50]) also showed that the factor structure of lexical personality descriptors (adjectives) was remarkably similar across seven studied language groups (Dutch, German, Hungarian, Korean, Polish, Italian, and French). De Fruyt et al. (2009[223]) provided similar evidence analysing descriptions of adolescents (12-17 year-olds) obtained in 24 cultures. The explicit listing of countries illustrates that these are well-spread across North and South America, Western, Eastern and Southern Europe, the Middle East and Africa, Oceania, and South/South-East Asia and East Asia.

Turning to the assessment of personality characteristics of children, Tackett et al. (2012[157]) conducted a large cross-cultural study involving 3 751 children, in 5 countries (Canada, China, Greece, Russia, and the United States) and four age groups (3-5, 6-8, 9-11, and 12-14 years of age). Parents and guardians rated each child's personality using the Inventory for Child Individual Differences (ICID) (Halverson et al., 2003[182]). The ICID was designed specifically for children, measures up to 15 narrow personality

characteristics using either 108 or 144 Likert items, and has been translated into Russian (Knyazev and Slobodskaya, 2005[224]), Chinese, and Greek (Halverson et al., 2003[182]) following commonly recommended scale adaptation practices. The authors conducted a series of within-country principal component factor analyses and then compared the results for the five component solutions. Table 5.1 shows the six items that had the highest correlations with each component by country. As can be seen in the table, the results show strong relationships with the Big Five model and are largely similar across countries.

Table 5.1. Items showing the highest correlations with ICID components in five countries

Canadian	Chinese	Greek	Russian	American
(N = 392)	(N = 506)	(N = 572)	(N = 1 374)	(N = 907)
Component 1				
E	*C/O*	*E*	*E*	*E*
Energetic	Good concentration	Sociable	Energetic	Outgoing
Outgoing	Large vocabulary	Loves to be w/ people	Sociable	Loves to be w/ people
Loves to be w/ people	Careful	Makes friends easily	Makes friends easily	Energetic
Sociable	Short attention span (rc)	Cheerful	Physically active	Friendly
Lively/enthusiastic	Quick to learn	Lively/enthusiastic	Always on the move	Happy
Makes friends easily	Unimaginative (rc)	Energetic	Lively/enthusiastic	Makes friends easily
Component 2				
A/N	*A*	*A/N*	*A/N*	*A/N*
Irritable	Loving	Quick tempered	Irritable	Rude
Angry easily	Thoughtful of others	Stubborn	Quick tempered	Selfish
Quick tempered	Considerate	Hard-headed	Aggressive	Mean
Complains	Helpful	Wants things own way	Rude	Quick tempered
Moody	Quick to understand	Rude	Whiny	Aggressive
Disrespectful	Caring	Angry easily	Angry easily	Angry easily
Component 3				
O	*E*	*C*	*A*	*O*
Thinking abilities	Outgoing	Organised	Sensitive	Quick to learn
Quick to learn	Withdrawn (rc)	Careful	Loving	Large vocabulary
Intelligent	Lively/enthusiastic	Neat and tidy	Caring	Good thinking abilities
Large vocabulary	Loves to be w/ people	Responsible	Thoughtful	Intelligent
Quick to understand	Talkative	Perfectionist	Joy to be with	Good memory
Speaks well	Makes friends	Drive to do better	Helpful	Quick to understand
Component 4				
A	*N*	*O*	*C*	*N*
Thoughtful	Easily upset	Quick to learn	Self-disciplined	Lacks confidence
Sensitive	Quick tempered	Quick to understand	Good concentration	Afraid of lots
Caring	Insecure	Thinking abilities	Organised	Feelings hurt
Loving	Irritable	Good memory	Careful	Fearful
Considerate	Feelings hurt	Intelligent	Responsible	Difficulty adjusting
Sweet	Afraid of lots	Slow to learn (rc)	Neat and tidy	Needs help w/ lots
Component 5				
C	*A/N*	*N*	*O*	*C*
Organised	Strong willed	Feelings hurt	Thinking abilities	Organised

Canadian	Chinese	Greek	Russian	American
(N = 392)	(N = 506)	(N = 572)	(N = 1 374)	(N = 907)
Self-disciplined	Hard-headed	Easily upset	Good memory	Neat and tidy
Neat and tidy	Stubborn	Afraid of lots	Large vocabulary	Careful
Disorganised	Gives in to others (rc)	Whiny	Intelligent	Responsible
Responsible	Interested in new things	Fearful	Interested in new things	Dependable
Hard worker	Disobedient	Sensitive to others	Asks questions	Self-disciplined

Source: Adapted from Tackett et al., (2012[157]), "The hierarchical structure of childhood personality in five countries: Continuity from early childhood to early adolescence", https://doi.org/10.1111/j.1467-6494.2011.00748.x.

The countries that would typically be characterised as individualistic (i.e. Canada and the United States) were largely similar to one another, but also similar to Russia and Greece, the two more collectivistic countries. Although China had a somewhat different order of the five components, their overall composition was largely similar to the other four countries with one exception. It was the only country in the study where separate components for conscientiousness and openness did not emerge; rather, they appear to represent a unified factor. This was somewhat consistent with previous cross-cultural research that has often found difficulties in identifying a robust openness analog in Asian samples (Cheung, F. M. et al., 2001[53]).

5.2. Comparisons of scale scores across cultures

The OECD Study of Social and Emotional Skills (SSES) will conduct surveys in a variety of cities and countries around the world. Since the same instruments (i.e. questionnaires) will be used, it is frequently assumed that the results will be comparable across groups. However, as each cultural context reflects a constellation of many factors, processes, and attributes, the same set of questions or assignments may have a different meaning for people from different cultures, i.e. somewhat different constructs may be measured in each culture (Kankaraš and Moors, 2011[225]). If this happens, the validity of conclusions from such comparative research is in question. Therefore, a fundamental concern in any cross-cultural research is ensuring equivalence (i.e. comparability) when testing for cross-cultural differences (Hui and Trandis, 1985[226]). In methodology, this comparability (called measurement equivalence) is defined as *"whether or not, under different conditions of observing and studying phenomena, measurement operations yield measures of the same attribute"* (Horn and McArdle, 1992, p. 117[227]).

There are two main sources of incomparability in cross-cultural research – construct and method biases (Van de Vijver and Leung, 1997[228]). Construct bias indicates dissimilarity of constructs across cultures. In this study, it would be present when an instrument measures social and emotional skills that differ or only partially overlap across cultures. Where construct bias exists, it is not possible to establish comparability of results across cultures as they do not share the same meaning, i.e. their comparison parallels that of comparing "apples and oranges" (Johnson, 1998[229]). Construct bias will usually increase when the cultural distance is wider and when a given instrument is more saturated into a specific culture (Kankaraš and Moors, 2010[230]).

As described above, in relation to possible construct bias, the Big Five broader dimensions and narrower skills have fortunately been identified across cultures, age groups, and gender categories. Hence, researchers and policy makers can make use of a common set of social and emotional skills.

Nonetheless, a simple comparison of scale scores across cultures (e.g. computed by adding or averaging responses to Likert rating scale items) may still not work due to the possible presence of method bias. Method bias represents all kinds of biases that originate from the methodological and procedural aspects of a cross-cultural study. Method bias is further divided into three subtypes of bias (Van de Vijver and Leung, 1997[228]):

- Sample bias, which stands for all differences in characteristics of samples from different cultures that can influence results.
- Instrument bias, is caused by characteristics of an instrument to which individuals from different cultural groups react in consistently dissimilar ways. This type of bias includes differences in stimulus familiarity (which is especially important in mental testing), social desirability and response styles (that are more important in personality measurement).
- Administration bias, which is induced by various procedural aspects of data collection, such as interviewer characteristics, testing facilities, communication problems, etc.

For example, when responding to Likert items (i.e. where respondents are asked to indicate their level of agreement with a particular statement, often using five response options ranging from "strongly agree" to "strongly disagree"), individuals from Western cultures often exhibit an "extreme response" style where the tendency is to choose extreme response categories irrespective of the meaning of the question. Individuals from Eastern cultures however, tend to exhibit a "central response" style by choosing options from the middle of the scale. Such method biases have also been found in regard to education status, race, and ethnicity (Greenleaf, 1992[231]; Kankaraš and Moors, 2011[225]).

Another problem is that there may not be a one-to-one correspondence between words in different languages. To illustrate, the item "Challenging" from a Satisfaction with Work scale, was endorsed by virtually all of the American workers with high job satisfaction but by almost none of the American workers with low job satisfaction. However, when translated into Spanish as "Retador", Mexican workers both low and high in job satisfaction endorsed the item at nearly the same rate (Drasgow and Hulin, 1987[232]; Hulin, Drasgow and Komocar, 1982[233]). In American English, "Challenging" has a positive connotation, perhaps tapping into self-actualisation. Clearly, in Mexican Spanish, "Retador" does not.

Drasgow and Hulin (1987[232]) found that nearly a third of their job satisfaction items had measurement bias when comparing English-speaking Americans and Spanish-speaking Mexicans. Of even more concern is that the rank-order of groups can be affected by the bias. For example, Nye and Drasgow (2011[234]) examined Big Five data from individuals in the United States, Greece and China. When comparing the summed self-ratings on Likert items, they found the Greek sample, on average, to be higher in conscientiousness and lower in extraversion than the United States' sample. However, after correcting for DIF (differential item functioning), they found that the Greek sample was actually lower in conscientiousness and higher in extraversion.

Establishing cross-cultural comparability is a complex issue. It involves not only appropriate translations of survey questions, but also a series of statistical analyses ensuring the same personality characteristics are being measured across cultures, and that survey questions measure similarly in different cultures and languages (Drasgow, 1984[235]; Hui and Trandis, 1985[226]; Kankaraš and Moors, 2011[225]; Van de Vijver and Leung, 2001[236]).

6. Taxonomy of the narrow Big Five skills/facets: Structure and characteristics

Thus far, we have reviewed research literature suggesting that the Big Five personality characteristics are a) useful for predicting important outcomes, b) applicable across different ages and many cultures, and c) malleable, especially at younger ages. However, as mentioned in the introduction of this report, such broad summaries of behavioural information are not ideal if we want to understand the reasons for predictor-criterion links or to design specific and effective interventions. Lower-order or narrowly-defined personality characteristics (a.k.a. facets) have much better fidelity than broad dimensions for these purposes. Facets can be seen as more contextualised manifestations of broad personality factors (Roberts, 2006[237]). For example, conscientiousness can be seen as an overall tendency to exercise a certain degree of control over one's internal or external environment and, thus, includes a range of behavioural patterns and thoughts such as industriousness, orderliness, and self-control (Roberts et al., 2005[56]). Increasing conscientiousness could thus be achieved via multiple pathways such as improving organisational and planning skills (orderliness), being better able to define and achieve goals (industriousness), or developing an ability to delay gratification (self-control).

Deciding on which personality facets to study is not a trivial matter. There could be hundreds, if not thousands, of different ways to group typical patterns of behaviours, thoughts and feelings. In fact, there has been a somewhat different lower-order structure proposed for every existing personality measure. Some of the best examples include the 45-facet structure of the Abridged Big Five-Dimensional Circumplex (AB5C) model (Hofstee, de Raad and Goldberg, 1992[238]) and the 30-facet structure of the NEO Personality Inventory (NEO-PI) (Costa, McCrae and Dye, 1991[239]). In both cases, researchers used a combination of prior empirical studies, theoretical justifications, and intuitions to 1) divide each Big Five factor into an equal number of facets and, 2) to then generate sets of items for each desired facet. Many early temperament models discussed in prior sections of this paper (e.g. Thomas and Chess (1977[163]) model) were also rationally derived from the content of parental interviews.

Another way to establish narrow skill taxonomies is to adopt a purely empirical stance and to conduct a series of factor analyses using responses to a diverse array of personality indicators (e.g. adjectives, behavioural statements, or scales). The main assumption here is that all important personality characteristics have been encoded in the human lexicon and, therefore, studying the co-variation among skill descriptors should lead to identification of these characteristics. The best examples of this approach in adult personality literature are a lexical study by Saucier and Ostendorf (1999[60]) who analysed responses to hundreds of personality descriptors (adjectives) to arrive at a Big Five factor solution; the Ashton et al. (2004[50]) study that analysed adjectives in seven different languages to find a Six Dimension solution (a.k.a. HEXACO), and the DeYoung, Quilty, and Peterson (2007[240]) study that factor-analysed responses to B5C and NEO-PI facet scales to derive their ten personality aspects. The development of previously discussed inventories, the Hierarchical Personality Inventory for Children (HiPIC) and the

Inventory for Child Individual Differences (ICID), also followed this strategy. Both inventories were based on analyses of thousands of personality descriptors obtained from parents and other caregivers.

We believe that the best approach to identify key facets for each Big Five personality dimension is to combine the rationally derived and empirically-based approaches. Facets that are consistently identified and cross-culturally replicated should be considered for inclusion in the OECD Study on Social and Emotional Skills (SSES). This not only ensures that a facet belongs to a particular domain, but also maximises the generalisability of the OECD findings to extant personality frameworks. For the SSES, we have selected seven facet-level taxonomies that represent the diverse viewpoints on the lower-order structure of personality inventories of both adults and children:

1. The Thomas and Chess (1977[163]) temperament model, which was based on interviews with parents of infants in New York City. This consists of nine basic temperament characteristics for which several assessment instruments were developed to assess infants, preschool, and school-age children (Thomas and Chess, 1977[163]; Hegvik, McDevitt and Carey, 1982[164]).
2. The 18 facets of Mervielde and De Fruyt's (1999[179]) HiPIC (Mervielde, De Fruyt and De Clercq, 2009[241]). This inventory originated from parental descriptors of Belgian children aged 6-12 years, and contains 144 personality descriptions (Kohnstamm et al., 1998[180]). All HiPIC items are phrased either in the first person, making it appropriate for administration to children, or in the third person singular, for administration to parents or other caregivers. With five broad and 18 narrow domains, this factor structure has proven to be highly replicable across both childhood and adolescence. Three of the HiPIC broad domains closely resemble the adult Big Five dimensions of extraversion, conscientiousness, and emotional stability. The fourth broad domain, benevolence, is conceptually and empirically (De Fruyt et al., 2000[181]) related to the adult agreeableness dimension. The fifth broad domain, imagination, contains facets of creativity, curiosity, and intellect, thus most closely aligning with the openness to experience factor.
3. The 15 personality facets of the ICID, which was developed by an international team of researchers from eight countries (Belgium, China, Germany, Greece, Netherlands, Poland, Russian Federation, and the United States). The development of the ICID began with over 50 000 country and language-specific parental descriptors of children ages 3 to 12 years, and was ultimately reduced to a common set of 141 culture-free items measuring 15 narrow personality characteristics. Halverson et al. (2003[182]) showed that parental ratings of ICID can be aggregated into the Big Five.
4. A rationally derived 15-facet structure of the Next Big Five Inventory (BFI-2) (Soto and John, 2017[20]). For each Big Five domain, the authors first selected a "factor-pure" facet, or a facet that had been identified in previous research as being central to its own domain and independent from the other four domains (Hofstee, de Raad and Goldberg, 1992[238]). The authors then selected two complementary facets that *"were prominent in the personality literature and represented in the original BFI's item content"* to *"provide continuity with the original BFI and previous research on personality structure"* (Soto and John, 2017[20]).
5. An empirically derived 18-facet taxonomy consisting of the Big Five broad factors, each one comprising 3-4 narrow facets. This is based on the widely cited

lexical study by Saucier and Ostendorf (1999[60]) who factor-analysed responses to German and English language personality adjectives.

6. The 24-facet taxonomy from the HEXACO personality inventory (Lee and Ashton, 2004[242]). The HEXACO model was based on eight independent investigations involving seven different languages – Dutch, French, German, Hungarian, Italian, Korean, and Polish. Lee and Ashton (2004[242]) found that a similar six-factor structure emerged from each language. This taxonomy is highly relevant for this OECD study because it was developed in a more culturally-appropriate way, using a number of languages as a starting point rather than American English only.
7. Twenty-one empirically derived facets implemented in the Tailored Adaptive Personality Assessment System (TAPAS) (Drasgow et al., 2012[243]). For each Big Five broad dimension, Drasgow and colleagues conducted a hierarchical factor analysis of scale scores from seven major adult personality inventories (Roberts et al., 2005[56])(see (Woo et al., 2014[244])). These included the revised NEO-PI-R (Costa, McCrae, & Dye, 1991), the Sixteen Personality Factor Questionnaire (16PF) (Conn and Reike, 1994[47]), California Personality Inventory (CPI) (Gough, 1987[245]), the Multidimensional Personality Questionnaire (MPQ) (Tellegen, 1982[246]), the Jackson Personality Inventory-Revised (JPI-R) (Jackson, 1994[247]), the Hogan Personality Inventory (HPI) (Hogan and Hogan, 1992[248]), and the Abridged Big Five-Dimensional Circumplex (AB5C) scales from the International Personality Item Pool (Goldberg, 1999[249]). All these inventories have been widely researched, translated into multiple languages, and shown to be cross-culturally relevant. For example, the AB5C was initially based on a trilingual item pool (Dutch, German and English) in a collaborative project between Wim K. B. Hofstee and his colleagues and students at the University of Groningen in the Netherlands (Hendriks, Hofstee and de Raad, 2002[250]), Lewis R. Goldberg and Gerard Saucier of the Oregon Research Institute in the USA, and Alois Angleitner and his team at Universität Bielefeld in Germany. The Personality Profiles of Cultures (PPOC) Project established the cross-cultural replicability of the NEO-PI-R scales in 50 cultures using translations into several languages (see (McCrae and Terracciano, 2005[222]). The TAPAS taxonomy is essentially an extended version of the 10-aspects taxonomy by DeYoung, Quilty, and Patterson (2007[240]) who analysed the same respondents (the United States Eugene and Springfield sample), but used scales from only two of the seven available inventories.

In the discussion below, we integrate these seven taxonomies into a common facet framework. For each Big Five domain, we have created a table that shows their alignment. We have also added facet scales from several well-known adult personality inventories such as AB5C, NEO-PI, 16PF, and the Occupational Personality Questionnaire (OPQ) (Saville et al., 1984[251]).

We then discuss validity evidence for each main facet category (e.g. self-control) and highlight evidence for their malleability based on results of two recent complementary studies that looked at facet-level personality changes. In the first of these studies, Soto et al. (2011[175]) examined mean-level changes for the ten facets from the earlier version of the Big Five Inventory (BFI) (John, Donahue and Kentle, 1991[252]) using a very large cross-sectional sample (N = 1 267 218) of children, adolescents, and adults (ages 10-65). In the second study, de Hann et al. (2017[196]) followed two independent community samples covering early childhood (2-4.5 years; N = 365, 39% girls) and middle childhood

to the end of middle adolescence (6-17 years; N = 579, 50% girls). Developmental changes were examined using cohort-sequential latent growth modelling on the 18 facets of the HiPIC (Mervielde and De Fruyt, 1999[179]). Although the two studies used different sampling methodologies, their results were remarkably similar and indicated considerable changes during the 6-17 age period.

6.1. Facets of conscientiousness

6.1.1. Taxonomy map

Conscientiousness includes a range of constructs that describe the propensity to be self-controlled, responsible to others, hardworking, orderly, and rule-abiding (Roberts et al., 2009[253]). Conscientiousness-related constructs such as achievement motivation, constraint, impulsivity, norm-favoring, ego control, and superego strength were studied long before the emergence of the Big Five (Block and Block, 1980[254]; John, Naumann and Soto, 2008[7]). Since the 1990s, hundreds of papers have been dedicated to researching the nature and usefulness of conscientiousness facets; several papers have been dedicated exclusively to understanding the underlying lower-order structure of this important domain (Roberts et al., 2005[56]; Roberts, Lejuez and Krueger, 2014[255]) (see (Roberts et al., 2004[256]).

Table 6.1 presents definitions and behavioural indicators of each of the identified Big Five facets, along with naming conventions for use in the SSES. The table also presents a conceptual map linking narrow conscientiousness skills identified in the seven facet taxonomies (Thomas and Chess temperament characteristics, lexical subcomponents, HEXACO, TAPAS, HiPIC, ICID, and BFI-2 facets) and five widely-used adult personality inventories (AB5C, NEO-PI, HPI, OPQ, and 16PF).

As can be seen, child-based personality taxonomies (Thomas and Chess, HiPIC, and ICID) define conscientiousness in terms of four facets: achievement striving (a.k.a. industriousness), orderliness, concentration/distractibility, and persistence. Adult-based inventories add two additional facets of responsibility, rule-following/non-delinquency, and virtue/fairness, as these patterns of behaviour seem likely to develop later in life.

Industriousness signifies working hard and aspiring to excellence. Positive adjectives identified in the Saucier and Ostendorf (1999[60]) taxonomy as belonging to this facet include ambitious, industrious, and purposeful, while negative adjectives include aimless, negligent, and lazy. Note that in adult inventories, industriousness also includes persisting in the face of challenges. An example BFI-2 item for the industriousness facet is being *"persistent, works until the task is finished"*. But, in child-based taxonomies (e.g. HiPIC), industriousness separates into achievement motivation and persistence facets.

Orderliness captures a tendency to be "prepared". This includes tendencies towards neatness, cleanliness, and planfulness on the positive side, or disorderliness, disorganisation, and messiness on the negative end of the spectrum (Roberts, Lejuez and Krueger, 2014[255]). An example HiPIC item for the orderliness facet is *"leaves everything lying around"*.

Self-control or self-discipline represents the propensity to control impulses, delay gratification, and maintain concentration. An example item from the HiPIC is *"works with sustained attention"*. Many adult inventories assess this facet, although the naming conventions tend to vary (e.g. cautiousness in the AB5C or deliberation in the NEO-PI).

Table 6.1. Conceptual map for narrow dimensions from the conscientiousness domain

Definitions and indicators	**Conscientiousness skills**						
Skill name	**Achievement motivation**	**Orderliness**	**Self-control/ self-discipline**	**Responsibility**	**Discipline/ rule-following**	**Honesty/ virtue**	**Persistence**
Definition	Setting high standards for oneself and working hard to meet them, as illustrated by a strong "work ethic", consistent effort, and high productivity.	Organisational skills are critical for planning and executing plans to reach longer-term goals. (Keeps things neat and tidy).	The ability to focus attention on the current task and avoid distractions in order to achieve personal goals. (Is efficient, gets things done).	Time management, punctuality, and honouring commitments are critical to reliability and consistency.	Tendency to follow rules and instructions.	Tendency to be fair and honest in contact with other people.	Persevere in tasks and activities, hard to get distracted.
Typical behavioural indicators	Work hard/do just enough to get by.	Like order/leave a mess.	Avoid mistakes/rush into things.	Dependable and steady/can be irresponsible.	Follow the rules/break rules.	Would never cheat on exam/use flattery to get ahead.	Get things done/easily give up.
Key Taxonomies and Inventories	**Conscientiousness skills**						
Temperament characteristics (Thomas and Chess, 1977[163])		Regularity	Distractibility				Task persistence
ICID facets (Halverson et al., 2003[182])	Achievement orientation	Organised	Distractible				
HiPIC facets (De Fruyt, Mervielde and Van Leeuwen, 2002[257])	Achievement motivation	Orderliness	Concentration				Perseverance
BFI-2 facets (Soto and John, 2017[20])	Productiveness	Organisation		Responsibility			
Lexical subcomponents (Saucier and Ostendorf, 1999[60])	Industriousness	Orderliness		Reliability			
HEXACO facets (Lee and Ashton, 2004[242])	Diligence	Organisation, perfectionism	Prudence			Fairness	
TAPAS facets (Drasgow et al., 2012[243])	Achievement	Order	Self-control	Responsibility	Non-delinquency	Virtue	
AB5C scales (Goldberg, 1999[249]; Hofstee, de Raad and Goldberg, 1992[238])	Efficiency, purposefulness, rationality	Organisation, orderliness, perfectionism	Conscientiousness, cautiousness		Liberalism	Morality	
NEO PI-R scales (McCrae and Costa Jr., 2008[258])	Achievement striving	Order	Deliberation	Dutifulness	Self-discipline		
HPI homogeneous item composites (Hogan and Hogan, 1992[248])	Competence		Not spontaneous, impulse control		Avoids trouble	Virtuous, moralistic	
OPQ scales (Saville et al., 1984[251])	Achieving, competitive	Detail conscious, forward planning	Conscientious		Traditional		
16PF scales (Conn and Reike, 1994[47])		Perfectionistic			Rule consciousness		

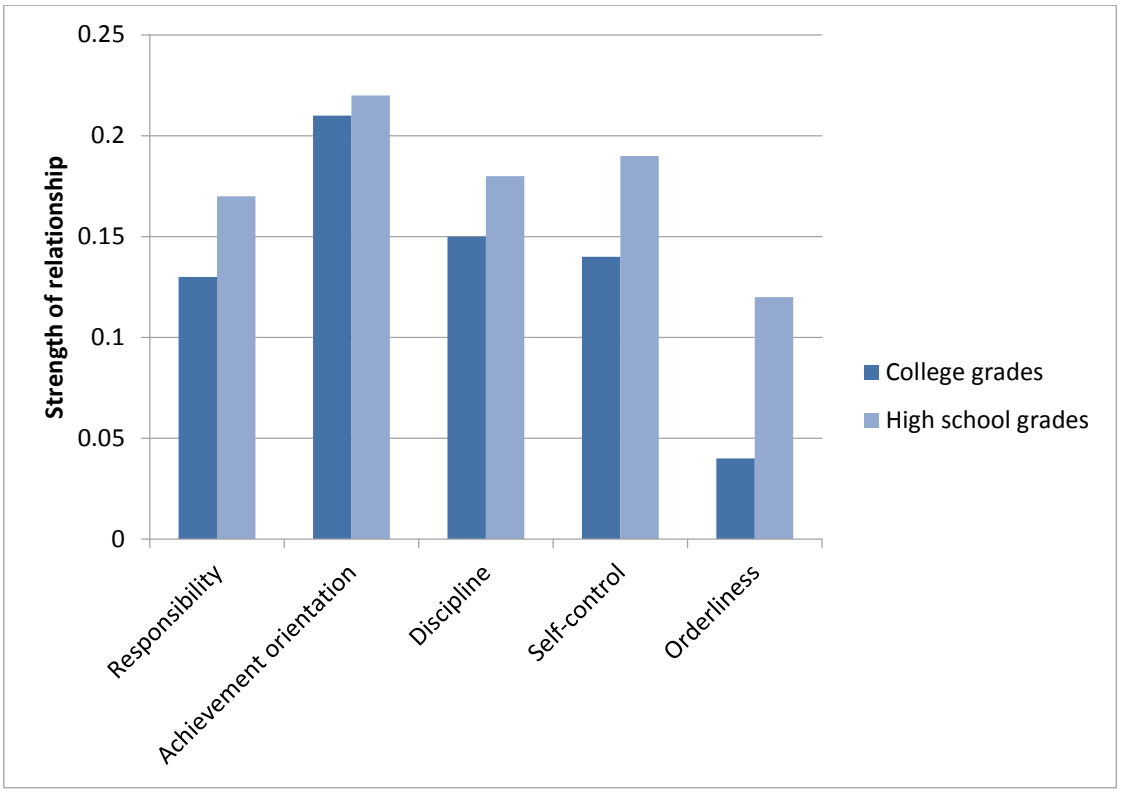
The remaining three facets, rule-following, responsibility, and virtue, are only identified in adult-based taxonomies. Rule-following reflects a tendency to follow and uphold rules, maintain discipline, and avoid trouble with authorities. For children, this facet is probably absorbed into orderliness and self-control because, for that age cohort, following rules often means being organised and being disciplined means not acting on impulses. Virtue represents a constellation of beliefs and behaviours associated with adherence to standards of honesty, morality, and "good Samaritan" behaviour. Responsibility reflects the tendency to follow through with promises to others. It is marked by such adjectives as reliable, dependable, responsible, prompt, and punctual vs. undependable and unreliable.

6.1.2. Predictive value of conscientiousness sub-domains

The importance of conscientiousness to educational, health and life outcomes is indisputable (see sections above). Most published research has either focused on broad factor measures, or has aggregated facet-level information into an overall conscientiousness score. However, some studies do provide facet-level correlates with outcomes, and from these studies there is emerging evidence that not all aspects of conscientiousness are equally useful as predictors. In this section, we present results of three published studies that appeared in top-tier journals and focus on relationships between conscientiousness facets and educational outcomes (Noftle and Robins, 2007[84]), job performance (Dudley et al., 2006[259]), and health behaviours (Bogg and Roberts, 2004[107]).

Noftle and Robins (2007[84]) investigated relationships between Big Five personality factors and high school and college grade point average (GPA) as measures of educational achievement. Some of their measures included facet-level information from NEO-PI and HEXACO (Ashton et al., 2004[50]; Ashton, Lee and de Vries, 2014[260]). In Figure 6.1, it is evident that the diligence (i.e. industriousness) and prudence (i.e. self-control) scales from the HEXACO instrument have substantial relationships with GPA at both the high school and college levels. From the NEO-PI facets, two more measures of industriousness (competence and achievement striving) have similarly large correlations.

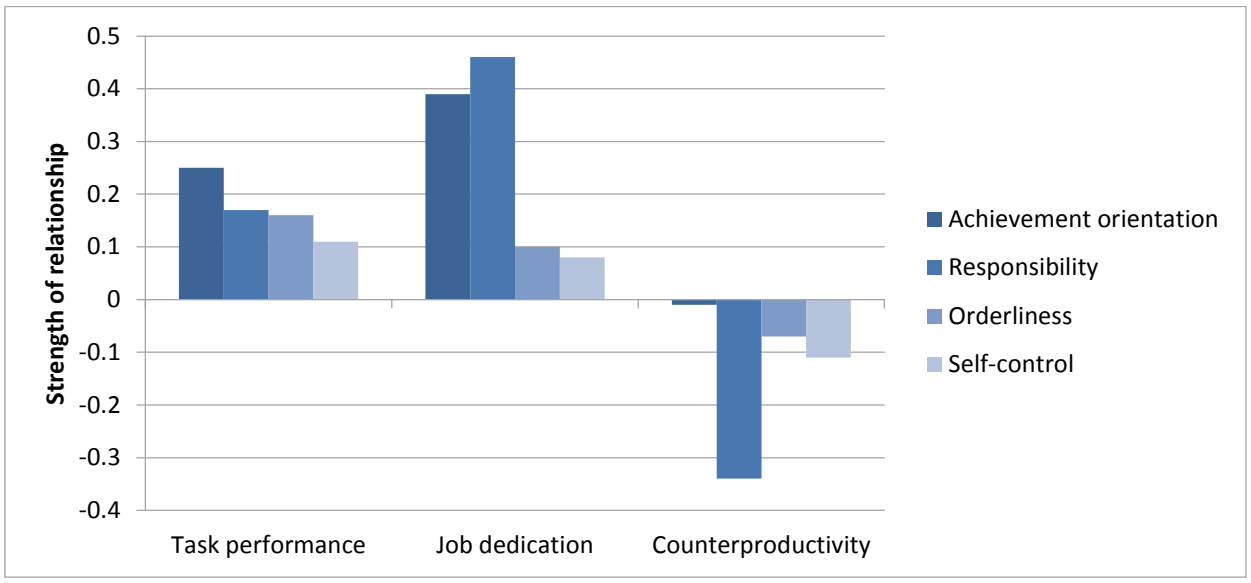
Figure 6.1. Relationship between conscientiousness-related skills and college and high-school grades



Note: Strength of relationships represents average correlation across studies.
Source: Adapted from Noftle and Robins (2007[84]), "Personality predictors of academic outcomes: Big Five correlates of GPA and SAT scores", https://doi.org/10.1037/0022-3514.93.1.116.

Dudley, Orvis, Lebiecki, & Cortina (2006[259]) conducted a meta-analysis investigating relationships between conscientiousness and its facets on the one hand, and various job performance criteria on the other (i.e. task performance, citizenship [job dedication], and counter-productivity). Their results are shown in Figure 6.2. Achievement (i.e. industriousness) and dependability (i.e. responsibility) scales were substantially correlated with task performance, which reflects performance of work that contributes to the production of a good or provision of a service, and were even more highly correlated with the organisational citizenship job performance dimension of job dedication. The dependability scale was also strongly negatively correlated with counterproductive work behaviours (e.g. absenteeism, insulting co-workers, stealing or engaging in alcohol or drug use). Similar findings were reported by Judge at al. for conscientiousness skills predicting task performance and organisational citizenship (2013[261]).

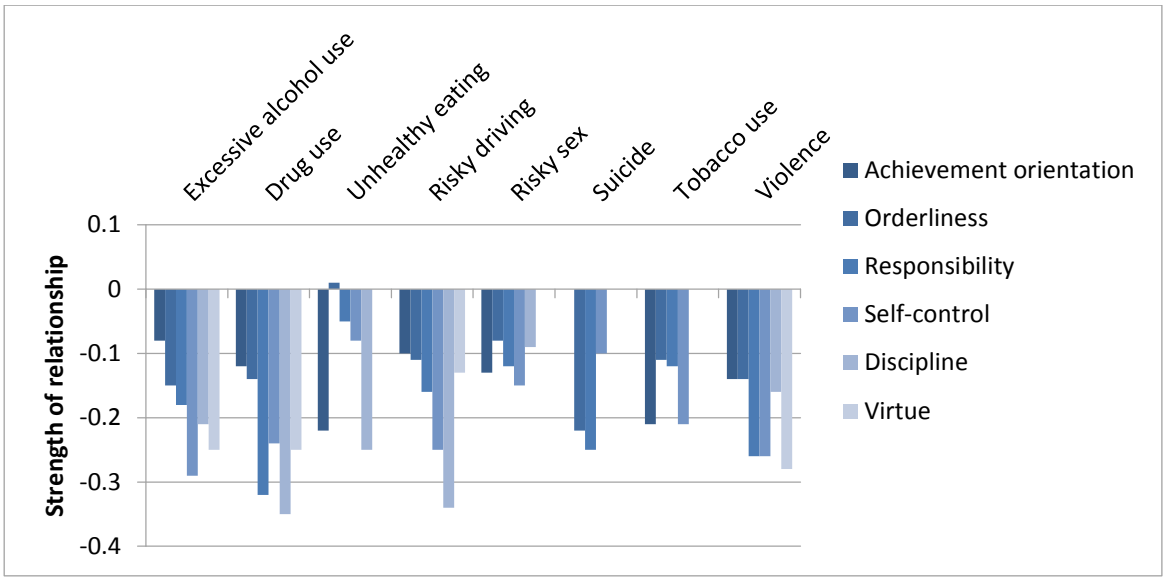
Figure 6.2. Relationship between conscientiousness-related skills and job performance



Note: Strength of relationships represents average correlation across studies. Correlations are corrected for scale reliability (i.e. they represent estimated true-score correlations).
Source: Adapted from Dudley et al. (2006[259]), "A meta-analytic investigation of conscientiousness in the prediction of job performance: Examining the intercorrelations and the incremental validity of narrow traits", https://doi.org/10.1037/0021-9010.91.1.40.

Bogg and Roberts (2004[107]) conducted a meta-analysis investigating relationships between conscientiousness facets and health-related behaviours. Their results, shown in Figure 6.3, clearly indicate the importance of the conscientiousness facets and that virtually all of the correlations of the facet of conscientiousness with unhealthy activities are negative. For example, industriousness has important negative relations with unhealthy eating and tobacco use. Order is meaningfully related to suicide. Responsibility has large negative relations with drug use, suicide, and violence. Self-control has negative relations with excessive use of alcohol, drug use, risky driving, tobacco use, and violence. Similarly, traditionalism and virtue have several substantial relations with unhealthy behaviours.

Figure 6.3. Relationship between conscientiousness-related skills and health-related behaviours



Note: Strength of relationships represents average correlation across studies.
Source: Adapted from Bogg and Roberts (2004[107]), "Conscientiousness and health-related behaviors: A meta-analysis of the leading behavioral contributors to mortality", http://dx.doi.org/10.1037/0033-2909.130.6.887.

The facet most often researched in early childhood studies is self-control. In a series of studies examining self-control among a sample of American pre-schoolers from a university community, delay of gratification at age 4 was associated with higher levels of cognitive and self-regulatory competence and coping at age 16, including higher scores on the standardised college entrance exams (SAT) (Shoda, Mischel and Peake, 1990[262]). In another study, 10-year-olds in a United States study who exhibited high levels of self-control were shown to have higher academic attainment four years later (Duckworth, Tsukayama and May, 2010[263]).

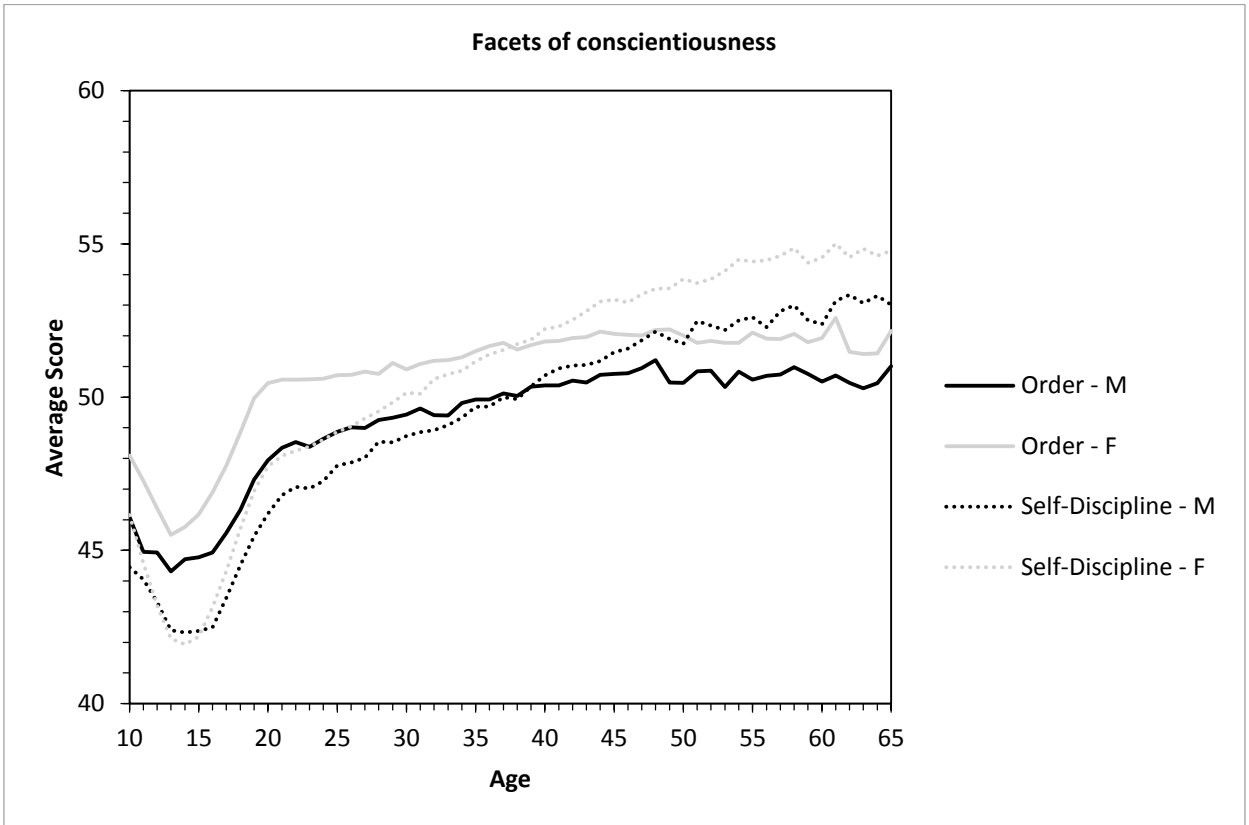
Using data from the New Zealand's Dunedin cohort, Moffitt and colleagues (2011[264]) linked lack of self-control in childhood to lower income, low socio-economic status and more self-reported financial difficulties at age 32. Better self-control was associated with better adult physical health (e.g. absence of metabolic abnormality, periodontal disease, airflow limitation etc.). Children who exhibited greater self-control were also less likely to be dependent on substances in adulthood, including tobacco, alcohol, cannabis, street or prescription drugs. These associations were independent of factors such as intelligence and socio-economic status.

A study using another New Zealand cohort (the Christchurch cohort) found that a self-control score at age 6 was related to a range of adult outcomes including violent offending, welfare dependence, educational attainment and income (controlling for socio-economic status, child conduct disorders, IQ and gender (Fergusson, Boden and Horwood, 2013[265])). British evidence from the United Kingdom National Child Development Study (NCDS) also suggested that childhood self-control is negatively associated with unemployment throughout the adult years (Daly et al., 2015[266]).

6.1.3. Malleability/Development evidence

Soto et al. (2011[175]) examined the stability of the Big Five dimensions and some of their facets using a huge cross-sectional sample of over a million research participants between 10- and 65-years-old. Figure 6.4 shows their findings for two conscientiousness facets, self-discipline (non-delinquency) and order. Interestingly, there are dips in the average levels of these facets from age 10 to the early teens for both boys and girls, when they bottom out. They then sharply increase during the late teens and finally show more gradual increases from age 20 to 65.

Figure 6.4. Average levels of self-discipline and order across a lifetime

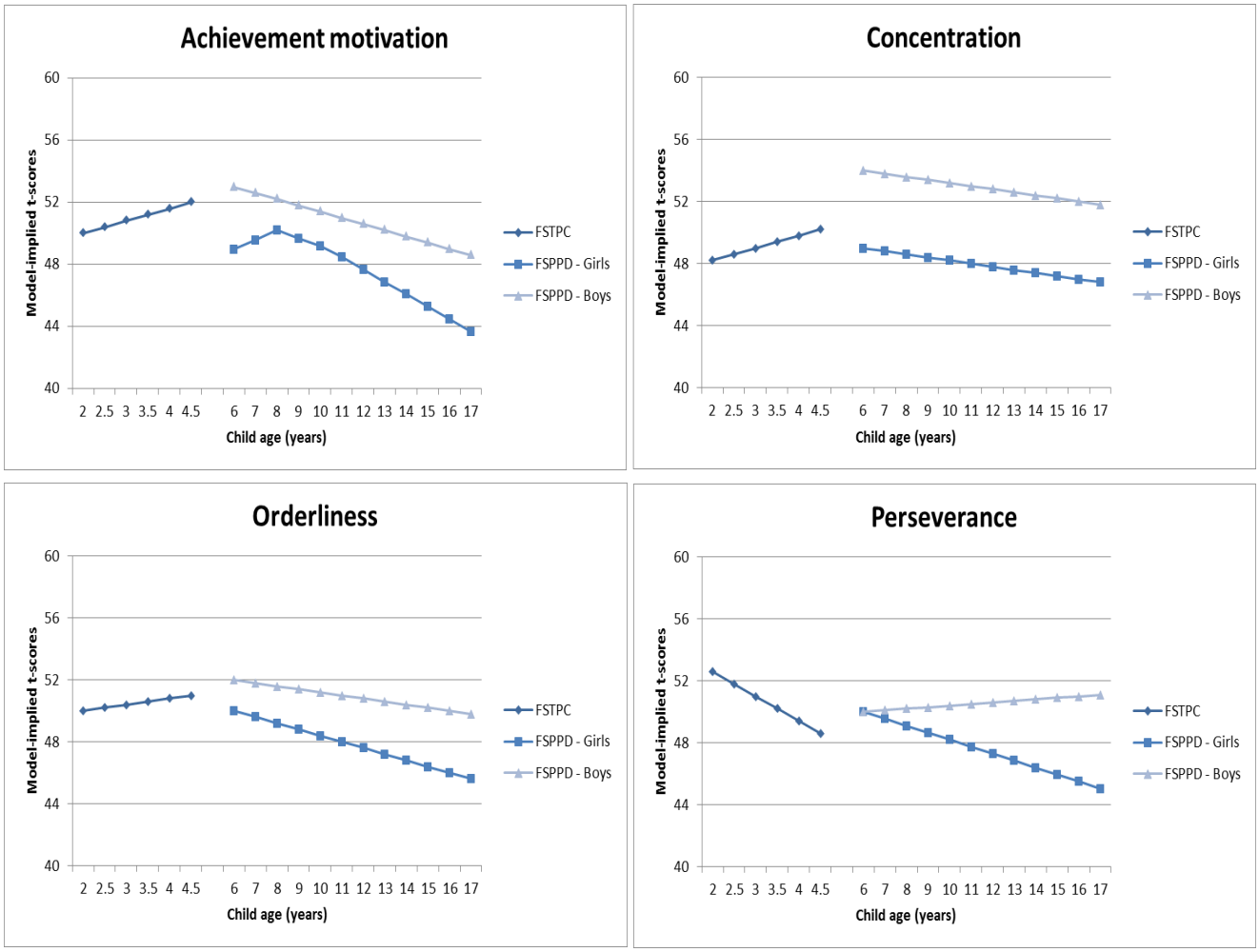


Source: Adapted from Soto et al. (2011[175]), "Age differences in personality traits from 10 to 65: Big Five domains and facets in a large cross-sectional sample", https://doi.org/10.1037/a0021717.

De Haan et al. (2017[196]) also examined changes in personality facets in childhood. They utilised two independent samples. The first was the longitudinal Flemish Study on Temperament and Personality in Childhood (FSTPC). Mothers reported on their children's personalities four times, at six months apart. At time 1, the mean age of the 317 children was 2 years and 4 months. The second sample consisted of the Flemish Study on Parenting, Personality, and Development (FSPPD). Here, mothers of 579 children provided ratings. At time 1, the children's mean age was 7 years and 6 months. Over the next 8 years, the mothers made three more sets of ratings. With both samples, mothers rated their children using Mervielde and De Fruyt's (1999[179]) HiPIC. These data were analysed with cohort-sequential latent growth modelling which is an analytic method

designed to build a model based on all of the available data. The results are shown in Figure 6.5.

Figure 6.5. Estimated levels of conscientiousness facets from age 2 to 17



Note: FSTPC = Flemish Study on Temperament and Personality in Childhood; FSPPD = Flemish Study on Parenting, Personality, and Development.
Source: Adapted from De Haan et al. (2017[196]), "Long-term developmental changes in children's lower-order Big Five personality facets", https://doi.org/10.1111/jopy.12265.

Figure 6.5 shows a relatively nuanced pattern of change. Sometimes boys and girls differ and, as in the Soto et al. (2011[175]) study, there are declines as well as increases. Focusing on ages 10 and 15, we see that achievement striving (industriousness), concentration (self-control), and orderliness (order) decrease over time, whereas perseverance (which is also a measure of industriousness) shows decreases for boys but is almost constant for girls. Interestingly, de Haan et al.'s data do not show the rebound in later teen years that is evident in Soto et al.'s data.

6.2. Facets of openness to experience

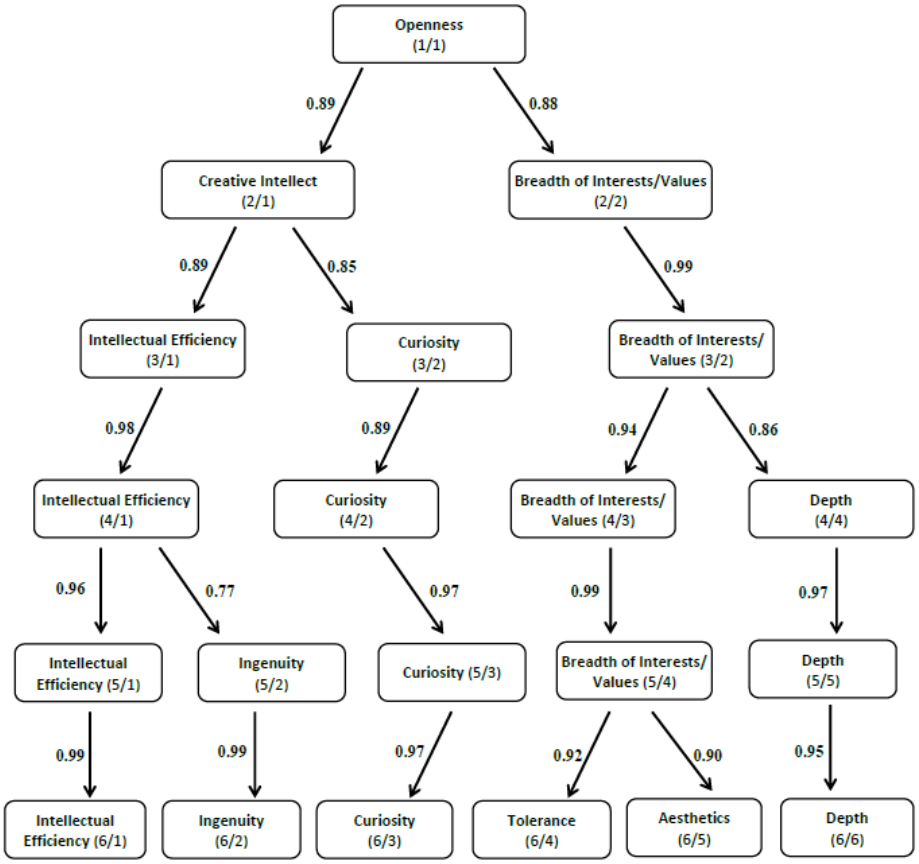
6.2.1. Taxonomy map

Openness to experience is regarded as one of the key personality variables for explaining and understanding behaviour of individuals in settings characterised by high levels of uncertainty and change (Hough, 2003[267]). Historically, there has been a divergence of views among researchers about the precise structure of this broad construct and the use of openness measures in applied research has been limited (Ashton et al., 2000[268]). Even at the broadest level, there is disagreement over whether openness to experience should be viewed solely as intellect (ability to efficiently process information or create new ideas) or whether it should also include other, less intellectualised behaviours, such as tolerance, fantasy, and interest in artistic experiences (Digman, 1990[15]; Goldberg, 1993[44]; McCrae, 1996[269]).

Fortunately, there have been a number of recent papers focusing specifically on the openness to experience dimension of the Big Five model. Woo et al. (2014[270]) defined openness as a multifaceted, hierarchically organised construct representing ways in which an individual typically deals with novel stimuli. At the highest levels of abstraction, openness to experience concerns an individual's preference for variety and novelty, but because novel stimuli can appear in the form of novel experiential stimuli (e.g. new sensations, new cultural experiences) plus that of original intellectual stimuli (e.g. new ideas, new theories), they stated that openness-related behaviours could be subsumed under at least two broad aspects: openness to intellectual stimulation (intellect) and openness to cultural experiences (culture). In turn, each aspect of openness might have different related behavioural expressions, creating different facets of openness within each aspect.

Figure 6.6 shows an example of the hierarchical representation of openness found in the TAPAS taxonomy (Drasgow et al., 2012[243]). To obtain the figure, researchers extracted an increasing number of factors and correlated factor scores from the adjacent solutions. In the figure, the openness factor is at the top of a hierarchy. It then splits into two narrower factors, creative intellect and breadth of interests/values (culture), which in turn split into even narrower factors to produce a total of six interpretable facets.

Figure 6.6. Hierarchical structure of openness to experience



Source: Adapted from Drasgow et al. (2012[243]), "Development of the Tailored Adaptive Personality Assessment System (TAPAS) to support Army selection and classification decisions", http://www.dtic.mil/dtic/tr/fulltext/u2/a564422.pdf.

Table 6.2 shows a conceptual map linking narrow openness characteristics across the seven facet taxonomies (Thomas and Chess temperament characteristics, lexical subcomponents, HEXACO, TAPAS, HiPIC, ICID, and BFI-2 facets) and five adult personality inventories (AB5C, NEO-PI, HPI, OPQ, and 16PF).

A lexical taxonomy by Saucier and Ostendorf (1999[60]) identified three facets associated with the domain of intellect. The imagination facet was marked by adjectives such as creative, inventive, and innovative, the intellect facet was marked by adjectives such as intelligent and analytical, and the perceptiveness facet was marked by perceptive, insightful, and foresighted. From a content inspection of each facet, it is apparent that the adjective analysis adopted a narrower view of openness to experience; namely, it focused on behaviours. The majority of other taxonomies, child-based or adult-based, uniformly identify the same three facets (e.g. HiPIC includes intellectual efficiency, creativity, and curiosity facets).

Table 6.2. Conceptual map for narrow dimensions from the openness to experience domain

Definitions and indicators	**Openness to experience skills**					
Skill name	**Intellectual efficiency**	**Creativity**	**Curiosity**	**Aesthetic interests**	**Tolerance/ Cultural flexibility**	**Self-reflection**
Definition	Intellectual competence, sharpness of thinking and ideas, cognitive capacities.	Generating novel ways to do or think about things through tinkering, learning from failure, insight, and vision.	Interest in ideas and love of learning, understanding, and intellectual exploration.	Valuing art and beauty that may be experienced or expressed through music, writing, visual and performing arts.	Open to different points of view, value diversity, appreciative of foreign people and cultures.	Understanding one's self and/or facilitating self-improvement and self-actualisation.
Typical behavioural indicators	Fast thinkers/have poor vocabulary.	Original and inventive/have difficulty imagining things.	Like to learn new things/seldom daydream.	Love art, music and literature/do not like poetry.	Have friends from different backgrounds/ dislike foreigners.	Enjoy philosophical discussions/not aware of ones strengths and weaknesses.
Key Taxonomies and Inventories	**Openness to experience skills**					
Temperament characteristics (Thomas and Chess, 1977[163])			Approach-withdrawal		Adaptability	
ICID facets (Halverson et al., 2003[182])	Intellect		Openness to experience			
HiPIC facets (De Fruyt, Mervielde and Van Leeuwen, 2002[257])	Intellectual efficiency	Creativity	Curiosity			
BFI-2 facets (Soto and John, 2017[20])		Creative imagination	Intellectual curiosity	Aesthetic sensitivity		
Lexical subcomponents (Saucier and Ostendorf, 1999[60])	Intellect	Imagination/ creativity	Perceptiveness			
HEXACO facets (Lee and Ashton, 2004[242])		Creativity	Inquisitiveness	Aesthetic appreciation	Unconventionality, flexibility	
TAPAS facets (Drasgow et al., 2012[243])	Intellectual efficiency	Ingenuity	Curiosity	Aesthetics	Tolerance	Depth
AB5C scales (Goldberg, 1999[249]; Hofstee, de Raad and Goldberg, 1992[238])	Intellect, competence	Ingenuity, imagination				Reflection, depth, introspection
NEO PI-R scales (McCrae and Costa Jr., 2008[258])		Fantasy	Ideas	Aesthetics, feelings	Actions, values	
HPI homogeneous item composites (Hogan and Hogan, 1992[248])	Good memory, maths ability, education	Generates ideas	Curiosity, reading, science ability	Culture		
OPQ scales (Saville et al., 1984[251])	Data rational, decisive	Innovative	Conceptual	Artistic	Change-oriented	Behavioural
16PF scales (Conn and Reike, 1994[47])			Sensitivity		Openness to change	Abstractness

Facets belonging to the domain of culture are less common. The most frequent scales are related to aesthetics, while tolerance/flexibility and self-reflection themes are relatively underrepresented. Most items in the aesthetics domain are concerned with artistic/aesthetic experiences. Individuals scoring high on the aesthetics facet genuinely enjoy acquiring, participating in, or creating various forms of artistic, musical, or architectural outputs.

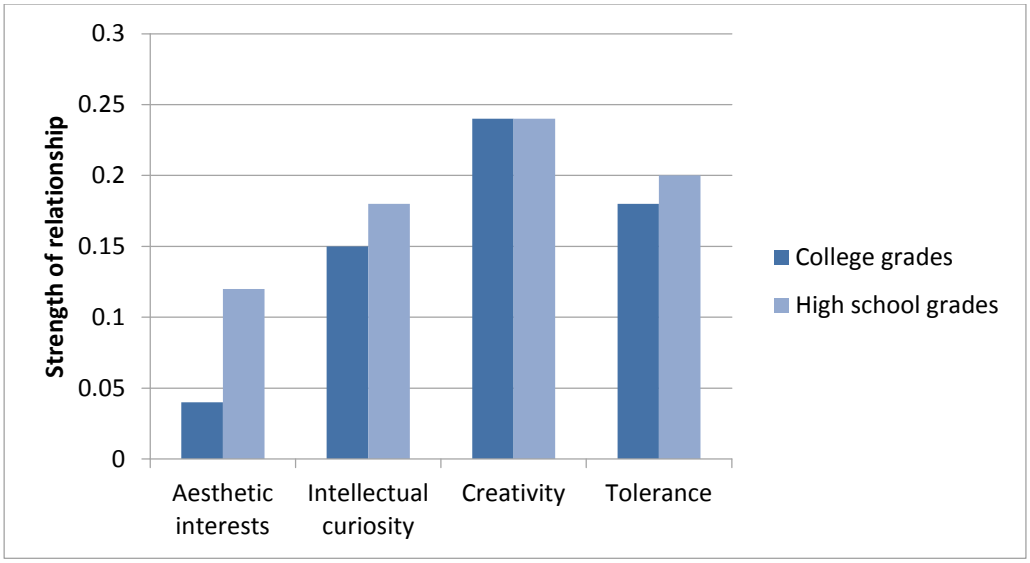
The tolerance facet deals with behaviour towards strangers and, more generally, novel stimuli. Individuals scoring high on tolerance are comfortable with people speaking a foreign language or expressing different viewpoints. They are interested in learning about different cultures and they often attend cultural events or meet and befriend people from around the world. When given a chance to travel, their intent is to immerse themselves into new customs and traditions, rather than merely enjoying the scenery.

The final openness domain includes a self-reflection theme aimed at understanding one's self and/or facilitating self-improvement and self-actualisation; it is exclusively present in adult-based taxonomies. Examples of such behaviours include reflection, meditation, introspection, attending personal growth seminars, and seeking spiritual enlightenment.

6.2.2. Predictive value of openness to experience sub-domains

Noftle and Robins (2007[84]) investigated relationships between various openness to experience facets underlying the Big Five, and GPA at high schools and colleges. As shown in Figure 6.7, both creativity (i.e. ingenuity) and unconventionality (i.e. tolerance) – both scales from the HEXACO instrument – have substantial relationships with GPA at both the high school and college levels. Of the NEO-PI facets included in Noftle and Robins's study, fantasy (i.e. ingenuity), actions (i.e. tolerance), and ideas (i.e. curiosity) have similarly large correlations. Von Stumm, Hell, and Chamorro-Premuzic (2011[271]) also found intellectual curiosity to correlate substantially with GPA (r = .26).

Figure 6.7. Relationship between openness-related skills and college and high school grades



Note: Strength of relationships represents average correlation across studies.
Source: Adapted from Dudley et al. (2006[259]), "A meta-analytic investigation of conscientiousness in the prediction of job performance: Examining the intercorrelations and the incremental validity of narrow traits", http://dx.doi.org/10.1037/0021-9010.91.1.40.

It seems unlikely that the relationships between facets of openness and academic performance are entirely mediated by cognitive ability. Table 6.3 shows meta-analytic correlations of openness and its facets with cognitive ability. Note that the relationships are not very strong. Therefore, controlling for cognitive ability is unlikely to substantially decrease the ability of the openness facets to predict academic performance.

Table 6.3. Meta-analytic correlations of openness and its facets with cognitive ability

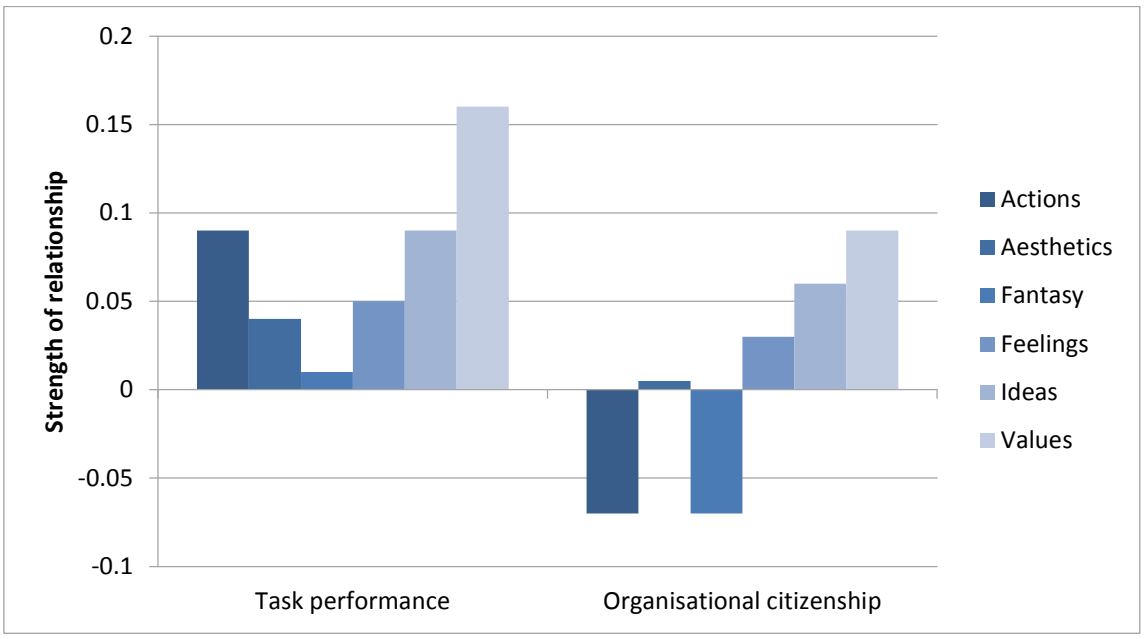
						95% CI			
Openness predictor	**N**	**k_d**	**k_c**	**r_{xy}**	**SD_r**	**Lower**	**Upper**	**ρ_{xy}**	**SDρ**
Overall dimension	85,140	8	102	.14	.11	.08	.21	.17	.12
Intellect aspect	34,021	5	50	.22	.10	.15	.29	.25	.11
Culture aspect	26,612	5	38	.06	.08	-.02	.13	.07	.08
Intellectual efficiency	20,430	5	23	.24	.09	.18	.30	.28	.10
Ingenuity	5,440	4	16	.10	.11	.00	.21	.12	.12
Curiosity	8,151	4	11	.24	.07	.17	.31	.28	.07
Aesthetics	4,206	2	11	.03	.12	-.07	.13	.03	.12
Tolerance	19,420	4	18	.07	.07	.01	.12	.08	.07
Depth	2,986	3	9	.04	.07	-.07	.15	.05	.05

Note: N = combined sample size; k_d = number of studies; k_c = number of correlations; r_{xy} = observed mean correlation; SD_r = standard deviation of observed correlations; CI = confidence interval; ρ_{xy} = estimated mean population correlation; $SD_{\square}$ = standard deviation of estimated population correlations.
Source: Adapted from Woo et al. (2014[270]), "Openness to experience: its lower level structure, measurement, and cross-cultural equivalence", https://doi.org/10.1080/00223891.2013.806328.

Judge et al. (2012[272]) reported results for a large cohort of individuals from the Midlife Development in the United States (MIDUS) study. Participants completed an adjective measure of the Big Five, including openness to experience scale that emphasised the intellect aspect of the openness domain (e.g. creative, curious, broad-minded). Openness was predictive of college graduation (r = .21) and income (r = .10).

Judge et al. (2013[261]) conducted a meta-analysis investigating relationships between openness facets (operationalised as NEO-PI facets) and task and citizenship job performance. Throughout this report, a great many important relationships between social and emotional skills and important outcomes have been identified. Results presented in Figure 6.8, however, show that these skills do not predict everything: across jobs, the relationship of openness facets with task and organisational citizenship are trivial. Nevertheless, matching the openness facet with the nature of a job might produce stronger relationships. For example, ideas may tend to be related to task performance in investigatory jobs.

Figure 6.8. Relationship between openness to experience-related skills and job performance



Note: Strength of relationships represents average correlation across studies.
Source: Adapted from Judge et al. (2013[261]), "Hierarchical representations of the five-factor model of personality in predicting job performance: Integrating three organizing frameworks with two theoretical perspectives", https://doi.org/10.1037/a0033901.

Woo et al. (2014[270]) conducted a meta-analysis that looked at differential relationships among seven organisational criteria and openness characteristics varying in breadth. Their findings (shown in Table 6.4 below) that most job performance outcomes appeared to be unrelated to openness sub-domains, were similar to Judge et al.'s (2013[261]) findings shown above. The notable exception was adaptive performance criteria, which were operationalised as self-other ratings of interpersonal adaptability, expatriate adjustment, creative performance, and coping with organisational change. It should also be noted that various sub-domains of openness may have strong relevance to particular classes of jobs and industries, a fact that would be lost when an overall relationship with job performance is examined. For example, intellectual curiosity is important in scientific or investigative professions, aesthetic interests are critical for work in art fields, innovativeness and creativity are especially beneficial in entrepreneurial settings, etc. Facets of ingenuity, curiosity and cultural tolerance exhibited higher validities with aggregated adaptive performance criteria.

Table 6.4. Relationship between openness facets and adaptive performance

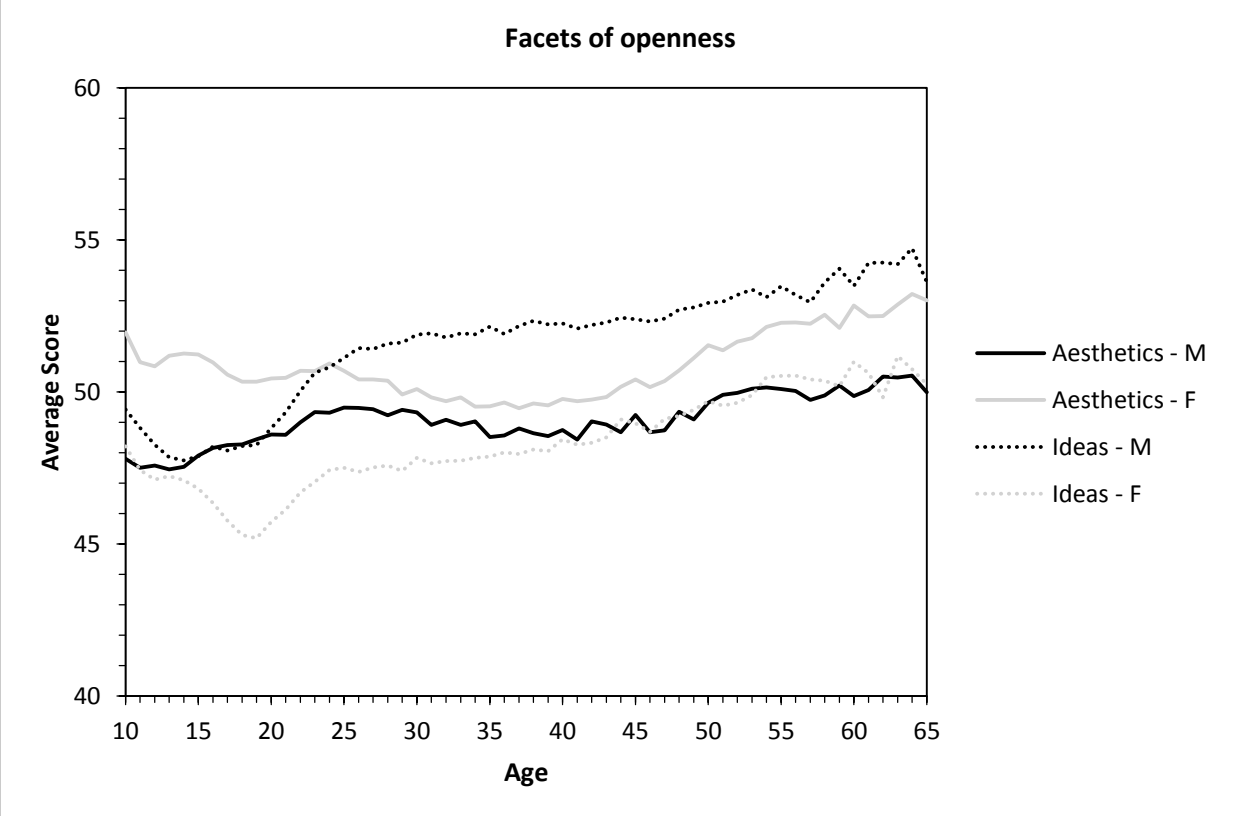
Openness facet	N	k_d	k_c	r_{xy}	ρ_{xy}
Intellectual efficiency	7,802	7	28	0.07	0.09
Ingenuity	2,131	3	6	0.18	0.23
Curiosity	4,531	4	14	0.1	0.13
Aesthetics	3,093	6	17	0.01	0.02
Tolerance	3,603	6	16	0.08	0.12
Depth	1,513	3	5	0.01	0.01

Note: N = combined sample size; $\mathbf{k_d}$ = number of studies; k_c = number of correlations; r_{xy} = observed mean correlation; ρ_{xy} = estimated mean population correlation.
Source: Adapted from Woo et al. (2014[270]), "Openness to experience: its lower level structure, measurement, and cross-cultural equivalence", https://doi.org/10.1080/00223891.2013.806328.

6.2.3. Malleability/Development evidence

Figure 6.9 shows Soto et al.'s (2011[175]) findings about the stability of two openness facets: ideas (curiosity) and aesthetics. As with the conscientiousness facets, dips seem to occur in the average levels of these facets from age 10 to the early teens. The decrease is especially prominent for girls on the ideas facet. Ideas increase rather sharply for both males and females around the age of 20, and then both facets show more gradual increases from about age 25 to 65.

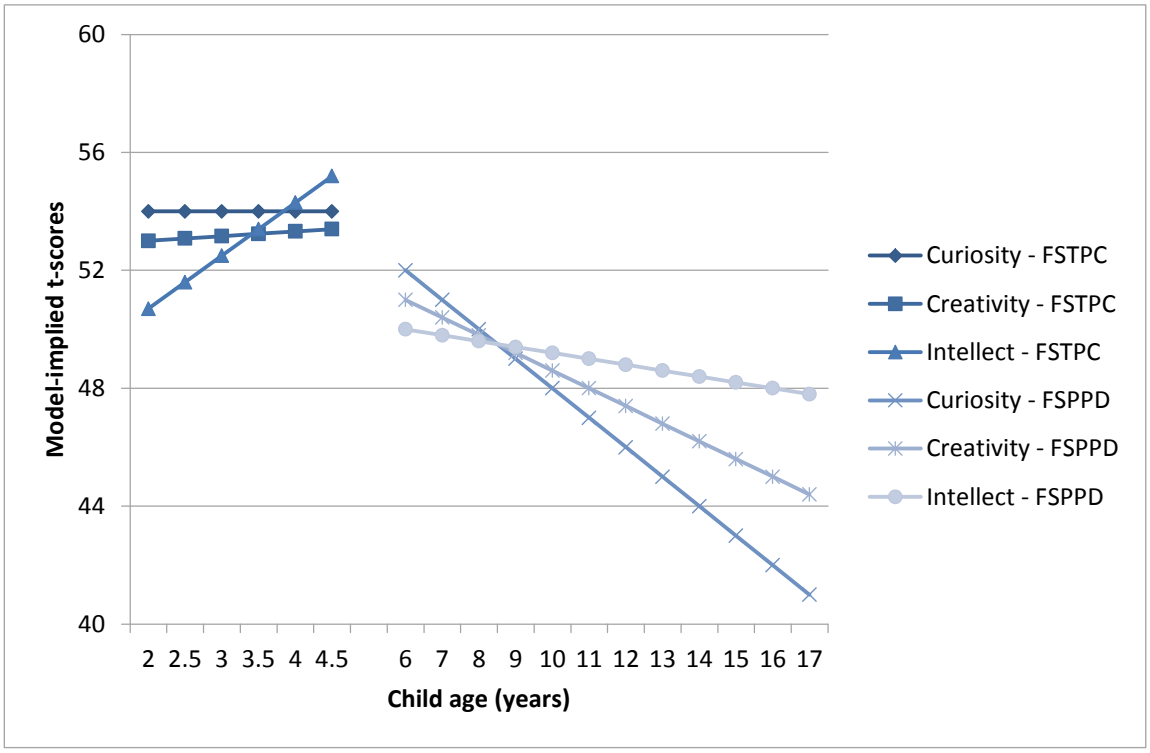
Figure 6.9. Average levels of ideas and aesthetics across a lifetime



Source: Adapted from Soto et al. (2011[175]), "Age differences in personality traits from 10 to 65: Big Five domains and facets in a large cross-sectional sample", http://dx.doi.org/10.1037/a0021717.

De Haan et al. (2017[196]) found decreases for all three of the facets they studied in the Flemish Study on Parenting, Personality, and Development sample: Creativity (i.e. ingenuity), curiosity, and intellect (i.e. intellectual efficiency). These are presented in Figure 6.10. As with the conscientiousness facets, de Haan et al.'s data do not show the rebound in later teen years that is evident in Soto et al.'s data. A possible explanation is that the de Haan study stopped at the age of 17, which is around the time when the openness facets begin to rebound in the Soto et al. study. Regardless of the data source, there appears to be a substantial change downwards in the openness-related skills during adolescence. Consequently, there is a definite opportunity to mitigate this negative trend via well-considered interventions.

Figure 6.10. Estimated levels of creativity, curiosity, and intellect from age 2 to 17



Source: Adapted from De Haan et al. (2017[196]), "Long-term developmental changes in children's lower-order Big Five personality facets", https://doi.org/10.1111/jopy.12265.

6.3. Facets of extraversion

6.3.1. Taxonomy map

Early personality researchers often disagreed about which behavioural classes to include as part of the extraversion domain. Most taxonomies and inventories included sociability and assertiveness (Hough and Ones, 2002[273]; Mershon and Gorsuch, 1988[59]), but less agreement exists about other facets. Some authors add an energy or activity level component (Digman, 1990[15]), others add excitement seeking (Costa and McCrae, 1985[11]; Norman, 1963[9]), yet others include optimism (De Fruyt, Mervielde and Van Leeuwen, 2002[257]), or even friendliness and warmth (Cattell, 1973[73]; Goldberg, 1993[44]). Fortunately, recent research aimed at determining the fundamental features of extraversion (Ashton, Lee and Paunonen, 2002[274]; Lucas et al., 2000[275]) has brought

some clarity to this domain. Specifically, recent studies have investigated whether extraversion should be viewed primarily as: 1) a preference for social interactions; 2) a tendency to experience pleasant emotions across a variety of rewarding situations (reward sensitivity); or 3) a tendency to engage and enjoy social attention for its own sake. Empirical evidence supports choosing the social attention as a fundamental feature of extraversion (Ashton, Lee and Paunonen, 2002[274]). From this viewpoint, extraversion is seen as affiliation (tendency to engage and enjoy friendly social interactions), ascendance (tendency to enjoy leadership, dominance, and assertive behaviours), and sensation seeking (tendency to enjoy exciting social interactions, such as parties). Finally, energy/activity (tendency to sustain vigorous activity throughout a day) could be added to this mix because all these behaviours demand considerable energy expenditure.

Table 6.5 provides an overview of the narrow extraversion skills from the seven facet taxonomies and five adult personality inventories. As can be seen in the table, Ashton et al.'s view of extraversion is well supported with all taxonomies and inventories identifying three or all extraversion facets. The lexical taxonomy by Saucier and Ostendorf (1999[60]), for example, identified four extraversion facets: sociability, unrestraint, assertiveness, and activity/adventurousness. BFI-2 had three facets: assertiveness, sociability, and energy level, but items from the energy level facet also contained content from the sensation/excitement seeking facet (e.g. *"rarely feels excited or eager"*). The three child-based taxonomies also identified the four facets.

Table 6.5. Conceptual map for narrow dimensions from the extraversion domain

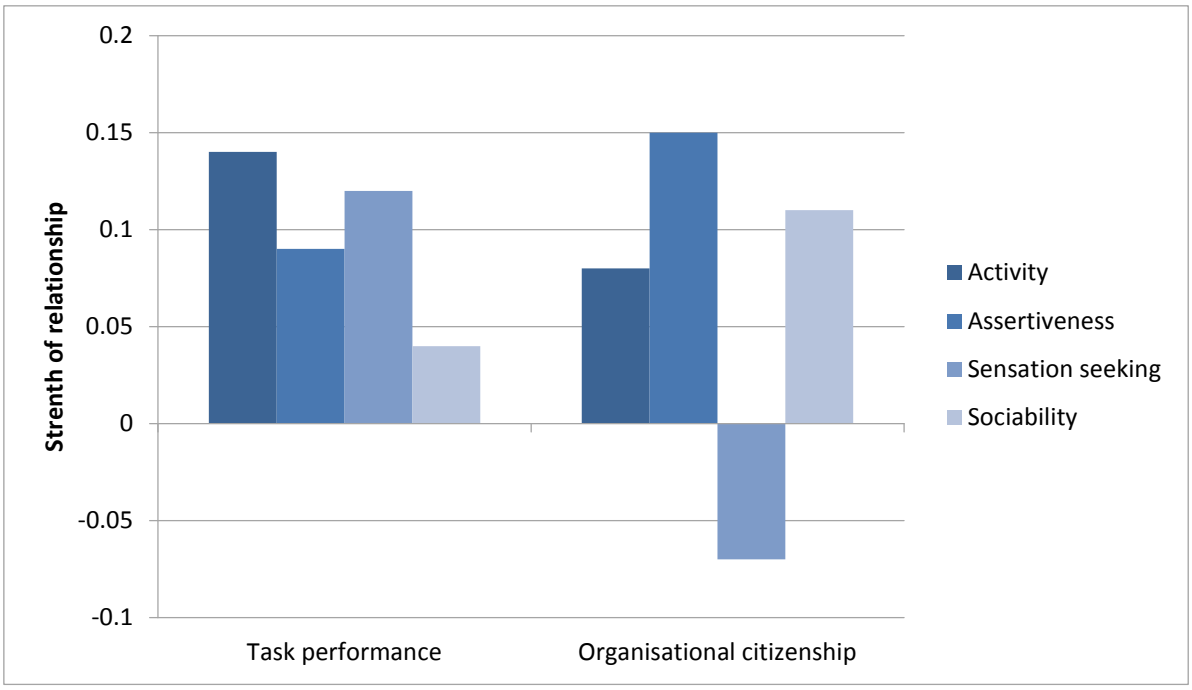
Definitions and indicators	Extraversion skills			
Skill name	**Assertiveness**	**Sociability**	**Energy/Enthusiasm**	**Sensation seeking**
Definition	Capacity to assert own will to accomplish goals in the face of opposition, such as speaking out, taking a stand, and confronting others if needed; courage.	Able to approach others, both friends and strangers, initiating and maintaining social connections.	Passion and zest for life; approaching daily life with energy, excitement, and spontaneity.	Tend to seek excitement, stimulation; is expressive.
Typical behavioural indicators	Take charge/wait for others to lead the way.	Enjoys meeting new people/tends to be quiet.	Full of energy/less active than others.	Love excitement/dislike parties and loud music.
Key Taxonomies and Inventories	**Extraversion skills**			
Temperament characteristics (Thomas and Chess, 1977[163])			Intensity of reaction	Threshold of responsiveness
ICID facets (Halverson et al., 2003[182])	Strong willed	Sociable-outgoing, shy	Activity level	
HiPIC facets (De Fruyt, Mervielde and Van Leeuwen, 2002[257])		Shyness	Energy	Expressiveness
BFI-2 facets (Soto and John, 2017[20])	Assertiveness	Sociability	Energy level	
Lexical subcomponents (Saucier and Ostendorf, 1999[60])	Assertiveness	Sociability	Activity-adventurousness	Unrestraint
HEXACO facets (Lee and Ashton, 2004[242])	Social boldness	Sociability	Liveliness	Expressiveness
TAPAS facets (Drasgow et al., 2012[243])	Dominance	Sociability	Physical activity	Attention seeking
AB5C scales (Goldberg, 1999[249]; Hofstee, de Raad and Goldberg, 1992[238])	Assertiveness, leadership	Poise, self-disclosure		Provocativeness
NEO PI-R scales (McCrae and Costa Jr., 2008[258])	Assertiveness	Gregariousness	Activity	Excitement seeking
HPI homogeneous item composites (Hogan and Hogan, 1992[248])	Competitive, leadership	Likes people, no social anxiety		Entertaining, exhibitionistic, likes crowds, likes parties
OPQ scales (Saville et al., 1984[251])	Controlling, independent, persuasive	Affiliative, outgoing, socially confident	Active	
16PF scales (Conn and Reike, 1994[47])	Dominance	Social boldness, private		Liveliness

6.3.2. Predictive value of extraversion sub-domains

Judge et al. (2012[272]) reported on three longitudinal studies that looked at the relationship between the Big Five dimensions and income, and found extraversion to be predictive of income and educational attainment. For example, in the 1997 National Longitudinal Survey of Youth study, the measure of extraversion was a combination of dominance and sociability facets. Extraversion had significant correlations with continuous work history (r = .13) and income (r = .10).

Judge et al. (2013[261]) conducted a meta-analysis investigating relationships between extraversion facets (operationalised as NEO-PI facet scales), and task and citizenship performance. Their results are shown in Figure 6.11. Activity (i.e. physical activity) is related to task performance, and assertiveness (i.e. dominance) is related to organisational citizenship. Interestingly, the global extraversion dimension, aggregating across 35 studies has been found to have a fairly strong relation with organisational citizenship.

Figure 6.11. Relationship between extraversion-related skills and task performance and organisational citizenship

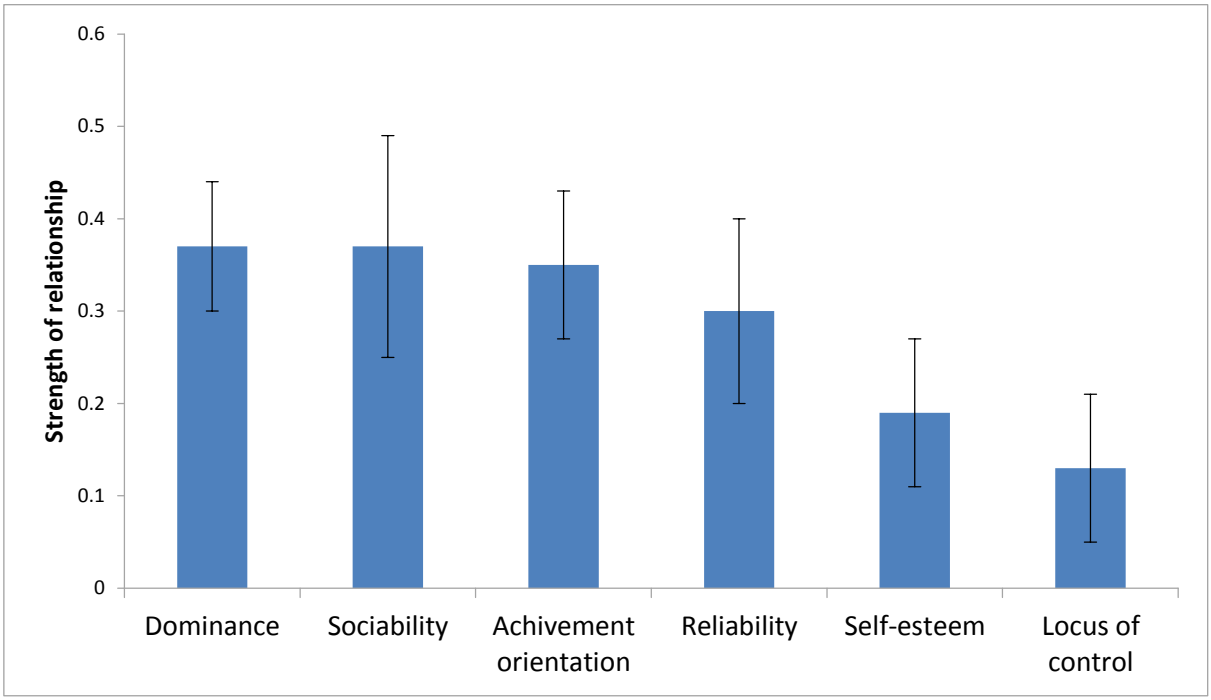


Note: Strength of relationships represents average correlation across studies.
Source: Adapted from Judge et al. (2013[261]), "Hierarchical representations of the five-factor model of personality in predicting job performance: Integrating three organizing frameworks with two theoretical perspectives", http://dx.doi.org/10.1037/a0033901.

Another outcome highly relevant to extraversion is leadership – the process by which an individual, group, or organisation *"creates a vision and intentionally influences the behavior of others in order to achieve their vision"* (Langford and Fitness, 2003, p. 279[276]). Organisations invest considerable resources into leadership development (Carter, Ulrich and Goldsmith, 2005[277]), and those in leadership positions are also typically well-compensated. Past research has established that, of the Big Five personality factors, extraversion is the best predictor of leadership outcomes (Bono and Judge, 2004[278]; Judge et al., 2002[279]). Research investigating facet-level correlates with

leadership performance identified dominance and sociability as best predictors. For example, Legree et al. (2014[280]) found, for a sample of 1 568 officer cadets, the dominance facet of extraversion had the highest correlation with the overall leadership development course ratings (r = .24). Judge et al. (2002[279]) reported meta-analytic correlations for several narrow personality facets and leadership. As can be seen from Figure 6.12 (below), dominance and sociability have strong meta-analytic correlation estimates.

Figure 6.12. Meta-analysis of the relationship between personality facets and leadership



Note: Strength of relationship represents average correlation coefficients across studies. Vertical bars represent 95% confidence intervals. The correlations are corrected for scale reliability.
Source: Adapted from Judge et al. (2002[279]), "Personality and leadership: A qualitative and quantitative review", http://dx.doi.org/10.1037//0021-9010.87.4.765.

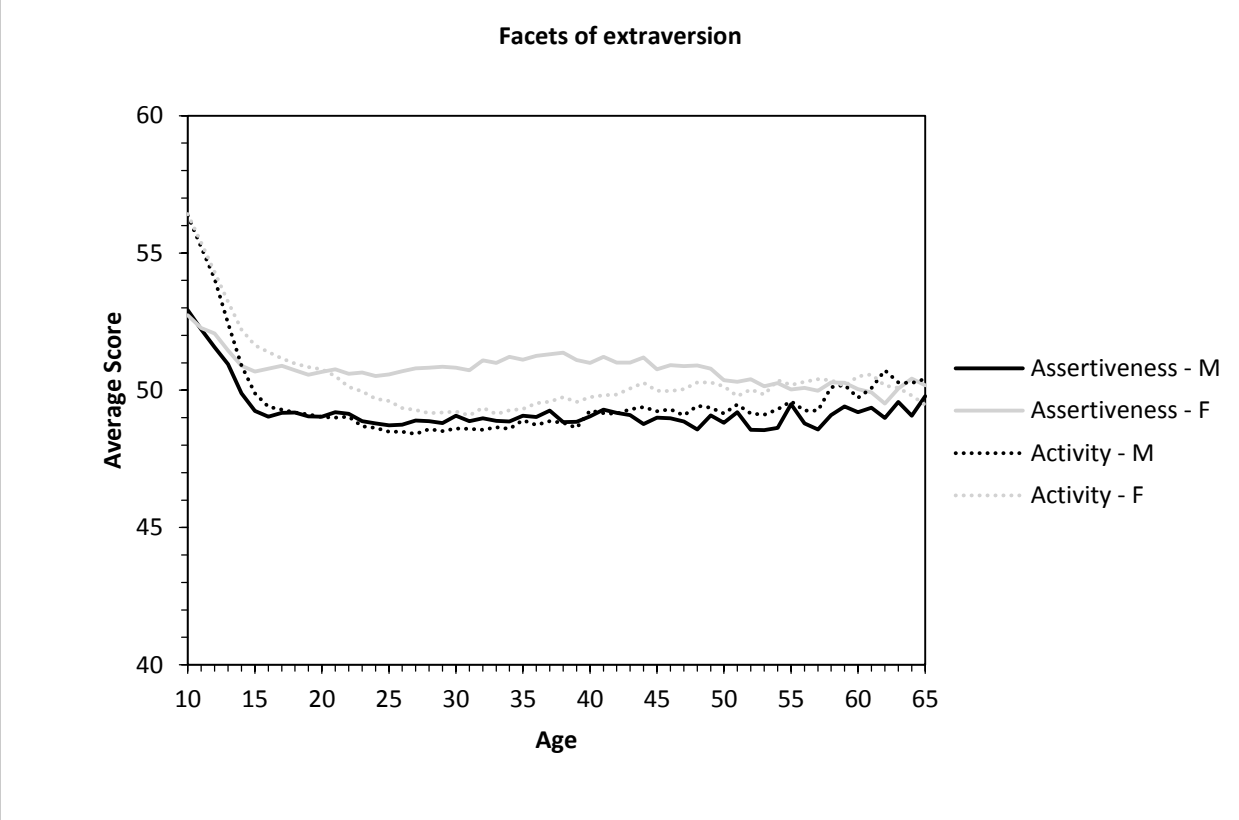
Early childhood studies have mainly been interested in sociability defined as a tendency to seek out interaction and forge relationships with others (Cheek and Buss, 1981[281]). In the Project Competence study (Masten and Tellegen, 2012[282]), social competence measured at age 8 was associated with better work competence (i.e. a record of holding down a job successfully and carrying out responsibilities well) at age 20. Evidence from the United Kingdom longitudinal study suggests that social competence in childhood (i.e. social skills and peer popularity measured at age 10) predict entrepreneurial status at age 34, and continuity in entrepreneurial activity (ages 30 and 34) as well as earnings among the self-employed at age 34 (Obschonka, Silbereisen and Schmitt-Rodermund, 2012[283]).

Another study using Finnish and Swedish data (Kokko, Bergman and Pulkkinen, 2003[284]) showed that 'timidity' at age 8 was related to adult unemployment. These effects however mainly operate via SES, school achievement and earlier emotional problems.

6.3.3. Malleability/Development evidence

Figure 6.13 shows Soto et al.'s (2011[175]) findings about the stability of two extraversion facets, assertiveness (i.e. dominance) and activity (i.e. physical activity). As with the conscientiousness and openness facets, there are dips in the average levels of these facets from age 10 to the early teens. The relationships then differ: rather than increasing, the average of extraversion facets remains roughly constant from the mid-teens to age 65.

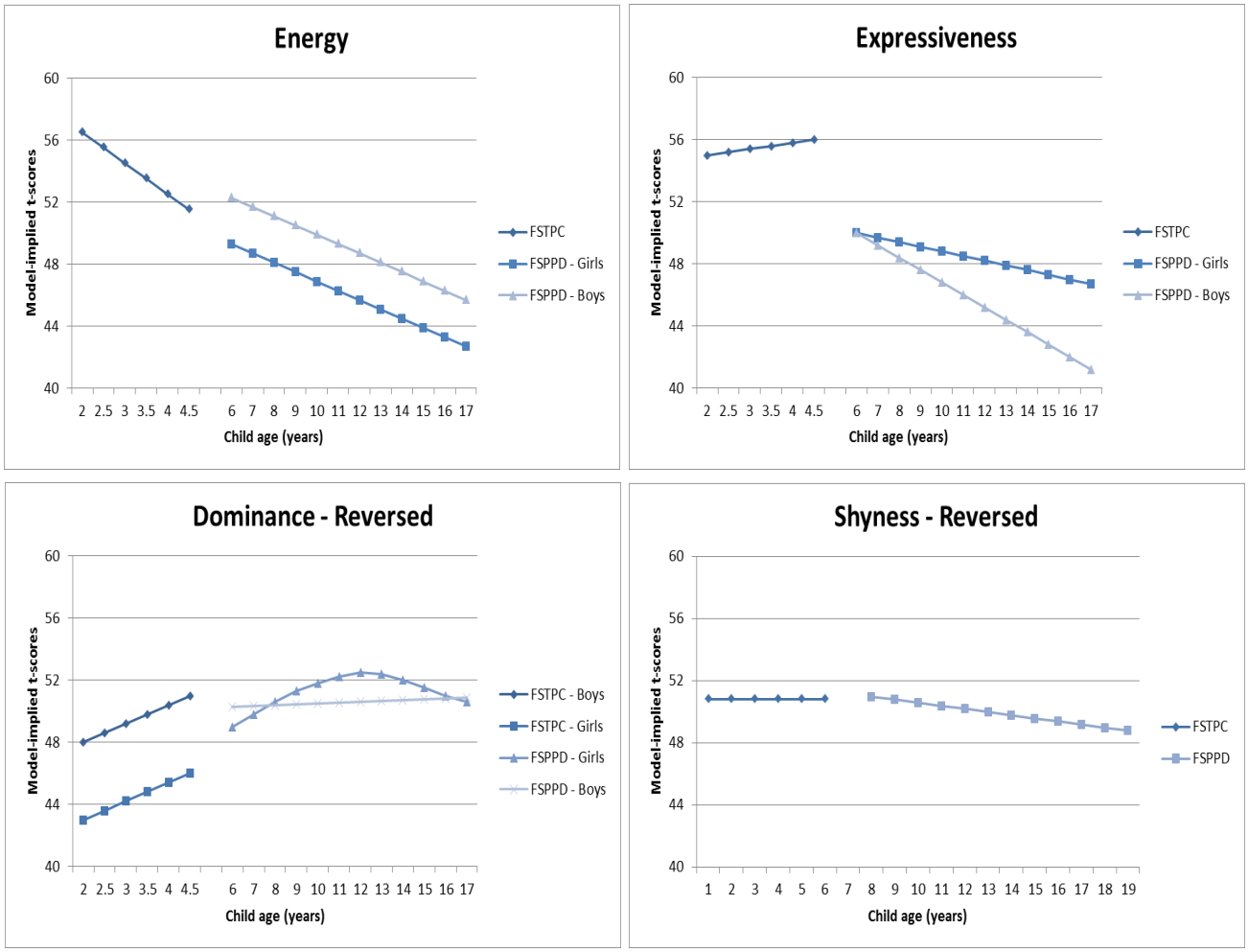
Figure 6.13. Average levels of assertiveness and activity across a lifetime



Source: Adapted from Soto et al. (2011[175]), "Age differences in personality traits from 10 to 65: Big Five domains and facets in a large cross-sectional sample", http://dx.doi.org/10.1037/a0021717.

De Haan et al. (2017[196]) found decreases for both of the facets they studied in the FSPPD sample: energy (i.e. physical activity) and expressiveness (i.e. attention seeking). In contrast to Soto et al.'s data, de Haan et al.'s data do not show any abatement in the decline of these facets in later teen years (see Figure 6.14 below). Again, a possible explanation is that the de Haan study stopped at age 17, which is around the time when the extraversion facets stabilised in the Soto et al. study. Regardless of the data source however, there appears to be a substantial decline in the extraversion facets during adolescence, presenting an opportunity for interventions aimed at mitigating this negative trend.

Figure 6.14. Estimated levels of energy, expressiveness, dominance and shyness (reversed) from age 2 to 17



Source: Adapted from De Haan et al. (2017[196]), "Long-term developmental changes in children's lower-order Big Five personality facets", https://doi.org/10.1111/jopy.12265.

6.4. Facets of agreeableness

6.4.1. Taxonomy map

According to Graziano and Tobin (2002[285]), agreeableness is concerned with individual differences in the motivation to maintain positive relations with others (Digman, 1997[286]; Hogan, 1983[287]; Graziano and Eisenberg, 1997[288]; MacDonald, 1992[289]; MacDonald, 1995[290]; Wiggins and Trapnell, 1997[291]) and to minimise interpersonal conflict (Graziano, Jensen-Campbell and Hair, 1996[292]; Jensen-Campbell and Graziano, 2001[293]). Examples of agreeableness-related behaviours include showing active emotional concern for others' well-being, treating others well, and holding positive generalised beliefs about others (Soto and John, 2017[20]).

Table 6.6 shows a conceptual map linking narrow agreeableness characteristics across six facet taxonomies and five adult personality inventories. The lexical investigation by Saucier and Ostendorf (1999[60]) found four agreeableness facets: warmth-affectionate,

gentleness, generosity, and modesty. Each facet exhibited a .70 to .84 loading on the broad factor and had a correlation of .50 to .82 with a questionnaire-based agreeableness scale. These results were interpreted as evidence that the four facets belonged to the agreeableness domain. The warmth-affectionate facet was marked by adjectives such as warm, affectionate, sensitive, and compassionate (positive pole of the skill continuum) and cold, unsympathetic, and insensitive (negative pole of the skill continuum). The adjectives for the gentleness facet were agreeable, cordial, and amiable vs. antagonistic, rough, and combative. The generosity facet was marked by adjectives such as charitable, helpful, and generous vs. greedy, stingy, and selfish. Finally, the modesty facet had modest and humble on its positive end and conceited, snobbish, and egocentric on its negative end.

The TAPAS taxonomy, which was based on the factor analysis of scores from 21 scales from the agreeableness domain, found three facets: co-operation, consideration, and selflessness. These facets corresponded closely to gentleness, warmth, and generosity found in the lexical study. Individuals scoring high on co-operation are trusting, cordial, co-operative, uncritical, kind, and easy to live with. Individuals scoring high on consideration are considerate, affectionate, and positive towards others. Unlike extroverts, however, who actively seek social attention, individuals with high consideration scores may be quite passive socially; they are simply *"there for you, whenever needed"*. Behaviours from the selflessness facet are more active, such as helping and doing things for others, giving to charity and volunteering for community improvement. Individuals scoring high on this facet are generous with their time and resources and think of others first.

Most other taxonomies and adult inventories also define agreeableness as empathy/warmth, generosity and co-operation/trust. A modesty facet was found in the lexical taxonomy and is also present in the OPQ (Occupational Personality Questionnaire).

The HEXACO taxonomy needs to be described separately, because essentially, it has two broad agreeableness dimensions: honesty-humility and agreeableness (Ashton and Lee, 2007[42]; Ashton et al., 2004[50]). Modesty, sincerity, and greed avoidance facets are part of the honesty-humility domain but we place them into respective warmth and generosity facets. Forgiveness and gentleness are part of HEXACO's agreeableness broad factor and are best placed within the trust/co-operation facet. Other HEXACO facets belonging to these two broad domains could be placed into other Big Five dimensions. For example, in this paper, the fairness facet from honesty-humility was placed into the virtue facet identified as part of the Conscientiousness domain.

Table 6.6. Conceptual map for narrow dimensions from the agreeableness domain

Definitions and indicators	**Agreeableness skills**					
Skill name	**Empathy**	**Altruism/ generosity**	**Co-operation/ relationship harmony**	**Trust**	**Respectfulness**	**Modesty**
Definition	Kindness and caring for others stems from perspective-taking and empathic concern for their well-being.	Generous to other people, cares about others interests, wants to help others.	Living in harmony with others and valuing interconnectedness among all people.	Belief that others generally have good intentions and forgiveness for those that have done wrong.	Treating people with respect and politeness according to notions of fairness, justice, and tolerance.	Is not self-centred, is moderate in needs and expectations.
Typical behavioural indicators	Sympathise with the homeless/can be cold and uncaring.	Share possessions freely/look down on others.	Easy to live with/argues a lot.	Borrows things/do not forgive people's mistakes.	Treats people with respect/is impolite to others.	Unassuming and modest/ feel superior and entitled.
Key Taxonomies and Inventories	**Extraversion skills**					
ICID facets (Halverson et al., 2003[182])	Considerate		Antagonism, compliance			
HiPIC facets (De Fruyt, Mervielde and Van Leeuwen, 2002[257])	Egocentrism	Altruism	Compliance			
BFI-2 facets (Soto and John, 2017[20])	Compassion			Trust	Respectfulness	
Lexical subcomponents (Saucier and Ostendorf, 1999[60])	Warmth-affection	Generosity	Gentleness			Modesty-humility
HEXACO facets (Lee and Ashton, 2004[242])	Sincerity, sentimentality	Greed avoidance	Forgiveness, gentleness			Modesty
TAPAS facets (Drasgow et al., 2012[243])	Consideration	Selflessness	Co-operation			
AB5C scales (Goldberg, 1999[249]; Hofstee, de Raad and Goldberg, 1992[238])	Warmth, tenderness, empathy, understanding	Sympathy	Pleasantness, nurturance			
NEO PI-R scales (McCrae and Costa Jr., 2008[258])	Positive emotions, warmth	Tender-mindedness, altruism	Compliance	Trust		
HPI homogeneous item composites (Hogan and Hogan, 1992[248])	Caring, sensitive, empathy		Easy to live with	Trusting		
OPQ scales (Saville et al., 1984[251])	Caring		Critical, democratic			Modest
16PF scales (Conn and Reike, 1994[47])	Warmth					

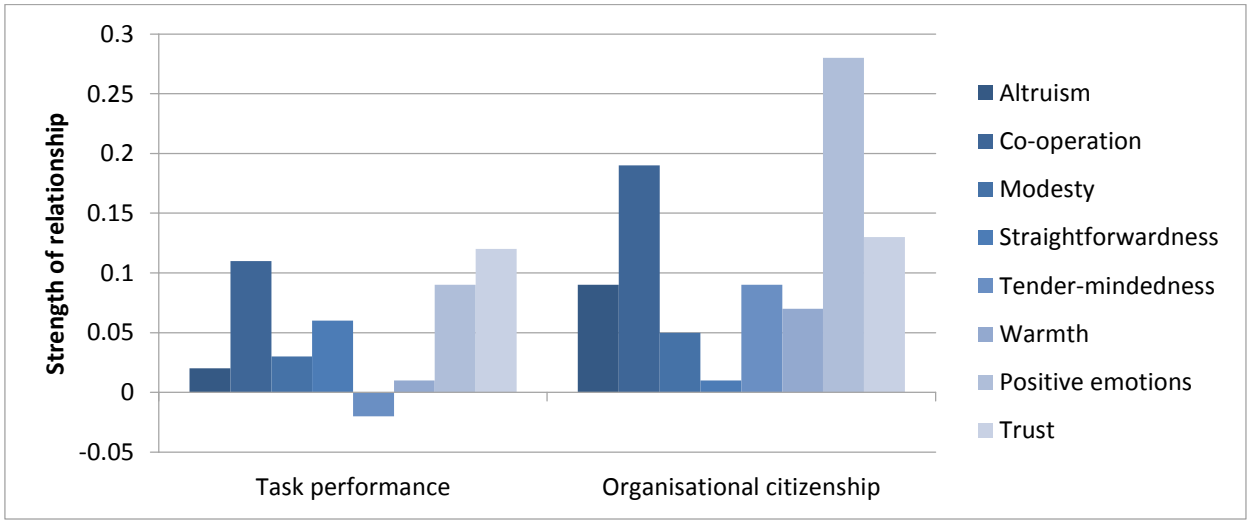
6.4.2. Predictive value of agreeableness sub-domains

Agreeable individuals place greater value on their interpersonal relationships (Graziano and Tobin, 2002[285]), are more co-operative and helpful (Graziano and Eisenberg, 1997[288]; LePine and Van Dyne, 1998[294]), and are better liked by their peers (Jensen-Campbell et al., 2002[295]). However, evidence suggests that agreeableness, despite positive social benefits, is negatively related to income and earnings (Bozionelos, 2004[296]; Mueller and Plug, 2006[297]; Spurk and Abele, 2010[298]). Judge at al. (2012[272]) analysed data from three longitudinal studies that measured agreeableness and found that it was negatively correlated with future earnings. In the third study involving 1 691 individuals from the Wisconsin Longitudinal Study (WLS), the authors reported -.14 correlations between agreeableness and income. The seven agreeableness items utilised in the WLS were a combination of consideration and co-operation facets.

Poropat (2009[86]; 2014[87]) found agreeableness characteristics not to correlate with grades, but Lounsbury et al. (2004[299]) found agreeableness to be an important predictor of school absences. They reported correlations of -.20 and -.24 for agreeableness with school absences for 10th and 12th graders, respectively. Unfortunately, neither study provided facet-level agreeableness information.

Figure 6.15 shows Judge et al.'s (2013[261]) meta-analytic estimates of the correlation of agreeableness facets with task performance and organisational citizenship. The correlations with task performance are not large. However, compliance (i.e. co-operation) and positive emotions (i.e. consideration) have substantial correlations with organisational citizenship.

Figure 6.15. Relationship between agreeableness-related skills and task performance and organisational citizenship



Note: Strength of relationships represents average correlation across studies.
Source: Adapted from Judge et al. (2013[261]), "Hierarchical representations of the five-factor model of personality in predicting job performance: Integrating three organizing frameworks with two theoretical perspectives", http://dx.doi.org/10.1037/a0033901.

Some early childhood studies have focused exclusively on the empathy facet and found that *lack* of empathy is associated with negative outcomes in adolescents. British children in the Twins Early Development Study who exhibited callous-unemotional (CU)

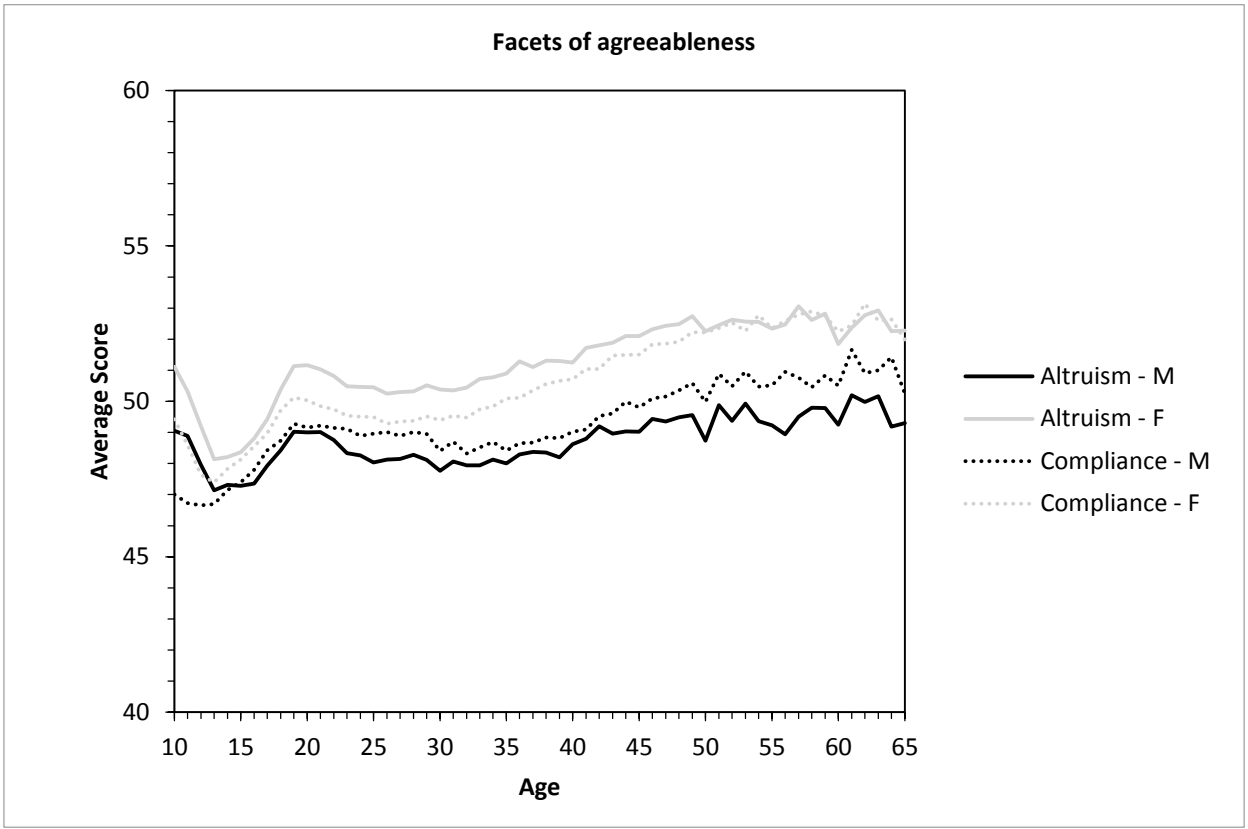
characteristics (in part indicated by a lack of empathy) at age 7, reported more antisocial and delinquent behaviours at age 12, characterised by hyperactivity, peer and emotional problems, as well as negative parental feelings (Fontaine et al., 2011[300]).

Similarly, a Swiss longitudinal study found that sympathy (example item: *"When I see another child who is hurt or upset, I feel sorry for him or her"*) and moral reasoning at 6 and 9 years of age were associated with social justice values, such as the belief in treating others fairly and minimising inequalities, at age 12. This association was found when controlling for social and emotional skills and cognitive ability (Daniel et al., 2014[301]).

6.4.3. Malleability/Development evidence

Figure 6.16 shows Soto et al.'s (2011[175]) findings about the stability of two agreeableness facets, altruism (i.e. selflessness) and compliance (i.e. co-operation). Again, there are dips in the average levels of these facets from age 10 to the early teens. In the late teens, the means rebound to the age 10 levels, and then show very slight increases to age 65.

Figure 6.16. Average levels of altruism and compliance across a lifetime

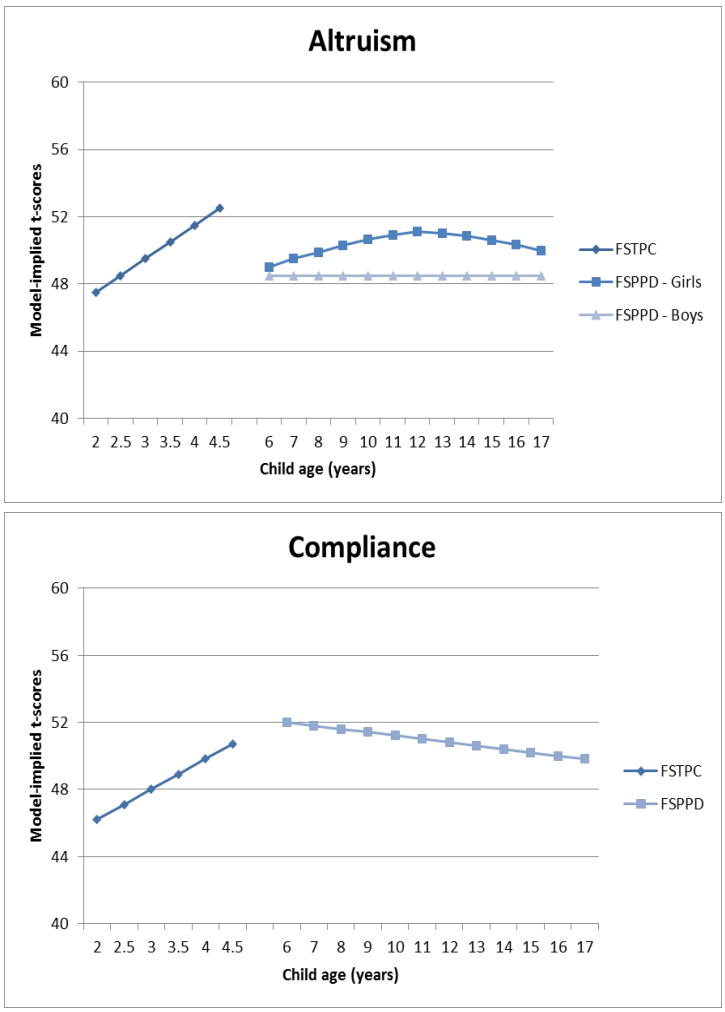


Source: Adapted from Soto et al. (2011[175]), "Age differences in personality traits from 10 to 65: Big Five domains and facets in a large cross-sectional sample", http://dx.doi,org/10.1037/a0021717.

De Haan et al. (2017[196]) found decreases for the altruism (i.e. selflessness) and compliance (i.e. co-operation) facets they studied in the FSPPD sample. In contrast to

Soto et al.'s data, de Haan et al.'s data show virtually no difference in altruism between ages 10 and 15, and only a very small decline for compliance (see Figure 6.17).

Figure 6.17. Estimated levels of altruism and compliance from age 2 to 17



Source: Adapted from De Haan et al. (2017[196]), "Long-term developmental changes in children's lower-order Big Five personality facets", https://doi.org/10.1111/jopy.12265.

6.5. Facets of emotional stability

6.5.1. Taxonomy map

Emotional stability, or its negative end known as neuroticism/negative emotionality, characterises individual differences in the frequency and intensity of affect (Clark and Watson, 2008[302]; Widiger, 2009[303]). Facet-level models of negative emotionality typically differentiate three types of negative affect: fear/anxiety, sadness/depression, and irritation/anger (Goldberg, 1999[249]; McCrae and Costa Jr., 2008[258]; Saucier and Ostendorf, 1999[60]). Of these, the tendency to experience anxiety and fear tends to be the most central and factor-pure (Hofstee, de Raad and Goldberg, 1992[238]). The tendency towards depression and sadness is often accompanied by low levels of energy and arousal and thus is related to physical activity from extraversion. Volatile mood swings often

disrupt social interactions, and thus are related to low agreeableness (Goldberg, 1999[249]; McCrae and Costa Jr., 2008[258]).

As can be seen in Table 6.7, there appears to be a fair amount of agreement between child-based and adult-based taxonomies for this broad factor. This is actually a bit misleading since some of the emotional stability facets are actually part of the agreeableness domain and vice versa. As was noted in section 3 of this paper, studies involving children often find negative aspects of emotional stability (anger and hostility) to co-vary with disagreeableness. On the other hand, positive aspects of emotional stability (i.e. optimism) are often correlated with gregariousness and energy, which are part of the extraversion broad domain. The HiPIC taxonomy, for example, has its irritability facet as part of the benevolence (agreeableness) domain, while optimism facets help make up extraversion. To avoid confusion, we placed irritability in the emotional stability facet of even tempered, and optimism into the emotional stability facet of optimism.

The lexical investigation by Saucier and Ostendorf (1999[60]) found three facets of emotional stability: irritability, insecurity, and emotionality. The irritability facet was marked by adjectives such as irritable and moody (i.e. the negative end of emotional stability) vs. undemanding and uncritical (the positive end of the skill continuum). The adjectives for the insecurity facet include insecure, unstable, nervous vs. relaxed and unenvious. The emotionality facet was marked by adjectives such as emotional, anxious, fidgety, and excitable vs. unemotional and unexcitable. Behaviours in all these facets deal with some form of emotional instability/excitability on the negative end and imperturbability/placidity at the positive end.

The TAPAS-based research investigating emotional stability involved factor analysis of responses to 30 scales identified as measuring various aspects of this domain. Drasgow et al. (2012[243]) found three facets: it was marked by the no depression scale from the HPI and the depression scale from the NEO-PI. In addition, a number of scales describing one's happiness and well-being are loaded on this facet (i.e. the moderation and happiness scales from the AB5C, the well-being scale from the CPI, the emotional stability scale from the 16PF, and the no guilt and identity scales from the HPI). All these scales seemed to assess an individual's general emotional tone. The continuum here is joy, well-being, and a positive outlook on one end, and a negative outlook, depressed mood, hopelessness, and despair on the other.

The second facet identified in the TAPAS research was adjustment. It was defined by three anxiety scales from the JPI, NEO-PI, and HPI, the apprehension scale from 16PF and the stress reaction scale from the MPQ. All of these scales described behaviours associated with various degrees of insecurity and anxiety. Individuals scoring low on the adjustment facet are high strung, self-conscious and apprehensive in most contexts. This facet essentially mirrored the insecurity facet found in the lexical investigation, but orientated into the direction of emotional stability.

The third facet, even tempered, was defined by the calmness scale from the AB5C, the hostility scale from the NEO-PI, the even tempered and empathy scales from the HPI, and the stability and tranquillity scales from the AB5C. Persons scoring low on this facet tend to experience a range of emotions including irritability, anger, hostility, or even aggression. In contrast, those scoring high on the even tempered facet tend to be calm, even tempered, and stable, even when threatened. This facet most closely resembles the irritability facet from the lexical investigation by Saucier and Ostendorf.

Table 6.7. Conceptual map for narrow dimensions from the emotional stability domain

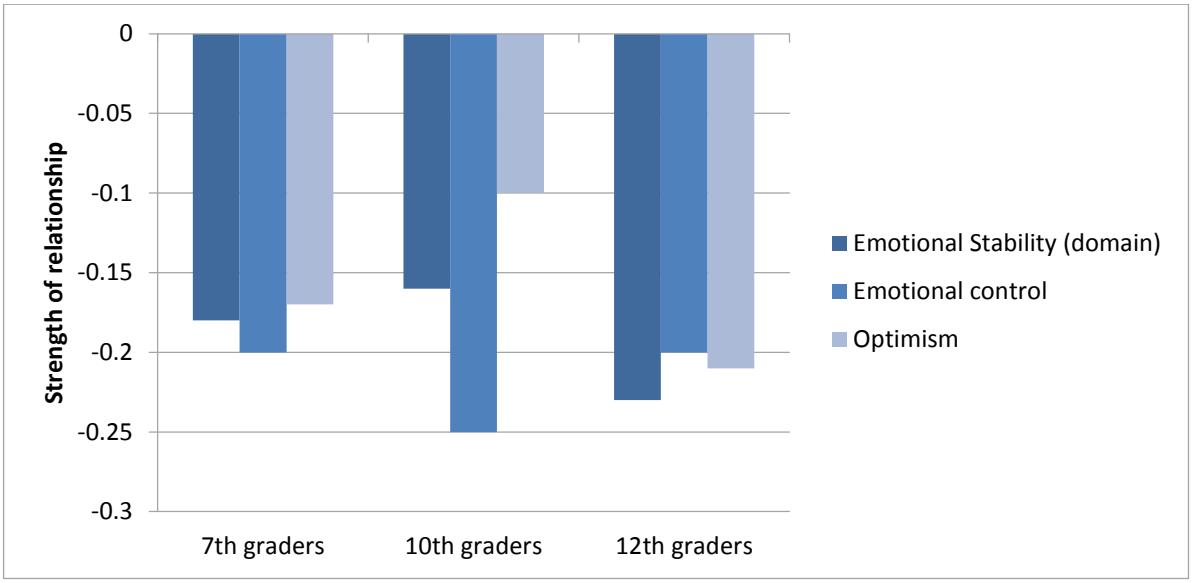
Definitions and indicators	**Emotional stability skills**		
Skill name	**Stress resistance/vs. anxiety**	**Emotional control/volatility**	**Optimism**
Definition	Able to deal with anxiety and stress; untroubled by excessive worry and able to calmly solve problems.	Effective strategies for regulating temper, anger, and irritation; able to maintain tranquillity and composure in the face of frustrations.	Positive and optimistic expectations for self and life; anticipates success; a "can-do" mindset.
Typical behavioural indicators	Worry about things/relaxed most of the time.	Rarely gets irritated/gets angry easily.	Often feels depressed/feels optimistic about the future.
Key Taxonomies and Inventories	**Emotional stability skills**		
Temperament characteristics (Thomas and Chess, 1977[163])			Quality of mood
ICID facets (Halverson et al., 2003[182])	Fearful/insecure	Negative affect	Positive emotions
HiPIC facets (De Fruyt, Mervielde and Van Leeuwen, 2002[257])	Anxiety	Irritability*	Self-confidence, optimism*
BFI-2 facets (Soto and John, 2017[20])	Anxiety	Emotional volatility	Depression
Lexical subcomponents (Saucier and Ostendorf, 1999[60])	Insecurity, emotionality	Irritability, emotionality	
HEXACO facets (Lee and Ashton, 2004[242])	Fearfulness, anxiety	Patience	Dependence
TAPAS facets (Drasgow et al., 2012[243])	Adjustment	Even tempered	Optimism
AB5C scales (Goldberg, 1999[249]; Hofstee, de Raad and Goldberg, 1992[238])	Toughness	Calmness, stability, tranquillity	Happiness, moderation
NEO PI-R scales (McCrae and Costa Jr., 2008[258])	Anxiety, self-consciousness, vulnerability	Hostility, impulsiveness	Depression
HPI homogeneous item composites (Hogan and Hogan, 1992[248])	No somatic complaints, not anxious, not autonomous	Even tempered, calmness, no hostility	Identity, no depression, good attachment, no guilt
OPQ scales (Saville et al., 1984[251])	Worrying	Emotional control, tough-minded, relaxed	Optimistic
16PF scales (Conn and Reike, 1994[47])	Apprehensive	Emotional stability	Tension

Note: * In the HiPIC taxonomy, irritability and optimism facets are part of benevolence and extraversion, respectively.

6.5.2. Predictive value of emotional stability sub-domains

Emotional stability, similar to conscientiousness, seems to be widely important, although its validities are slightly lower. Lounsbury et al. (2004[299]) studied school absences and assessed personality of 7th, 10th, and 12th graders at the start of the school year. They found that the broad factor of emotional stability (measured by the Adolescent Personal Style Inventory [APSI], Lounsbury et al., 2003[255]) and separately measured facets of optimism and emotional control consistently predicted school absences (see Figure 6.18). The other consistent predictors were the work drive facet of conscientiousness, openness to experience, and, for the later grades, agreeableness.

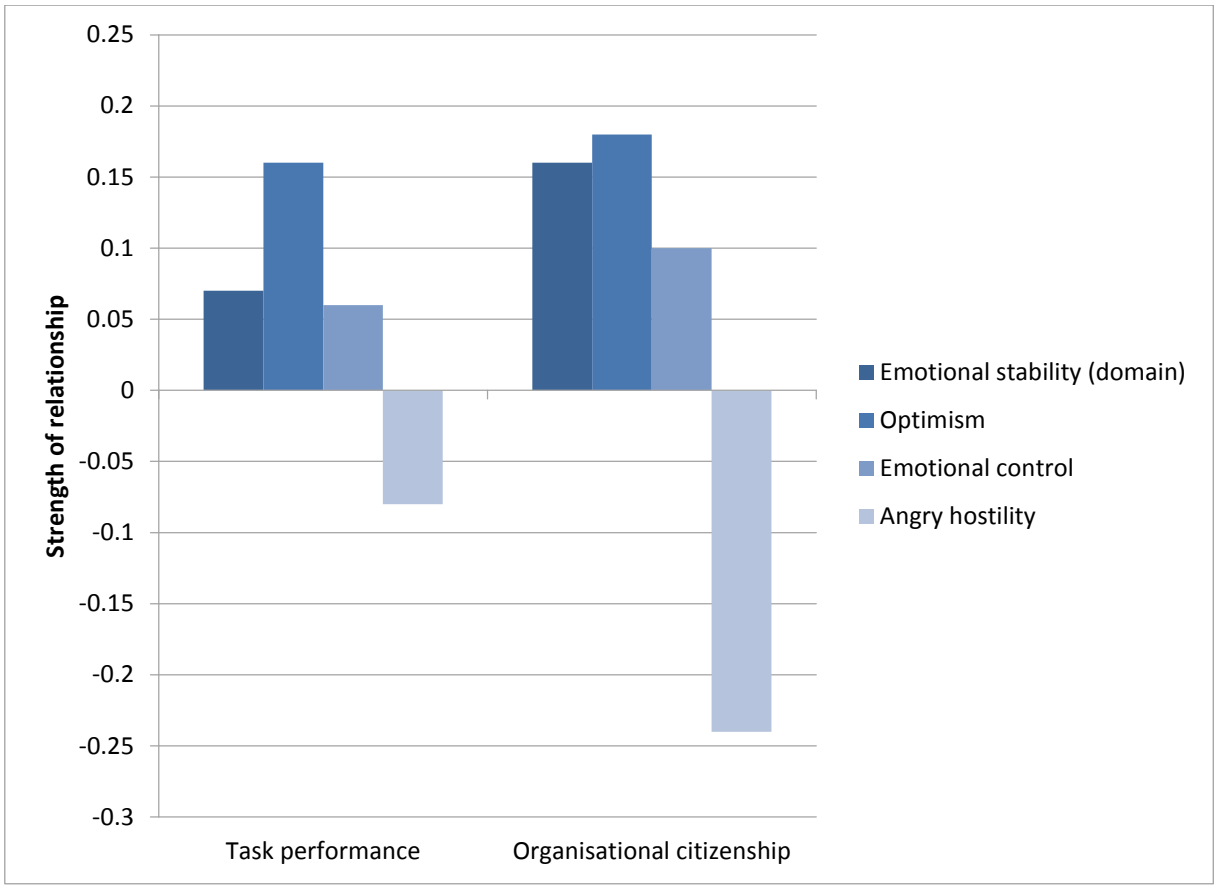
Figure 6.18. Personality characteristics and school absences by grade level



Note: Strength of relationships represents average correlation across studies.
Source: Adapted from Lounsbury et al. (2004[299]), "An investigation of personality traits in relation to adolescent school absenteeism", https://doi.org/10.1023/B:JOYO.0000037637.20329.97.

Figure 6.19 shows Judge et al.'s (2013[261]) meta-analytic estimates of the correlation of neuroticism facets with task performance and organisational citizenship. As with agreeableness, the correlations with task performance are not large. However, angry hostility (i.e. the reverse of even tempered) and depression (i.e. the opposite of optimism) have substantial correlations with organisational citizenship.

Figure 6.19. Relationship between emotional stability related skills and task performance and organisational citizenship

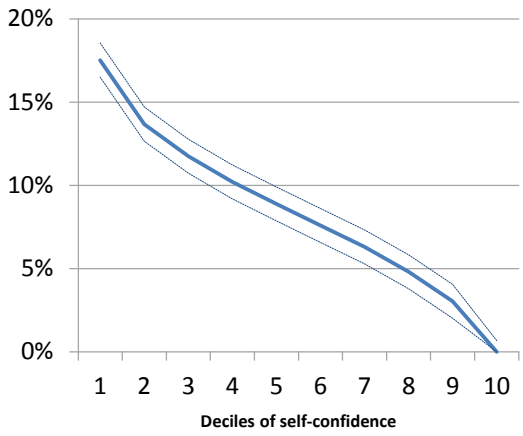


Note: Strength of relationships represents average correlation across studies.
Source: Adapted from Judge et al. (2013[261]), "Hierarchical representations of the five-factor model of personality in predicting job performance: Integrating three organizing frameworks with two theoretical perspectives", http://dx.doi.org/10.1037/a0033901.

Tauber et al. (2016[304]) studied predictors of life satisfaction using data from two cohorts from the Interdisciplinary Longitudinal Study of Adult Development and found emotional stability to correlate in the .30 to .40 range with reported life satisfaction 4 and 12 years later. Strickhouser et al.'s (2017[105]) review of 30 meta-analyses of personality-health relationships also found emotional stability characteristics to be most predictive of mental health. Steel, Schmidt and Shultz (2008[111]) provided insights about which facets of emotional stability drive these observed relationships. Their study estimated the optimism facet (operationalised as NEO-PI Depression) to have the highest relation to life satisfaction scores (r = .49); adjustment and even tempered facets had somewhat lower correlations ranging from .12 to .43.

The Youth in Norway study (OECD, 2015[1]) estimated self-confidence using measures of self-satisfaction and confidence in oneself at ages 15-19. Self-reported measures of weight and height were collected later on when these youth were ages 26-31 and obesity operationalised by having a BMI >= 30 (BMI is body mass index). Figure 6.20 shows the strong negative relationship between self-confidence and obesity.

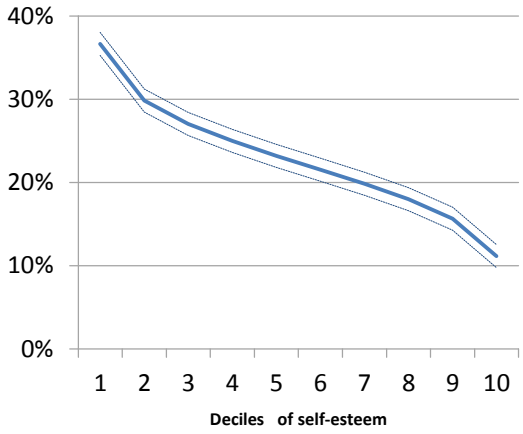
Figure 6.20. Probability of obesity as a function of self-confidence (in deciles) from the Youth in Norway study



Note: The solid line depicts the probability of BMI greater than 30 with 2.5-97.5% confidence intervals given by dashed lines.
Source: OECD (2015[1]), *Skills for Social Progress: The Power of Social and Emotional Skills*, http://dx.doi.org/10.1787/9789264226159-en.

Switzerland's Transition from Education to Employment study shows how another emotional stability facet, self-esteem, is important. Self-esteem is akin to the optimism/self-confidence facet found in most facet models. In this study, a latent self-esteem factor was estimated using measures of self-satisfaction: seeing one's own merit and confidence at age 16 (OECD, 2015[1]). Figure 6.21 shows the relation of depression at age 25 with the latent self-esteem measure, where again the relationship is substantial and negative.

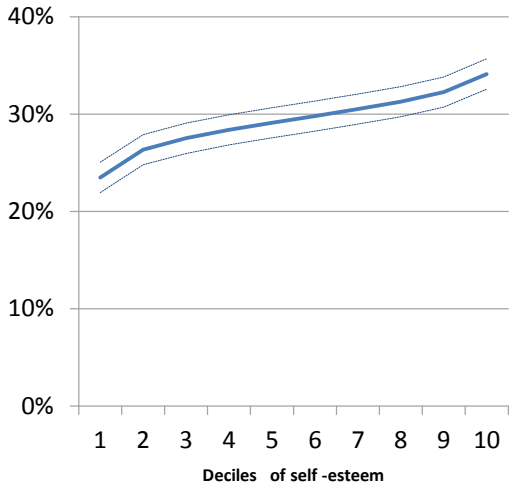
Figure 6.21. Probability of self-reported depression at age 25 as a function of self-esteem (in deciles) from Switzerland's Transition from Education to Employment study



Note: The solid line depicts the probability of being in the top quartile of a depression scale and the dotted lines depict the 2.5-97.5% confidence interval.
Source: OECD (2015[1]) *Skills for Social Progress: The Power of Social and Emotional Skills*, http://dx.doi.org/10.1787/9789264226159-en.

The Swiss study also examined the relationship between self-esteem (assessed at age 16) and positive attitudes towards life measured at age 25. This is graphed in Figure 6.22 as a substantial positive relationship.

Figure 6.22. Probability of having a positive attitude towards life at age 25 as a function of self-esteem at age 16 (deciles) using data from Switzerland's Transition from Education to Employment study



Note: The solid line depicts the probability of having a positive attitude towards life at age 25 and the dotted lines depict the 2.5-97.5% confidence interval.
Source: OECD (2015[1]) *Skills for Social Progress: The Power of Social and Emotional Skills*, http://dx.doi.org/10.1787/9789264226159-en.

Shuey and Kankaraš's (2018[305]) report on the impact of early life skills on later outcomes summarises several findings concerning emotional stability. For predicting later economic outcomes, they reported mixed evidence. For example, the Finnish Jyvaskyla Longitudinal Study of Personality and Social Development (JYLS) found that teacher-rated anxiety at age 8 predicted low career orientation at age 36 for women. For men, anxiety and passivity at age 8 predicted an *"unstable career"*, although it was believed that these effects were *"rooted in family SES"* (Pulkinnen, Kaprio and Rose, 1999[306]).

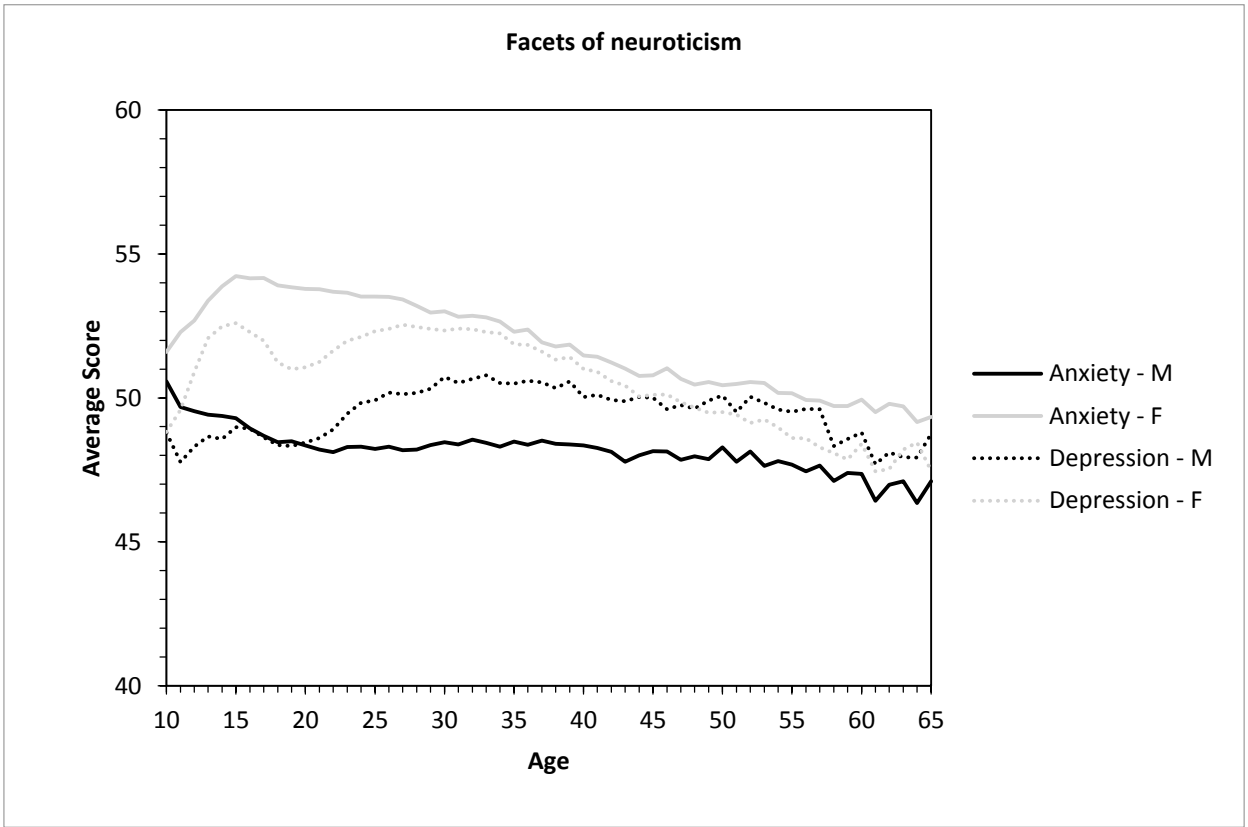
Shuey and Kankaraš found that the links between childhood emotional stability and mental health in later life were stronger. For example, results from the Dunedin cohort study found that parent-reported anxiousness and withdrawal at age 8 were predictive of mood, anxiety and phobic disorders during the ages of 16 and 21, even after controlling for social, childhood and family factors (Goodwin, Fergusson and Horwood, 2004[307]). The Christchurch Health and Development Study found early anxiety/withdrawal to be associated with an increased risk of later anxiety and depression (Jakobsen, Horwood and Fergusson, 2012[308]).

Shuey and Kankaraš also noted that a Dutch general population study found associations between mood and anxiety disorders assessed between age 6 and 14 years through parental reports, and psychological disorders 14 years later (Roza et al., 2003[309]). An internalising composite (being withdrawn, somatic complaints, and anxious/depressed) administered during childhood and adolescence predicted later mood disorders.

6.5.3. Malleability/Development evidence

Figure 6.23 shows Soto et al.'s (2011[175]) findings about the stability of two emotional stability facets, anxiety (i.e. the opposite end of adjustment) and depression (i.e. the opposite end of optimism). Because these facets are reversed, dips seen in other Soto et al. graphs would be expected to be replaced by rises here. For females, this is what is shown in the figure: sharp increases in anxiety and depression from age 10 to about age 15. Then there is a gradual decrease in these characteristics that continues to age 65. For males, the pattern is quite different. Anxiety drops noticeably from age 10 to age 20, and then shows more gradual decreases to age 65. Depression, on the other hand, is relatively constant from age 10 to 20, and then increases until the early 30s. After the early 30s until age 65, depression gradually declines again.

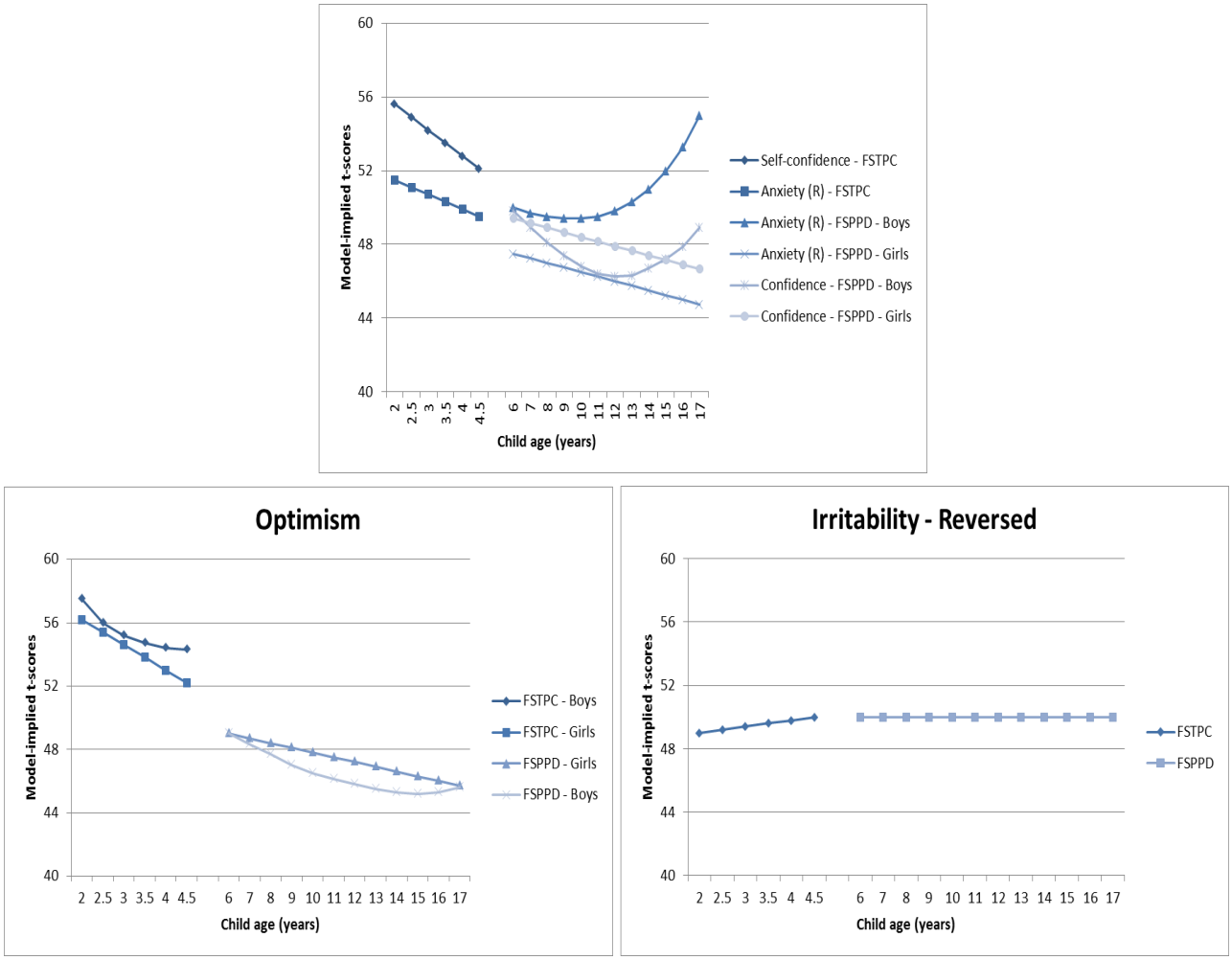
Figure 6.23. Average levels of anxiety and depression across a lifetime



Source: Adapted from Soto et al. (2011[175]), "Age differences in personality traits from 10 to 65: Big Five domains and facets in a large cross-sectional sample", http://dx.doi,org/10.1037/a0021717.

Figure 6.24 shows de Haan et al.'s (2017[196]) findings for anxiety (i.e. adjustment) and confidence (i.e. optimism). For girls, confidence and anxiety show consistent decreases from age 6 to age 17. For boys, a quadratic relation is shown for both characteristics, with initial decreases but then increases in the later teens. This is especially apparent for boys' anxiety.

Figure 6.24. Estimated levels of anxiety, confidence, irritability, and optimism from age 2 to 17



Source: Adapted from De Haan et al. (2017[196]), "Long-term developmental changes in children's lower-order Big Five personality facets", http://dx.doi.org/10.1111/jopy.12265.

6.6. Compound skills

In addition to the Big Five dimensions and their sub-dimensions/individual skills, there has also been considerable research into a number of other social and emotional skills outside of the Big Five framework. These are sometimes called "compound" skills since they are found to be combinations of different aspects of individual skills. Examples include self-efficacy, meta-cognition, critical thinking, self-esteem and core self-evaluations.

6.6.1. Taxonomy of compound skills

Compound skills can be conceptually divided into two broad categories. The first category comprises skills containing aspects of multiple social and emotional skills. Among these are: self-efficacy, self-esteem, locus of control, core self-evaluations, growth mindset, etc. The second category includes those skills that can be conceptually

placed along the dividing line between cognitive and non-cognitive skills. In other words, they have strong elements of both and are difficult to classify either as cognitive or social and emotional. Examples of such skills are critical thinking, creativity, meta-cognition, emotional intelligence, etc. This group of skills blurs the lines between cognitive and socio-emotional aspects. It exemplifies the actual interaction and mutual inter-dependence of the two mental processes that are present in each skill category (Kankaraš, 2017[2]).

Table 6.8. Definitions and behavioural indicators of compound skills

Broad domain	Skill names	Description/definition	Typical behavioural indicators
Compound skills	**Self-efficacy**	Beliefs in one's capabilities to mobilise the motivation, cognitive resources, and courses of action needed to meet given situational demands.	Can deal with most problems/ avoids difficult situations.
	Independence/ Critical thinking	Thinking for yourself; grounding beliefs, attitudes, and values on a critical analysis through independent thought.	Thinks critically about things/ is dependent on others for guidance.
	Meta-cognition/ Self-reflection	Awareness of inner processes and subjective experiences, such as thoughts and feelings, and possessing the ability to reflect on and articulate such experiences (meta-cognition).	Likes complex problems/ avoids philosophical discussions.

6.6.2. Self-efficacy

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, p. 408[310]). In other words, self-efficacy represents the strength of individuals' beliefs in their ability to execute tasks and achieve goals. Beliefs concerning self-efficacy are related to the extent to which individuals 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, 1997[311]). 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 influence 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.

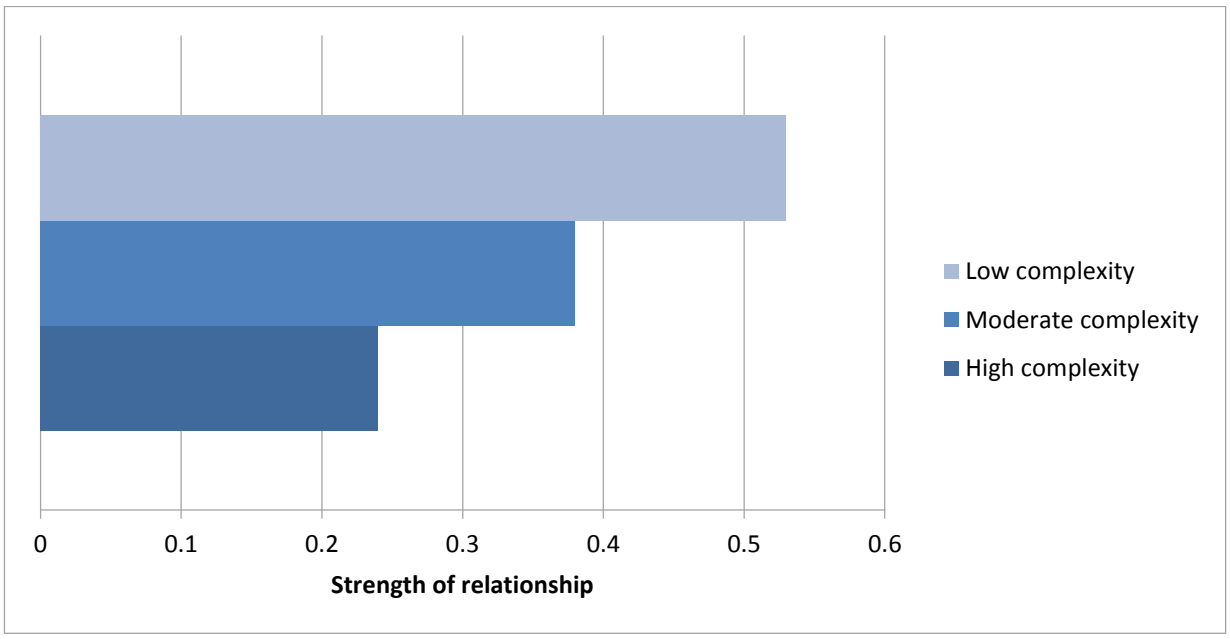
Beliefs about self-efficacy are determined by four broad factors: individuals' own successful efforts, learning from successful examples (modelling), social persuasion and physiological factors. Self-efficacy is especially influenced by the main social actors in childhood – parents, peers and important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

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[312]; Andrew, 1998[313]). Likewise, parents' beliefs regarding the academic self-efficacy of their children affect 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[314]).

Self-efficacy is also an important determinant of career choice (Betz and Hackett, 2006[315]; Betz, 2000[316]), job attitudes (Saks, 1993[317]), training proficiency (Martocchio and Judge, 1997[318]) and job performance (Stajkovic and Luthans, 1998[319]; Lunenburg, 2011[320]). 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[321]; Bradley and Roberts, 2004[322]). However, a meta-analysis of the effect of self-efficacy on work-related performance when controlling for personality characteristics (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[323]). In particular, self-efficacy better predicted performance in low-complexity jobs or tasks than in those of medium or high complexity (Figure 6.25).

Figure 6.25. Relationship between self-efficacy and work-related performance



Note: Strength of relationship represents average correlation across studies.
Source: Adapted from Stajkovic and Luthans (1998[319]), "Self-efficacy and work-related performance: A meta-analysis.", http://dx.doi.org/10.1037/0033-2909.124.2.240.

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 tracks due to low self-efficacy perceptions about their competence (Zeldin and Pajares, 2000[324]; Herbert and Stipek, 2005[325]).

Self-efficacy affects a wide range of health-related behaviour, such as smoking, exercise, diet, hygiene and self-examination (Conner and Norman, 1996[326]). It contributes to the initiation of health improvement or prevention behaviour, the establishment of more ambitious health goals, and persistence in overcoming obstacles.

6.6.3. Meta-cognition

Meta-cognition 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[63]). 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. Meta-cognition 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[327]). Meta-cognition not only regulates actions but also helps to maintain motivation; improves effort, persistence and resilience; avoids distractions and alleviates 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[328]). 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. Learning to learn is considered to be one of the key capabilities for effective functioning in the modern age (in fact, it is listed as one of the main competences 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 (Pintrich and De Groot, 1990[329]; Kuhn, 1999[330]; Steinberg, 2005[331]). In addition, several meta-analyses have shown that teaching metacognitive strategies has medium to large effects on school performance (Gutman and Schoon, 2013[332]). 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[333]).

6.6.4. Critical thinking

One example of why the term *"non-cognitive skills"* is a misnomer is due to critical thinking, a compound skill that relies heavily on both cognitive and non-cognitive components. Critical thinking is the ability to question, i.e. to analyse and evaluate information as a basis for beliefs and actions (Hullfish, 1963[334]; Ennis, 1962[335]; Scriven and Paul, 1987[336]; Halpern, 2006[337]; Petress, 2004[338]). Critical thinking entails examination of assumptions, concepts, empirical evidence, reasoning, implications, arguments and limitations. It transcends specific subject matter and represents a universal intellectual approach based on evidence, depth, fairness, accuracy, consistency, etc.

It involves the ability to use the rules of logic and cost-benefit analysis, to think strategically, and apply the rules to new situations to solve problems (Lucas, Claxton and Spencer, 2013[339]). This skill has a very strong cognitive component relying on the ability to reflect on information, interpret it in a new context and find solutions to novel problems based on existing knowledge (Halpern, 2001[340]).

However, critical thinking also incorporates aspects of the Big Five dimension of openness to experience, such as independence (autonomy) and unconventionality, which represent the driving factors behind the use of cognitive skills for the purposes of critical inquiry (John and Srivastava, 1999[21]). People who think critically are very aware of the fundamental flaw of human thinking when left unchecked (Elder and Paul, 2002[341]). They use intellectual powers to promote virtues such as intellectual integrity, civility, sense of fairness and justice, and to contribute to a more rational, civilised society. Critical thinking helps individuals to establish existing evidence, to isolate a problem from its context, to identify relevant criteria for making judgments, and to use adequate constructs for understanding and solving problems at hand (Reynolds, 2011[342]). It is one of the fundamental skills in the process of learning and is consequently important in school and academic settings. But its importance in every aspect of a student's and an

adult's life, as well as for societies as a whole, was recognised early (Dewey, 1910[343]). Critical thinking is considered one of the key abilities for promotion of human rights and democracy (UNESCO, 1995[344]).

There is a consensus that formal education should cultivate critical thinking skills of students, but there is little evidence that it is done in a systematic way (Lucas, Claxton and Spencer, 2013[339]). One reason is that these competences or habits of mind are not assessed formally in most education systems, giving little incentive to teachers to develop them. Another related reason is that, beyond the agreement on the broad objective, it is not clear how these skills can be made visible and tangible and articulated by teachers, students and policy makers, especially as part of the curriculum.

6.6.5. Other compound skills

There are a number of other compound skills that have attracted the attention of researchers and policy makers. Some of these skills have a large degree of conceptual overlap with particular Big Five sub-domains. For example, one widely researched compound variable is Core Self-Evaluations (CSE), originally proposed by Judge, Locke, and Durham (1997[345]). They conceptualised CSE as a broad combination of self-esteem, generalised self-efficacy (Locke, McClear and Knight, 1996[346]), emotional stability, and Rotter's (1966[347]) locus of control. In terms of the Big Five, this translates into a combination of emotional stability, conscientiousness and extraversion (or more specifically, the well-being facet of emotional stability, the industriousness facet of conscientiousness, and the dominance facet of extraversion). In a recent study, Judge, Hurst, and Simon (2009[348]) reported that the 12-item CSE scale correlated with emotional stability moderately (.43), extraversion moderately (.39), and conscientiousness only weakly (.29). Similarly, self-esteem, which represents positive or negative evaluations of self, can be seen as a composite skill that is primarily associated with the emotional stability dimension of the Big Five model, but also draws from extraversion and conscientiousness dimensions along with its own unique aspects (Schoon and Duckworth, 2012[90]).

Another popular skill that is conceptualised as a compound of different aspects is "grit" defined as *"perseverance and pursuit of long-term goals"* (Duckworth et al., 2007[349]). The concept and its measure are assumed to consist of two related aspects: passion for certain goals and perseverance to pursue these goals in spite of obstacles. In initial research of Duckworth and colleagues, grit has been found to be associated with important life outcomes such as job retention, academic achievement and school graduation (Eskreis-Winkler et al., 2014[350]). However, grit scale scores (Duckworth et al., 2007[349]; Duckworth and Quinn, 2009[351]) have exhibited substantial correlations with three of the Big Five personality dimensions: conscientiousness (.70), agreeableness (.47) and emotional stability (.40), which indicate that grit is a compound skill. Furthermore, Rimfeld et al. (2016[352]), found that grit added little predictive accuracy once the Big Five dimensions were controlled for, which shows that it is essentially a repackaging of the Big Five. Credé, Tynan and Harms' (2017[353]) recent meta-analysis of 88 studies involving grit scores reached a similar conclusion that the concept of grit is largely indistinctive from conscientiousness dimension of the Big Five and especially its perseverance facet.

Similarly, there is a lack of evidence on the discriminant and conceptual validity of some other compound skills. For example, emotional intelligence has become a popular term in recent decades, especially in the fields of human resources and companies' hiring

practices. However, 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 (Kankaraš, 2017[2]). For example, Spector and Johnson (2006[354]) claim that *"there is perhaps no construct in the social sciences that has produced more controversy in recent years than emotional intelligence"* (p. 325[354]). On one side, there have been exaggerated claims about emotional intelligence being more important than IQ and other personality characteristics. 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[355]).

Taken together, empirical research suggests that the conceptual independence of emotional intelligence models and the incremental predictive validity of emotional intelligence measures have still not been established (Kankaraš, 2017[2]). In other words, the unique contribution of emotional intelligence 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[356]; Harms and Credé, 2010[357]).

7. Social and emotional skills selected for inclusion in the Study on Social and Emotional Skills (SSES)

7.1. Principles for selecting the social and emotional skills to include in the SSES

In reaching a view on which skills should be prioritised, a set of principles were used. These guiding principles state that the social and emotional skills to be included in the SSES should be:

- *Broad and comprehensive* as a set
  - All five social and emotional domains should be assessed in the SSES in order to ensure breadth and comprehensiveness.
- Provide enough *depth*
  - Selected skills need to provide information at the level of individual sub-domains in order to provide more meaningful and actionable results. To ensure this, each of the broad Big Five domains should be represented with 2-3 sub-domains.
- *Well-balanced* as a set
  - Selected skills should be considered as a whole package rather than individually. This ensures there is a balanced set of skills that do not mutually overlap in order to minimise possible redundancies and maximise value for money.
- Have *predictive value*
  - Knowledge of a child's standing in a particular skill should indicate higher or lower likeliness of certain life outcomes. We have divided life outcomes into four separate categories: education (educational attainment and school grades), economic (income, employment, job satisfaction), health (physical and mental health), and quality of life outcomes (life satisfaction, sense of meaning, subjective well-being). Although these are treated separately, it is important to note that, for example, education and income are factors influencing other outcomes. As such, these outcomes can also be considered as intermediary outcomes.
- *Malleable* within age groups that are younger, between and older than the two age cohorts selected for the SSES
  - Malleability of sub-domains is also an important criterion. If a skill cannot be affected by an intervention, it is probably of less interest to city and country representatives. Most of the Big Five sub-domains have similar levels of malleability, with the general rule being that they are susceptible to interventions, especially during childhood and adolescence. These skills tend to fluctuate more widely in childhood than in adulthood meaning that they become increasingly stable with age.
- *Appropriate* for ages 10 and 15
  - Each selected skill should be a distinct and measurable personality characteristic at ages 10 and 15. Most of the sub-domains identified in this

paper are likely to satisfy this criterion. However, some sub-domains are clearly more appropriate for adults, such as the introspection sub-domain from openness to experience, modesty from the agreeableness domain, and honesty/virtue from the conscientiousness domain.

- *Comparable*, appropriate and relevant across different cultures, languages, social strata and schooling contexts
  - The study will conduct surveys in a variety of countries around the world. The results will be much easier to interpret if scores for various skills are comparable across cultures and nations. Skills that are identified and found to be relevant in more cultural and social settings will be prioritised.
- *Not burdensome* as a whole
  - In terms of the time students, parents, teachers and principals will spend in completing the questionnaires. This is an important consideration and the main reason why only a limited number of skills can be included in the SSES.
- *Relevant for the future*
  - Selected skills should not only be relevant for the world as it is now (indicated mainly by their predictive validity) but also for the world that is to be. After all, current children will be living in a different world by the time they grow up.
- *Analytically important*
  - Selected skills should be well-researched and have analytical importance either as a key aspect in a Big Five domain or as a skill of special relevance outside of the Big Five research field. Sub-domains that are frequently identified across various taxonomies and inventories should have priority as they will ensure comprehensiveness of the selected set of skills.

Our review of the importance of social and emotional skills indicates that all five broad domains have merit in determining later educational, work and life outcomes. Conscientiousness and emotional stability stand out in consistently predicting most outcomes examined. Conscientiousness has somewhat higher validities for educational and work-related criteria, while emotional stability is more important for life outcomes (i.e. mental and physical health). The other three domains have more nuanced patterns of importance. Extraversion, with its emphasis on seeking social attention, is critical for leadership and, as such, leads to better employment outcomes. Extroverts also build social support networks more quickly, which is beneficial for mental health outcomes. Openness is predictive of educational attainment, which has lifelong positive benefits and seems to better equip individuals to deal with changes. It is also a dimension that will have increasing relevance in the future, allowing individuals to be more tolerant, innovative and flexible in a more complex and changing world. Finally, agreeableness translates into better relationship quality, more prosocial behaviours and, at least for children, less behavioural problems.

7.2. The social and emotional skills selected for the SSES

The empirical evidence presented in this paper, as well as previous OECD reviews of empirical literature on social and emotional skills (John and De Fruyt, 2015[6]; OECD, 2015[1]; Kankaraš, 2017[2]), were used to make an informed decision about which social and emotional skills to include in the SSES. Based on this evidence and taking into account the principles outlined above, 19 social and emotional skills have been chosen for inclusion in the SSES (Figure 7.1). These include four skills belonging to the domain of

task performance (conscientiousness) and three skills belonging to the other Big Five domains, as well as to the domain of compound skills.

Please note that the list is still preliminary since four out of the 19 selected skills will be excluded from the study at a later stage, after a round of initial testing (i.e. from the field test). The intention is to allow empirical data from participating countries and cities to influence the final selection of the 15 skills that will be assessed in the main study.

It is also important to note that to limit the response burden on the younger cohort (children aged 10), a smaller number of skills may be assessed in their case. The total number of skills for the younger cohort will be decided at a later stage, based on the results from the initial testing.

Figure 7.1. Selected social and emotional skills for inclusion in the SSES

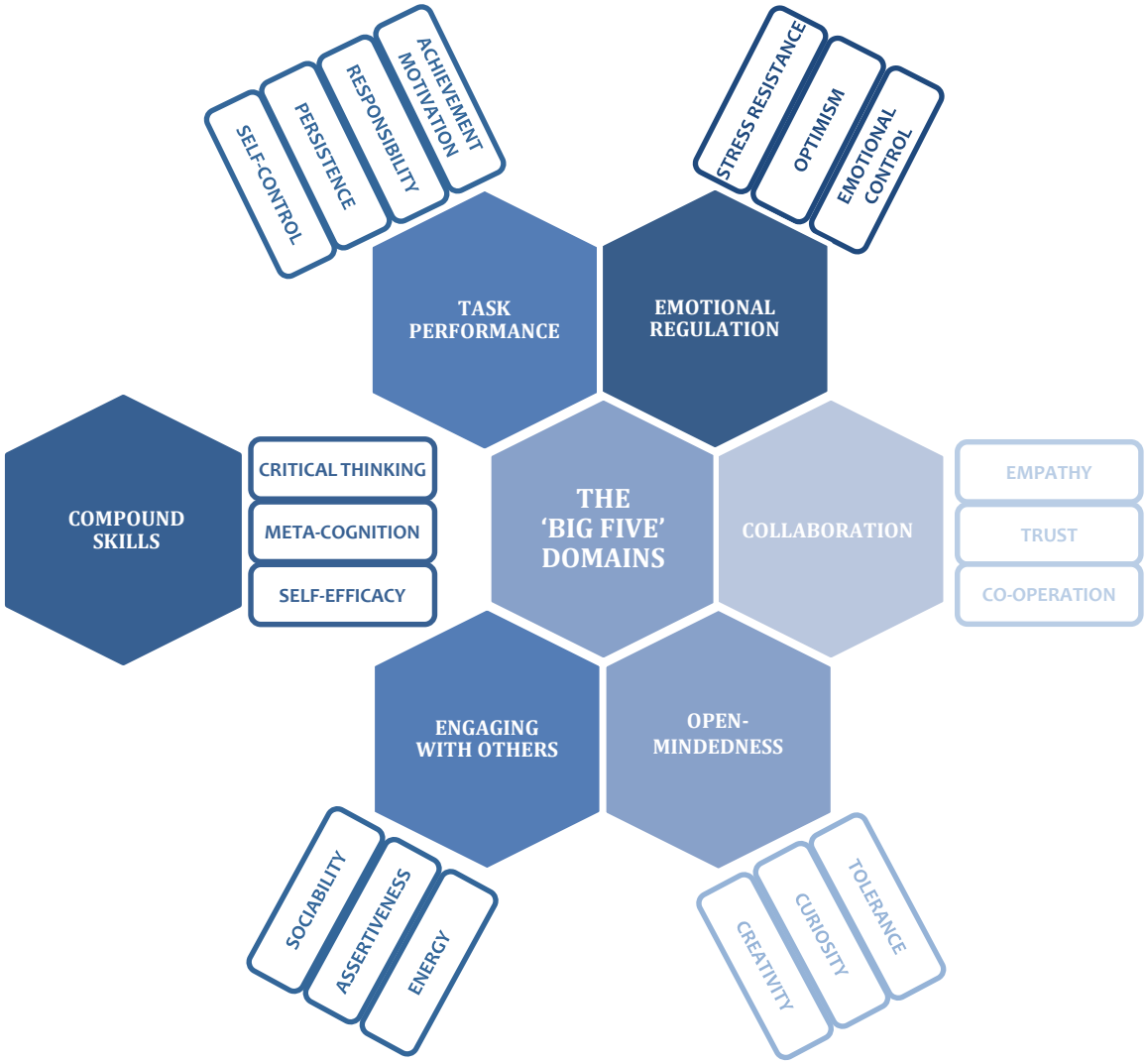


Table 7.1 below provides a short description of each of the selected social and emotional skills. **Achievement motivation** and **responsibility** are predictive of a wide range of life outcomes, with special relevance for school and work settings. **Self-control** and **persistence** have attracted substantial research attention in many fields, with evidence

pointing to their strong relevance for children and how their lives will be shaped after school. **Stress resistance, emotional control** and **optimism** are highly predictive of a wide variety of positive future life outcomes, and are increasingly relevant skills for the modern world.

Sociability and **empathy/compassion** provide a basic set of social and emotional skills needed for effective functioning and integration in work and personal environments. **Assertiveness** is a characteristic of leadership and is also related to entrepreneurship, while **energy/activity** allows people to lead a more dynamic and eventful lifestyle. **Trust** is highly relevant for personal well-being and societal cohesion, while **tolerance**/**cultural flexibility** have growing social relevance in increasingly diverse and polarised societies. **Co-operation** is a very relevant skill for children, and is highly regarded in the workplace.

Curiosity is a critical skill that improves learning outcomes and provides intrinsic incentives for lifelong self-development. **Creativity/imagination** is another skill that can bring strong benefits to both individuals and societies, while **critical thinking** is gaining importance in a world full of false and misleading information. **Meta-cognition/self-reflection** has been found to be one of the most fundamental skills for lifelong learning, along with the ability to adjust to changing requirements and settings. **Self-efficacy** is a well-researched skill with high predictive validity and is of special importance in school settings.

Table 7.1. Description of the skills included in the SSES

"BIG FIVE" DOMAINS	SKILLS	DESCRIPTION	BEHAVIOURAL EXAMPLES
TASK PERFORMANCE (Conscientiousness)	ACHIEVEMENT ORIENTATION	Setting high standards for oneself and working hard to meet them	Enjoys reaching a high level of mastery in some activity. Opposite: uninterested in career development.
	RESPONSIBILITY	Able to honour commitments, and be punctual and reliable.	Arrives on time for appointments, gets chores done right away. Opposite: doesn't follow through on agreements/promises.
	SELF-CONTROL	Able to avoid distractions and focus attention on the current task in order to achieve personal goals.	Doesn't rush into things, is cautious and risk averse. Opposite: is prone to impulsive shopping or binge drinking.
	PERSISTENCE	Persevering in tasks and activities until they get done.	Finishes homework projects or work once started. Opposite: Gives up easily when confronted with obstacles/distractions.
EMOTION REGULATION (Emotional stability)	STRESS RESISTANCE	Effectiveness in modulating anxiety and able to calmly solve problems (is relaxed, handles stress well).	Is relaxed most of the time, performs well in high-pressure situations. Opposite: worries about things, difficulties sleeping.
	OPTIMISM	Positive and optimistic expectations for self and life in general.	Generally in good mood. Opposite: often feels sad, tends to feel insecure.
	EMOTIONAL CONTROL	Effective strategies for regulating temper, anger and irritation in the face of frustrations.	Controls emotions in situations of conflict. Opposite: gets upset easily; is moody.
COLLABORATION (Agreebleness)	EMPATHY	Kindness and caring for others and their well-being that leads to valuing and investing in close relationships.	Consoles a friend who is upset, sympathises with the homeless. Opposite: Tends to disregard other person's feelings.
	TRUST	Assuming that others generally have good intentions and forgiving those who have done wrong.	Lends things to people, avoids being harsh or judgmental. Opposite: is suspicious of people's intentions.
	CO-OPERATION	Living in harmony with others and valuing interconnectedness among all people.	Finds it easy to get along with people, respects decisions made by a group. Opposite: has a sharp tongue, is not prone to compromises.
OPEN-MINDEDNESS (Openness to experience)	CURIOSITY	Interest in ideas and love of learning, understanding and intellectual exploration; an inquisitive mindset.	Likes to read books, to travel to new destinations. Opposite: dislikes change, is not interested in exploring new products.

"BIG FIVE" DOMAINS	SKILLS	DESCRIPTION	BEHAVIOURAL EXAMPLES
OPEN-MINDEDNESS (Openness to experience)	TOLERANCE	Is open to different points of view, values diversity, is appreciative of foreign people and cultures.	Have friends from different backgrounds. Opposite: dislikes foreigners.
	CREATIVITY	Generating novel ways to do or think about things through exploring, learning from failure, insight and vision.	Has original insights, is good at the arts. Opposite: seldom daydreams, dresses conventionally.
ENGAGEMENT WITH OTHERS (Extraversion)	SOCIABILITY	Able to approach others, both friends and strangers, initiating and maintaining social connections.	Skilled at teamwork, good at public speaking. Opposite: avoids large groups, prefers one-to-one communication.
	ASSERTIVENESS	Able to confidently voice opinions, needs, and feelings, and exert social influence.	Takes charge in a class or team. Opposite: waits for others to lead the way, keeps quiet when disagrees with others.
	ENERGY	Approaching daily life with energy, excitement and spontaneity.	Is always busy; works long hours. Opposite: gets tired easily.
COMPOUND SKILLS	SELF-EFFICACY	The strength of individuals' beliefs in their ability to execute tasks and achieve goals.	Remains calm when facing unexpected events. Opposite: avoids challenging situations.
	CRITICAL THINKING/INDEPENDENCE	The ability to evaluate information and interpret it through independent and unconstrained analysis.	Good at solving problems, at ease in new and unknown situations. Opposite: dependent on others' guidance.
	SELF-REFLECTION/META-COGNITION	Awareness of inner processes and subjective experiences, such as thoughts and feelings, and the ability to reflect on and articulate such experiences.	Good exam preparation strategies, able to master skills more effectively. Opposite: over- or under-estimates time needed for exam preparation or project completion.

8. Conclusion

Social and emotional skills shape human thoughts, feelings and 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, social and emotional skills have a demonstrable relevance for a wide range of policy issues and represent an important, although often neglected, subject of policy interest.

All five broad domains of social and emotional skills have merit in determining later educational, work and life outcomes. Skills belonging to conscientiousness and emotional stability domains stand out, because these two broad dimensions consistently predict most examined outcomes. Conscientiousness has somewhat higher validities for educational and work-related criteria, while the domain of emotional stability is important across all outcomes, especially quality of life (i.e. mental and physical health, subjective well-being). Skills in the other three dimensions have more nuanced patterns of importance. Extraversion, with its emphasis on seeking social attention, is critical for leadership and, as such, leads to better employment outcomes. Extroverts also build social support networks more quickly, which are beneficial for mental health outcomes. Openness is predictive of educational attainment, which has lifelong positive benefits and seems to better equip individuals to deal with change. Many cross-cultural competencies are also driven by skills belonging to the domain of openness. Agreeableness translates into better relationship quality, more prosocial behaviours and less behavioural problems. Finally, skills representing a combination of multiple individual skills, such as critical thinking, meta-cognition and self-efficacy are also found to have strong relevance for a range of life events and achievements.

Social and emotional skills are malleable and change with biological maturation, environmental influences, individual effort and the occurrence of important life events. At the aggregate level, as people age, certain skills tend to increase, others decrease, and others follow an inverted U shape. Social and emotional skills tend to fluctuate far more widely in childhood than in adulthood meaning that they become increasingly stable with age. Substantial changes in social and emotional skills can occur in childhood and adolescence when multiple other biological, social, and psychological transitions are also taking place. Evidence also indicates that planned and systematic interventions aimed at improving social and emotional skills can be successful.

When discussing the relative importance of individual skills, it is important to be aware of the complexity of the relationships between social and emotional skills 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 social and emotional skill will be appropriate or influential across different contexts, cultures or eras. But the bottom line is that although different social and emotional skills

are relevant in different situations, their cumulative effects are highly consequential and persist even when controlling for cognitive ability. This means that better cognitive skills will not compensate for inadequate social and emotional skills. It is therefore critically important to expand the traditional policy focus on cognitive skills and to embrace a more holistic approach by better supporting children and adults in developing and nurturing social and emotional skills.

The Study on Social and Emotional Skills (SSES) is to date the most ambitious international effort to develop a comprehensive set of metrics around social and emotional skills designed to enhance policies to improve the development and well-being of children. The focus is on skills that are found to be the most predictive of success in a wide range of important life outcomes. Skills included in the SSES have been shown to be malleable, assessable in school-age children, and relevant in different cultural and social contexts. Finally, the selected skills provide children with the capabilities that are not just relevant for the world as it is now but also for the world that is to be. The study will examine the skills in two groups of children – 10- and 15-year-olds – thus allowing the study not only to determine average levels but also to compare these across different developmental stages.

Apart from assessing students' social and emotional skills, the study will also gather a wide range of information on the children's family, school and community environments from their teachers, parents and school principals. Along with information collected from the children, this will help to place social and emotional skills in the context of other relevant individual, group and community characteristics and factors that are relevant to the development of these skills.

Hence, the ultimate goal of the study is more than just to obtain valid, reliable and comparable information on the level of these skills in children. Rather, it is to help participating cities and countries identify stimulating factors and potential barriers that improve or prevent children's socio-emotional development. This information can then be used by parents, teachers and schools to understand which socio-emotional skills matter for which situations or outcomes, why they matter, and how they can be fostered.

By supplementing information about students' social and emotional skills to existing information about their academic and cognitive skills, the study will give policy makers, education leaders and other stakeholders improved understanding of whole-child development. Thus, SSES findings will be able to be used to review existing policies and practices and adopt policies that better support the development of these skills. In doing so, they will be able to adapt children's learning environments to better promote the growth of these skills, thus improving children's well-being and paving the way for their better future.

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