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Social and emotional skills: Latest evidence on teachability and impact on life outcomes

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Abstract

Education systems around the world increasingly recognise that social and emotional skills (SES) are essential for students and societies alike. The OECD has worked towards measuring and building the evidence base on SES by developing, implementing and analysing the findings of the *OECD Survey on Social and Emotional Skills (SSES)*. The aim of this working paper is to clarify several conceptual and empirical issues related to SES as part of the *Innovative approaches to measuring social and emotional skills* project, which aims to complement the skill measures based on self-reports in SSES with more direct assessments. Firstly, the paper takes a closer look at how the SSES framework for SES was created, discusses and responds to criticisms, such as basing the framework on the Big Five model of personality. Secondly, the paper addresses the questions of whether SES are generally teachable and how SES compare to each other in terms of teachability. Thirdly, it presents a compilation of recent evidence on the relationship between SES and key life outcomes. Finally, the paper aims to bridge the conceptual gap between different strands of literature by updating the general definition of SES, pointing out discrepancies in definitions of specific skills and identifying teachable skills with high predictive value.

Résumé

Les compétences sociales et émotionnelles (CSE) sont de plus en plus reconnues par les systèmes éducatifs dans le monde comme étant essentielles pour les élèves et la société. L'OCDE a réalisé un premier travail considérable pour mesurer ces compétences et en constituer une base de données, grâce à l'Enquête sur les Compétences Sociales et Émotionnelles (le projet *Survey on Social and Emotional Skills* – SSES). Ce document de travail a pour but de clarifier plusieurs questions conceptuelles et empiriques afin de préparer le nouveau projet de l'OCDE sur ces compétences, intitulé *Approches Innovantes pour la Mesure des Compétences Sociales et Émotionnelles,* qui vise à compléter les mesures auto-évaluatives du SSES par des méthodes plus directes d'évaluations. Premièrement, ce document réexamine le cadre conceptuel du projet SSES. Il discute et répond aux principales critiques, telles que le fait qu'il soit basé sur un modèle de la personnalité (modèle du Big Five). Deuxièmement, le document présente une revue de littérature récente sur la question de savoir si les CSE sont généralement enseignables, et comment les CSE se comparent les uns aux autres en termes d'enseignabilité. Troisièmement, il présente une compilation de données récentes sur la relation entre les CSE et différentes variables d'intérêt (qualité de vie, réussite académique, vie professionnelle, et autres facteurs sociétaux). Enfin, le document vise à combler le fossé conceptuel entre les différents courants de la littérature en actualisant la définition des CSE, en soulignant les divergences dans les définitions des compétences spécifiques, et en identifiant les compétences enseignables ayant un lien important avec les variables d'intérêt.

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Acronyms

- 16PF: Sixteen Personality Factor Questionnaire
- AB5C: Abridged Big Five-Dimensional Circumplex
- BESSI: Behavioral, Emotional, and Social Skills Inventory
- BFI: Big Five Inventory
- CASEL: Collaborative for Academic, Social, and Emotional Learning
- NEO-PI: Revised NEO Personality Inventory
- SEL: Social and Emotional Learning
- SES: Social and Emotional Skills
- SSES: Survey on Social and Emotional Skills
- USB: Universal School-Based intervention
- WEIRD: Western, Educated, Industrialised, Rich and Democratic [societies]

Key terms

- Behavioural tendency – construct related to an individual's habitual tendency to act in a particular manner most of the time, as opposed to functional capability (Soto et al., 2022[1]). Behavioural tendencies relate to personality traits and are referred to as typical behaviour.

- Construct – idea or theory containing various conceptual elements. It is a "conceptual tool used to facilitate understanding of human behaviour" (Britannica, 2023[2]). In this working paper, this term encompasses concepts such as skills, personality traits, or competencies.

- Domains – higher-order constituents in social and emotional skills / personality taxonomies (e.g. conscientiousness or openness to experience in the Big Five model). Sometimes referred to as dimensions in the literature.

- Emic approach – approach to the study of a particular language or culture that emphasises culture-specific characteristics and considers the unique aspects of each culture.

- Etic approach – approach to the study of a particular language or culture that focuses on universal aspects that can be applied across cultures and aims to identify core similarities in human behaviour.

- Facets or sub-domains – lower-order constituent sub-dimensions of the Big Five and other personality taxonomies. The facet-level of these frameworks is comparable to the skills level of SES' taxonomies. These terms are used interchangeably for both personality and SES taxonomies (e.g. in the SSES framework, intellectual curiosity is a facet of openness to experience).

- Functional capability – construct related to an individual's capacity to act in a particular manner in a relevant situation as opposed to a behavioural tendency (Soto et al., 2022[1]). Functional capabilities relate to SES and to states and are referred to as maximal behaviour.

- Malleability – susceptibility to any environmental influence, whether intentional or unintentional.

- Maximal behaviour – see "functional capability".

- Outcome research – literature looking at the predictive value of social and emotional skills.

- Plasticity – susceptibility to change, whether biological and intrinsic or environmental and extrinsic.

- Predictive value – proven empirical relationship between SES and key life outcomes, such as academic, labour market, quality of life and societal outcomes (discussed in more detail in **Table 6**).

- Social and emotional learning (SEL) literature – literature looking at the teachability of social and emotional skills through deliberate interventions.

- Social and emotional skills (the OECD 2015 definition) – "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 behaviours; (c) continue to develop through formal and informal learning experiences; and (d) influence important socio-economic outcomes throughout the individual's life" (De Fruyt, Wille and John, 2015, p. 279[3]).

- Social and emotional skills (the updated definition proposed by this paper) – individual characteristics that are: a) subject to developmental change; b) teachable / responsive to intervention; c) predictive of key life outcomes; d) dependent on situational factors (e.g. task context, fatigue); e) manifested in patterns of thoughts, feelings and behaviours; f) manifested in maximal behaviour more than typical behaviour (and therefore distinct from personality traits); g) conceptually distinct from simple cognitive processes (e.g. visual processing, executive function) and academic skills (e.g. literacy, numeracy).

- SSES framework for social and emotional skills (referred throughout the paper as SSES framework) – a framework that includes 15 social and emotional skills developed for and used in the OECD SSES.

- States – "characteristic patterns of thinking, feeling, and behaving in a concrete situation at a specific moment in time" (Schmitt and Blum, 2020, p. 5206[4]). States are related to maximal behaviour, which is measured in standardised, high-effort situations, as opposed to traits (Soto, Napolitano and Roberts, 2021[5]). See also "functional capability".

- Teachability – susceptibility to deliberate intervention in education settings.

- Traits – "characteristic patterns of thinking, feeling, and behaving that generalise across similar situations, differ systematically between individuals, and remain rather stable across time" (Schmitt and Blum, 2020, p. 5206[4]). Traits represent typical behaviour, which is averaged over time, as opposed to *states* (Soto, Napolitano and Roberts, 2021[5]). See also "behavioural tendency".

- Typical behaviour – see "behavioural tendency".

1. Introduction

Education systems around the world increasingly recognise that social and emotional skills (SES) are essential for students and societies alike. As the curriculum focus shifted from imparting knowledge to teaching skills, cognitive abilities received more attention from educators and policy makers. That is changing as SES turn out to be as important and, in some cases, even more important than cognitive abilities in predicting key life outcomes (OECD, 2015[6]). This change in priorities is evidenced by SES becoming part of school curricula and assessment in many education systems. The CORE's School Quality Improvement System in California (West et al., 2018[7]) and the Happiness Curriculum in India (Care et al., 2020[8]) as well as the extensive participation of cities in the *OECD Survey on Social and Emotional Skills* (SSES) exemplify how SES are becoming central to education agendas around the world.

The OECD has done substantial work in measuring and building the evidence base on SES through the design and implementation of SSES as well as the analysis of SSES findings. The first round of the survey showed that SES are significantly related with students' academic success, career expectations and well-being, yet they tend to be unevenly distributed across gender and socio-economic background (OECD, 2021[9]). In addition, the OECD presented some evidence that SES are malleable and can be learned (Chernyshenko, Kankaraš and Drasgow, 2018[10]). Results of the second round of the survey are on the way and promise to further strengthen the knowledge about SES.

Nevertheless, many conceptual and empirical issues require clarification, including the justification for basing the SSES framework for SES on the Big Five model of personality and the comprehensiveness of the SSES framework. Moreover, given the recent expansion of the research field, the empirical evidence on teachability and relation to key life outcomes needs to be updated and clarified. In particular, the review is enriched by considering evidence on five new skills that are not part of the SSES framework. Throughout the paper, particular attention is dedicated to limiting the conceptual confusion caused by the multitude of terms to describe SES (referred to as the jingle-jangle fallacy). By addressing these issues, this paper seeks to inform the development of innovative assessment tools to measure SES in the next phases of the *Innovative approaches to measuring social and emotional skills* project.

The paper is structured in the following way. Section **Error! Reference source not found.** introduces the definition of social and emotional skills, takes a closer look at how the OECD SSES framework was created, discusses criticisms and outlines how some of these limitations are addressed in the paper. Section 2 addresses the question of whether SES are generally teachable, while Section 4 outlines how SES compare to each other in terms of teachability. Section 5 presents a compilation of recent evidence on the relationship between SES and key academic, labour market, quality of life and societal outcomes. Section 6 aims to bridge the conceptual gap between different strands of literature reviewed in this paper by updating the general definition of SES, pointing out discrepancies in skill definitions. Finally, Section 7 identifies teachable skills with high predictive value.

2. Revisiting the conceptual foundations of social and emotional skills

To consolidate the conceptual basis for the *Innovative approaches to measuring social and emotional skills* project, it is necessary to revisit the theoretical work forming the basis of the SSES framework (Chernyshenko, Kankaraš and Drasgow, 2018[10]). To this end, three major limitations are identified and can serve as a starting point for this revision. A first shortcoming of the SSES framework concerns the way in which it has been constructed, i.e., based on models of personality traits (and specifically on the Big Five model). A second criticism relates to the selection process of the skills included in the SSES framework, driven by an operational more than a conceptual approach. A third limitation concerns a wider problem in the field of SES, which is the general lack of clear terminology and definitions. This section presents these limitations and describes how they are addressed throughout the *Innovative approaches to measuring social and emotional skills* project.

2.1. Definition of social and emotional skills

Before discussing these limitations, it is essential to clearly define social and emotional skills as the literature "is populated by a confusing array of terms, definitions, and taxonomies" (Soto et al., 2022, p. 26[11]). Other common terms used to refer to SES include 21st-century competencies, employability skills, character strengths, non-cognitive skills, personality traits, soft skills, qualities, transformative skills and lifelong learning skills (Jones and Doolittle, 2017[12]). To guide the review on the predictive value and teachability of SES, this paper adopts the following operational definition of social and emotional skills (referred to as the SSES definition): "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 behaviours; (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, p. 279[3]). Based on the reviewed literature, this definition will be updated at the end of the paper.

2.2. The Big Five model of personality – a framework for social and emotional skills?

Following an extensive literature review, the Five-factor model of personality (hereunder referred to as the Big Five model) was selected as the overarching structure of the SSES framework (**Figure 1**) because it offers a strong empirical foundation, a comprehensive and parsimonious summary of individual differences in SES, has a high predictive power of its domains and individual skills, encompasses skills that are both malleable and temporally stable, and because correlations between Big Five domains and 21st century skills were empirically validated (Chernyshenko, Kankaraš and Drasgow, 2018[10]). Organising SES into the five overarching categories of this framework could thus provide a concise yet comprehensive conceptualisation of the different skills and evidence for their validity. However, the question of whether this framework, originally developed as a personality trait framework, can be used as a starting point for organising SES remains controversial for several reasons. The following parts examine the criticisms, limitations, and arguments in favour of using the Big Five as a framework for SES.

Figure 1. The SSES framework based on the Big Five model of personality
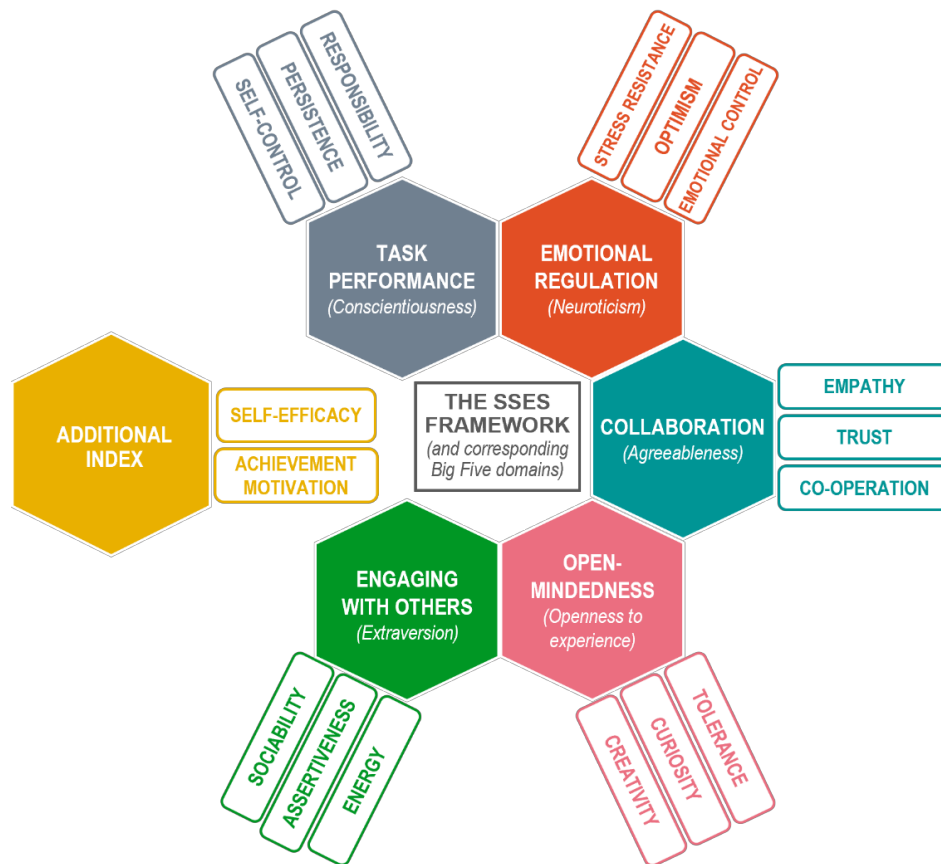
Source: adapted from (OECD, 2021[9]).

2.2.1. *Personality traits and social and emotional skills – one framework to bind them all?*

Personality traits are enduring patterns of thoughts, feelings, and behaviours that distinguish individuals from each other. While they are often seen as descriptive summaries of behaviour, they are better understood as factors that can impact life outcomes by influencing how individuals think, feel, and behave, particularly in ambiguous or novel situations (Cieciuch and Strus, 2021[13]).

The Big Five model stems from a synthesis of multiple research streams and data-driven approaches based on the study of vocabulary (Digman, 1990[14]; McCrae and Costa Jr, 1997[15]; Norman, 1963[16]). Its primary objective is to uncover the overarching structure of the main domains that constitute human personality. It organises personality traits into five major domains: Conscientiousness/Task performance, Extraversion/Engaging with others, Agreeableness/Collaboration with others, Neuroticism/Emotion regulation, and Openness to experience/Open-mindedness (Schoon, 2021[17]). Each of these domains are further divided into more specific sub-domains or facets.

While the Big Five model is primarily focused on personality traits, there are arguments to consider the facets of the five main domains as related to SES. Recent research (Lipnevich, Preckel and Roberts, 2016[18]; Abrahams et al., 2019[19]; Soto et al., 2022[11]) has confirmed that a large number of SES can be categorised into these five broad domains. Both the skills and the personality trait domains encompass similar social, emotional, and behavioural aspects that are used to define and assess their respective

constructs (Soto et al., 2023[20]). A main distinction lies in how the constructs are conceptualised, either as functional capabilities (SES) or behavioural tendencies (personality traits).

There is an inherent connection between capabilities and tendencies, as individuals need to possess the capability to engage in a behaviour before they can consistently exhibit it in various situations. Nevertheless, the differentiation between capabilities and tendencies can still have significant implications. An individual may have a habitual tendency to act in a particular manner, yet they might possess a high level of capability to behave differently when the situation demands it (Soto et al., 2022[1]). For instance, someone may typically exhibit introverted and reserved traits, yet still possess the skill to assert themselves when necessary. Conversely, another person might display a talkative nature without demonstrating particularly skilled conversational abilities. In personality research, this distinction is sometimes referred to as traits versus states. In this work, this distinction is broadly described as typical behaviour versus maximal behaviour. Typical behaviours are considered personality traits while maximal behaviours are here seen as skills.

Prior research has indicated that personality traits and SES are related, that they both can be categorised into five broad domains, and that personality traits are associated with important life outcomes (Chernyshenko, Kankaraš and Drasgow, 2018[10]). However, only recently has the specific predictive value of SES been tested beyond personality traits. A recent study (Soto et al., 2022[1]) using both skills and traits self-reported assessments (the Behavioral, Emotional, and Social Skills Inventory [BESSI], the Big Five model of personality traits and the Collaborative for Academic, Social, and Emotional Learning [CASEL] core competencies) revealed that SES exhibit expected and conceptually meaningful relationships with the Big Five personality traits (and to a lesser extent with the CASEL core competencies). The study concluded that both skills and traits contribute significantly to predicting academic outcomes and well-being (even when controlling for demographic characteristics). Another study (Walton et al., 2023[21]) analysed the structure of high school students' self-reports on the Big Five personality traits and on a major taxonomy used to describe SES, the CASEL core competencies. It found that personality traits and SES formed a joint five-factor structure, thus also arguing for the validity of the Big Five model as an overarching framework for SES.

2.2.2. Cross-cultural validity

The Big Five model originated from research conducted primarily in Western cultures (Becker, 1999[22]). Thus, the framework may not adequately capture the cultural variations and diversity in SES, limiting its generalisability to non-Western or multicultural contexts. For this reason, researchers have been extensively investigating its cross-cultural validity, by determining the applicability and replicability of the Big Five across diverse cultures and languages. Historically, there have been two traditional research strategies for the study of personality across cultures (Cheung, van de Vijver and Leong, 2011[23]). When researchers conduct cross-cultural studies, they may use either imported instruments (originating from a different culture; the *etic* approach) or indigenous instruments (specifically designed for the local culture or language; the *emic* approach). Several large-scale international studies have been conducted to examine the replicability of the five-factor structure in different cultural contexts using various adult self-report assessments (*etic* approach). Notably, Schmitt and colleagues (2007[24]) translated the Big Five Inventory into 28 different languages and administered it in 56 countries, while McCrae and Terracciano (2005[25]) explored the factor replicability of the Revised NEO Personality Inventory in 50 cultures across 50 countries and territories. These studies found replication of the factor structure in most cultures and recognised its presence in all

cultures. Even a nonverbal protocol has confirmed the generalisability of the Big Five model in cross-cultural context (Paunonen, Ashton and Jackson, 2001[26]).

However, critics, including cultural psychology proponents, have raised concerns about the dominance of the etic approach in cross-cultural personality assessment, which traditionally relies on translating and adapting English-language tests (Cheung et al., 2001[27]). Evidence shows that a five-factor structure does not robustly emerge everywhere, and some researchers have posited more than five personality factors within certain populations (Cheung et al., 2001[27]; Cheung and Leung, 1998[28]; Lee and Ashton, 2004[29]; Lee and Ashton, 2008[30]). Other studies employing indigenous lexical approaches (emic approach) to compare different personality models on a number of languages have faced challenges in fully replicating the five-factor structure of the Big Five. De Raad and colleagues (2010[31]), for example, found that only three factors of personality description are replicable across 12 different languages if they are derived independently by a psycholexical approach (and not transposed from one language to the others). Moreover, in most cross-cultural studies, the samples predominantly consist of urban students, commonly known as Western, Educated, Industrialised, Rich, and Democratic (WEIRD) populations (Henrich, Heine and Norenzayan, 2010[32]). Despite the extensive exploration of cultures and languages to assess the Big Five model, the similarity in personality structure observed in WEIRD populations may be attributed to the influence of living in large urban and literate communities. Notably, Gurven and colleagues (2013[33]) conducted a study among an indigenous population of foragers-horticulturalists, the Tsimane of Bolivia, did not find reliable evidence supporting the five-factor structure of personality. This finding persisted even after accounting for potential biases, such as acquiescence bias, social desirability bias, and various variables, including education level, gender, and age cohort.

Experts have proposed different approaches to improve the cross-cultural fit of the Big Five model. First, suggestions have been made to expand it (see next subsection on comprehensiveness). Accumulating evidence suggests that the addition of a sixth factor related to personal integrity (Honesty-Propriety in the Big Six model of personality and Honesty-Humility in the HEXACO Personality Inventory ; see Thielmann et al. (2017[34]) for a comparison) may better capture cross-cultural variations (Thalmayer and Saucier, 2014[35]). These expanded models, drawn from a larger and more diverse population base, are expected to replicate over time and across additional languages and cultures. Another way to improve cross-cultural fit would be through statistical analyses. The use of new methods could enhance data fit and limit factor correlations when testing the a priori 5-factor structure of Big Five self-report instruments, such as the BFI (Chiorri et al., 2016[36]). Finally, Kankaraš and Moors (2011[37]) and McCrae and colleagues (2010[38]) also emphasise the importance of addressing construct and method biases, which can affect cross-cultural comparisons. Construct bias refers to the dissimilarity of constructs (in this case, personality traits) across cultures, while method bias represents all kinds of biases that originate from the methodological and procedural aspects of a cross-cultural study, and encompasses sample bias, instrument bias, and administration bias.

In summary, challenges related to cultural construct and method biases, as well as the limitations of traditional measurement approaches, have been acknowledged by the research community. However, the cross-cultural validity of the Big Five model has been supported by numerous studies demonstrating the replicability of the factor structure across diverse cultural contexts using mainly etic methodologies. While evidence suggests that the Big Five domains and their facets are relatively universal and conceptually comparable across cultures, countries, and economies (OECD, 2021[39]), emic and etic approaches can lead to different interpretations of the social and perceptual world of the individuals within a specific culture (Yik and Bond, 1993[40]). Models of SES validated through imported and

indigenous instruments may lead to somewhat different theories of local reality. Even if both these types of models are accurate and valuable, the derived theories will "cut the social-perceptual world differently" (Yik and Bond, 1993, p. 75[40]). This situation raises concerns about the potential undermining of the broader development of indigenous theories when relying heavily on imported instruments (Cheung et al., 2001[27]).

Although this limitation is acknowledged and understood, the status and purpose of the OECD, as an international organisation focusing on producing comparable data across cultures, supports the use of a broader etic approach in its work. The *Innovative approaches to measuring social and emotional skills* project will consider improvement solutions by exploring the most promising statistical approaches and relying on international experts to discuss the skills to target for assessment.

2.2.3. Comprehensiveness

While the Big Five model encompasses a wide range of personality traits, it may not comprehensively capture all relevant domains of SES. As discussed above, indigenous lexical studies conducted in non-Western countries identified additional skills and personality traits. For example, Cheung (2008[41]) and Cheung, van de Vijver and Leong (2011[23]) identified an additional factor of interpersonal relatedness in China and other Asian countries which is not represented in the model (although some others argued that it is). In addition, the model does not account for skills reflecting self-awareness, or the ability to correctly understand the social cues of others (John, Naumann and Soto, 2008[42]). Some researchers also point out that the model may not appropriately encompass skills oriented toward the low spectrum of a domain, such as the capacity to argue as a skill associated with low agreeableness (Soto et al., 2022[11]). Other models or frameworks, such as the CASEL framework for systemic social and emotional learning (SEL), the Emotional Intelligence or Social Competence models, or alternative personality models as the HEXACO, offer additional domains that may be important for a more complete understanding of the traits and skills (Feher and Vernon, 2021[43]). The HEXACO model introduces an additional personality factor known as "honesty-humility," which plays a crucial role in predicting moral behaviour (Pilch, 2023[44]). Research findings have shown that the HEXACO model outperforms the Big Five model in its ability to predict important criterion variables, including manipulativeness, delinquency, and materialism (Pilch, 2023[44]). However, the facets of this personality factor (Honesty/Virtue and Modesty) included in the initial review process were not kept in the final SSES framework based on the ranking by an external international contractor and the OECD, and feedback from the cities participating in the survey and the technical advisory group experts (OECD, 2021[39]). Similarly, the authors of the paper decided not to explore them further as they do not correspond to the definition of SES used in this paper (see Section 6).

Nevertheless, several strains of research show that the five domains of the Big Five model are broad enough to organise a large number of SES (considered at the facet level). This evidence has been extensively reviewed by the OECD (Chernyshenko, Kankaraš and Drasgow, 2018[10]). More recently, Soto and colleagues (2022[1]) translated the Big Five domains into five skill domains (i.e. reconceptualising tendencies into capabilities), in an effort to use the Big Five model as a comprehensive taxonomy for SES: (1) Social Engagement Skills: capacities used to actively engage with other people; (2) Co-operation Skills: capacities used to maintain positive social relationships; (3) Self-Management Skills: capacities used to effectively pursue goals and complete tasks; (4) Emotional Resilience Skills: capacities used to regulate emotions and moods; (5) Innovation Skills: capacities used to engage with novel ideas and experiences. They argued that, conceptually, these domains encompass the most prominent psychological aspects of interpersonal

behaviour (i.e., capacities to enact agentic and communal behaviours (DeYoung et al., 2013[45]), emotional life (i.e., capacities to regulate positive and negative affect (Diener, Oishi and Lucas, 2003[46]) and educational and occupational attainment (i.e., capacities to complete tasks and apply knowledge (Wilmot and Ones, 2019[47]; Noftle and Robins, 2007[48]). Building on this work, they reviewed a large pool of social, emotional and behavioural measures and identified over 30 facet-level constructs that could be readily conceptualised as social emotional and behavioural skills (Soto et al., 2022[11]). They then showed that these specific skill facets can be organised in terms of these five skill domains across multiple samples of adolescents' and adults' self-reports and observer-reports.

In conclusion, a large body of literature supports the idea that the Big Five model can serve as a basic but robust taxonomy for the organisation of many SES. However, several streams of research point to the limitations of the five domains in comprehensively capturing specific traits and skills, particularly in non-Western cultures (Schoon, 2021[17]).

2.2.4. Age appropriateness

Another criticism of the Big Five model is its lack of a developmental perspective. The Big Five model primarily represents relatively stable and enduring traits, which may not sufficiently address the developmental nature of SES. Without a proper theory of how SES can change over the lifespan, through ageing, experiencing, and learning, it may not fully account for developmental specificities and therefore be inappropriate for non-adult populations.

As the Big Five model was originally derived from research on adults, the OECD (Kankaraš and Suarez-Alvarez, 2019[49]) examined whether it can be applied to school-age children. The answer is that yes, it mostly can, according to the review of the evidence in childhood research on this topic (De Fruyt and De Clercq, 2014[50]; Measelle et al., 2005[51]; Shiner and Caspi, 2003[52]; Tackett et al., 2008[53]; Tackett et al., 2012[54]).

2.2.5. The Big Five model as a framework for Social and Emotional Skills

In conclusion, the recent evidence supports using the Big Five model as a valuable general framework for organising SES. It provides a structured and broad taxonomy that aligns with existing psychological theories and empirical evidence, facilitating the examination of the relationships between personality traits, SES, and various life outcomes (Chernyshenko, Kankaraš and Drasgow, 2018[10]). Especially considering that the model's more granular facet-level seems to improve its comprehensiveness, particularly in the context of SES.

However, it is important to acknowledge the evidence underlining the limitations of the Big Five model in terms of its cross-cultural applicability and comprehensiveness. Given the international context in which the OECD operates where balance and scope are critical, including skills highlighted in other frameworks is essential to complement the model and keep the discussion open around other skills relevant in non-Western cultures.

Therefore, the *Innovative approaches to measuring social and emotional skills* Skills project will use the SSES framework (based on the Big Five model) as a general taxonomy for organising SES and will address potential comprehensiveness issues in several ways. First, the groundwork for identifying promising skills (including the literature reviews on the teachability of SES and their relationship to key life outcomes presented in this paper) will include skills not originally in the SSES framework or the Big Five model. Second, the literature reviews will focus on the skill- or facet-level, leaving the domain-level as a general organisational structure. In addition, to avoid confusion between skills and personality traits, particular attention will be paid to highlighting the nature of the

constructs examined in the articles reviewed (traits vs. skills; typical vs. maximal behaviour). The search will focus primarily on studies that examine skills and maximal behaviour. These methodological decisions also address the following limitation, regarding the development of the SSES framework.

2.3. The SSES framework: An operational rather than a conceptual framework?

The second criticism of the SSES framework relates to the way in which skills were selected for final inclusion. In fact, several skills were excluded not on theoretical grounds but on the basis of the results of the pre-tests of the survey questionnaire, making the SSES framework an operational rather than a conceptual one. As such, the SSES framework may not properly apply to other assessment tools.

The Big Five model was selected as the overarching structure for the SSES framework (Kankaraš and Suarez-Alvarez, 2019[49]) and, in order to identify key facets or skills for each of the Big Five personality domains, seven taxonomies were selected to represent the diverse viewpoints on the structure of personality inventories of adults and children[1]. In addition to these taxonomies, other skills were included from several well-known adult personality inventories such as AB5C, NEO-PI, 16PF, and the Occupational Personality Questionnaire. The skills extracted from these taxonomies were integrated into a common framework, based on their respective alignments for each Big Five domain (and a 6th group of additional skills). Around 30 SES were initially identified (OECD, 2021[39]). However, several skills were later excluded on the basis of an extensive literature review designed to assess them according to a set of principles. . Following this first selection, 19 SES leftwere tested during the item trials and field test. Finally, the 15 SES (plus two compound skills) chosen to be included in the main study were selected based on the results of the item trials and field test.

The selection of skills for the final SSES framework demonstrates that the nature of the measurement tool determined the structure of the framework, rather than vice versa. The framework provided a functional, or operational, taxonomy for distinguishing various constructs measured by the SSES. Although it was created with particular attention to breadth and wide applicability, it should not be regarded as a comprehensive or universal framework of SES. Thus, the SSES framework should be viewed as an operational framework rather than a theoretical one. This implies that the skills excluded from the SSES framework solely based on the needs of the survey should still be explored in other SES assessments.

Table 1. Development of the SSES framework

Steps	Number of skills retained after
Initial selection of skills compiled from seven taxonomies and other adult inventories	31 skills and compound skills
Rounds of revisions between the OECD, contractor and technical advisory group	19 skills and compound skills
Pool of items compiled for item trials and field test	17 skills and compound skills
Main study	15 skills + two additional indices

The *Innovative approaches to measuring social and emotional skills* project addresses this issue by expanding the pool of skills and related terms selected for review (see **Table 2**). In this working paper, we will explore the literature on teachability, predictive value and existing direct assessment tools by preserving the SSES framework as the general structure for organising skills and using the 19 SES identified originally (including critical thinking

and metacognition, which were eliminated from the final selection of the main study based on the item trials and field test results). The literature reviews will coveradditional skills that are commonly found in the literature:

- Conflict resolution / Social problem-solving
- Emotional intelligence
- Grit
- Self-awareness
- Perspective-taking / Theory of mind / Mentalising.

Moreover, the literature searches will include a series of synonyms and terms associated with these SES for increased coverage. To select these synonyms, we mainly draw on the conceptual work of two projects, the Harvard Easel Lab's Taxonomy project (in particular the ExploreSEL tool) and the development of the conceptual framework by the OECD's Education 2030 team (OECD, Forthcoming[55])[2]. The exact methodology used in the various literature reviews and the terms used in the searches can be found in Annex A and Section 5. Exploring the evidence on a larger number of skills overcomes the shortcomings of the selection process of the SSES framework.

Table 2. List of SES reviewed in this working paper

Domain	Social and emotional skills
Task performance	Achievement motivation**
	Persistence
	Responsibility
	Self-control
Emotion regulation	Emotional control
	Optimism
	Stress resistance
Engaging with others	Assertiveness
	Energy
	Sociability
Collaboration	Co-operation
	Empathy
	Trust
Open-mindedness	Creativity
	Curiosity
	Tolerance
Other skills from the SSES project	Critical thinking*
	Metacognition*
	Self-efficacy** / Locus of control
	Conflict resolution / Social problem-solving

Domain	Social and emotional skills
Skills that are not part of the SSES framework	Emotional intelligence
	Grit
	Self-awareness
	Perspective-taking / Theory of mind / Mentalising

Note: * skills that were left out of the final SSES framework; ** skills that were measured as additional indices in the SSES.

2.4. The jingle-jangle fallacy: Are we talking about the same concepts?

A third limitation of the SSES conceptual framework relates to an overarching challenge in the field, that is a confusion of terms and concepts due to the wide-ranging terminology used to describe SEL and SES (Jones, McGarrah and Kahn, 2019, p. 133[56]). The exponential and interdisciplinary interest for the field has led to a proliferation of terms and models (Abrahams et al., 2019[19]; Duckworth and Yeager, 2015[57]). A recent project led by American Institutes for Research for the Robert Wood Johnson Foundation identified 136 frameworks for such constructs (Berg et al., 2017[58]). Addressing this issue, known as the jingle-jangle fallacy, becomes crucial as SEL gains prominence in research and education. Utilising precise terminology in research and practice can minimise confusion and enhance the applicability of SEL across contexts. Emphasising precision and transparency will help identify common skills and competencies, distinguish differences, and recognise overlaps across disciplines, leading to more effective approaches and alignment between research, evidence, programs, and evaluation in the field.

In this working paper, we will address this issue in several ways. We will pay particular attention to flagging both differences in terminology for the same skills and potential mismatches in definitions, conception and/or measurement despite similar terms. As discussed previously, we will also use synonyms to scope through the literature and identify the relationships between different terms and constructs from different fields of research or different models throughout the review. To do this, we rely on the two resources cited above (the ExploreSEL tool and the concept notes on Skills for Education 2030 from the OECD's Education 2030). For each skill, we will analyse the existing definitions and their respective links (interrelatedness). Conceptual and terminological discrepancies are highlighted in the respective review sections and discussed in Section 6. Based on the literature review, Section 6 also updates the SSES definition of SES for the *Innovative approaches to measuring social and emotional skills* project.

2.5. Conclusion: Key points

This section revisited the theoretical work of the SSES framework to provide conceptual foundations for the *Innovative approaches to measuring social and emotional skills* project.It covered several limitations of the SSES framework how they will be addressed in the literature reviews on the teachability and predictive values of the SES presented in this working paper, and more broadly the lessons learnt from the flaws in the current evidence-based research that will guide further OECD work on assessing SES.

1. The reviewed evidence supplements the SSES framework and supports the use of the Big Five model of personality as a general framework for organising SES. Nevertheless, we acknowledge limited cross-cultural validity and comprehensiveness as the main limitations of this framework, especially when using emic research approaches. We also acknowledge the limitations related to the

selection process of SES in the SSES framework. These limitations will be addressed in the next steps of the project (including in the literature reviews of the current paper) by:

- Focusing on the skill or facet-level and keeping the domain-level as a general organisational structure.

- Reviewing additional skills that are not present in the SSES framework nor in the Big Five model (see **Table 2**). In the literature reviews of this working paper, searches will also be expanded by using related skill terms.

- Avoiding any confusion between skills and personality traits, and highlighting the nature of the constructs in the reviewed articles (e.g. traits vs. skills, typical vs. maximal behaviour). Specifically, the literature reviews of this paper will focus primarily on studies that examine skills and maximal behaviour.

- Exploring the most promising statistical approaches and rely on a group of international experts to discuss the relevant skills to target for assessment and limit risks of cultural bias.

2. The jingle-jangle fallacy remains a major shortcoming of current research on SES. This working paper will address this limitation and adds clarity to the field by:

- Flagging discrepancies in terminology and in concepts throughout the literature reviews.

- Identifying relationships between different terms and constructs from different fields of research or different models.

- Discussing existing definitions and their respective links for each skill in Section 6.

- Presenting an updated definition of SES for the *Innovative approaches to measuring social and emotional skills* project in Section 6.

2.6. Endnotes

[1] These taxonomies are: the Thomas and Chess (1977[59]) temperament model; The Hierarchical personality inventor for children (HiPIC) (Mervielde, De Fruyt and De Clercq, 2009[60]) ; the Inventory of Children's Individual Differences (ICID), the Big Five Inventory 2 (BFI-2) (Soto and John, 2017[61]) ; a taxonomy based on the lexical study by Saucier and Ostendorf (Saucier and Ostendorf, 1999[62]) ; the Tailored Adaptive Personality Assessment System (TAPAS) (Drasgow, 2012[63]); and the HEXACO personality inventory (Lee and Ashton, 2004[29]).

[2] The Taxonomy Project is a multi-year research project aims to create an evidence-based system for organising, describing, and linking frameworks and skills in the non-academic domain. Explore SEL, an online platform, houses practical tools generated by the Taxonomy Project. The thesaurus and visual tools on the site draw information from the Taxonomy Project's database of coded frameworks, illustrating relationships between terms and skills based on the received Taxonomy Project codes. OECD Education 2030 team analysed a large number of key knowledges, skills, attitudes and values for 2030 (including more than 30 skills) in order to construct the OECD's "Learning Compass 2030" framework.

3. General teachability and development of social and emotional skills

3.1. Introduction

This section presents an empirical review of the teachability of SES, with focus on the general teachability of SES and their developmental trajectories through childhood and

adolescence. This is, first, an update to the research done on SES' malleability that undergirded the development of the original SSES framework. Second, it is a re-assessment of what is known and not known about SES, how they evolve and what factors inform their development. Although they address SES in the general and not specific skills, the findings here can support assessment design by showing which skills, domains or age groups are appropriate subjects of SES assessment and which contextual factors might influence performance on such assessments.

Firstly, we introduce the nested concepts of plasticity, malleability and teachability. This part discusses recent updates on children's social and emotional development in the fields of neuroscience, personality psychology and education and provides an overview of how these skills evolve during childhood and adolescence. It identifies key areas of consensus and debate between fields as well as factors known to influence skill malleability generally. Secondly, we examine the holistic evidence for the teachability of SES. This part shares the results of a systematic search and review of meta-analyses and systematic reviews of SEL effectiveness worldwide. In this, it provides a state-of-the-art research overview and identifies key factors for skill teachability in education settings. However, as discussed above, the huge information gaps in this review necessitated a second type of review, one which identifies the teachability of individual skills – or, at least, what we do not know (this latter review is covered in Section 4). Finally, we discuss issues of equity in SEL interventions and their effectiveness research.

In terms of methodology, this section required two separate reviews of research. The subsections on plasticity, malleability and teachability and on equity in SEL interventions involved general literature reviews of SES and SEL from education, psychology and educational neuroscience. In particular, these sections use literature reviews conducted by other institutions (e.g. Cantor et al. (2019[64]); Chatterjee Singh, and Duraiappah (2020[65]). In contrast, the sub-section on evidence for the general teachability of SES presents a systematic review of meta-analyses and systematic reviews of the effectiveness of Universal School-Based (USB) SEL interventions. It summarises new evidence produced since 2015 and updates the findings that informed the original SSES framework (Chernyshenko, Kankaraš and Drasgow, 2018[10]). The methodology is covered in greater detail in that section and in **Annex B**.

3.2. Plasticity, malleability and teachability

The empirical review of the teachability evidence for SES relies on three distinct concepts: **plasticity**, **malleability** and **teachability** (**Figure 2**). They are defined as follows:

- **Plasticity** denotes the brain's capacity to change "in both structure and function throughout life and in response to experience" (Voss et al., 2017, p. 1[66]). This includes changes resulting from both internal, biological processes like puberty and external influences like the school environment.

- **Malleability** denotes susceptibility to change due to environmental influences, whether deliberate and unintentional. These can be experiences, relationships or general contexts at home, in school and in society more broadly (Cantor et al., 2019[64]).

- **Teachability** denotes susceptibility to deliberate intervention in education settings. These can be school-based, after-school or out-of-school interventions that take place outside students' homes. They are led by instructors who are, generally, not the students' caregivers.

"Deliberate intervention" is any intervention that explicitly seeks to cultivate SES in students through lessons, school structures and/or students practicing the skills via activities. The following four real-life SEL programmes exemplify how this might look. Although they do not all involve stand-alone lessons on SES, they qualify as deliberate interventions because they target SES in structured ways:

- The Positive Action programme includes explicit lessons on SES

- Responsive Classroom does not have distinct, SES-focused lessons but inculcates skills explicitly through schoolwide activities, teaching practices and rules

- Girls on the Run is an after-school programme that teaches SES through structured physical activities

- The Hindleap Warren Outdoor Education Centre programme occurs outside of schools but deliberately develops SES through structured outdoor and group activities.

Figure 2: The nested concepts of plasticity, malleability and teachability
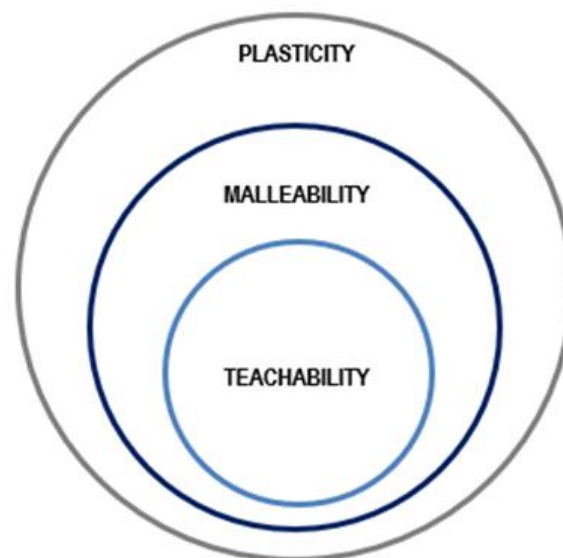
These terms are nested rather than mutually exclusive. For a skill to be malleable, it must also be plastic, etc. Yet the distinctions matter, particularly between malleability and teachability. "Plasticity" and "malleability" are broad terms. Plasticity encompasses any type of change to the brain and resulting traits, capacities and skills, whether hereditary or environmental. Malleability refers to all types of environmental influences, both within education and out (e.g. parental influence as well as academic learning). Policy makers and researchers have historically focused on malleability, but this term obscures a potentially important point: some capacities may be *malleable* but not *teachable* in education settings by professionals within formal curricula. As Jones et al. (2019, p. 2[67]) write: "just because these traits are desirable does not mean that they are suitable targets for school-based programs".

Take attachment to others, for example. The ability to form healthy attachments is an emotional and social capacity, and it is crucial to human development (Immordino-Yang, Darling-Hammond and Krone, 2019[68]). It is also highly malleable. Attachment patterns form after birth, primarily through our relationships with our caregivers and later, peers and others (Cantor et al., 2019[64]). Schools and activities outside the home do create opportunities to learn relationship skills and adjust attachment patterns. Yet the ability to form healthy attachments itself is likely a broader, less teachable and more malleable capacity that arises from our key personal relationships. Caregivers are its primary mediators (Cantor et al., 2019[64]).

On the other hand, evidence suggests that emotional control or, the ability to manage one's own emotions such as anger, is teachable. Four separate randomised control trials (RCTs) of the social and emotional learning PATHS Program (**Box 1**) found significant improvements across ages 4 to 10 in emotional regulation, executive functions and prosocial behaviour as well as reduced aggression, behavioural problems and "aggressive interpersonal negotiation strategies" (Jones et al., 2021, p. 288[69]). Numerous other programmes have improved emotional control from preschool to secondary school (CASEL, 2023[70]; Grant et al., 2017[71]).

The distinction between a malleable capacity or a teachable skill can blur, however. First, many key factors that determine malleability also influence teachability, such as quality of relationships, stress, motivation and social climates in school, at home or in the wider community (Cantor et al., 2019[64]; Cefai et al., 2018[72]). Second, the difference can depend on how one defines 'skill' generally and the specific skill in question. Resilience, for example, can be considered teachable when it is defined narrowly as coping skills or short-term stress resistance, but when defined broadly as positive adaptation despite adversity or "presence of risk", it is found to be malleable but not teachable (Gutman and Schoon, 2013[73]). In this latter form, resilience can be nurtured indirectly by "reducing risk factors and promoting protective factors" (ibid.) in the child's environment. These include supportive relationships with adults, teaching emotion- and self-regulation (i.e., coping skills), and developing other skills like self-efficacy and locus of control (Center on the Developing Child, 2015[74]).

In short, not all desirable and malleable social and emotional capacities may be teachable. Plasticity and malleability are prerequisites for teachability, but a distinction can help identify the SES that can be taught substantively in schools and education programmes.

3.3. How do skill, trait and brain plasticity shift over the lifespan?

All competencies and skills, be they academic, social or emotional, rely on the brain and its complex neural networks (Rogers and Thomas, 2023[75]; Immordino-Yang, Darling-Hammond and Krone, 2018[76]). Thus, the basic principles of brain development undergird skill development. Predictably then, emerging findings from neuroscience are increasingly influencing education and psychology studies. Research in these cognitive and human sciences is moving toward broad consensus on several key factors that affect how skills, personality traits and the brain evolve over the lifespan. They increasingly agree on the following:

1. All human systems – cognitive, social, emotional and physical – are interrelated. They depend to various extents on the brain and the development of its complex neural networks throughout life (Rogers and Thomas, 2023[75]; Roberts, 2018[77]).

2. The brain, traits and skills retain some degree of plasticity throughout life (Kankaraš, 2017[78]; Chatterjee Singh and Duraiappah, 2020[65]).

3. Brain, traits and skills are all malleable and affected by experience and environment, albeit to varying degrees. Brain and skill development are highly context-dependent (Cantor et al., 2019[64]; Immordino-Yang, Darling-Hammond and Krone, 2019[68]), while personality traits are by definition more stable.

4. Plasticity is, however, not constant either across one's lifespan or the brain itself. Temporally, there are 'sensitive periods' where plasticity and malleability peak, especially early childhood and adolescence (Chernyshenko, Kankaraš and Drasgow, 2018[10]; Cantor et al., 2019[64]).

5. Functionally, different brain regions are differentially prone to change (Wenger and Lövdén, 2016[79]).

6. Skills may follow a more complex, non-linear and continuous pattern of development than previously thought. However, skill development is also hierarchical and progresses generally from simpler, concrete forms to more sophisticated, complex expressions as children age (Denham, 2018[80]; Chatterjee Singh and Duraiappah, 2020[65]).

7. Skills can develop in all social environments (Cantor et al., 2019[64]; Roberts, Wood and Caspi, 2008[81]).

8. There is significant individual variability in the pace and nature of brain and skill development, including variation in plasticity itself (Voss et al., 2017[66]; Chernyshenko, Kankaraš and Drasgow, 2018[10]; Cantor et al., 2019[64]).

The research behind points 1-5 in particular has evolved in recent years. Recent work in educational neuroscience is increasingly establishing the bidirectional, dynamic interactions between cognitive, social and emotional neural networks. In one direction, for example, emotions rely on cognitive processes like memory formation in the hippocampus (Wenger and Lövdén, 2016[79]). In the other, attention and learning, including academic learning, rely on what we might consider emotional and social responses like motivation and sense of belonging (Rogers and Thomas, 2023[75]). Concepts like epigenetics – in which the environment triggers or inhibits gene expression – highlight how "nurture" and "nature" are more co-developing than distinct (Cantor et al., 2019[64]). Despite its focus on "relatively enduring" (Roberts, Wood and Caspi, 2008, p. 375[81]) traits, personality psychology has likewise noted the "dynamic interaction" (Chernyshenko, Kankaraš and Drasgow, 2018, p. 21[10]) between cognitive, social and emotional capacities and between hereditary and environmental influences. For example, epigenetics is now informing new models of trait development (Kuper et al., 2021[82]; Roberts, 2018[77]).

Furthermore, although psychology, neuroscience and education have long acknowledged the existence of neuro-, trait and skill plasticity, research is uncovering more complex degrees than previously thought. Historically, plasticity has been conceived as more time-limited with make-or-break "critical periods" (Hsu, Novick and Jaeggi, 2014[83]) and more fixed dichotomies between genetic and environmental factors (Jang, Livesley and Vernon, 1996[84]; Pomerantz and Thompson, 2008[85]). Now this is changing. For example, up until recently research found that self-control, defined as "the ability to resist short-term impulses in order to prioritise longer-term goals", was only malleable until age 10 (Gutman and Schoon, 2013, p. 20[73]). Self-control was also deemed to be managed predominantly by the brain's pre-frontal cortex (Hsu, Novick and Jaeggi, 2014[83]). However, recent research identifies an "Executive Control Network" and highlights how skills and functions operate through networks of co-activated regions of the brain (Immordino-Yang, Darling-

Hammond and Krone, 2019[68]). Executive control functions may also be plastic throughout the lifespan (Hsu, Novick and Jaeggi, 2014[83]). Personality psychology has similarly found trait plasticity extending into middle and old age. Specht et al. (2011[86]) found that emotional stability, extraversion, openness and agreeableness became more stable with age and peaking at ages 40-60, before becoming less stable again after age 60.

An important caveat is that plasticity is not constant or equal for all traits or skills. Neuroplasticity is elevated during childhood and adolescence, but in adulthood, change depends more on "intense and prolonged learning or dramatic changes in the environment" (Chatterjee Singh and Duraiappah, 2020, p. 37[65]). Some parts of the brain appear to be plastic for longer than others, such as the hippocampus, which is critical to memory formation (Wenger and Lövdén, 2016[79]). In personality psychology, plasticity similarly changes with age and trait domain. The *cumulative continuity principle* describes how rank-order stability of personality traits becomes increasingly stable with age. The *maturity principle* describes how agreeableness, conscientiousness, emotional stability and "social dominance" (a facet of extraversion) generally increase with age. Additionally, psychology research does find heritability plays a factor, also in plasticity. Studies have found that it varies from 41% for emotional stability to 61% for openness to experience (Jang, Livesley and Vernon, 1996[84]). Bleidorn et al. (2009[87]) also found that genetic factors explain differences in plasticity itself between the domains. Changes in agreeableness, conscientiousness and neuroticism were mostly due to genetic effects, whereas shifts in extraversion and openness to experience were almost entirely environmentally driven.

Malleability is also present throughout life to varying degrees. At birth, our genes "underspecify our development" (Immordino-Yang, Darling-Hammond and Krone, 2019, p. 187[68]) and require significant external input. Human brains then take 25 years to mature, the longest of any species (Chatterjee Singh and Duraiappah, 2020[65]). These factors engender humans' "unparalleled proclivity for socially mediated learning" (Immordino-Yang, Darling-Hammond and Krone, 2019, p. 187[68]). Personality traits also display malleability and even some teachability. Major life events and even careers have been shown to influence changes in personality, such as marriage, one's first job, parenthood, retirement or military service (Kankaraš, 2017[78]). Studies have also examined the impact of interventions and thus teachability, also in adults. Studies of short 2- and 16-week interventions found increases in emotional stability and openness to experience in adults aged 60-94 (Chernyshenko, Kankaraš and Drasgow, 2018[10]). Unfortunately, this malleability also works adversely**.** Chronic stress and deprivation can undermine neuroplasticity and children's cognitive, social and emotional development (Cantor et al., 2019[64])**.** According to one study, "in suboptimal environments measures of environmental quality and learning opportunities overwhelmingly swamp the predictive power of genes" (Immordino-Yang, Darling-Hammond and Krone, 2019, p. 187[68]).

As a result of this complexity, skills also follow a more complex, non-linear pattern of development. Models of social and emotional development in neuroscience now posit "successive waves" rather than sequential stages (Chatterjee Singh and Duraiappah, 2020[65]). Education studies similarly agree that skills follow non-linear trajectories, with significant individual variability (Cantor et al., 2019[64]). Skills "co-develop hierarchically" (Cantor et al., 2019, p. 312[64]) rather than in isolation, in a spiral of increasing complexity and integration (Chatterjee Singh and Duraiappah, 2020[65]). For these reasons, researchers advise a "developmental" approach to teach SES effectively (Denham, 2018[80]; Yaeger, 2017[88]). For Denham (2018[80]), SES acquisition is a "process of development" composed of "age-differentiated developmental tasks" (pp. 1-2[80]) in which skill domains are continually taught with increasing sophistication from early childhood through adolescence, rather than being completed at a given age. For example, social awareness skills in late adolescence may involve understanding how past experience or culture affects

a peer's reactions. This builds upon simpler social awareness skills developed in primary school, such as the ability to correctly infer others' feelings.

Three caveats need mention. First, while all skill development rests on certain common principles, there is variability between domains, skills and individuals. Their developmental trajectories are still not fully understood (Bailey et al., 2019[89]). Second, although the field of personality psychology does examine the susceptibility of traits to teaching or intervention, it does not usually distinguish between "traits" and "skills". Some very recent research explicitly adapts the Big Five for SES (Soto et al., 2022[11]), but this field generally focuses on "relatively enduring" traits (Roberts, Wood and Caspi, 2008[81]). Third and finally, the domain specificity versus generality of various skills is also debated (Lamb, Maire and Doeke, 2018[90]). Some research suggests that skills, including SES, begin as domain specific but "over time, can and will generalise to other contexts" (Cantor et al., 2019, p. 312[64]). In their skill-specific review, however, Lamb, Maire and Doeke (2018[90]) contest that this depends on the skill.

3.4. Are there "sensitive periods" for skill development?

Are there "sensitive periods" for skill development? In sum: yes, but understandings of these have also recently shifted. Early childhood has long been seen as a period of exceptional neuroplasticity and skill malleability (Cefai et al., 2018[72]), but recently adolescence has also emerged as a similar period (Yaeger, 2017[88]; Soto and Tackett, 2015[91]; Immordino-Yang, Darling-Hammond and Krone, 2018[76]). Physical changes, including hormonally driven changes during adolescence, contribute to this (Chatterjee Singh and Duraiappah, 2020[65]). The following paragraphs give an overview of brain, skill and trait development across childhood and adolescence.

Young children's brains rapidly develop regions controlling sensory, motor, language, spatial and visual functioning as well as simple SES. They can already develop a range of SES, such as self and emotional control, co-operation and assertiveness (Jones et al., 2021[69]), but concrete ones focused on basic self-management and social engagement rather than abstraction (Immordino-Yang, Darling-Hammond and Krone, 2019[68]; Denham, 2018[80]). They do, however, begin to adopt perspective-taking, or theory of mind (OECD, Forthcoming[55]). Play is essential for developing all these (Immordino-Yang, Darling-Hammond and Krone, 2019[68]). During this age, basic attachment patterns also develop and form the templates for future relationships (Cantor et al., 2019[64]).

Middle and late childhood are also plastic periods, but perhaps less sensitive than early childhood (Cefai et al., 2018[72]; Immordino-Yang, Darling-Hammond and Krone, 2019[68]). Psychology identifies all of childhood as a period of instability, where studies find fluctuating scores on personality measures and low test-retest correlations between ages (Chernyshenko, Kankaraš and Drasgow, 2018[10]). Studies of personality in children and adolescents have also found traits correlations that do not exist in adulthood. These suggest that some traits, like self-regulation and a "mastery-orientation trait" (a trait similar to the SSES skill "achievement motivation"), manifest differently in childhood (Soto and Tackett, 2015, p. 359[91]). According to Immordino-Yang, Darling-Hammond and Krone (2019[68]), "SEL capacities and scholarly capacities are becoming increasingly integrated" during middle and late childhood (p. 193[68]). Children gradually internalise and reproduce the cognitive, social, emotional and cultural patterns they witness, but do not yet display fully individuated identities. Children at this stage shift from initial prosocial behaviours to dyadic friendships and more stable peer relations, developing necessary emotional regulation and conflict resolution strategies (Denham, 2018[80]).

Adolescence is now widely viewed as another highly sensitive developmental period (Chatterjee Singh and Duraiappah, 2020[65]; Yaeger, 2017[88]), but with different emphasis compared to early childhood. According to Denham (2018[80]), early adolescent social and emotional learning needs centre on forming group-based identities with peers and independent from adults as well as more complex emotional awareness and conflict resolution between individuals and groups. These dovetail with increased capacity for abstract thinking (Rosen et al., 2022[92]) and social and moral principles (Gestsdottir and Lerner, 2008[93]).

Major neurological and physiological changes accompany these developments and contribute to well-known temporary disruptions in traits and skill maturity (Chernyshenko, Kankaraš and Drasgow, 2018[10]). The asynchronous development of various brain regions and hormonal changes produce the socially sensitive, risk-taking (reward-seeking) behaviour of teenagers (Chatterjee Singh and Duraiappah, 2020[65]). At the same time, frontal lobes begin a slower "period of intense development (lasting into the early 20s)" (Immordino-Yang, Darling-Hammond and Krone, 2019, p. 193[68]) that both affect skills related to planning, decision-making and higher-order thinking but also strengthen connections "involved in emotional reactivity, social sensitivity, and reward" (p. 193[68]). Pubertal hormones, including testosterone in all genders, also increase susceptibility to stress and social rejection (Yaeger, 2017[88]). In psychology, this produces the *adolescence disruption principle* (Soto and Tackett, 2015[91]). Gender differences appear in emotional stability, where girls experience bigger dips than boys. These dips have also been corroborated in the OECD's first round of the SSES (OECD, 2021[9]).

In late adolescence, the synaptic pruning of unused neural networks intensifies. Along with increased neural "cross-talk", this contributes to the development of the high-level cognition related to abstract thinking and understanding cultural values and beliefs (Immordino-Yang, Darling-Hammond and Krone, 2019[68]). Yet the brain continues to mature until the mid-20s and even after this, plasticity is still present (Chatterjee Singh and Duraiappah, 2020[65]). This matches findings in personality psychology, where the temporary dips in traits like emotional stability disappear by the early 20s (Soto et al., 2011[94]), but malleability and plasticity still occur in adulthood. In education studies, late adolescence is characterised by emotional independence from adults, understanding "unique emotional perspectives" and forming an "individuated personal" (Denham, 2018, p. 2[80]) with personal, generalised values to guide behaviour, rather than group-based identity. Consequently, youth at this age are capable of quite sophisticated SES, like metacognition and complex social problem-solving (OECD, Forthcoming[55]).

In this overview, it should be noted that while neuroscience has much to contribute to the study of SES, its findings do not always easily correspond. A single SES often comprises multiple cognitive processes and networks that cannot be readily separated (Immordino-Yang, Darling-Hammond and Krone, 2019[68]). Thus, while areas like the prefrontal cortex or the executive control network do influence skills like metacognition or self-control, SES cannot be mapped onto a particular brain region. This also likely contributes to "the interdependent, hierarchical character of skill construction" (Cantor et al., 2019, p. 312[64]).

3.5. Key factors that influence malleability

In malleability research, several contextual factors are known to consistently promote or undermine SES development.

3.5.1. Relationships

Human relationships are one of the most important factors in human development (Jones, McGarrah and Kahn, 2019[56]; Cantor et al., 2019[64]). Children's brains require an "environment of relationships" to develop (Center for the Developing Child, 2009[95]). Strong, supportive relationships protect against the damages of adversity and chronic stress (Center on the Developing Child, 2015[74]) and it is through relationships with adults that children develop their foundational cognitive, social and emotional capacities (Immordino-Yang, Darling-Hammond and Krone, 2019[68]; Pomerantz and Thompson, 2008[85]). In terms of SEL, instructor-child relationships can significantly affect outcomes. For example, in the Chicago School Readiness Project, teacher-child relationships were a key moderating factor for the preschool intervention's effectiveness (Jones, McGarrah and Kahn, 2019[56]). In essence, "when children feel comfortable with their teachers and peers, they are more willing to grapple with challenging material and persist at difficult learning tasks", including SEL (Chatterjee Singh and Duraiappah, 2020, p. 75[65]).

3.5.2. Stress

Stress affects all aspects of human development. It "is a model through which the biological and contextual influences mutually reinforce each other at multiple levels, including the level of the cell" (Cantor et al., 2019, p. 323[64]). Research distinguishes between "positive stress", which are "brief" and "mild" increases in heart rate and stress hormones; "tolerable stress" that is a serious but temporary stress response, mitigated by supportive relationships; and "toxic stress", which is defined as frequent, "prolonged activation of stress response systems" without adequate buffering relationships (Center on the Developing Child, 2015[96]).

Positive stress is a necessary part of healthy development. Toxic stress, however, can trigger a cascade of negative effects. It disrupts the maturation and integration of all major brain structures, accelerates neural pruning and truncates plasticity (Cantor et al., 2019[64]). Through this, it impairs the development of social and emotional capacities including emotional and self-control, executive functions, and stress reactivity (Chatterjee Singh and Duraiappah, 2020[65]). Children exposed to prolonged adversity, such as poverty, abuse, discrimination or community violence, often develop hypervigilance to social threats, negative bias, numbness to risk and a range of learning difficulties and health problems (Cantor et al., 2019[64]; Immordino-Yang, Darling-Hammond and Krone, 2019[68]). They struggle more with social relationships, recognising and managing emotions, and awareness of their strengths and needs (Cipriano et al., 2023[97]). Thus, in toxic amounts, stress affects not only how skills and capacities develop, but the capacity to learn and develop itself.

3.5.3. Physical health & diet

Physical health can influence social and emotional development. Quality of sleep affects maturation of brain regions important to learning, memory consolidation and stress sensitivity (Wenger and Lövdén, 2016[79]). Diets deficient in iron or high in refined sugars and saturated fats have been found to impair emotion, mood, memory and motivation (Chatterjee Singh and Duraiappah, 2020[65]). In SEL, these effects manifest as increased anxiety, restlessness and aggression. In contrast, adequate sleep, nutrition and physical environments that give access to exercise and green spaces, all promote social and emotional development (Immordino-Yang, Darling-Hammond and Krone, 2018[76]). For example, SEL interventions that promote skills through exercise and experiences in nature (e.g. Playworks) have shown positive effects on attention, self-control and emotional regulation (Jones et al., 2021[69]; Clarke et al., 2015[98]).

3.6. Can social and emotional skills be taught?

Can SES be taught? In sum: yes. A huge body of evidence, including multiple meta-analyses of SEL interventions around the world, have determined that SES can be taught in education settings. Impact varies, however, depending on the implementation and context.

3.6.1. Overview of meta-analyses on SEL intervention effectiveness

Two sets of reviews to assess the empirical evidence for the teachability of SES were conducted for this paper. The first was a review of meta-analyses and systematic reviews conducted since 2015. Using Google Scholar and Scopus, the main selection criteria were peer-reviewed meta-analyses or systematic reviews that:

- Focus on USB interventions explicitly targeting SES.

- Focus on the impact on the social and emotional outcomes and skills of students.

- Focus on school-age children (ages 5-18).

- Examine more than one intervention.

- Are in English.

- Were published no earlier than 2015.

These criteria were chosen for reasons of rigour, relevance and efficiency. First, each meta-analysis and review would efficiently summarise findings of many smaller studies and include criteria for quality. Second, USB interventions cater to general school populations, which are the majority of students. Third, since this review focused on the *teachability* of SES, the search focused on school-based programmes whose primary function is to teach SES. Other types of programmes, such as well-being or violence prevention, also address SES, but not always directly. They also often target related but different topics, such as general well-being. Fourth and finally, while there are many valuable SEL interventions that cater only to sub-groups, searching through each category would have expanded the scope of the search to be unmanageable. Instead, equity issues and the effectiveness of SEL targeting sub-groups is addressed in a narrative review towards the end of Section 3.

In summary, a total of 771 titles were screened, leading to 19 final articles (see Annex A for detailed methodology). Reviews that focused on mental health, violence prevention, well-being or interventions targeted at sub-groups were excluded. Three of the 19 did not focus on in-school interventions or students' social and emotional outcomes. These were kept for background information, leaving 16 total for review. The key findings are presented in **Table 3** and **Table 4**. Not every meta-analysis or systematic review is presented in the tables, only those with comparable findings that could help determine the teachability of SES. The rest inform the discussion or are presented in **Annex B**. One additional meta-analysis is included, namely Durlak et al. (2011[99]), because it is by far the most cited meta-analysis of SEL and one of the primary SEL reviews used to inform the original SSES (Chernyshenko, Kankaraš and Drasgow, 2018[10]) and policy making and research generally Academic effects are not discussed since this section focuses on the teachability of SES. Notably, one meta-analysis was itself a review of reviews that discussed other analyses included here (Durlak, Mahoney and Boyle, 2022[100]).

Summary of meta-analyses and teachability

Table 3 summarises the findings of the reviewed articles. It confirms the consensus in the literature: SES are generally teachable. The outcome categories in Table 3 are drawn from Durlak, Mahoney and Boyle (2022[100]) and defined below. Moreover, these outcome measures are themselves derived from Durlak et al. (2011[99]) and almost all of the meta-analyses in Table 3 use the same or near-identical outcomes and definitions. They can be summarised as follows:

- *SES:* A broad category comprising all skills related to "different types of cognitive, affective, and social skills related to such areas as identifying emotions from social cues, goal setting, perspective taking, interpersonal problem solving, conflict resolution, and decision making" (Durlak et al., 2011, p. 410[99]). Other studies use almost identical definitions (Boncu, Costea and Minulescu, 2017[101]; Taylor et al., 2017[102]). Some add more, for example, Goldberg (2019[103]) combines skills and attitudes to self and others.

- *Attitudes:* attitudes towards self (Wigelsworth et al., 2016[104]), self and others (Boncu, Costea and Minulescu, 2017[101]) or self, others and school (Taylor et al., 2017[102]; Durlak et al., 2011[99]). This category includes self-esteem, self-efficacy and self-concept; values and beliefs related to others, like helping or avoiding violence or substance abuse; and sense of belonging or connectedness in school and attitudes to teachers and education in general.

- *Positive/pro-social behaviour:* outcomes for "getting along with others" in daily life (Durlak et al., 2011[99]), including co-operation, problem-solving and efforts to help others (Taylor et al., 2017[102]). Wigelsworth et al. (2016[104]) adds "social awareness" and Boncu et al. (2017[101]) perceived quality of relationships to others.

- *Conduct problems:* reports on problem behaviours, such as aggression, violence, bullying, classroom disruption, non-compliance and disciplinary referrals or suspensions (Taylor et al., 2017[102]; Durlak et al., 2011[99]; Wigelsworth et al., 2016[104]).

- *Emotional distress:* outcomes related to "internalized mental health issues" (Durlak et al., 2011, p. 411[99]), especially depression and anxiety but also stress and social withdrawal. Some also include well-being (Goldberg et al., 2019[103]).

- *Emotional competence:* Wigelsworth et al. (2016[104]) define this as "internal domains related to emotional competency" (p. 355[104]) as distinct from interpersonal or social skills and awareness.

Table 3. Meta-analytic findings on SES' teachability and social and emotional outcomes, as effect size

Meta-analysis	Number (location of studies)	Age range	Assessed at post or follow-up?	SES	Attitudes	Positive/ prosocial behavior	Conduct problems	Emotional distress	Emotional competence
Cipriano et al. (2023[97])	258 (53 countries)	5-17	Mixed	0.22*[1] (f.u. 0.18*)[2]	0.21* (f.u. 0.20*)	0.18* (f.u. 0.14)	0.18*	0.14* (f.u. 0.12*)	n/a

Kim, Lim & An (2022[105])	22 (South Korea)	3-18	Mixed	0.34*	n/a	n/a	n/a	n/a	n/a
van de Sande et al. (2019[106])[3]	40 (12 countries including USA)	11-19	Post	0.24* - 0.58*	n/a	n/a	0.33*	0.27*, 0.31*[5]	n/a
Goldberg et al. (2019[103])	45 (9 countries)	4-16	Post	0.22*	n/a	n/a	n/a	0.10*	n/a
Taylor et al. (2017[102])	82 (44 from USA, 38 other)	5-18	Follow-up 6+ months	0.23*	0.13*	0.13*	0.14*	0.16*	n/a
Boncu et al. (2017[101])	37 (n/r) [4]	3-18	Post	0.36*	0.19*	0.20*	0.37*	0.17*	n/a
Wigelsworth et al. (2016[104])	89 (n/r)	4-18	Post	0.53*	0.17	0.33*	0.28*	0.19*	0.27*
Durlak et al. (2011[99])	213 (USA)	3-18	Post & follow-up 6+ months	0.57* (f.u. 0.26*)	0.23* (f.u. 0.11*)	0.24* (f.u. 0.17*)	0.22* (f.u. 0.14*)	0.24* (f.u. 0.15*)	n/a

Note: This table is largely adapted from (Durlak, Mahoney and Boyle, 2022[100]), with Kim, Lim & An (2022[105]) and Cipriano et al. (2023[97]) as additions. Impact on academic outcomes is not reported but was assessed in six of the 11 meta-analyses. 1 - *= statistically significant finding; 2 - f.u. = follow-up effects; 3 - van de Sande et al. (2019[106]) reported on domain-level outcomes without aggregation, hence outcome ranges are reported. Full domain-level results are reported in Table 2; 4 - n/r = not reported; 5 - results for anxiety and depression respectively.

In **Table 3**, the meta-analyses show that SEL interventions produce small to moderate effect sizes, even at follow-up. In Cipriano et al. (2023[97]) and Taylor et al (2017[102]), these follow-up effects were measured from 6 months to 3 or 4 years post-intervention, respectively. Yet they do reveal some fade-out. This is a common phenomenon for skill interventions and the results here match those found for cognitive skills (Hart et al., 2023[107]). The fade-out is largest for SES. While this may suggest that taught SES do not last, the other outcomes are arguably also important indicators of teachability. Outcomes like prosocial behaviour, reduced conduct problems and reduced emotional distress reflect the successful transfer of SES to real-world settings outside SEL curricula, such as managing relationships, engagement in school and coping with stress.

Box 1. Learning to walk the PATHS

The Promoting Alternative THinking Strategies (PATHS) programme is a well-documented SEL programme for primary school students with an international evidence base. It aims to reduce aggression and anti-social behaviour by fostering SES. Initially implemented in the United States, it has been expanded to countries such as Canada, the United Kingdom, the Netherlands, Australia, Türkiye and South Korea (Jones et al., 2021[69]). The programme targets primary school students from 3 to 10 years old, and it has been successfully implemented across a range of different ethnicities and with students from disadvantaged socio-economic backgrounds. It consists of up to fifty 30-minute fully scripted lessons tailored to each grade, focusing on various skills, such as self-control, interpersonal problem-solving and empathy. The lessons emphasise emotional knowledge and expression and include discussions, didactic instructions and role play sessions, always coordinated by teachers. US studies showed improved emotional regulation and emotional understanding, reduced levels of aggression and higher levels of social co-operation (Crean and Johnson, 2013[108]; Fishbein et al., 2016[109]). Evidence from Sweden and Türkiye also shows that, when culturally adapted, PATHS can improve emotional knowledge, social withdrawal and anxiety in preschoolers, although it can also result in increased impulsivity behaviours (Eninger et al., 2021[110]; Bilir Seyhan et al., 2019[111]). A recent meta-analysis combining studies from the US and other countries found moderate improvements in social-emotional competence in students from preschools to elementary schools (Shi, Cheung and Ni, 2022[112]).

The findings in **Table 3** also demonstrate teachability across cultural and national contexts. It combines studies from North America (predominantly US), Europe, Asia and Oceania. A key criticism of SEL literature has been its overwhelming focus on US programmes. While this is still sometimes the case (Taylor et al., 2017[102]; Jones et al., 2021[69]), this search demonstrates a growing expansion to countries beyond the US and English-speaking countries, such as China, Germany, Spain and South Korea.

Table 4 presents the only three reviews found that break results down by SEL skill domain. They cover a wide array of countries, from Chile to the Netherlands. They all use the five-domain framework of the Collaborative for Academic Social and Emotional Learning (CASEL) (2023[113]). CASEL introduced the concept of SEL in the 1990s and its framework is one of the most common – but by no means only – one in education. It defines each domain as follows (CASEL, 2023[113]):

- *Self-awareness:* "The abilities to understand one's own emotions, thoughts and values and how they influence behaviour in across contexts", including recognising one's strengths, limitations and possessing "well-grounded" confidence (e.g. self-esteem, self-efficacy, growth mindset) and purpose.

- *Social awareness:* "The abilities to understand the perspectives of and empathize with others, including those from diverse backgrounds, cultures, & contexts." This includes understanding others' perspectives, recognising others' strengths, showing concern for others, and identifying social norms (just and unjust).

- *Self-management:* "The abilities to manage one's emotions, thoughts, and behaviours effectively in different situations and to achieve goals and aspirations." This includes the capacities to delay gratification, manage stress, and feel motivation & agency.

- *Relationship skills:* "The abilities to establish and maintain healthy and supportive relationships and to effectively navigate settings with diverse individuals and groups." This includes co-operation, collaborative problem-solving, conflict resolution and asserting oneself appropriately on one's own or others' behalf.

- *Responsible decision-making:* "The abilities to make caring and constructive choices about personal behaviour and social interactions across diverse situations." This includes demonstrating curiosity and open-mindedness, moral reasoning,

evaluating consequences of one's behaviour and identifying solutions to personal and social problems.

Table 4. Intervention impacts on CASEL skill domains, as effect size or main result

Meta-analysis or systematic review	Number (location of studies)	Age range	Social awareness	Self-awareness	Self-management[2]	Decision-making	Relationship skills	Notes on evidence
Kim, Lim & An (2022[105])	22 (South Korea)	3-18	0.58[1]	0.25	0.29	0.31	0.20	Overall effect size (0.34) was statistically significant, but differences in effect sizes between domains were not. Very mixed study quality, including several without control groups.
van de Sande et al. (2019[106])	40 (12 countries including USA)	11-19	0.58*[3]	0.42*	0.39*	0.34*	0.24*	39 of the 40 studies were RCT or QE design, with 23/40 rated as "strong" design, the rest as "moderate".
Fernández-Martin et al. (2021[114])	22 (Brazil, Chile, Portugal, Spain)	3-18	3 studies s.s. 1 study n.s.[4]	3 studies s.s. 1 study n.s	5 studies s.s. 1 study n.s	1 study s.s. 1 study n.s	5 studies s.s. 3 studies n.s	Did not report effect sizes but divided primary studies into those that found statistically significant results for a given domain and those that did not.

Notes: [1] numerical findings are effect sizes; [2] Kim et al. (2022[105]) and Fernández-Martin et al. (2021[114]) call this domain "self-control"; [3]* = statistically significant; [4] s.s. = statistically significant findings, n.s. = not statistically significant findings. Fernandez-Martin et al. (2021[114]) also examined impacts on school climate, student well-being and academic performance, reported in the same fashion.

Table 4 illustrates the teachability of a range of SES domains. Social awareness, self-awareness and self-management appear particularly responsive to teaching. These are the top domains in van de Sande et al. (2019[106]), which presents the most comprehensive study. These three domains also show the highest ratio of significant to non-significant results in Fernández-Martin et al. (2021[114]). Notably, van de Sande et al.'s (2019[106]) effects are stronger than those of Kim, Lim and An (2022[105]), where inter-domain significance was affected by wide variation in study quality and outcomes.

Van de Sande et al. (2019[106]) also reveal how interrelated skills are and the challenge of trying to separate and target them individually. Self-management and relationship skills "have been assumed to be the core targets in school programs" (Van De Sande et al., 2019, p. 1560[106]) and thus could be expected to the greatest effect sizes. However, Van de Sande and colleagues (Van De Sande et al., 2019[106])show that self-awareness and social awareness – both knowledge rather than behaviour centered domains – improved the most. On the other hand, the strongest psychosocial outcomes (not reported above) were reduced substance use ($d = 0.39$) and aggression ($d = 0.33$), two areas that relate to responsible decision-making and self-management per their definitions. This implies that these latter,

behaviour-centered domains, did substantively improve in real-life situations. Collectively, Table 4 suggests that all SES are teachable, but especially those emphasising awareness and information processing.

3.7. Limitations of this review

Table 3 and Table 4 demonstrate the teachability of SES – but also the limits of the data at the review level. The effect sizes in Table 3 vary considerably in all domains except attitudes. For example, the SEL effects range from 0.22 to 0.57 even when ignoring follow-up effects. This could be due to variability in the design and results of primary studies, but also in the inclusion criteria of the meta-analyses.

The greater limitation, however, is a lack of granularity of detail. At the review level, the aggregate categories and domain-level analysis provides little insight into exactly which skills are teachable, to what extent, for which age groups and which outcomes (Durlak, Mahoney and Boyle, 2022[100]). Moreover, the definitions of the outcome categories are sometimes unclear. For SES, for example, most studies give an incomplete list of concepts that are included. Other studies do not define their outcome variables (Durlak, Mahoney and Boyle, 2022[100]) or do not define them clearly (Wigelsworth et al., 2016[104]). At the level of primary studies, there is large variation in the definitions of skills and outcomes and the quality of study design (Durlak, Mahoney and Boyle, 2022[100]; Rowe and Trickett, 2018[115]; Wigelsworth et al., 2016[104]). Some studies even find statistically significant variation by study design (Wigelsworth et al., 2016[104]). A clearer picture of the teachability of individual skills or domains would require locating the definitions and measures used in each primary study.

The last limitation is age range and analysis of sub-groups. While the reviews cover all age ranges, primary school students comprise a far higher proportion compared to secondary students, especially upper secondary. For example, Taylor et al. (2017[102]) reported a sample distribution of 38% primary school, 45% lower secondary (~11-13 years old) and only 13% in upper secondary. Even in van de Sande et al.'s (2019[106]) study of secondary school programmes, only 35% of the primary studies addressed students over 14 years old. For sub-group analysis, this is discussed towards the end of this section.

These issues necessitated a second teachability review that focused on distinct skills and is covered in Section 4.

3.8. Key factors that influence teachability and SEL effectiveness

Despite gaps in the data, the reviewed studies agreed on important factors that influence the teachability of SES: age and developmental stage, student motivation, instructor identity and competencies, cultural and contextual fit, and implementation quality.

3.8.1. Developmental stage (adolescence vs. childhood)

There is sometimes a misconception in education policy that SEL only works in primary school, especially early childhood (Rosen et al., 2022[92]; Cefai et al., 2018[72]). This may be due to traditional ideas about neuroplasticity (discussed above) but also, the higher success rates of SEL interventions for primary school students compared to secondary (Yaeger, 2017[88]). For example, Boncu et al. (2017[101]) found age to be significant moderator of intervention effectiveness. With 33 primary studies and using a single combined measure for all outcomes, they found moderate effect sizes for ages 3-6 ($g = 0.31$) and 7-12 ($g = 0.38$), but statistically insignificant results for ages 13-18.

In reality, SES are teachable at all ages, but developmental changes mean that what works for 5-year-olds may not work for 15-year-olds (Denham, 2018[80]; Yaeger, 2017[88]). This is the "developmental approach" proposed by Denham (2018[80]) and Bailey (2019[89]). This matters, because common strategies for primary school interventions, such as didactic lessons and scripted skill rehearsal, may be ineffectual for secondary students (Yaeger, 2017[88]; Yeager et al., 2015[116]). Another reason for inconsistent results for secondary students may be ill-prepared teachers. OECD analysis of SSES teacher reports showed that secondary teachers feel less prepared to teach SES than their counterparts in primary schools (OECD, Forthcoming[55]).

Across ages, integrating SEL into academics' and students' daily lives is essential (Immordino-Yang, Darling-Hammond and Krone, 2019[68]; Denham, 2018[80]). For primary school, a "strategies-based" approach that integrates SEL into teachers' daily practices has proven effective (Bailey et al., 2019[89]) . For secondary, Yeager (2017[88]) proposes a "mindset model" for adolescents, rather than a "skill model", based on evidence from multiple effective secondary programmes. This approach honours adolescents' needs for status, competence, belonging and sense of purpose by a) focusing on mindsets rather than explicit skills and b) contextualising these in students' lives, values and desires.

Box 2. The power of positivity

The **Positive Action** programme targets children of ages 3 to 17 and has demonstrated effectiveness across ages 3 to 14, including indigenous and low-income students. It aims to promote character development and social and emotional learning through positive sense of self and dialogue between thoughts, actions and feelings. It posits that students feel better about themselves when they pursue positive and constructive actions to discover their interests and become better people. Applied in the United States and in Canada, this programme has proven effective with Hawaiian, Black and Hispanic minorities, particularly from low-income urban backgrounds (Jones et al., 2021[69]). Its core component comprises differentiated scripted lessons, which include discussions with the class as well as original stories, poems and games. The programme attempts to balance the development of emotional and social skills with emphasis on values and on developing the identity of students. It explores dimensions and skills such as personal responsibility, self-efficacy, self-improvement, and self-knowledge. Evidence for students ages 5 to 13 shows that this approach to self-development has resulted in reduced levels of physical and sexual violence, decreased use of drugs and alcohol, fewer suspensions and absenteeism, and improved academic results (Beets et al., 2009[117]; Li et al., 2011[118]; Lewis et al., 2016[119]; Snyder et al., 2009[120]).

3.8.2. Motivation

Motivation is an underlying "disposition or mindset" (Lamb, Maire and Doeke, 2018, p. 25[90]) that is crucial to all learning, including SEL (Rogers and Thomas, 2023[75]). It affects engagement and, thus, is associated with the transfer of learning (Lamb, Maire and Doeke, 2018[90]). Students who are motivated by an activity or topic "are more likely to develop transferable knowledge and skills" (p. 25[90]) within that activity or field.

Motivation is malleable as well as partly heritable (Rogers and Thomas, 2023[75]). It is shaped by individual interests but also environmental factors like sense of belonging, self-efficacy and perceived value of the task at hand. Some of these factors are teachable, like self-efficacy. Others can be influenced by school and classroom cultures, such linking tasks to students' lives (Gutman and Schoon, 2013[73]) or increasing "situational interest" through

choice or surprising elements (Rogers and Thomas, 2023[75]). However, motivation also appears to be domain specific. Individuals may be motivated by particular topics or tasks but not others, and the degree of domain specificity also varies (Lamb, Maire and Doeke, 2018[90]).

Although some research considers general motivation as SES, others conclude that it is a multi-faceted construct and only certain, narrower types of motivation are likely teachable (Lamb, Maire and Doeke, 2018[90]). Academic motivation that targets specific subjects is teachable, as is "achievement goal theory" that underlies the construct of growth mindset (Gutman and Schoon, 2013[73]). However, evidence for the teachability of growth mindset outside experimental settings is still sparse (Rogers and Thomas, 2023[75]).

3.8.3. Instructors

Debate continues as to whether teachers, school staff or external professionals are the best instructors for school based SEL interventions (Wigelsworth et al., 2016[104]). The emerging answer is usually teachers, but there are exceptions. According to Cefai et al. (2018[72]), "programmes delivered by teachers with the whole classroom are as effective or more effective than when delivered by external practitioners" (p. 59[72]). Teachers often have stronger relationships to students and are better placed to integrate SES into the school culture and curriculum, both of which improve impact (Cefai et al., 2018[72]; Green and García-Millán, 2021[121]). However, programmes that require specialised knowledge may be better done by professionals (Wigelsworth et al., 2022[122]), such as mental health programmes implemented by therapists who possess the requisite knowledge and confidence to teach it (Clarke et al., 2015[98]).Confident well-trained instructors are key to SEL success (Cefai et al., 2018[72]). This requires 1) supporting teachers in developing their own social and emotional competencies and well-being, 2) explicit training in the intervention so teachers feel comfortable with the terminology and approach, and 3) strengthening teachers' self-efficacy with resources and time to implement the programme (Clarke et al., 2015[98]; Cefai et al., 2018[72]; Green and García-Millán, 2021[121]).

3.8.4. Cultural and contextual fit

Teachability of SES also depends on the alignment between the skill, intervention and the "ecology of the school and community" (Clarke et al., 2015, p. 100[98]). The success of SEL in the US has led American programmes to be exported, but not always with good results (Wigelsworth et al., 2016[104]). Although international exchange of practice can improve education, cookie-cutter importation or mismatches between interventions and cultural values can undermine it (Chatterjee Singh and Duraiappah, 2020[65]). In their meta-analysis, Wigelsworth et al. (2016[104]) found that cultural transfer significantly affected SEL effectiveness. Interventions implemented in their country of origin had stronger effects, whereas imported ones showed mixed results. SEL must be adapted to the needs, experiences, mission and values of the school, community, staff and students (Cefai et al., 2018[72]; Jones et al., 2021[69]). Yet fidelity to a programme's core elements also matters. Wigelsworth (2016[104]) proposes "mutual adaptation" (p. 365[104]). For example, Cefai et al. (2018[72]) found that including students, particularly older ones, in planning and delivery of SEL benefitted both their own and other students' engagement and skill development.

Supporting teachers to adapt material to the needs and experiences of their students can strengthen SEL (Bailey et al., 2019[89]). Recent research suggests a "strategies-based" approach, rather than isolated, scripted curricula, can promote adaptation and integration (Bailey et al., 2019[89]). The former uses shorter strategies that teachers incorporate into their daily practice, while rigid, stand-alone curricula can risk isolating SEL from the school culture and disempowering instructors.

3.8.5. Implementation quality

Implementation of SEL really matters, and it is context dependent. Programmes that have proven effective in certain contexts are not in others (Clarke et al., 2015[98]). Besides cultural adaptation and effective instruction, several factors help ensure effective implementation:

- Developmentally appropriate curriculum that follows the S.A.F.E. model (Sequenced, involves Active learning, Focused on social and emotional development, and Explicit about the targeted skills) (Durlak et al., 2011[99]; Weissberg et al., 2015[123])

- Whole-school approaches that integrate SES, concepts and intervention into school life, systems, ethos and settings (Cefai et al., 2018[72]; Jones et al., 2021[69])

- "Enabling environments" focused on creating safe, supportive environments for students and staff, both generally and in relation to SEL (Green and García-Millán, 2021[121])

- Quality of the programme content (Barnes, Domitrovich and Jones, 2023[124]; Cefai et al., 2018[72])

- Targeted intervention, whereby at-risk children or those not responding to the universal interventions receive targeted support (Cefai et al., 2018[72])

- Sufficient dosage and duration (Chatterjee Singh and Duraiappah, 2020[65])

- Systems for monitoring and evaluating implementation and impact (Chatterjee Singh and Duraiappah, 2020[65])

- Parental and community partnerships (Cefai et al., 2018[72]; Barnes, Domitrovich and Jones, 2023[124]).

There are three caveats. As stated above, some research argues the prescriptive, didactic teaching may be less effective for adolescents (Yaeger, 2017[88]; Yeager et al., 2015[116]). Second, there have been mixed results for whole-school approaches (Wigelsworth et al., 2022[122]). Yet the research consensus is that, where meaningfully adapted and integrated, whole-school approaches are considerably more effective and achieved more sustained outcomes than isolated classroom initiatives (Clarke et al., 2015[98]; Green and García-Millán, 2021[121]). Finally, any "ideal" dosage and duration is still unknown, but fragmented, sporadic and truncated lessons weaken effectiveness (Chatterjee Singh and Duraiappah, 2020[65]). Dosage and duration must consider the design and intent of the intervention as well as the students and context.

3.9. What about equity? Do teachability or impact vary across groups?

As in all education, SEL must consider how interventions affect various groups and promote equitable opportunity. The results from the first round of the SSES found a significant SES gap between socio-economically advantaged and disadvantaged students (OECD, 2021[9]). Other research shows that SEL interventions can especially benefit children from disadvantaged backgrounds, across gender, race, socio-economic and disability status (Jones, McGarrah and Kahn, 2019[56]; Durlak, Mahoney and Boyle, 2022[100]). However, review-level evidence is still thin on the differential effects of universal school-based SEL for different subgroups (Wigelsworth et al., 2022[122]), especially for race, disability and socio-economic status (Rowe and Trickett, 2018[115]).

SEL interventions "tend to have their largest effects among students with the greatest number of risks or needs, including those with lower socio-economic status or those who enter school behind their peers either academically or behaviorally" (Jones, McGarrah and Kahn, 2019, p. 133[56]). Several interventions reviewed, such as 4Rs or the PAX Good Behavior Game, showed particular benefits for at-risk students, like boys with emotional and behavioural difficulties (Jones et al., 2021[69]). Interventions targeting gender disparities for girls, such as Girls on the Run and Playworks, also found significant improvements in girls' self-concept and assertiveness (Jones et al., 2021[69]). Finally, evidence suggests that inclusion can benefit all students, not just those with disabilities. In their South Korean meta-analysis, Kim, Lim and An (2022[105]) found that interventions using inclusive designs that mixed disabled and non-disabled students had significantly greater positive effects compared to segregated interventions.

Yet alongside these promising results, there is a striking lack of research on equity in SEL, particularly for USB interventions. In their review of USB SEL impact research in the United States from 2008-2020, Cipriano et al (2022[125]) found that of 269 studies covering 107 interventions, only 28% addressed ethnicity and only 7% addressed students with disabilities. In fact, only nine USB SEL interventions had any studies examining effects on race and disability. In their global review of reviews, Wigelsworth et al. (2022[122]) identifies lack of consensus about whether SEL interventions help disadvantaged students "catch up". Evidence was particularly limited or unclear for students with special education needs and mental health issues. Review analyses "are still almost solely based on broad socio-demographic data" (p. 918[122]) which does not distinguish different special needs or health conditions.

However, SEL interventions can have mixed or negative effects if they are not suited to the population or context (Daley and McCarthy, 2021[126]). USB interventions that show general positive effects, for example, may mask null or even damaging outcomes for minority groups (Rowe and Trickett, 2018[115]). Additionally, children in adversity are at particular developmental risk and need effective support. On the positive side, evidence suggests designing for equity can improve SEL effectiveness. This includes cultural responsiveness, incorporating student voice and developing inclusive programmes that affirm student identities and address environmental stressors (Cefai et al., 2018[72]; Cantor et al., 2019[64]; Jones et al., 2021[69]).

Box 3. Breaking the chain

The **Second Step** programme has helped improve executive functions (e.g. self-control), emotional control and stress resistance in PreK – Grade 8 children in Germany, Norway and the United States. It emphasises skills related to emotional management, self-control and empathy, as well as cognitive and social skills concerning problem-solving and responsible decision-making. The programme offers tailored lessons for each grade level and promotes a wide variety of pedagogical methods, which include games, videos, stories and songs combined with class discussions, writing and drawing activities, and movement exercises (Jones et al., 2021[69]). This programme has been extensively studied in kindergartens and elementary schools in the United States, where positive outcomes include improved executive functions and social and emotional competence, with specific gains in emotional control and reduced problematic behaviours (Low et al., 2019[127]; Upshur et al., 2019[128]). Interestingly, US studies found particularly positive effects in younger children, boys and those children who began with the most problematic behaviours and lowest social and emotional competencies (Low et al., 2015; 2019). A meta-analysis looking at 24 different studies, from ages 3 to 13, found the overall impact of the programme on the social and emotional skills of students was indeed positive, but of small effect

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(Moy and Hazen, 2018[129]).

The **Colors of Kindness** is an innovative programme first implemented in Bangladesh, for children aged 5 to 12, aimed at empowering students in low-resource environments and emergency settings. First established in 2020, this programme focuses on improving children's social and emotional skills, well-being and academic performance. It focuses on skills such as self-awareness, responsible decision-making, relationship-building, creativity and social and environmental awareness. Structured as a 10- to 16-week programme, it delivers its contents through audio podcasts integrated in a digital workbook experience, all led by a teacher. Its practical activities involve breathwork, digital games related to emotions, yoga and dance exercises, a gratitude practice and also art therapy. Since its first implementation in Bangladesh, which included a high percentage of girls and Rohingya refugees, the programme has been implemented in Uganda and in Greece. Moreover, it is being translated into Spanish, French, and Arabic, and it is also being adapted for preschoolers (3- to 6-year-olds). In Bangladesh, Uganda and Greece, findings report statistically significant improvements in social and emotional competencies and a great increase in mood and positive outlooks for children in these vulnerable contexts. Amongst the competencies which showed the best improvements was this sentence: "I think about the future and believe it is wonderful" (Norman et al., 2022[130]; Green and García-Millán, 2021[121]).

3.10. Conclusion: Key points

Humans are unique in the intensely "socially mediated" nature of their development (Immordino-Yang, Darling-Hammond and Krone, 2019[68]). With the longest brain maturation of any species, our brains and capacities are highly malleable and dependent on social environments (Chatterjee Singh and Duraiappah, 2020[65]). SES are thus fundamental to all learning and growth. Understanding how they develop and interact with various biological, cognitive and environmental systems is fundamental to nurturing them. It is also fundamental to designing appropriate assessments that consider the developmental and contextual factors that shape student responses.

This section synthesises the general understanding of SES' teachability with the following points:

- Plasticity, malleability and teachability form a nested set of concepts that distinguish the types of change that brain, traits and skills undergo. Plasticity denotes any type of change. Malleability denotes change caused by any environmental factor. Finally, teachability offers a new concept that denotes susceptibility to deliberate intervention in education settings.

- Humans' cognitive, social, emotional and physical systems are interrelated. They depend to various extents on the brain and thus, brain development has a major influence on the development of traits and skills.

- Neuroscience, personality psychology and education all provide important insights into how traits and skills develop over the lifespan, including during school years. There is broad consensus and even borrowing between these fields, although they may stress different aspects.

- Early childhood and adolescence are the most sensitive periods for SES development, although all of childhood shows heightened malleability. Brain, skill and traits continue to change throughout life.

- Meta-analyses and systematic reviews of SEL interventions consistently demonstrate that SES are teachable in school settings across age groups and national contexts. They also demonstrate how SES can help students handle other challenges, such as managing anxiety.

- However, this literature review of SES' teachability is very general and only reports aggregate categories or, at best, domain-level effects. Different literature and reviews are needed to determine the teachability of specific SES.

4. Teachability of individual social and emotional skills

4.1. Introduction

Meta-analyses and reviews have focused on aggregate, holistic outcomes rather than assessing particular skills. This section addresses this issue by homing in on the teachability of individual skills. Using the evaluation evidence from dozens of interventions as well as literature reviews on the malleability of SES, it maps the existing evidence on the teachability for 23 skills.

This section moves through three parts. The first reviews the evaluation evidence of 74 of the most well-studied SEL interventions across 22 countries. Using the outcomes of impact studies of each intervention, it compiles the evidence into a chart assessing the teachability of each skill in the SSES framework (Table 5). In addition to the 19 skills of this framework, the review adds four skills deemed missing yet important based on relevant literature (Social problem-solving/Conflict resolution, Emotional intelligence, Grit and Perspective-taking/theory of mind). The subsequent part reviews additional evidence from literature reviews and identifies key conceptual issues. The final part reviews the evidence gaps that emerged from the reviews presented in Sections 3 and 4.

4.2. Are some skills more teachable than others?

This part presents a novel type of review which tries to mitigate the jingle-jangle fallacy. It discusses the teachability evidence for each of the 19 skills in the SSES framework along with four additional skills that the framework does not address, but which the literature suggests are salient. The discussion also identifies conceptual issues that could affect comparison and assessment.

Section 3 showed that a second review was required to determine the teachability evidence for individual skills. Most of the existing malleability research for specific skills relies on experimental studies and does not distinguish clearly between malleability and teachability. SEL interventions, in contrast, provide real-world settings and data on teachability by their very nature. The results of the review focused on "compilations" of SEL interventions, i.e. reports on the effectiveness evidence for particular interventions, such as "Navigating SEL from the Inside Out" by Jones et al. (2021[69]). These compilations collect information on many interventions and summarise the effectiveness evidence for each, making it easier to identify the skills targeted in each intervention and each evaluation. These compilations were then supplemented by the evidence from three reviews that focused on skill-level malleability: Gutman & Schoon (2013[73]), Lamb, Maire and Doeke (2018[90]) and forthcoming work from the OECD *Education 2030* project (OECD, Forthcoming[55]).

In summary (see Annex A for a detailed methodology), Google Scholar, Scopus and the references of the meta-analyses and literature from Section 3 were searched for compilations that contained the following:

- more than 20 individual SEL interventions
- distinct descriptions and reporting for each intervention

- evaluation studies reported for each intervention, including number of studies and their methodologies (randomised control trial, quasi-experimental)

- summary of findings of each study

- reported in English

- published in 2015 or later.

Three published compilations were found (Clarke et al., 2015[98]; Grant et al., 2017[71]; Jones et al., 2021[69]) along with one online database (CASEL, 2023[70]). Two additional reports were also found and added (Gutman and Schoon, 2013[73]; Lamb, Maire and Doeke, 2018[90]). However, all these sources focused on the United States and the United Kingdom, so they were supplemented with meta-analyses and systematic reviews from Section 3 that discussed other countries and identified individual interventions (Fernández-Martín et al., 2021[114]; Kim, Lim and An, 2022[105]); the OECD Education 2030 competence reviews (OECD, Forthcoming[55]); and suggestions from experts (Belfield et al., 2015[131]; Life Skills Collaborative, 2023[132]).

From these compilations, interventions were identified based on the following criteria:

- school-based programmes targeting ages 5 and older

- targeted at least one SES

- had at least one randomised control trial (RCT) or quasi-experimental (QE) evaluation with student-focused outcomes

- outcome evidence sufficiently detailed to map onto the SSES skills.

74 interventions were reviewed. Several repeated across the compilations and databases. The definitions and evaluation evidence from each were mapped onto the SSES framework using the ExploreSEL tool from the EASEL Lab (2023[133]). The resulting teachability evidence for each skill is presented in Table 5. Differences in definitions between the SSES framework and interventions, or ambiguities in the alignment of skills and outcomes, are commented on in the subsequent discussion section.

This review is detailed but not comprehensive. It relies on the summaries provided by the compilations, which do not always specify all the skills assessed in the evaluations. Nor does this review capture all possible interventions or relevant evaluation studies. However, it does cover dozens of interventions and hundreds of evaluation studies from around the world.

4.3. Teachability of individual skills according to intervention research

Table 5 uses the evidence from the intervention compilations and supplementary meta-analyses and systematic reviews, but not from other reports and articles, such as Gutman and Schoon (2013[73]) or Lamb, Maire and Doeke (2018[90]). These are included in the subsequent discussion. In Table 5, each skill's teachability is ranked according to the following criteria:

1. Very high = At least 15 interventions out of the 74 assessed demonstrated significant positive outcomes that both a) align to the skill in question (qualitatively assessed) and b) come from rigorously conducted studies (randomised control trials (RCT) or quasi-experimental (QE) study) that met the inclusion criteria of the programme reviews. Two additional criteria were also required: at least one of the

relevant studies showed follow-up effects documented after one year<, and three or more countries were represented in the relevant evaluation studies.

2. High = At least 10 interventions out of 74 demonstrating significant positive outcomes aligned to the relevant skill. Studies also meet criteria above (more than three countries represented, follow-up effects in at least one study).

3. Moderate= At least 5 interventions out of 74 demonstrate significant positive outcomes aligned to the relevant skill. Moreover, follow-up effects of 1 year< are not required and only two or more countries have to be represented in any evaluation. These did not necessarily have to be RCT or QEs or focused on child outcomes.

4. Limited = At least 2 interventions out of 74 show significant positive outcomes aligned to the relevant skill. In addition, skills in this category will lack evidence of follow-up effects at 1 year< and, if studies exist in two or more countries, these are not RCT/QEs or not focused on child outcomes. Results may also be inconsistent across countries.

5. Unclear = There is not enough evidence to determine whether this skill is teachable. This can be due to lack of evaluations or findings focused on the skill, conflicting results in rigorous evaluations (RCT/QE), or insufficient scope and quality of relevant studies (i.e. non-experimental studies).

There is no category for unteachable skills. This is because of the nature of the compilations, which only report effective interventions.

A detailed methodology, including how evaluation terms were coded, is presented in Annex A. A detailed table with the corresponding ExploreSEL terms, countries of evaluation and recommended SEL programmes for each skill can be found in **Annex C**.

Table 5. Evidence map for teachability of individual social and emotional skills based on intervention evaluations

SSES domain	Skills	OECD 2015 definitions of each skill[1]	Evidence of teachability	Number of interventions with related, significant outcomes (out of 74)[2]	Number of countries where relevant interventions have been evaluated[3]	Evidence of significant follow-up effects (1 year<)[4]	School level for which evidence exists[5]
Task performance	**Self-control**	Able to avoid distractions and sudden impulses and focus attention on the current task in order to achieve personal goals.	Very high	31	20	Yes	Primary, lower secondary, upper secondary
	Persistence	Able to persevere in tasks and activities until they get done	High	10	5	Yes	Primary, lower secondary
	Responsibility	Able to honour commitments and be punctual and reliable.	Moderate	8	5	Yes	Primary, lower secondary
Open-mindedness	**Curiosity**	Interested in ideas and love of learning, understanding and intellectual exploration; an inquisitive mindset.	Unclear	0	n/a	n/a	n/a
	Tolerance	Is open to different points of view, values diversity, is appreciative of foreign people and culture.	Moderate	7	4	Yes	Primary, lower secondary, upper secondary
	Creativity	Generates novel ways to do or think about things through exploring, learning from failure, insight and vision.	Unclear	0	n/a	n/a	n/a
Engaging with Others	**Sociability**	Able to approach others, both friends and strangers, initiating and maintaining social connections.	Limited	4	3	No	Primary, lower secondary
	Assertiveness	Able to confidently voice opinions, needs, and feelings, and exert social influence.	Very high	28	16	Yes	Primary, lower secondary, upper secondary

SSES domain	Skills	OECD 2015 definitions of each skill[1]	Evidence of teachability	Number of interventions with related, significant outcomes (out of 74)[2]	Number of countries where relevant interventions have been evaluated[3]	Evidence of significant follow-up effects (1 year<)[4]	School level for which evidence exists[5]
	Energy	Approaches daily life with energy, excitement and spontaneity.	Unclear	0	n/a	n/a	n/a
Collaboration	Empathy	Understands and cares about others, and their well-being. Values and invests in close relationship	Very high	19	10	Yes	Primary, lower secondary
	Trust	Assumes that others generally have good intentions and forgives those who have done wrong	Moderate	7	4	Yes	Primary
	Co-operation	Lives in harmony with others and values interconnectedness among all people.	Very high	42	21	Yes	Primary, lower secondary, upper secondary
Emotional Regulation	Stress resistance	Effectiveness in modulating anxiety and able to calmly solve problems (is relaxed, handles stress well).	Very high	26	13	Yes	Primary, lower secondary
	Optimism	Positive and optimistic expectations for self and life in general.	Moderate	8	6	Yes	Primary, lower secondary
	Emotional control	Effective strategies for regulating temper, anger and irritation in the face of frustrations.	Very high	38	20	Yes	Primary, lower secondary, upper secondary
Additional SSES skills	Achievement motivation	Sets high standards for oneself and works hard to meet them.	High	12	7	Yes	Primary, lower secondary
	Self-efficacy	Beliefs in one's capabilities to mobilise the motivation, cognitive resources, and courses of action needed to meet given situational demand	Very high	20	5	Yes	Primary, lower secondary, upper secondary

SSES domain	Skills	OECD 2015 definitions of each skill[1]	Evidence of teachability	Number of interventions with related, significant outcomes (out of 74)[2]	Number of countries where relevant interventions have been evaluated[3]	Evidence of significant follow-up effects (1 year<)[4]	School level for which evidence exists[5]
	Critical thinking	Thinking for yourself; grounding beliefs, attitudes, and values on a critical analysis through independent thought	Unclear	0	n/a	n/a	n/a
	Meta-cognition	Awareness of inner processes and subjective experiences, such as thoughts and feelings, and possessing the ability to reflect on and articulate such experiences.	Very high	17	12	s	Primary, lower secondary, upper secondary
Additional skills from literature	Social problem-solving/ Conflict resolution	Ability to identify and enact solutions to social life situations in an effort to resolve problems, conflicts and/or one's relation to these (Adrian et al., 2011[134])	Very high	33	Australia, Brazil, Chile, Germany, Iran, Jamaica, Lebanon, Norway, South Korea, Turkey, United Kingdom, USA	Yes	Primary, lower secondary, upper secondary
	Emotional intelligence	Ability to recognise one's own and others' emotions and to use emotional information to guide thinking and behaviour (Kankaraš, 2017[78])	High	14	Australia, Ireland, Norway, Spain, South Korea, United Kingdom, USA	Yes	Primary, lower secondary, upper secondary
	Grit	Persistence and passion for reaching long-term goals (Gutman and Schoon, 2013[73])	Unclear	0	n/a	n/a	n/a
	Perspective-taking / Theory of mind	The ability to accurately perceive the thoughts, experiences and feelings of others and how these might differ from one's own (OECD, Forthcoming[55])	Moderate	9	Australia, Canada, Germany, Lebanon, Norway, United Kingdom, USA	Yes	Primary, lower secondary, upper secondary

SSES domain	Skills	OECD 2015 definitions of each skill[1]	Evidence of teachability	Number of interventions with related, significant outcomes (out of 74)[2]	Number of countries where relevant interventions have been evaluated[3]	Evidence of significant follow-up effects (1 year<)[4]	School level for which evidence exists[5]

Notes: [1] Definitions come from the SSES conceptual framework and the international report on Round 1 of the SSES (Chernyshenko, Kankaraš and Drasgow, 2018[10]; OECD, 2021[9]); [2] This reports the number of SEL interventions with positive outcomes aligned to a given skill, out of a total 74 interventions reviewed from across the compilations. One intervention might have several positive outcomes aligned to several skills. [3] This refers to all the evaluation countries for a relevant intervention, even if some of those evaluations do not measure the skill listed. For example, if intervention A was evaluated in three countries and one of those evaluations measured skill X, then all three countries are still counted for skill X, because intervention A was found to align with skill X. [4] This includes any significant follow-up outcome for a relevant intervention, even if that follow-up outcome does not measure the corresponding skill. For example, if intervention A shows significant outcomes for skill X and any of A's evaluations showed any significant follow-up effects, then this column is marked "Yes" – regardless of whether the follow-up effect measures skill X. This was because precise follow-up outcomes were not always reported. [5] School level: Primary school = ages 5-10 or grades Kindergarten-5; lower secondary = ages 11-15 or grades 6-10; upper secondary = ages 16-18 or grades 11-12.

4.4. Discussion of individual skill teachability and evidence coherence

This discussion section covers, firstly, comments on evidence of teachability, especially those found in other sources (primarily Gutman and Schoon (2013[73]), Lamb, Maire and Doeke (2018[90]) and OECD Education 2030 materials (OECD, Forthcoming[55]). Secondly, it covers any conceptual issues that emerged in the review, such as mismatched definitions.

4.4.1. Self-control

Evidence: Self-control is highly teachable. Many SEL interventions focus on self-control defined as focus and restraining impulses in order to complete current or short-term tasks (Gutman and Schoon, 2013[73]; EASEL Lab, 2023[133]). ExploreSEL's taxonomy identifies "inhibitory control" and "attention control" as two components of this definition of self-control. The evaluation evidence frequently reports improvements in these areas. Teachability evidence is particularly strong for children in elementary school (Gutman and Schoon, 2013[73]), but recent evidence suggests that self-control is teachable through adolescence (CASEL, 2023[70]; Clarke et al., 2015[98]). For example, Hsu, Novick and Jaeggi (2014[83]) find that executive control, a "constellation" (p. 1[83]) of processes including self-control, is malleable into early adulthood and may follow a "non-linear trajectory" (p. 2[83]).

Conceptual issues: Evidence summaries in the compilations do not always define self-control when it appears, and there is some disagreement about how it relates conceptually to self-regulation, executive control and executive function. Additionally, executive control and executive function relate to a wide range of cognitive processes and skills, not just SES (Bailey et al., 2018[135]; Hsu, Novick and Jaeggi, 2014[83]).

4.4.2. Persistence

Evidence: Persistence appears highly teachable but borderline so. Its teachability or even malleability "depends significantly on the definition used" (Lamb, Maire and Doeke, 2018, p. 27[90]), partly due to evidence of task- or domain-specificity. Academic perseverance is teachable, but this may not be transferred to other contexts, like hobbies and sports (Lamb, Maire and Doeke, 2018[90]). The moderate-high number of aligned outcomes in **Table 5** is due to broad outcome descriptors in the compilations, such as "improved learning behaviours" (Grant et al., 2017[71]), which do not specify if persistence is included.

Conceptual issues: There are several different definitions of persistence and perseverance. The SSES framework focuses on academic persistence, while Gutman and Schoon (2013[73]) define perseverance as both engagement and grit.

4.4.3. Responsibility

Evidence: The moderate evidence for the teachability of responsibility is largely due to definition issues. The evidence summaries that do report on responsibility rarely define the term (Clarke et al., 2015[98]). Neither Lamb, Maire and Doeke (2018[90]) nor Gutman & Schoon (2013[73]) have sections on responsibility. The former mentions it as a sub-facet of Conscientiousness, displaying the general malleability of that personality trait domain.

Conceptual issues: The OECD 2015 definition emphasises dependability and keeping commitments. However, most SEL interventions interpret responsibility as recognising and accepting responsibility for one's own actions (Jones et al., 2021[69]) and proactively recognising and executing one's "role, purpose and appropriate response in a personal or social context" (Life Skills Collaborative, 2023[132]). This includes accepting how one's

actions affect outcomes and other people. It is not clear how such definitions of responsibility would manifest in observable behaviour.

4.4.4. Curiosity

Evidence: Curiosity's teachability is unclear. No evaluation summaries contain outcomes for it, nor do the supplementary reports (Gutman and Schoon, 2013[73]; Lamb, Maire and Doeke, 2018[90]). Some interventions do target "open-mindedness", such as Wings For Kids, but the evidence summary focuses on other skills (Jones et al., 2021[69]). Otherwise, SEL interventions focus more on related, strategy-centred skills, such as asking questions and identifying information gaps or problems (EASEL Lab, 2023[133]).

Conceptual issues: The SSES framework presents a narrow definition of curiosity compared to others. It focuses on preferences and the intellectual aspects of curiosity, namely liking or valuing learning new things. ExploreSEL therefore categorises this an "intellectual value" that is narrower than a skill (2023[133]). The Life Skills Collaborative, which reviewed over 63 frameworks for its Glossary of terms, also defines curiosity more broadly. It adds "recognising an information gap and having an intrinsically motivated desire to close it", asking questions of people and topics, and seeking out challenges (2023[132]).

4.4.5. Tolerance

Evidence: Tolerance's teachability has moderate evidence because the evaluation literature rarely addresses it or is not clear if it does, since evaluations often assess compound constructs such as "prosocial behaviour" (Gutman and Schoon, 2013[73]; Grant et al., 2017[71]). However, some well-evidenced interventions do explicitly target it, such as Facing History and Ourselves (CASEL, 2023[70]) and 4Rs (Jones et al., 2021[69]). Notably, Facing History and Ourselves is a secondary school programme, designed to use social studies subjects and adolescents' growing capacity for moral reasoning to enhance tolerance.

Conceptual issues: The OECD 2015 definition focuses on tolerance of cultural diversity. Most SEL interventions define the term more broadly as tolerance of different opinions and values as well as respect for difference across a range of characteristics, such as gender, religion, race, economic background and sexuality (Jones et al., 2021[69]; Life Skills Collaborative, 2023[132]).

4.4.6. Creativity

Evidence: The "unclear" status for creativity's teachability in **Table 5** is due to definitional issues and limited attention in the evaluation evidence (Clarke et al., 2015[98]; Grant et al., 2017[71]; Jones et al., 2021[69]). Gutman and Schoon (2013[73]) present studies where creativity was improved in children aged 6-10 and also in university students.

Conceptual issues: There is little agreement on creativity's definition, its context-specificity and the domain-specificity of individual creative capacity (Lamb, Maire and Doeke, 2018[90]). It usually involves the "production of novel and useful ideas" (Gutman and Schoon, 2013, p. 29[73]) that go beyond technical expertise, but "useful" requires that the creative idea be "socially recognised as valuable" (Lamb, Maire and Doeke, 2018, p. 21[90]). This makes creativity potentially context-specific, e.g. to culture and situation.

The SSES framework takes a generic approach, stressing preference for thinking of novel ideas. Other frameworks add other components, such as identifying alternative explanations, generating multiple ideas and solutions and combining information in

unexpected and useful ways (Life Skills Collaborative, 2023[132]). Rather than target a preference for original thinking, SEL interventions typically emphasise concepts with more concrete strategies, such as problem solving (Grant et al., 2017[71]; Jones et al., 2021[69]).

4.4.7. Sociability

Evidence: There is limited evidence for sociability because the term and concept are not common in SEL interventions or literature. Evidence of "reduced social withdrawal", increased "social independence" and decreased social "inhibition" was coded as evidence of sociability (Annex A), resulting in four aligned interventions. If sociability is considered as part of a broader umbrella of social skills, there is extensive research on its teachability (Gutman and Schoon, 2013[73]).

Conceptual issues: If defined purely as liking to meet new people or being talkative, it is unclear whether sociability is a teachable skill or a stable trait (sub-facet of Extraversion). SEL interventions tend to focus on practicable aspects of such interpersonal skills, such as understanding social cues, "interpersonal negotiation strategies" and conflict resolution (Grant et al., 2017[71]; Jones et al., 2021[69]).

4.4.8. Assertiveness

Evidence: Assertiveness is very highly teachable. It is often targeted in leadership, anti-bullying and anti-substance abuse interventions, since these often emphasise taking initiative in a group, resisting negative peer pressure and defending oneself or others. Improved "emotional self-expression" and reduced victimisation or bystander behaviour were coded as assertiveness. In this light, assertiveness appears teachable at both primary and secondary levels (Clarke et al., 2015[98]; Grant et al., 2017[71]; Jones et al., 2021[69]). Leadership, defined as "the ability to influence significantly the thoughts, behaviours, and feelings of other people" (Gutman and Schoon, 2013, p. 24[73]), has some evidence for teachability. Notably, out-of-school SEL interventions, like service learning and mentoring, can improve it (Gutman and Schoon, 2013[73]).

Conceptual issues: The SSES framework uses a general definition focused on speaking one's mind and taking charge in a group. SEL interventions, again, usually develop assertiveness in more context-specific ways focused on social goals, e.g. conflict resolution skills or resisting bullying (Clarke et al., 2015[98]; Grant et al., 2017[71]). The overlap between assertiveness and leadership is unclear, since the latter often comprises multiple skills and its definition varies (Gutman and Schoon, 2013[73]).

4.4.9. Energy

Evidence: Energy does not appear as a targeted skill or evaluation outcome in any of the reviewed interventions, nor is it reviewed in Gutman & Schoon (2013[73]) or Lamb, Maire and Doeke (2018[90]). The lack of evidence and lack of concrete, practicable behaviours or mindsets suggests that, in this form, Energy is a trait rather than a skill.

Conceptual issues: According to ExploreSEL, the SSES sub-domain of Energy is a form of "enthusiasm/zest" and falls under the "Perspectives" domain, along with similar concepts from nine other frameworks such as "positive attitude" and "initiative" (EASEL Lab, 2023[133]). However, if Energy is distinct from optimism and positive self-concept, which have some teachability evidence (see below), it seems it may not be a skill.

4.4.10. Empathy

Evidence: Empathy is very highly teachable and frequently targeted in SEL interventions at all school levels (e.g. 4Rs, Facing History and Ourselves, Roots of Empathy). However, it emerges less clearly in the evaluation data. This seems to be, again, partly due to compound outcome measures, like "prosocial behaviour", that may conflate empathy with other skills. The short summaries in the compilations rarely define the components of these outcomes and, where named, empathy is not always defined (Clarke et al., 2015[98]; Grant et al., 2017[71]; Jones et al., 2021[69]). Gutman and Schoon (2013[73]) group empathy under "social skills", where evidence is strong for primary school students but sparse for secondary students. However, they identify evidence for empathy's teachability at the secondary level. The interventions Connect with Kids and Facing History and Ourselves both target adolescents and show improved empathy (CASEL, 2023[70]; Grant et al., 2017[71]).

Conceptual issues: The SSES framework aligns with other definitions of empathy and includes understanding others' feelings and showing kindness. In SEL literature, empathy is typically defined as two things: "the ability to emotionally understand what other people feel, see things from their point of view" and second, to consequently relate to others with acceptance and sensitivity (Life Skills Collaborative, 2023[132]). Much SEL literature, however, stresses "perspective-taking" as a key teachable component of empathy, which is less emphasised in the SSES framework.

Box 1. Helping through a tough time

Projeto Atitude Positiva, designed for early adolescents, is a programme first implemented in the Torres Vedras municipality of Portugal almost 20 years ago. It shows the success of SEL in different geographies. Delivered by educational psychologists, the programme promotes healthy social conduct and prevents risk behaviours by focusing on the development of SES, such as self-esteem, emotional awareness and management, perspective-taking, positive communication or conflict-resolution. Moreover, it particularly aims to help students during their school level transitions, thus targeting students from Grade 4 (transition between primary and lower secondary school) up to Grade 9 (between lower and upper secondary school) (ATV, 2023[136]). Studies have identified significant effects of the programme in self-awareness, as well as reductions in social isolation and social anxiety. Stronger benefits were reported for students with the lowest levels of social and emotional competence at the start of the intervention. Interestingly, according both to self-reports and teacher reports, positive outcomes of the programme are also gender-dependent. Boys benefitted more from a reduction in self-isolation and girls improved their self-esteem more (Coelho, Marchante and Sousa, 2015[137]; Coelho, Sousa and Figueira, 2016[138]).

4.4.11. Trust

Evidence: Trust appears moderately teachable because the aspects of trust that involve believing in others' general good intentions somewhat teachable. Multiple intervention evaluations report reduced "hostile attribution bias" (CASEL, 2023[70]; Grant et al., 2017[71]), which is the tendency to "interpret ambiguous situations as hostile than benign" (Wang et al., 2019[139]). Furthermore, Cantor et al. (2019[64]) suggest that trust is malleable. Chronic stress and adversity can produce "negative bias" that engenders negative

perceptions of self, others and relationships as well as dissociative coping. These negative biases towards others suggest lack of trust influenced by the environment. They are thus malleable and potentially reversable through teaching.

Conceptual issues: Despite the above, it seems trust may be a malleable mindset, not a skill. The SEL literature does not address "trust" as SSES defines it. It also seems to be a construct where malleability overlaps significantly with "teachability". Strong, positive relationships with adults are a key protective factor against "toxic stress" and adversity, in part because of how they engender a sense of trust and security for children (Cantor et al., 2019[64]; Center on the Developing Child, 2015[96]). Consequently, trust is malleable and can be improved indirectly with supportive environments. However, this does not mean that it is directly teachable. There is also an ethical dimension to the debate. Should it be a child's responsibility to exercise trust, as implied by designating it a skill? Or is it the responsibility of adults to create trustworthy environments?

4.4.12. Co-operation

Evidence: Co-operation appears very highly teachable because it is frequently targeted and assessed in SEL evaluations as a component of interpersonal skills. However, it is not always called "co-operation" (Clarke et al., 2015[98]; Grant et al., 2017[71]; Jones et al., 2021[69]; CASEL, 2023[70]). The PATHS and Second Step programmes both target "co-operation" and report significant positive findings for it (Jones et al., 2021[69]). However, much of the other compilation evidence only reports on "improved prosocial behaviour" (e.g. Grant et al., (2017[71])) which has been coded as co-operation. Another common term outcome is "improved social skills" (Jones et al., 2021[69]; Grant et al., 2017[71]). Yet as Gutman and Schoon (2013[73]) point out, both prosocial behaviour and social skills are composite and include a range of behaviours and affects like empathy, co-operation, sharing, communication, and general friendliness (sociability).

Conceptual issues: Both the SSES framework and SEL evaluations provide broad or vague definitions for this skill, which makes the jingle-jangle fallacy more likely. Most SEL interventions actually target a range of narrower skills, e.g. sharing, turn taking, following directions and teamwork, understanding social cues, and managing conversations or communication (EASEL Lab, 2023[133]; Jones et al., 2021[69]).

4.4.13. Stress resistance

Evidence: Stress resistance is very highly teachable. Coping with stress and anxiety is a common target for SEL interventions and there is strong evidence for its teachability. Both meta-analyses and individual intervention studies examine the effects of SEL on "emotional distress", anxiety, depression and other "internalising behaviours" (Durlak, Mahoney and Boyle, 2022[100]; Jones et al., 2021[69]; Grant et al., 2017[71]). All of these were coded as evidence for stress resistance. Mindfulness interventions like MindUp and the Mindfulness Programme seem particularly effective for addressing this skill (Clarke et al., 2015[98]), but other interventions have proven effective as well. Gutman and Schoon (2013[73]) also find that "coping skills" are teachable.

Conceptual issues: Stress resistance as a skill aligns well with the intervention literature if it is defined as coping skills and the ability to resist negative internalising behaviours like anxiety. However, if defined as resisting all negative emotions, it overlaps with emotional control. The construct may also require distinction between mild-moderate stress resistance in daily life versus dealing with more severe mental health issues. If too broad, it may get

confounded with these clinical conditions or with "resilience" (Gutman and Schoon, 2013[73]).

4.4.14. Optimism

Evidence: The moderate teachability evidence for optimism is somewhat unclear, due to lack of targeting in interventions and evaluations. In Jones et al. (2021[69]), only three out of the 33 reviewed interventions target it. Across all compilations, mindfulness programmes like MindUp and the "b. Mindfulness Programme" are the only interventions that explicitly target optimism and have assessed positive outcomes (Jones et al., 2021[69]; CASEL, 2023[70]; Clarke et al., 2015[98]). However, if one focuses more narrowly on self-esteem and positive self-concept, which are components of optimism, these appear teachable in both the evaluation evidence and supplemental reports (Gutman and Schoon, 2013[73]).

Conceptual issues: As suggested, optimism is not well-studied due to lack of targeting and definitional issues. The reviewed SEL interventions and literature emphasise positive attitudes towards self (e.g. self-esteem), so it is unclear whether broader positive outlook can be taught or arises as a secondary benefit from developing positive self-oriented mindsets and perceptions (i.e. it is malleable, not teachable).

4.4.15. Emotional control

Evidence: Emotional control is another popular skill to target and assess in SEL. It is also very highly teachable. In evaluations, it is directly assessed or assessed as part of "externalising behaviours" (e.g. Jones et al., (2021[69]); Grant et al., (2017[71]). For this review, outcomes involving reduced aggression, conduct problems or externalising behaviours as well as improved "emotional control" were coded as evidence for emotional control. There is evidence of teachability at both primary and secondary levels. For the latter, emotional control is appears in both mindfulness programmes and anti-violence ones like the Leadership Program's Violence Prevention Project (CASEL, 2023[70]; Grant et al., 2017[71]). Out-of-school interventions with outdoor components have also improved emotional control (Clarke et al., 2015[98]).

Conceptual issues: SEL literature uses various terms to describe emotional control, such as emotional regulation and self-regulation (Jones et al., 2021[69]). However, self-regulation and emotional regulation may cover a wider range of emotions than just negative externalising ones like anger. Furthermore, both self- and emotional regulation are sometimes treated as skills, other times as domains (see ExploreSEL). Yet the OECD 2015 definition of emotional control as managing negative externalising emotions aligns well with emotional control and regulation skills targeted in SEL interventions.

4.4.16. Achievement motivation

Evidence: Achievement motivation shows high teachability if one overlooks some conceptual confusion. Only two of the 33 interventions reported in Jones et al. (2021[69]) report positive outcomes for "achievement motivation". Instead, evaluation studies report effects for "academic engagement" and "academic motivation", which were coded as improved achievement motivation (Grant et al., 2017[71]). Furthermore, Gutman & Schoon (2013[73]) or Lamb, Maire and Doeke (2018[90]) both discuss the complexity of assessing the teachability of motivation, due to its domain-specificity, individual variability and the numerous theories of motivation. However, there is evidence that academic motivation is teachable (Lamb, Maire and Doeke, 2018[90]).

Conceptual issues: The OECD 2015 definition of achievement motivation aligns well with the reviewed literature on academic motivation (Lamb, Maire and Doeke, 2018[90]; Rogers and Thomas, 2023[75]) but less well with SEL literature. ExploreSEL classifies the OECD 2015 definition of achievement motivation as a "performance value" (EASEL Lab, 2023[133]) and thus questionably a skill. Furthermore, the OECD 2015 definition does not distinguish between different drivers of motivation, such as performance versus competence (Gutman and Schoon, 2013[73]).

4.4.17. Self-efficacy

Evidence comments: Self-efficacy is very highly teachable, and this is evident both in the reviewed SEL interventions and other literature and experimental studies (Gutman and Schoon, 2013[73]; Lamb, Maire and Doeke, 2018[90]). Self-efficacy can be improved from infancy through adulthood (Schunk and Pajares, 2002[140]). However, self-efficacy does blur the boundary between malleability and teachability. It appears best shaped indirectly through classroom environments, the attitudes and messaging of adults, teacher feedback and developing mindsets that emphasise effort (OECD, Forthcoming[55]). These collectively nurture children's self-perceptions. For example, students who believe in "growth mindset" and see ability as a product of effort rather than inborn talent "are more likely to engage and persevere in academic endeavours" and demonstrate self-efficacy (Lamb, Maire and Doeke, 2018, p. 25[90]). However, more research is needed, especially longitudinal work and research on transferability across contexts (ibid.).

Conceptual issues: While there are gradations of difference between terms like self-concept, confidence, self-esteem and self-efficacy, they all denote a related and mutually reinforcing cluster of concepts.

Box 2. Play your way to skills

The **Playworks** project, for ages from 3 to 11, differentiates itself by developing SES through inclusive games and physical activity during recess periods in school. While exploring more than 150 different activities, which include icebreakers, cooperative games and fitness exercises, a safe space is promoted so all children can engage in the activities and develop a sense of empowerment. Students engage with both schools and out-of-school communities to develop skills like co-operation, teamwork and communication, but also other dimensions such as self-management, empathy, decision-making and social problem-solving (Jones et al., 2021[69]). In the United States, studies have focused predominantly on economically disadvantaged minority groups, namely Latino and Black children ages from 8 to 10. Generally, the programme generated positive impacts for Black and Latino students. They demonstrated higher levels of physical activity, more positive language usage and decreased levels of bullying and exclusion. The programme has also shown particularly positive outcomes for girls and their subsequent engagement in physical activities (James-Burdumy et al., 2016[141]; Bleeker et al., 2015[142]).

4.4.18. Critical thinking

Evidence: Critical thinking appears as "unclear" because the reviewed SEL evaluations do not assess it. Some SEL interventions do target critical thinking, e.g. Lion's Quest, but not many (Jones et al., 2021[69]). The lack of evaluation evidence may be because critical thinking is considered a higher order cognitive and thus, academic skill. Most SEL evaluation research focuses on social outcomes and general academic achievement. Yet

other "accumulated reliable evidence" including meta-analyses have found critical thinking to be teachable (Lamb, Maire and Doeke, 2018, p. 20[90]).

Conceptual issues: Critical thinking remains challenging to define (Ennis, 2016[143]) and thus, assess consistently. Debates also continue about its domain-specificity and transferability. Researchers broadly agree, however, that some background knowledge is imperative in order to evaluate claims and make judgments. They also agree that cognitive processes alone do not define this skill, but that dispositions like inquisitiveness and interest in alternative viewpoints are key (Lamb, Maire and Doeke, 2018[90]).

4.4.19. Metacognition, Self-reflection and Self-awareness

Evidence: Metacognition, or the ability to recognise and consciously adjust one's own habits of perception, inquiry, learning, and feelings (Maudsley, 1979[144]), is very highly teachable. In addition to the evidence summarised in **Table 5**, a 2008 meta-analysis found that interventions targeting metacognitive strategies significantly improved self-directed learning with a moderate effect size (d=0.54). When combined with other aspects of self-regulation, such as cognitive or motivational strategies, the average effect sizes were large (d=0.81 and 0.97, respectively) (Dignath and Buttner, 2008[145]; Gutman and Schoon, 2013[73]). Effects were strongest at lower secondary level (Dignath and Buttner, 2008[145]).

Metacognition's developmental trajectories begin in early/middle childhood, with children as young as 5 self-correcting and evaluating choices during play, but really takes off starting at ages 8 or 9 (Whitebread et al., 2009[146]). It then develops rapidly through adolescence in tandem with the maturation of the prefrontal cortex and capacity for abstraction (Veenman, 2011[147]; Veenman and Spaans, 2005[148]; van der Stel and Veenman, 2010[149]). This development persists into early adulthood (Veenman and Beishuizen, 2004[150]; Weil et al., 2013[151]). Self-awareness follows a similar trajectory. Infants learn to identify themselves, and toddlers and young children can identify concrete, physical characteristics in themselves. During childhood, this progresses to awareness of psychological characteristics and comparing self to others (e.g. "I get angry easily" or "I am the best speller in my class") (Winsler and Naglieri, 2003[152]). In adolescence, increasing capacity for abstraction and complex thinking allows youth to form more integrated self-perceptions and sophisticated metacognition, as they navigate group and individual identities and develop stable personal ethics (Denham, 2018[80]; Winsler and Naglieri, 2003[152]). There is, however, high individual variability at all stages (van der Stel and Veenman, 2010[149]; Veenman and Beishuizen, 2004[150]).

Throughout this process, schools and education play a major role. Metacognition develops primarily during the school years and through social interactions with adults and peers. It can be taught at both primary and secondary levels, although greatest development occurs in late childhood and adolescence.

Conceptual issues: In this review, results for self-reflection and self-awareness were also coded as metacognition. Metacognition is a key cognitive component of self-awareness and reflective thinking (Lamb, Maire and Doeke, 2018[90]), but these concepts are not entirely overlapping and there is confusion about the differences. Metacognition is often used to describe academic and rational processes or strategies about one's own thinking and learning, sometimes with goal-directed components (Gutman and Schoon, 2013[73]). Self-awareness, on the other hand, is used to describe affective or emotional aspects of intrapersonal awareness, such as recognising one's own emotions and distinguishing between internal reactions and external triggers (Seal et al., 2011[153]; Weissberg et al., 2015[123]). Yet, metacognition can also be defined to include affective awareness (Chernyshenko, Kankaraš and Drasgow, 2018[10]). Additionally, metacognition is itself a

complex skill "comprising both cognitive self-knowledge and active cognitive self-monitoring" (Lamb, Maire and Doeke, 2018, p. 21[90]). Self-awareness is sometimes treated as a skill, e.g. in the OECD's *Education 2030* project, and sometimes as a whole domain, e.g. in CASEL (2023[113]). Any assessment must clearly delineate metacognition and its relationship to related concepts like self-reflection and -awareness.

4.4.20. Emotional intelligence

Evidence: Emotional intelligence does not appear as a construct in any of the reviewed SEL interventions or evaluations, nor in the supplementary literature reviews (Gutman and Schoon, 2013[73]; Lamb, Maire and Doeke, 2018[90]). It displays high teachability because some of its components, such as "emotional literacy" or "emotional knowledge", do appear and have been coded as emotional intelligence. The specific coding is listed in Annex A. If emotional intelligence is defined to include recognising and understanding one's own and others' emotions, and then using these to drive more effective inter- and intrapersonal behaviour, then it overlaps with co-operation, empathy and emotional control. This makes it very highly teachable.

Conceptual issues: Emotional intelligence presents many conceptual issues, since there is little agreement about its definition, and it usually comprises several sub-skills. This suggests it is a multidimensional construct and not a skill. According to one review, "there is perhaps no construct in the social sciences that has produced more controversy in recent years" (Spector and Johnson (2006[154]) quoted in Kankaraš (2017, p. 57[78])). Multiple models have been proposed, each involving several intra- and interpersonal skills or competencies. If targeted by assessment, emotional intelligence will likely need to be disaggregated into more specific skills.

4.4.21. Grit

Evidence: Neither grit nor any kind of long-term persistence appeared in the SEL intervention evaluations. This may be partly due to the challenge of measuring grit, which is by definition long-term, and distinguishing it from persistence (Gutman and Schoon, 2013[73]). Moreover, evidence from other sources challenges the validity and value of "grit". On the one hand, individual intervention studies have shown grit to be teachable, using purpose-designed tasks and self-report measures (Duckworth et al., 2007[155]; Zappala-Piemme et al., 2023[156]; Alan, Boneva and Ertac, 2019[157]). On the other hand, meta-analyses and a large-scale study of twins show no evidence of grit's malleability. Once persistence and the Big Five domain of Conscientiousness were accounted for, "grit" showed no additional predictive value (Kankaraš, 2017[78]). As Lamb, Maire and Doeke (2018[90]) note, it seems "there is little evidence that working directly on changing students' grit or perseverance would be an effective lever" for improving academic outcomes (p. 27[90]).

Conceptual issues: As the evidence discussion shows, it is not clear whether grit is a distinct construct from persistence, perseverance or the Big Five domain of Conscientiousness. The meta-analytic and twin study results indicate that it is not (Kankaraš, 2017[78]). It may also overlap with achievement motivation and self-efficacy. Studies have shown that both influence persistence and cause it to vary by task and situation. This suggests that "grit", i.e. long-term persistence, may not be a stand-alone construct that can be nurtured generally (Gutman and Schoon, 2013[73]).

4.4.22. Social problem-solving and Conflict resolution

Evidence: Social problem-solving and conflict resolution are very highly teachable and popular foci of SEL interventions across primary and secondary school. Programmes like The Social Decision Making/Problem Solving Program specifically target this skill and show evidence of improvement. Given social problem-solving often involves other skills like emotional control, empathy and perspective-taking, interventions include it as part of a suite of targeted skills.

The SEL evaluations in this review target social problem-solving and conflict resolution in simple ways as early as preschool (i.e. age 3 or 4 in the I Can Problem Solve programme). They show improvements in these areas by grade 1 (age 6) and through lower secondary school (evidence up to age 12) (Jones et al., 2021[69]; Grant et al., 2017[71]). In upper secondary school, conflict resolution often appears in anti-violence programmes and has shown improvement through grade 10 (age 15) (Grant et al., 2017[71]).

Conceptual issues: Social problem-solving overlaps with general or academic problem-solving in that both centre on thinking of multiple, plausible solutions to problems and flexible thinking (OECD, Forthcoming[55]), but the exact contours are not always clear. Some frameworks have developed an overarching domain of "collaborative problem-solving" that involves both cognitive and social components (Lamb, Maire and Doeke, 2018[90]). Interventions sometimes target both successfully, e.g. I Can Problem Solve and a nursing school intervention in Türkiye (Seren and Ustun, 2008[158]; Jones et al., 2021[69]).

4.4.23. Perspective-taking / theory of mind

Evidence comments: Perspective-taking, or theory of mind, appears moderately teachable because the compilation evidence rarely reports on perspective-taking as distinct from empathy. However, this skill is often targeted in interventions (Jones et al., 2021[69]). The interventions reviewed here document improvements in perspective-taking starting in grade 3 (age 8) and up through grade 10 (age 15) (Grant et al., 2017[71]; CASEL, 2023[70]). Additionally, supporting evidence suggests it is not only teachable, but a crucial aspect of empathy and social interaction (Chatterjee Singh and Duraiappah, 2020[65]). More empirical research is needed to identify which programmes and contexts develop perspective-taking specifically (OECD, Forthcoming[55]).

Perspective-taking follow a well-mapped course of development. Children begin displaying perspective-taking, or the ability to attribute mental states to self and other, around age 4 (OECD, Forthcoming[55]). With increased socialisation upon entry to school, this ability develops rapidly through preschool but then follows a "protracted development" through middle adolescence "paralleling the structural maturation observed in the 'social brain'" (Chatterjee Singh and Duraiappah, 2020, p. 43[65]).

Conceptual issues: Perspective-taking is a cognitive aspect of the multidimensional construct of empathy (OECD, Forthcoming[55]). It distinguishes itself from empathy in its "degree of embodiment – theory of mind involves propositional knowledge of another's mental or affective state, while empathy involves sensory, affective or bodily state sharing" (Chatterjee Singh and Duraiappah, 2020, p. 43[65]). This cognitive emphasis, separate from affect and concern for others, also means that perspective-taking can effectively be used to manipulate and deceive others. It underlies empathy but also psychopathy. It is an a-moral tool to understand others' thoughts and emotions. Whether that skill is used to do good (empathy and compassion) or to hurt (psychopathy) is the subsequent dimension.

Some research further distinguishes "social perspective taking" from general perspective-taking (OECD, Forthcoming[55]), but the SEL intervention literature does not consistently make this distinction.

4.5. Limitations of this review

Despite best efforts, this review has several limitations as a result of the sources and feasibility constraints. They are:

- Publication bias in the compilations: the compilations and databases were created to provide policy makers, schools and practitioners with advice on "what works". Hence, they only report interventions with demonstrated effectiveness. This explains the lack of the "un-teachable" category since negative evidence was not consistently collected. Clarke et al. (2015[98]) and CASEL (2023[70]) do report null findings, weak study design and inconclusive evidence.

- Lack of clarity on skill and outcome definitions and overlap (i.e. jingle-jangle risk): Many of the reported interventions and evaluations use the same terms, e.g. "emotional control", but these terms are rarely defined. Additionally, many evaluation outcomes use composite measures that may comprise several skills, e.g. "prosocial behaviour", but do not define them. Consequently, it is not always clear to what extent the constructs or outcomes overlap.

- Inherent bias in existing SEL interventions and evidence: Evaluation studies inherently reflect what is currently common or extant. This may skew data towards popular programmes (e.g. PATHS), popular skills (e.g. self-control), populations (e.g. primary school students or Americans), or outcomes (e.g. academic achievement or substance use). This creates natural paucity of information for less popular skills, programmes, groups or outcomes, even though these might be relevant.

- Focus on reviews and SEL literature: This review does not examine skill-specific literature from outside SEL interventions, education studies or from single studies. This means other evidence, such as experimental studies or studies of more conventionally "academic" skills like critical thinking, is not included.

Collectively, this means that there may be more evidence for the Limited or Moderate teachability of skills than appears in SEL intervention research. There may also be conflicting or more nuanced evidence from other disciplines.

4.6. Conclusion: Evidence gaps and next steps

This review demonstrates that the majority of the SSES framework skills are teachable. Moreover, by using SEL evaluation studies, it demonstrates the teachability of these skills in real-world, ecologically valid settings. At the same time, it exposes major evidence gaps and points of confusion. Many of these are discussed in the articles consulted for this work (Durlak, Mahoney and Boyle, 2022[100]; Wigelsworth et al., 2022[122]).

Based on the two reviews on teachability of SES presented in this paper, the main gaps that require attention are:

- **The mismatch between the targeted skills of the intervention and the measured outcomes:** Most evaluations and SEL reviews assess the impact of programmes on holistic academic, social or personal outcomes, such as "improved learning behaviors", rather than the acquisition of the skills or behaviors targeted in the

intervention (Van De Sande et al., 2019[106]). Jones et al. (2019[56]) note that, where measures are aligned with the programme goals, positive effects tend to be greater.

- **Lack of clarity on the links between particular skills or skill combinations and outcomes:** As Durlak, Mahoney and Boyle (2022[100]) note, "No meta-analysis to date has examined which targeted skills or their combination might influence various outcomes, but it is precisely this type of information that requires clarification" (p. 777[100]) This review demonstrates exactly this problem. Not only do studies use aggregate measures, but often they are not clearly grounded in any theory of change (Jones, McGarrah and Kahn, 2019[56]; Durlak, Mahoney and Boyle, 2022[100]). Consequently, it is often not clear which skills produce which outcomes.

- **Lack of clear definitions and measures in the evaluation literature:** Although several research centres have mapped and clarify the definitions of skills across frameworks (EASEL Lab, 2023[133]; Life Skills Collaborative, 2023[132]), this does not make it into the evaluation literature. Often, the assessment components – either skills or instruments – are not defined (e.g. Taylor et al., 2017[93]).

- **Lack of analyses of differential effects of SEL and skills acquisition for sub-groups:** As noted in the equity section, there is a paucity of research on any differing effects of USB SEL on various sub-group populations or the links between SEL and outcomes for these groups (Rowe and Trickett, 2018[115]). Durlak, Mahoney and Boyle (2022[100]) also note the need to assess "other sample features", like prior skill levels, social or emotional issues, or achievement.

- **Lack of clarity about "sensitive periods" for particular skills:** Research is increasingly uncovering how child, brain and skill development evolve generally (Rogers and Thomas, 2023[75]), but there is limited research on the extent to which particular skills have "sensitive periods" where they are particularly malleable. "Developmental" approaches to SES, however, suggest skills do not have clear cut-off points but evolve continuously from infancy into adulthood (Cantor et al., 2019[64]; Denham, 2018[80]).

- **Mapping the domain specificity or generality of skills or domains:** Skills like Creativity and Achievement motivation show how the debates about domain specificity can affect teaching and assessment (Gutman and Schoon, 2013[73]; Lamb, Maire and Doeke, 2018[90]). More research is needed to establish which skills – or which conceptualisations of skills – are domain specific versus general.

- **Lack of impact assessment specifically for older adolescents:** There remains a gap in both SEL interventions and impact studies targeted at adolescents, especially in upper secondary, compared to younger children (Yaeger, 2017[88]). As Denham (2018[80]) and Yeager (2017[88]) observe, adolescents have different developmental needs and school structures, necessitating different programmes and goals.

- **Lack of individual evaluation of programme components and their interactions, especially for whole-school approaches:** Although much is known about the general components of effective SEL interventions, little is known "about the importance of different program features" (Durlak, Mahoney and Boyle, 2022, p. 777[100]) at the review level. For example, gaps remain regarding the most effective pedagogies for particular skills, the impact of teacher training, or which forms of adaptation are best. This applies both to interactions between features and between features and outcomes.

In addition to these general evidence gaps, the research about the individual skills in the SSES framework also revealed gaps. Some skills in the SSES framework have limited or no research on their teachability in an education context. In some cases, this may be because definitions and evidence are misaligned. This is the case for Optimism, Curiosity, Creativity and Responsibility as SSES defines them. Energy and Sociability have not or barely been included in SEL interventions and evaluations, begging the question whether they are skills at all. Still others need clarification, like Metacognition/Self-awareness, Co-operation, Self- versus Emotional control, and Social problem-solving. Finally, the mixed evidence for Grit and the conceptualisation of Trust challenges their merit as skill constructs.

5. Social and emotional skills: the key to a successful and fulfilling life?

It has long been known that SES are essential for individual and societal flourishing. On one hand, interpersonal qualities are necessary to forge meaningful relationships in and outside of school, which in turn are a key ingredient for children well-being. There is substantial evidence that children who experience bullying and psychological stress are less likely to do well in school (OECD, 2019[159]), in large part due to internalised negative self-evaluation (Raskauskas et al., 2015[160]). For this reason, children who struggle early in school are at risk of facing more disadvantages as they grow up. On the other hand, intrapersonal qualities, such as the ability to focus and work consistently towards one's goals, are as important in equipping children with the necessary tools to lead successful and flourishing lives.

The connection between SES and a set of key outcomes has been demonstrated in previous OECD work (OECD, 2015[6]; Chernyshenko, Kankaraš and Drasgow, 2018[10]) as well as extensive interdisciplinary academic literature. However, there are three reasons for carrying out the literature review presented in this section. Firstly, the last OECD review on the predictive value of SES includes articles that were published no later than 2015, while the research field has grown since then. Thus, this review aims to compile and summarise the most recent evidence. Secondly, this review seeks to be more comprehensive by investigating the predictive value of a set of skills that were not part of the original OECD SSES framework, such as emotional intelligence and grit. While acknowledging that these constructs may simply be repackaged versions of skills from the SSES framework, investigating their relation to key life outcomes and other skills was considered necessary. Thirdly, unlike a substantial part of SES studies that tend to exclusively focus on a bundle of skills, this review predominantly focuses on the skill level, by specifying conceptual and empirical distinctions between different SES. This level of analysis may be more useful for the design of assessment instruments and the design and evaluation of SEL interventions.

5.1. Methodology

The literature review for this section involved a compilation and summary of empirical evidence describing the relationship between selected SES and key life outcomes (Table 6). The review followed a two-step process:

1. The article search was performed based on the following criteria: review articles (meta-analyses, literature reviews, systematic reviews), published no earlier than 2015 in the English language. The search strategy involved:

- Entering different search terms into "Google Scholar" and screening articles titles until reaching the 10th non-relevant article in a row

- Screening the abstracts of the selected articles to further discard non-relevant studies.

6. A total of 72 articles were selected at this stage. These articles were further screened to assess their suitability for answering the main research question. Articles were considered non-relevant and excluded if they:

- Did not mention any of the selected SES or the Big Five personality traits.

- Were of low quality: being sporadic or demonstrating an incoherent selection and presentation of primary studies.

- Did not review empirical evidence on how skills relate to key life outcomes (e.g. articles focusing on conceptual and measurement issues instead).

- Did not include references to primary studies.

Out of the 72 articles, 47 satisfied the relevance criteria and were selected for analysis. Some additional papers, such as the OECD report *Skills for Social Progress* (OECD, 2015[6]), were included in the analysis in an ad-hoc manner. Primary studies were considered in cases where there was a lack of review evidence for specific skills and outcomes.

While the primary evidence for this review comes from studies that focus on SES, some studies focusing on personality traits are included as well given that previous research has shown that they are correlated with both SES and key life outcomes (Soto, Napolitano and Roberts, 2021[5]). In addition, this review promises to lay the foundation for future inquiries into how specific traits and skills compare in terms of their predictive value.

5.2. Findings

The literature on the predictive value of SES is vast and diverse in terms of the research fields (Table 6). Most studies summarised below come from education science, psychology, economics, management, medicine, criminology and political science and analyse the effects of individuals' social and emotional skills on academic outcomes, labour market outcomes, quality of life outcomes and societal outcomes. The research fields roughly correspond to the outcomes of interest, while the terms for specific skills as well as for the umbrella term for "social and emotional skills" differed across the research fields as well.

Table 6: Literature on the predictive value of social and emotional skills

Type of outcomes	Research field	Outcomes	Key terms for social and emotional skills
Academic outcomes	Education science, psychology, economics	Performance, attainment, completion, attendance, years of schooling	Social and emotional skills, noncognitive skills
Labour market outcomes	Economics, management	Earnings, wages, employment, occupational attainment / prestige, job performance, job complexity	Soft skills, noncognitive skills

Type of outcomes	Research field	Outcomes	Key terms for social and emotional skills
Quality of life outcomes	Medicine, psychology	Health, obesity, suicide, life expectancy, life satisfaction, well-being, happiness, substance abuse	Socioemotional competencies, noncognitive skills
Societal outcomes	Criminology, political science	Crime, antisocial / prosocial behaviour, civic engagement, political participation, violence	Socioemotional competencies, social and emotional skills

Discussion of the findings below is structured based different types of outcomes, while the most predictive skills are summarised in Table 7. In addition, to ensure conceptual clarity and sound interpretation of the findings (and avoid the jingle jangle fallacy), SES' definitions are provided in Annex C Table 13, while differences between definitions from the SSES framework and definitions from SEL literature are provided in Section 6.

5.2.1. Academic outcomes

Learning is a social process that requires working together with teachers, parents and peers (OECD, 2019[161]). Interpersonal skills are essential for this purpose. It is reasonable to suppose that intrapersonal and task-related skills are important for excelling academically. Thereby, this subsection takes a closer look at the evidence underpinning the link between SES and academic outcomes, such as academic performance (measured by test results and grade averages) as well as educational attainment and attendance.

Table 7: Social and emotional skills with the highest predictive value

Type of outcomes	Outcomes	Self-control	Self-efficacy and locus of control	Emotional intelligence	Social problem-solving	Empathy / compassion
Academic outcomes	***Academic Performance***	++++	++++	++++	X	X
	Attainment, enrolment	++	0	X	X	X
Labour market outcomes	***Employment***	+++	+++	X	X	X
	Earnings	++	++++	++	X	X
	Job performance	+++	X	++	X	++
	Subjective outcomes	++	+++	++++	X	X
Quality of life outcomes	***Life satisfaction***	+	++	+++	X	++
	Health	++	+++	+++	++++	X

Societal outcomes	Civic engagement	X	X	X	X	++++
	Antisocial behaviour	++++	++	X	++++	++

Note: **Very high (++++)** = Three review articles or at least seven primary studies all showing a positive or negative relationship; **High (+++)** = Two review articles or five to six primary studies all showing a positive or negative relationship; **Moderate (++)** = One review article or three to four primary studies all showing a positive or negative relationship; **Limited (+)** = One to two primary studies all showing a positive or negative relationship; **Unclear (X)** = Mixed findings – similar number of articles showing diverging relationships (null, positive or negative) or no articles identified; **Null (0)** = most studies indicating null findings.

5.2.2. Academic performance

Several skills seem to play a crucial role in enabling students to excel academically. **Self-control** is particularly important in school contexts where "students experience conflict between academic goals that they value in the long run and non-academic goals that they find more gratifying in the moment" (Duckworth et al., 2019, p. 391[162]). Thus, it is not surprising that self-control has been shown to be a reliable predictor of academic performance as measured by course grades and standardised achievement tests (Duckworth et al., 2019[162]) exceeding the impact of cognitive skills (Cobb-Clark et al., 2019[163]). Specifically, self-control has been linked to children's "literacy, vocabulary, and math skills as well as school readiness" (Cobb-Clark et al., 2019, p. 15[163]). It is worth noting that there is some evidence showing that self-control drives changes in academic performance rather than the opposite (Lee Duckworth, Tsukayama and May, 2010[164]).

Academic self-efficacy (ASE) is another key predictor of high academic performance – numerous reviews report small to large effect sizes linking these constructs (Honicke and Broadbent, 2016[165]; Lee and Stankov, 2018[166]; Nunes et al., 2022[167]; Costa and Fleith, 2019[168]; Tindle et al., 2022[169]; van der Zanden et al., 2018[170]). Some reviewed studies exhibited no significant correlation between ASE and academic performance which may be a result of different operationalisation of the constructs or timing of the measurement (Honicke and Broadbent, 2016[165]). ASE and academic performance are likely to be mutually reinforcing – high academic performance is likely to inspire students with positive learning emotions which may in turn further raise their performance (Honicke and Broadbent, 2016[165]). According to Lee and Stankov (2018[166]), performance self-efficacy, mathematics self-efficacy and general self-efficacy were stronger predictors of math performance in PISA and TIMSS than socio-economic status variables – home possessions and parental education. These findings form a part of the holistic model in which teacher self-efficacy influences the quality of classroom processes, academic adjustment, and teacher well-being. Some evidence, although lower in volume and scope, indicates that a related construct, **locus of control** (i.e. a person's beliefs about how much control they have over what happens in their lives, see **Annex C Table 13**), is also predictive of academic achievement (Feinstein, 2000[171]; Madu, 2018[172]; Chisholm-Burns et al., 2021[173]).

The reviewed studies generally indicate a positive correlation between **emotional intelligence** and academic performance with the strength of the relationship varying from weak to strong (Perera, 2016[174]; Chis and Rusu, 2016[175]; Hanafi and Noor, 2016[176]; Quílez-Robres, Moyano and Cortés-Pascual, 2021[177]; Sánchez-Álvarez, Berrios Martos and Extremera, 2020[178]; Singh, Kulkarni and Gupta, 2020[179]; Somaa, Asghar and Hamid, 2021[180]). The different streams of emotional intelligence show varying levels of association with academic performance – ability emotional intelligence measures tend to

have a greater association with academic performance compared to self-report emotional intelligence measures (Sánchez-Álvarez, Berrios Martos and Extremera, 2020[178]; Somaa, Asghar and Hamid, 2021[180])**.** Moreover, there is some evidence showing that the impact of emotional intelligence depends on its specific dimension. Rodeiro, Emery, and Bell (2012[181]) show that self-control is predictive of academic achievement, but sociability is not, while Chiș and Rusu (2016[175]) conclude that adaptability and stress management are most common emotional intelligence dimensions predictive of academic excellence. Some studies suggest that the link between emotional intelligence and academic performance is mediated by other factors – engagement coping strategies, motivation and effort (Perera, 2016[174]) and core self-evaluations (Quílez-Robres et al., 2023[182]). Quílez-Robres and colleagues (2023[182]) conclude that the evidence on the impact of gender is mixed with some studies showing that boys tend to have higher emotional intelligence, while other studies demonstrate the opposite. According to the authors, these diverging results may be explained by cross-cultural differences in gender norms and parenting practices.

Perera (2016[174]) outlines several mechanisms that may explain the association between emotional intelligence and academic success. Firstly, cognitive processes such as emotion regulation and emotional self-efficacy may help students excel academically. Specifically, the former can "minimize susceptibility to the potentially deleterious effects of negative emotions on cognitive functioning in learning and evaluation settings" (p. 234[174]). Secondly, individuals with high emotional intelligence may be more motivated to reach academic goals due their favourable general outlook towards the future. Thirdly, emotion expression and emotion perception, may enable students with high emotional intelligence to thrive in collaborative academic settings which require forging relations with other people (Perera, 2016[174]).

In addition, examining correlational and experimental evidence Andres and colleagues (2017[183]) show that **stress resistance and emotional control** are positively related to academic performance in math and reading. The impact of stress resistance can be explained by its role in countering negative emotions that arise due to continuous engagement required by learning.

Lastly, some studies provide a link between **perspective-taking** and academic achievement. Specifically, Dore and colleagues (2018[184]) provide preliminary evidence indicating that putting oneself in others' shoes may help develop reading comprehension among pre-primary and primary school children. Wellman and colleagues (2018[185]) partly corroborate this hypothesis by demonstrating that some studies demonstrate a positive association between perspective-taking and academic achievement, while others report null findings. The authors observe that it may have a direct effect or contribute to academic ability through enhancing metacognition, improving academic motivation and peer relations.

5.2.3. Educational attainment and enrolment

SES are also key for educational attainment and enrolment. Looking at survey data from Germany, Cobb-Clark and colleagues (2019[163]) show that, controlling for cognitive skills, the Big Five personality traits and economic preferences, **trait self-control** is a major predictor of educational attainment as measured by years of schooling and the highest level of education. This finding is corroborated by Duckworth and colleagues (2019[162]) who present longitudinal evidence on the importance of self-control in preventing students from dropping out from high school and college.

However, the impact of other SES on attainment is mixed. On the one hand, in Switzerland and the United Kingdom a combination of **persistence, self-efficacy and self-esteem** have only a marginal impact on the chance of completing college, which is largely predicted by

pupils' cognitive skills. On the other hand, in the United States the impact of cognitive skills is exceeded by **that of a combination of persistence and self-esteem** among high school graduates (OECD, 2015[6]).

In addition, longitudinal data reveals that the impact of SES on tertiary attendance may be limited and outmatched by that of cognitive skills (OECD, 2015[6]). In Korea, **responsibility and locus of control** have no significant impact on college attendance. Similarly, a measure of **self-esteem and locus of control** in the United States and a measure of **grit, social anxiety and social co-operation** in Sweden are not predictive of tertiary attendance, while cognitive skills are related to tertiary enrolment in both countries. The fact that cognitive ability is generally more predictive of tertiary enrolment can be explained by the fact that selection into tertiary education institutions is often based on grades or exam results, which are also used to measure cognitive ability (OECD, 2015[6]).

5.3. Labour market outcomes

There are several reasons why SES are increasingly recognised as indispensable in the labour market and career development. Firstly, as they are transferable across different jobs and sectors, they enable individuals to adapt to rapidly changing labour market demands (Basharat et al., 2020[186]). Secondly, the value of social and emotional skills is both direct and indirect as it helps individuals to find and secure employment as well as perform well on the job (Basharat et al., 2020[186]). Thirdly, the importance of SES has increased with the rise of service sector jobs in many countries (Lippman et al., 2015[187]). Nevertheless, employers note a shortage of SES especially among young individuals who "face individual, structural, and social barriers to finding sustainable employment" (Basharat et al., 2020, p. 5[186]). This shortage is mostly owing largely to the fact that SES are often not part of the school curriculum (Cunningham, 2014[188]).

5.3.1. Demand for social and emotional skills

A lot of evidence on the importance of SES in the labour market comes from employer surveys, interviews and employment data (Basharat et al., 2020[186]). This data typically reflects the skill demand in a specific industry, occupation and location. While these perspectives do not reveal correlation between skills and outcomes, they are essential for gauging the demand for SES in the labour market. This is especially important given that information on skill shortages can inform education and training policy.

In employer surveys, SES are often called "soft skills" or "employability skills" which describe "a wide range of skills related to emotional intelligence, inter- and intra-personal abilities, and personal traits or attributes favourably associated with career development" (Basharat et al., 2020, p. 6[186]). Some examples of SES that are sought after by employers include critical thinking, communication, leadership, work ethic, teamwork (Lippman et al., 2015[187]), negotiation and conflict-resolution skills (Gamer Eldeen et al., 2018[189]; García-álvarez et al., 2022[190]).

Employers generally consider SES a necessary asset in the modern workplace. In their review of 28 studies of employer perspectives across the world, Cunningham (2014[188]) show that SES such as ethics, punctuality, and honesty are valued as much as high-order cognitive skills and more than basic cognitive or technical skills. While these findings are consistent across companies of different size, type of economy, type of firm, the level of country development, some variance is observed when it comes to the value of specific skills. The following subsections discuss skills that are predictive of key labour market outcomes such as employment, earnings and job performance.

5.3.2. Employment

There is ample of evidence that strong SES can improve individuals' employment prospects. Three longitudinal studies show that **self-control** improves chances of employment as an adult. One study in Finland showed that attentive children are more likely to find white collar jobs and less likely to be unemployed as adults (Viinikainen et al., 2010[191]). Another study focused on women in the United Kingdom, indicating that attentiveness among children predicted unemployment (Feinstein, 2000[171]), while according to the last study, focusing on two British cohorts, self-control is a significant negative predictor of unemployment (Daly et al., 2015[192]). Self-control also seems to be positively related to occupational prestige (Converse et al., 2012[193]) and attainment (Roberts, 2018[77]). In addition, Lippman and colleagues (2015[187]) conclude that the evidence on the impact of **grit** is at best mixed with a few studies pointing to positive and null effects with regards to employment.

Core self-evaluations are among the key predictors of employment outcomes. Specifically, **self-efficacy** has been shown to be linked to employment outcomes. According to a cross-sectional study focused on young adults in Chile and Argentina (Bassi et al., 2012[194]), self-efficacy improves workplace participation, while a longitudinal study in Germany revealed that occupational self-efficacy is a key moderator between personality domains such as neuroticism and conscientiousness and working hours (Spurk and Abele, 2011[195]). There is substantial evidence on the impact of a related construct, **locus of control,** on employment with several studies demonstrating significant positive effects on employment (Caliendo, Cobb-Clark and Uhlendorff, 2010[196]; Feinstein, 2000[171]), occupational attainment and occupational prestige (Rauber, 2007[197]). Nevertheless, one study failed to show a significant relationship once additional controls, such as academic performance, were added (Macmillan, 2013[198]).

There is some evidence that SES are as important in protecting against unemployment as cognitive skills. For instance, in the United Kingdom, the combination of **self-efficacy, persistence and self-esteem** has an impact on unemployment on par with that of cognitive skills (OECD, 2015[6]).

The importance of cognitive skills in the labour market can be partly explained by the fact that hiring decisions are often based on a candidate's academic experience which in turn is determined to a large degree by one's cognitive abilities (OECD, 2015[6]). SES may also boost employment opportunities indirectly by helping with the job search. For instance, , there is some evidence that candidates with high internal **locus of control** (Caliendo, Cobb-Clark and Uhlendorff, 2010[196]) and **trait self-control** (Baay et al., 2014[199]) are more inclined to proactively look for a job.

5.3.3. Earnings

Several longitudinal studies demonstrate a positive association between **self-control** and earnings (Roberts, Caspi and Moffitt, 2003[200]; Viinikainen et al., 2010[191]; Converse et al., 2012[193]; Converse et al., 2016[201]). Several of these studies specify that the link between self-control and earning potential is mediated by educational attainment (Converse et al., 2012[193]; Converse et al., 2016[201]) as well as core self-evaluations and job complexity (Converse et al., 2016[201]). Furthermore, Lippman and colleagues (2015[187]) conclude that the evidence on the impact of a related concept of **grit** on earnings is limited as the number of studies failing to demonstrate a significant association exceeds that of studies showing a significant effect.

As employment outcomes, earnings seem to be tightly linked to core self-evaluations (Judge and Hurst, 2007[202]; Converse et al., 2016[201]). There is substantial evidence that

one of the self-evaluations – **locus of control** plays a key role in improving earnings. Lippman and colleagues (2015[187]) contend that its link with income is well established in the literature by presenting evidence from twelve empirical studies. Specifically, internal locus of control is shown as a positive and external locus of control – as a negative predictor of income. These findings are further corroborated by Cobb-Clark's (2015[203]) review which concludes that locus of control affects various labour market outcomes including higher wages, better employment and career advancement opportunities. The impact of locus of control may differ across genders, although the evidence is inconsistent, with one study showing that the effect is only present for men (Cobb-Clark and Tan, 2011[204]) and one study indicating that locus of control affects exclusively women (Linz and Semykina, 2005[205]). Lastly, several studies point to a positive relationship between earnings and another core self-evaluation – **self-efficacy** (Converse et al., 2016[201]; Bassi et al., 2012[194]).

One reason why workers with internal locus of control enjoy higher wages could be their tendency to search for jobs more intensively (Caliendo, Cobb-Clark and Uhlendorff, 2010[196]). Another key mechanism through which locus of control seems to improve one's earnings is by encouraging human capital investments (Cobb-Clark, 2015[203]). Simply put, individuals with internal locus of control are more likely to believe that obtaining education will help them earn a higher wage and are thereby more likely to invest in education.

In addition, Pirsoul (2023[206]) provides meta-analytic evidence that **emotional intelligence** predicts higher salaries, although the effect is mediated by age (with a stronger impact for older people) and self-efficacy. This effect may be explained by the ability of individuals with high emotional intelligence to forge interpersonal relationships and networking opportunities which eventually help them to find a high-paying job.

In some cases, **cognitive skills** appear to have a larger impact on income than SES. Based on longitudinal data from a handful of OECD countries, cognitive skills among adolescents substantially predict the level of income later in life, while the effect of SES varies from zero to small positive and negative depending on the skill (OECD, 2015[6]). However, several studies indicate that SES such as **self-efficacy** have a larger impact on earnings than cognitive skills (Bassi et al., 2012[194]; Converse et al., 2016[201]).

Social and emotional skills can impact earnings in several ways. Firstly, strong SES may directly enhance workers' productivity and thereby increase their income (Lippman et al., 2015[187]). Secondly, strong SES are associated with higher educational attainment which is in turn a reliable predictor of earnings (Mohanty, 2009[207]; Heckman, Stixrud and Urzua, 2006[208]).

5.3.4. Job performance

Lippmann and colleagues (2015[187]) present evidence from five longitudinal studies demonstrating a positive relationship between **self-control** and job performance. Moreover, the authors also present some evidence on the link between another facet of conscientiousness – **achievement motivation** – and entrepreneurship success. One way strong SES can enhance job performance is through enabling continuous learning. For instance, employees with high **trait self-control** (see the glossary for a distinction between state and trait) have been shown to be more inclined to accept negative feedback and adjust their performance accordingly (Ruttan and Nordgren, 2015[209]). This in turn may incentivise companies to invest more in employees showing such proclivity to improve (Lippman et al., 2015[187]). Lian and colleagues (2017[210]) also contend that there is some evidence that **state self-control** can improve job performance as employees with depleted self-control tend to be less engaged and get more easily distracted at work.

Joseph, Newman and O'Boyle (2015[211]) contend that a strong relationship between **mixed emotional intelligence and job performance** has been well established in the literature. Nevertheless, the authors demonstrate that the association between mixed emotional intelligence and supervisor-rated job performance is insignificant when controlling for the impact of ability emotional intelligence, self-efficacy, and self-rated performance, conscientiousness, emotional stability, extraversion and general cognitive ability. This can be explained by the fact that mixed emotional intelligence has been constructed by sampling from the abovementioned psychological constructs.

Personality studies present another source of evidence on the key predictors of job performance. Wilmot and colleagues (2019[212]) review evidence on **extroversion related traits showing that sociability and assertiveness** are significant predictors of supervisor-rated job performance, while the former is also positively associated with peer and subordinate rating of job performance. In another review, Wilmot and colleagues (2022[213]) outline that overall job performance is related to **trust, co-operation** and **compassion** with the latter exhibiting the largest effect. Moreover, He, Donnelan and Mendoz (2019[214]) point out that **achievement motivation** and **assertiveness** are positively associated with job performance.

Lastly, London, Sessa and Shelley (2023[215]) argue that **self-awareness** may improve a leader's performance as being aware of others' opinions helps them to adjust their behaviour.

5.4. Subjective labour market outcomes

SES may also impact subjective labour market outcomes. Specifically, many studies have demonstrated a positive relation between career or job satisfaction and **emotional intelligence** (Pirsoul et al., 2023[206]; Singh, Kulkarni and Gupta, 2020[179]), **self-efficacy** (Zee and Koomen, 2016[216]) and **career optimism** (Eva et al., 2020[217]). Singh, Kulkarni and Gupta (2020[179]) contend that job satisfaction in turn enhances organisational commitment and decreases turnover intentions which are negatively related to emotional intelligence.

There is substantial evidence indicating that **emotional intelligence** is positively related to career adaptability (Pirsoul et al., 2023[206]; Vashisht, Kaushal and Vashisht, 2023[218]). Vashisht and colleagues (2023[218]) find that the effect is particularly pronounced in North America potentially pointing to the role of cultural norms in shaping career adaptability defined as "the flexibility or desire to accomplish career tasks, to pursue career change and to deal with career disturbances with the appropriate steps" (p. 317[218]). The authors also find that career adaptability is positively related to **self-efficacy, self-control and optimism**, which may be explained by the fact that these constructs are part of the mixed emotional intelligence measures (Joseph et al., 2015[211]).

Clark, Robertson and Young (2019[219]) present some preliminary evidence linking **empathy** to organisational citizenship behaviour (voluntary, extra-role actions by employees that benefit the organization and its members). However, the authors suggest treating the findings with caution as many studies confuse empathy with sympathy. Similarly, the evidence on the relationship between empathy, task performance and counterproductive work behaviour and leadership is inconsistent. According to the authors, mixed findings may be explained by "deficient measures, measures misaligned with construct definitions or unclear measures of empathy" as well as "the impact of training, or substantive differences in perspectives between interaction partners and independent observers" (p. 183[219]).

5.5. Quality of life outcomes

When it comes to human development, a shift from focusing exclusively on economic prosperity to other components of well-being such as health and life satisfaction has been long underway (OECD, 2015[6]). The following subsection discusses the contribution of SES to these aspects of human development.

5.5.1. Life satisfaction

SES have been shown to be linked to life satisfaction and related outcomes such as subjective well-being, attitude towards life and happiness. Cobb-Clark and colleagues' (2019[163]) analysis of survey data from Germany reveals that after controlling for cognitive skills, the Big Five personality traits, and economic preferences, **trait self-control** is the strongest predictor of satisfaction with life, work and family. Furthermore, researchers focusing on **career optimism** have shown its positive association with life satisfaction (Eva et al., 2020[217]). Wilmot and colleagues (2019[212]) conclude that **assertiveness and sociability traits** predict life satisfaction. Moreover, Wilmot and colleagues (2022[213]) review the predictive value of agreeableness' traits and find that **cooperativeness** is positively linked to life satisfaction.

Another key predictor of life satisfaction is **self-efficacy**. Van der Zanden and colleagues (2018, p. 72[170]) define coping self-efficacy as "the belief that one is able to effectively manage difficult situations" and show that it is instrumental to first year student social-emotional well-being. However, the authors note the variability of social-emotional well-being definitions with some studies focusing on a general sense of well-being and others emphasising well-being in specific domains (van der Zanden et al., 2018[170]).

Sánchez-Álvarez and colleagues (2016[220]) and Quilez-Robres and colleagues (2021[177]) present **emotional intelligence** as a predictor of subjective well-being. In particular, the authors argue that emotional intelligence may have a twofold impact on well-being by enhancing positive and circumventing negative emotions (Sánchez-Álvarez, Extremera and Fernández-Berrocal, 2016[220]). In addition, Morelli, Lieberman and Zaki (2015[221]) present evidence on the association between positive **empathy** and well-being.

Lastly, OECD analysis of longitudinal data showed that different combinations of SES may be conducive to life satisfaction (OECD, 2015[6]). For instance, in Switzerland improving **self-efficacy, self-esteem and persistence** of 16-year-olds substantially contributes to a more positive attitude towards life at age 25, while high cognitive skills are associated with a more negative attitude to life 10 years later. A similar dynamic is seen in New Zealand, where scoring high on **a mixed measure of perseverance, responsibility and social skills** as an 8-year-old increases the chance of being very happy at age 20, with cognitive skills showing no effect. In Korea, **cognitive skills, responsibility, and locus of control** among 14-year-olds are all predictive of life satisfaction at age 19, with the latter skill exhibiting the largest effect. However, in the United Kingdom **a combination of self-esteem, locus of control and persistence** at age 10 is not related to life satisfaction in early adulthood, while high cognitive skills are associated with a lower chance of life satisfaction.

5.5.2. Health and related behaviours

The link between SES and health outcomes has been established by numerous studies. Firstly, several reviews have linked low SES to obesity. Analysis of longitudinal data from several OECD countries (OECD, 2015[6]) reveals that SES tend to reduce obesity. In the United Kingdom, **a skill factor of self-esteem, locus of control and persistence** at age 10 is linked to a decreased obesity risk at age 16, whereas cognitive ability exhibits a

somewhat weaker negative effect. In the United States, **a skill factor of self-control, approaches to learning and internalising behaviours** in the kindergarten is negatively related to the probability of obesity at grade 8, with cognitive skills having the same level of impact. Moreover, in their meta-analysis, Andrade and Hoyle (2023[222]) link sleep problems and, to a lesser extent, unhealthy eating and low physical activity to low **trait self-control**. Nevertheless, the authors note that the impact of self-control is modest suggesting that other "individual differences, contextual affordances, and biological factors" may better explain health-related activities (Andrade and Hoyle, 2023, p. 1[222]).

Secondly, SES have been shown to be essential for physical and mental health. Cobb-Clark and colleagues (2019[163]) analyse survey data from Germany and show that controlling for cognitive skills, the Big Five personality traits, and economic preferences, **trait self-control** is the second most important predictor of physical and mental health besides age. Moreover, **optimism** has been shown to reduce the risk of mortality and cardiovascular events (Rozanski et al., 2019[223]; Craig et al., 2021[224]).

Another key predictor of mental health is **self-efficacy** – Zee & Koomen (2016[216]) found that "self-efficacious teachers may suffer less from stress, emotional exhaustion, depersonalization, and overall burnout, and experience higher levels of personal accomplishment, commitment, and job satisfaction" (p. 1007[216]). Similarly, several studies mention **social problem-solving** as a protective factor against depression and anxiety (Krause et al., 2021[225]; Campbell et al., 2022[226]; Michelson et al., 2022[227]) and suicidal behaviour (Siu,, 2019[228]; Littlewood et al., 2017[229]).

Moreover, Baudry and colleagues (2018[230]) show that **trait emotional intelligence** is a positive predictor of mental and to a lesser extent physical and general health. In addition, focusing on different measurements of emotional intelligence, Domínguez-García and Fernández-Berrocal (2018[231]) demonstrate its essential role in protecting against suicidal behaviour. The authors suggest that the positive effect of emotional intelligence may be a result of more extensive use of self-care health practices, greater social support and adaptive coping. They further found that the impact of intrapersonal dimensions of emotional intelligence such as emotion regulation exceed that of interpersonal dimensions such as understanding others' emotions.

Lastly, a number of studies have shown that **perspective-taking** and related constructs may be beneficial for mental health. In a systematic review, Hall and colleagues (2021[232]) showed that perspective-taking among adolescents is associated with low depressive symptoms and self-esteem. This effect may be explained by the role perspective-taking plays in protecting self-esteem "by enabling the individual to differentiate the points of view, beliefs, and situations of others from their own" (p. 145[232]). In addition, Diaz (2022[233]) presented preliminary evidence linking deficits in **theory of mind** to first-episode psychosis. Similarly, according to Nestor and Sutherland (2022[234]) analysis, theory of mind may protect against suicidal behaviour regardless of age and sex. Furthermore, Aival-Naveh, Rothschild-Yakar and Kurman (2019[235]) show that **mentalising** is negatively associated with eating disorders, psychosomatic disorders, depression and non-suicidal self-harm. Williamson and Mills (2023[236]) found that the state of evidence on the relationship between mentalising and internalising disorders such as anxiety and depression is mixed, owing largely to "inaccuracies resulting from conflating various aspects of mentalising (e.g. propensity and degree)" (p. 8[236]). However, when it comes to the impact of **self-awareness** and related constructs on mental health is mixed. On the one hand, some studies have identified it as a protective factor against anxiety, depression (Ferreira et al., 2022[237]; London, Sessa and Shelley, 2023[215]) and suicide (Posamentier, Seibel and DyTang, 2023[238]). On the other hand, London, Sessa and Shelley

(2023[215]) warn that self-awareness may lead to excessive introspection which may in turn lead to aggression and narcissism.

Thirdly, SES play an equally important role in reducing substance abuse (OECD, 2015[6]). In Korea, the chance of smoking at age 19 is substantially reduced by higher level of **responsibility** at age 14. In the United Kingdom, a combination of **self-esteem, locus of control and persistence** at age 10 only marginally reduces the chance of smoking at age 26. In addition, Sheeran and colleagues (2016[239]) demonstrated that **self-efficacy** is a significant predictor of unhealthy behaviour such as lack of physical activity, alcohol consumption and smoking. Lastly, Cobb-Clark (2015[203]) asserts that there is substantial evidence linking **internal locus of control** to lack of exercise and high alcohol consumption, while Kumar, Skrzynski and Creswell (2022[240]) demonstrated a negative link between **perspective-taking** (theory of mind in the article) and alcohol abuse.

5.6. Societal outcomes

In the context of global crises such as climate change and democratic backsliding, it is crucial to consider factors that contribute to societal outcomes such as civic engagement, violence and crime. Accordingly, the subsequent subsections focus on how developing SES may facilitate societal resilience.

5.6.1. Civic engagement

A handful of studies substantiate the link between SES and civic engagement. Employing a longitudinal design, Sewell and colleagues (2023[241]) show a strong association between the student volunteering and their level of **perspective-taking and stress resistance** However, in the same study, mixed results are observed for creativity (with non-significant to positive associations depending on the considered statistics). These findings are consistent across gender, first generation college student status, family income, racial and ethnic background.

Moreover, drawing on cross-sectional survey data, Metzger and colleagues (2018[242]) found that **empathy** predicts all types of civic engagement. However, it was linked only with improved civic skills, informal helping and environmental behaviour. Finally, the relationship between empathy, civic skills and voting intentions was stronger for "youth in middle childhood and early adolescence compared to youth in late middle and late adolescence" (Metzger et al., 2018, p. 1676[242]). A study by Luengo Kanacri and colleagues (2016[243]) of adults in Chile provides further support for the positive relation between **empathy** and civic engagement. The authors contended that empathy towards people in poverty and seeing people as potentially autonomous agents predict monetary donations and higher civic engagement. These findings are further substantiated by Morelli, Lieberman and Zaki (2015[221]) who draw on correlational, experimental and neuroscience studies to demonstrate a strong positive link between positive empathy and prosocial behaviour, such as spending money on others and providing emotional support. Positive empathy is also shown to predict social closeness, specifically relationship satisfaction, commitment, intimacy and trust.

5.6.2. Antisocial behaviour and conduct problems.

Another strand of literature focuses on SES as predictors of antisocial behaviour such as crime and violence. Since Gottfredson and Hirschi have put forward the social control theory many studies have confirmed the link between **self-control** and criminality and other delinquent behaviours (Vazsonyi, Mikuška and Kelley (2017[244]); Murray and colleagues (2018[245]); Burt (2019[246]); Tharshini and colleagues (2021[247]). For instance, Burt

(2019[246]) reviews cross-sectional and longitudinal studies focusing on predictors of crime and finds evidence that "self-control is a primary cause of individual differences in offending" (Burt, 2019, p. 47[246]). These findings are robust across studies using self-reports and official criminal records as well as after controlling for criminal opportunity. Moreover, most findings linking self-control to crime have proven to hold across time, different demographic groups, countries, types of crime (Burt, 2019[246]). However, some studies point out that women tend to exhibit higher levels of self-control which may in turn explain their lower inclination to commit crime (Forrest et al., 2019[248]).

The simple mechanism behind the association between crime and low self-control is the inability to foresee the long-term consequences of one's actions (Forrest et al., 2019[248]). Another important factor is that individuals who lack self-control tend to adopt deviant values due to socialisation with delinquent peers and lack of quality parental care and consequently engage in various types of antisocial behaviour (Forrest et al., 2019[248]). However, the relationship between self-control and social consequences is reciprocal. Low self-control may lead to antisocial behaviour which in turn may lead individuals to situations where it's difficult to develop self-control. Conversely, a feedback loop may be positive – high self-control creates conditions which are favourable to its further improvement, such as through gaining access to prestigious academic institutions.

Another key predictor of violence is **self-awareness** as its loss is associated with violence as a coping mechanism to escape negative emotions (Morley et al., 2023[249]) and through increased proclivity to consume alcohol (Parrott and Eckhardt, 2018[250]). Similarly, **conflict resolution skills** have been shown to be effective in preventing violence among adolescents (Gavine, Donnelly and Williams, 2016[251]; Kelly, 2017[252]; Malhi et al., 2020[253]; Spencer et al., 2021[254]). Similarly, Murray and colleagues (2018[245]) identified a small number of studies which link **external locus of control** to antisocial behaviour. The core limitation of the review is that it did not test the potential influence of moderator variables such as geographical location or methodological characteristics of the included studies.

In addition, Jahnke, Abad Borger and Beelmann (2022[255]) systematically reviewed evidence regarding psychological risk factors and their association with political violence among adolescents and young adults. Most of the reviewed studies were conducted in the global north, with fewer studies in low- or middle-income countries. The key finding is that **empathy** is negatively associated with political violence, which is defined as "the deliberate collective attempt to use force against persons or objects for political reasons" (Sageman (2017[256]) cited in (Jahnke, Abad Borger and Beelmann, 2022, p. 112[255]). The findings are consistent across age, year of publication, gender, peer review status, low social status, and the level of political violence. Unlike for empathy, there is a lack of substantial evidence linking **perspective-taking** to prosocial behaviour. For instance, Imuta and colleagues (2016[257]) showed that perspective-taking among children is weakly associated with prosocial behaviour such as comforting, cooperating, helping. However, the authors note that it may be a necessary but not a sufficient condition for acting in a prosocial manner as that also depends on parenting behaviour, sibling influences, social exclusion, religiosity, empathy, positive mood. Concerning crime, Karoglu, Ferguson and Ciardha (2022[258]) found mixed evidence for its association with perspective-taking after controlling for the quality of the studies. Lastly, a number of studies warn that perspective-taking may also lead to antisocial behaviour, such as relational and psychological aggression (Hall et al., 2021[232]), lying and manipulation (Lee and Imuta, 2021[259]). These abilities require a moral dimension if they are to benefit the society, which is encapsulated by a related concept – empathy (Lee and Imuta, 2021[259]).

When it comes to antisocial behaviour, the predictive power of SES may exceed that of academic skills. Analysis of longitudinal data from Korea, New Zealand and Switzerland (OECD, 2015[6]) showed that **social skills, self-efficacy, self-esteem, responsibility and perseverance** among 8-year-olds is associated with a decrease in probability of conduct problems, such as drinking, smoking and violence) at age 16. At the same time, the impact of cognitive skills on conduct problems ranges from insignificant to slightly positive. However, somewhat different trends were observed in the United Kingdom and the United States samples. In the former, conduct problems appeared to be relatively similar across different levels of SES, while higher cognitive skills were associated with lower probability of conduct problems at age 16. In the latter, both SES and cognitive skills were negative predictors of conduct issues at age 8. A similar positive impact is observed with regards to bullying – **responsibility and locus of control** were shown to decrease engagement in bullying among Korean adolescents, while no such effect is observed for cognitive skills. Similarly, in the United States 8th graders with high **cognitive skills as well as self-control, approaches to learning and internalising behaviours** were less likely to be bullied.

5.7. Life success and social and emotional skills: which comes first?

So far, SES were discussed as factors affecting key life outcomes rather than the other way around. Correlational evidence, however, can only provide a partial view of how these skills and key life outcomes develop and influence each other over time. Moreover, one of the key features of SES is their cumulative nature. Several analyses from the United States and Korea have shown that investing in SES brings more benefits in terms of SES and cognitive skills the higher the current level of pupils' SES (Heckman, 2012[260]; OECD, 2015[6]). This added benefit is larger than for cognitive skills, which indicates that current level of SES is particularly important for future skill development.

The fact that SES are fundamental to children development can create a vicious cycle between lack of opportunity and skills. Children with high socio-economic status tend to have higher social and emotional skills (OECD, 2021[9]), which may be explained by a crucial role the family plays in fostering SES by "providing guidance, developing habits, imparting values and sharing expectations" (OECD, 2015, p. 82[6]). For instance, the vocabulary of children from high socio-economic backgrounds has been estimated to be roughly three times larger than that of children from low socio-economic backgrounds (Hart and Risley, 2003[261]). This gap in skills may be explained by the fact that parents from lower socio-economic backgrounds generally have less time, energy and knowledge to provide quality care to their kids (OECD, 2015[6]). In addition, the experience of growing up poor causes stress among children which may in turn hamper their cognitive development (OECD, 2015[6]).

Formal educational institutions can exacerbate these inequalities. For instance, teachers in the United States have been shown to have lower expectations for students of colour and from disadvantaged backgrounds (Boser, Wilhelm and Hanna, 2014[262]). This can in turn harm students' self-evaluations which are fundamental to academic and economic success. In addition, institutional and informal pathways between elite educational institutions and companies may limit the social mobility of low performing students by denying them the chance to develop the social and emotional skills (Brown, 2013[263]). Thus, while investing in skill development of gifted children may seem more efficient, it is likely to increase inequality in skills and associated key life outcomes over time.

Conversely, the vicious cycle between lack of socioeconomic opportunity and SES may be averted with early and targeted investments in SEL (discussed in more detail in Section 3). According to Heckman (2012[260]), investing in SES of young at-risk children can offset the short-term costs of early childhood interventions through "reduction in the need for special

education and remediation, better health outcomes, reduced need for social services, lower criminal justice costs and increased self-sufficiency and productivity among families" (Heckman, 2012, p. 2[260]). Therefore, investment in early childhood education as well as parent environments to develop SES can be both equitable and efficient.

5.8. Conclusion

The most predictive SES are highlighted in Table 7. Firstly, evidence shows that both self-control and core self-evaluations are related to all four groups of outcomes. The fact that SES predict the same outcomes to a similar degree may be explained by a positive association between self-control and self-efficacy (Chow, Hui and Lau, 2015[264]). In other words, a virtuous cycle between believing in one's abilities, exercising self-control and actual performance may be at play here. Secondly, like self-control and core self-evaluations, emotional intelligence is a reliable predictor of academic, labour market and quality of life outcomes. This is somewhat expected given that mixed emotional intelligence is composed of self-efficacy and task performance among other constructs. However, unlike self-control and core self-evaluations, no evidence was identified concerning emotional intelligence's impact on antisocial behaviour. Thirdly, social problem-solving appears to be key to health and prosocial behaviour. Fourthly, there is substantial evidence that empathy is indispensable for quality of life and societal well-being. Specifically, it stands out as the most important skill for civic engagement.

For many SES, no studies were identified (see the full list of skills and their relation to key life outcomes in Table 14. Specifically, only one study focusing on a skill within the open-mindedness domain was identified. Given the evidence that open-mindedness domain is linked to academic and labour market outcomes (He, Donnellan and Mendoza, 2019[214]; Chen et al., 2022[265]), skills such as creativity, curiosity and tolerance deserve more attention. However, that should not be interpreted as evidence that SES are not important. Instead, this absence of evidence may reflect inconclusive literature review or the lack of attention given to certain skills within specific disciplines (e.g. research on civic engagement tends to focus on empathy and perspective-taking). It is worth noting that the evidence on health largely depends on the outcome in question. For instance, only optimism seems to be related to physical health, while self-control, emotional intelligence and social problem-solving are among the key mental health predictors and core self-evaluations play a key role in protecting against substance abuse and obesity.

This review has several notable limitations. Firstly, longitudinal studies focusing on the OECD countries (OECD, 2015[6]) use a composite measure of SES which includes constructs that are not part of the selected skills. This renders the interpretation of the findings difficult as it is impossible to disentangle the predictive value of individual skills. Nevertheless, the inclusion of these findings offers a valuable addition to a pool of evidence on the predictive value of SES. Secondly, the quality of some studies is suboptimal, the main issues being – "small study and publication bias that may overestimate true effects" (Smithers et al., 2018, p. 867[266]) and failing to control for confounding variables. Moreover, focusing on reviews, especially meta-analyses, risks aggregating findings that are difficult to compare. The most common difference across studies is the definition and measurement of skills as well as outcome variable. While this may bias the meta-analytic findings, only some studies included type of measurement as a control variable. Fourthly, looking at correlational evidence begs the question about the direction of the relationship between skills and key life outcomes. As discussed in the previous subsection, they are likely to be mutually reinforcing as early advantages tend beget skills which in turn enable children to lead successful and flourishing lives.

6. Updated OECD SES definitions

This section aims to integrate the findings on SES' teachability and predictive value discussed in previous sections and thereby:

- Update the general definition of SES

- Identify skills that are both teachable and of high predictive value

- Discuss the discrepancies between the SSES framework's definitions of each skill and those found in the literature reviewed.

6.1. Updated definition of social and emotional skills

The evidence presented in this working paper relies on the OECD 2015 definition of SES first proposed by De Fruyt, Wille and Oliver (2015[3]). However, **Box 1** proposes an updated definition to better reflect the latest conceptual developments in SES literature and the need for developing innovative assessment tools. Moreover, future reviews focusing on SES could benefit from adopting this definition to ensure conceptual and empirical rigour when describing SES, their teachability and relation to key life outcomes.

Box 1. Updated definition of social and emotional skills

SES are individual characteristics that are:

- Expressed in repeatable patterns of thoughts, feelings and behaviours.

- Manifested in maximal behaviour more than typical behaviour (and therefore distinct from personality traits).

- Dependent on situational factors (e.g. task context, fatigue).

- Subject to developmental change and genetic predispositions.

- Teachable / responsive to intervention.

- Predictive of key life outcomes.

- Conceptually distinct from foundational cognitive processes (e.g. visual processing, attention, memory retrieval) and academic skills (e.g. literacy, numeracy).

6.1.1. Expressed in repeatable patterns of thoughts, feelings and behaviours

As discussed previously, SES are not stable – they are bound to change due to the developmental cycle and environmental influences and they are dependent on situational factors. However, to observe or measure a given skill, an individual must be able to consistently and repeatedly manifest thoughts, feelings or behaviours underlying that skill across time. Performing consistently in similar situations ensures that an observed behaviour (which may also be taken as a proxy for thoughts and feelings) is due to a developed skill and not an accidental occurrence. Manifested in maximal behaviour more than typical behaviour.

Manifested in maximal behaviour more than typical behaviourA key departure point from the OECD 2015 definition of SES is their separation from personality traits. Specifically, skills denote maximal behaviour or capacity that can be exercised as needed, while personality traits represent typical behaviour (Soto, Napolitano and Roberts, 2021[5]). It is worth noting that the two concepts are likely related – a person who often recognises people's emotions will tend to be skilled in emotion recognition and vice versa. However,

skills may offer additional information compared to traits, such as a person's adaptability to different circumstances and performance on specific tasks in high-stake situations (Soto et al., 2022[11]). Moreover, this distinction promises to improve the design of SEL interventions as skills and traits require different teaching approaches (Soto et al., 2022[11]). Most importantly, this distinction is consequential for the selection and design of assessment tools as most innovative assessments focus on maximal behaviour.

6.1.2. Dependent on situational factors

The expression of SES among individuals changes with their mental states, task context and the nature of the activity they are involved in. For instance, a student who is feeling exhausted after a long day at school may not be as proficient in recognising their own emotions as when they are well-rested. Similarly, a student in a loud classroom may struggle to focus on a task measuring his or her self-control. The influence of situational factors is therefore a key consideration for the design of assessment tools, which should try to minimise differences in the task context and mental states across the studied population.

6.1.3. Subject to developmental change and genetic predispositions

The environment may inhibit or strengthen children's genetic predispositions towards certain SES. Specifically, socialisation and education and, more generally, interactions with the world, its people and its events, shape the development of SES. Research shows that the level of SES changes substantially through childhood and adolescence as developmental tasks with which children must deal with become more complex with age. While the rate of development slows down during adulthood, adults can still develop their SES, such as emotional regulation (Roberts et al., 2017[267]).

6.1.4. Teachable / responsive to interventions

A key component of SES is their teachability – educators' and parents' capacity to foster the development of SES. As discussed in previous sections, not all skills are equally teachable, while the effectiveness of social and emotional learning interventions varies significantly depending on the context, the quality of the program and the implementation. Research and educational stakeholders interested in the development of SES should also be careful to distinguish between evidence of teachability and evidence of malleability. Compared to the OECD 2015 definition of SES, we suggest that future OECD work focus on skills that are proven teachable to ensure they respond to educators' interventions, as opposed to skills which are only malleable and, thus, simply change throughout life.

6.1.5. Predictive of key life outcomes

An important feature of SES is that they enable individuals and communities to thrive. While a substantial amount of literature has looked at how SES enable learning and academic success, their impact on labour market, quality of life and societal outcomes should not be overlooked as well. While the value placed on certain SES may differ across time and cultural settings, this paper focused on recent evidence reflecting contemporary needs and value orientations. It is important to note that failing to find consistent evidence linking a particular skill to a particular outcome does not prove a lack of association, only a lack of research. Finally, whenever research demonstrates a skill is unrelated to a particular outcome, that does not negate the usefulness of that skill in other circumstances.

6.1.6. Conceptually distinct from foundational cognitive processes and academic skills

Another difference between the updated and the OECD 2015 definitions is distinguishing SES from foundational cognitive processes such as memory and attention and academic skills such literacy and numeracy abilities. This distinction does not deny the fact that SES depend on cognitive processes. In fact, SES rely on various of those cognitive processes, while invoking additional social and emotional dimensions, which are usually applied in social and emotional contexts.

6.1.7. Highly teachable skills with high predictive value

Table 8 displays skills that are both teachable and are related to key life outcomes. It was compiled by synthesising the findings from the literature reviews on SES' teachability and SES' relationships to key life outcomes as well considering conceptual mismatches between these literature strands. Pulling this evidence together may not only inform the development of innovative assessment tools in the next stages of the *Innovative approaches to measuring social and emotional skills* project but may also bring policy makers' and educators' attention to skills that matter and can be taught.

Self-control appears to be highly teachable and important for many key life outcomes, especially academic performance and antisocial behaviour. Nevertheless, its definition overlaps with that of emotional control. Another set of highly teachable skills which are predictive of key life outcomes is self-efficacy and locus of control. Evidence suggests that they are especially important for academic performance and earnings. When interpreting the results, it must be noted that self-efficacy is domain-specific and locus of control – a domain-general skill.

In the review of the outcome research and SEL literature, emotional intelligence appears highly teachable and particularly important for academic performance and subjective labour market outcomes. This may be due to emotional intelligence being a compound construct that includes self-efficacy, conscientiousness, emotional stability and extraversion, all of which are correlated with key life outcomes. However, the question remains whether compound constructs are more useful from the assessment and teaching perspectives.

Table 8. Highly teachable skills with high predictive value

Type of outcomes	Self-control	Locus of control and self-efficacy	Emotional intelligence	Social problem-solving	Empathy	Assertiveness	Co-operation
Teachability	++++	++++	+++	++++	++++	++++	++++
Academic performance	++++	++++	++++	X	X	X	X
Academic attainment	++	0	X	X	X	X	0
Employment	+++	+++	X	X	X	X	X
Earnings	++	++++	++	X	X	X	X

Type of outcomes	Self-control	Locus of control and self-efficacy	Emotional intelligence	Social problem-solving	Empathy	Assertiveness	Co-operation
Job performance	+++	X	++	X	++	+++	++
Subjective outcomes	++	+++	++++	X	X	X	X
Life satisfaction	+	++	+++	X	++	++	++
Health	++	+++	+++	++++	X	X	X
Civic engagement	X	X	X	X	++++	X	X
Antisocial behaviour	++++	++	X	++++	++	X	X
Comments on definition	Overlaps with emotional control	Locus of control is a domain-general skill that is not part of the SSES framework.	Likely comprises multiple skills	N/A	Closely related to perspective-taking / theory of mind / mentalising.	The SEL literature associates it with leadership skills and resisting bullying	N/A

Note: ***Evidence level = predictive value / teachability*: Very high (++++)** = Three review articles or at least seven primary studies all showing a positive or negative relationship / At least 15 interventions out of the 74 assessed demonstrated significant positive outcomes; **High (+++)** = Two review articles or five to six primary studies all showing a positive or negative relationship / At least 10 interventions out of 74 demonstrating significant positive outcome; **Moderate (++)** = One review article or three to four primary studies all showing a positive or negative relationship / At least five interventions out of 74 demonstrate significant positive outcomes; **Limited (+)** = One to two primary studies all showing a positive or negative relationship / At least two interventions out of 74 show significant positive outcomes; **Unclear (X)** = Mixed findings – similar number of articles showing diverging relationships (null, positive or negative) or no articles identified / There is not enough evidence to determine whether this skill is teachable; **Null (0)** = most studies indicating null findings.

Social problem-solving is another highly teachable skill which also shows strong association with health and antisocial behaviour. In addition, evidence suggests that empathy is highly teachable and shows strong association with civic engagement. Conceptually, it is closely related to perspective-taking / theory of mind / mentalising. However, unlike perspective-taking, empathy implies feeling what others feel, not merely understanding other people's emotions, an ability that could also be linked to antisocial behaviour if used with the intent of manipulating or deceiving.

Assertiveness is both highly teachable and highly predictive of job performance. However, in some studies on SES' teachability, the distinction between assertiveness and leadership skills is unclear. Moreover, according to definitions provided by the OECD and life outcome research, assertiveness is related to exerting social influence without specifying how it affects other individuals. The SEL literature, however, emphasises assertiveness as standing up for oneself and others in the face of bullying. Lastly, co-operation stands out

as a skill with most evidence on its teachability. In terms of life outcomes, there is moderate evidence on its relation to life satisfaction and job performance.

6.1.8. Skill definitions: are we talking about the same concepts?

Some SES are defined differently across the SEL literature (Section 4) and the outcome research (Section 5) – sometimes the same term is used to describe different skills or different terms are employed to describe the same skill. Another set of SES is simply lacking evidence. Table 9 displays the full list of skills with diverging definitions across the two literature strands and / or the SSES framework, as well as the skills for which no evidence was identified. The lack of evidence may reflect a lack of research examining these skills or a predominance of null findings.

Table 9. Skills with diverging definitions and lack of evidence

Diverging / lack of definitions	No evidence identified
• Achievement motivation	• Critical thinking (on predictive value)
• Assertiveness	• Curiosity (on teachability and predictive value)
• Creativity	• Energy (on teachability and predictive value)
• Emotional control	• Metacognition (on predictive value)
• Metacognition	• Tolerance (on predictive value).
• Optimism	
• Responsibility	
• Self-control	
• Tolerance	
• Trust.	

6.1.9. Task performance

Several skills within the task performance domain are particularly prone to the jingle-jangle fallacy. For example, while the SSES framework considers self-control and emotional control as belonging to two separate domains, their definitions often overlap across studies. In addition, from the assessment perspective, a clear distinction between purely cognitive processes (e.g. executive functions) and social and emotional processes is lacking. In addition, unlike in the SSES framework, most studies focusing on emotional control include positive emotions. Nevertheless, it must be acknowledged that these skills tend to work together in real life settings.

Persistence, achievement motivation, assertiveness and grit are another set of related constructs for which both the evidence on teachability and life outcomes should be analysed cautiously. A large amount of literature has explored the distinction between the three constructs (Credé, Tynan and Harms, 2017[268]). Specifically, a lack of agreement on definitions makes the evidence on their teachability less clear. In the life outcome literature, persistence, achievement orientation and assertiveness describe an inclination towards goal achievement, which is also one of the dimensions of grit. However, in the SEL literature, assertiveness is not synonymous with persistence and achievement orientation as it exclusively refers to the ability to exert social influence.

There is some evidence that achievement motivation is teachable, at least in academic contexts. However, its teachability may depend on a specific definition of the construct as

they differ significantly within the SEL literature. In addition, the amount of evidence for achievement motivation's relation to life outcomes may be understated given that its definition overlaps with assertiveness and persistence.

There is moderate evidence that responsibility is teachable. Nevertheless, it is defined differently across the two literature strands. The SEL literature refers to it as recognising and accepting responsibility for one's own actions (EASEL Lab, 2023[133]; Jones et al., 2021[69]), while in the outcome research it appears only in one study as a combination of impulsiveness, despondency and apprehensiveness. Since these terms are conceptually related to self-control, energy and optimism the evidence on the predictive value of responsibility is discarded.

6.1.10. Open-mindedness

A few skills within the open-mindedness domain are defined differently across the two literature strands. For instance, the SEL literature offers a broad definition of tolerance including respect for differences across several characteristics, while the OECD 2015 definition exclusively emphasises cultural diversity. In addition, the evidence regarding teachability of tolerance is moderate, while no studies focusing on the predictive value of tolerance were identified.

Moreover, some evidence supports the notion that creativity is teachable. This skill has been related to various other constructs, such as critical thinking or problem-solving (Wechsler et al., 2018[269]), creating a conceptual confusion. Creativity could be seen as an umbrella term encompassing various narrower skills, or as an ensemble of strategies supported by different processes. For this reason, aggregated evidence should be taken cautiously. In addition, in the review on predictive value, this construct appears only in one study. This could either be due to a limited number of search keywords or reflect a general lack of evidence on creativity's relation to key life outcomes.

6.1.11. Emotion regulation

In the SEL literature, optimism is related to self-esteem, while the evidence for its teachability is very limited. However, in the outcome research, it is conceptualised as a general positive attitude towards the future and it is shown to be positively associated with subjective labour market and health outcomes.

6.1.12. Collaboration

According to the OECD and the SEL literature, assuming that other people have good intentions is a key aspect of trust. Moreover, the level of evidence for trust's teachability is moderate. However, in the outcome research, trust appears in only one review article where it is shown to be predictive of job performance but is not defined.

6.1.13. Other skills

Metacognition relates to many similar terms (self-reflection, self-awareness, self-concept, self-knowledge), that are not clearly distinguished in the SEL literature. To add to the confusion, metacognition overlaps with more general cognitive processes that are not solely related to social and emotional contexts.

7. Conclusion

This paper has made several key conceptual and empirical contributions to better understanding social and emotional skills. Firstly, it reviewed and responded to common criticisms concerning the SSES framework. Specifically, it argued that while the Big Five model's validity in specific cultural contexts is still discussed, it can act as a valid and general framework for organising SES. In addition to the skills from the SSES framework, evidence on seven more skills (metacognition, critical thinking, emotional intelligence, grit, self-awareness, social problem-solving, and perspective-taking) was considered to ensure the comprehensiveness of empirical reviews on teachability and predictive value of SES.

Secondly, this paper introduced several novelties to the conceptual work underpinning the OECD's work on SES. An important departure is shifting the focus from malleability to teachability. Teachability should matter more to the education community as it describes skill changes arising specifically from intentional efforts of educators and instructors. Aiming to grapple with the jingle-jangle fallacy, SES' definitions were compared across the SEL literature, outcome research and SSES past publications. This should help to ensure rigour when interpreting evidence on SES' predictive value and teachability as well guide future research in the field. Moreover, the SES definition was updated to include maximal behaviour, thereby separating SES from personality traits.

Thirdly, this paper presented extensive and up-to-date evidence on SES' teachability and predictive value. The review on teachability showed that SES are generally teachable across different age groups, school settings and national contexts. Nevertheless, not all SES are clearly teachable. Evidence is robust for 12 of the 23 skills but moderate, limited or unclear for 11 of them. Empathy, metacognition, co-operation, self-control, assertiveness, stress resistance, emotional control, social problem-solving and self-efficacy appeared as the most teachable skills.

Similarly, different skills are related to different life outcomes. It was shown that self-control and self-efficacy / locus of control are the most important skills as they are related to academic, labour market, quality of life and societal outcomes. In addition, emotional intelligence appears to predict all types of outcomes (except societal outcomes), while social problem-solving is particularly important for health and prosocial behaviour, and empathy for civic engagement. However, these skills should not be seen as the sole determinants of individual success and societal well-being. Socio-economic status, key life outcomes and SES are mutually reinforcing and thereby should be considered together in SEL interventions. In addition, the lack of evidence for critical thinking, curiosity, energy, metacognition, tolerance and grit should not be interpreted as proof that they do not matter. The lack of evidence may result from these skills receiving considerably less attention from educators and researchers.

Lastly, self-control, locus of control and self-efficacy, emotional intelligence (likely a composite of several SES), social problem-solving, empathy, assertiveness and co-operation were identified as the skills with the highest level of evidence of both teachability and predictive value.

Combined, the findings of this paper identify key conceptual and empirical weaknesses in current research, highlight which SES matter for educators and policy makers, and provide a robust basis for the measurement work involved in producing direct assessments of SES.

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Annex A

Detailed methodology for Section 4: Review of meta-analyses

The method for the search progressed as follows. The search terms fell into three categories which were combined with each other in various ways. The first was "social and emotional learning", "socio-emotional learning", "social and emotional skills", "employability skills", "soft skills", "21st century skills" and "life skills". The second was "intervention", "impact", "effectiveness", "malleability", "evaluation", "program"/"programme" and "review". The third, which was only used in more general searches, was "malleability", "plasticity" and "teachability". Filters were applied to locate "reviews only" and published from 2015 onwards.

A total of 739 titles were screened, followed by 220 abstracts. 118 articles were then skimmed (introductions, headings, tables) along with an additional 32 articles located through citation chaining or in searches for other sections of this paper. Reviews that focused on mental health, violence prevention or well-being initiatives or interventions targeted at sub-groups were excluded. Reviews that focused on mental health, violence prevention or well-being initiatives or interventions targeted at sub-groups were excluded. 18 final articles were left. Three of the these did not focus on in-school interventions or students' social and emotional outcomes. These were kept for background information, leaving 15 total for main analysis.

Detailed methodology for Table 5 and Section 4:

The review in Section 4 that produced Table 5 occurred in three phases, as follows.

Phase 1: Identifying interventions

1. Reviews of multiple SEL programmes were used for reasons of efficiency and rigour. These evaluations had already conducted the necessary "leg work" of identifying programmes and reviewing the quality of their effectiveness studies. They also systematically described each intervention.

    7. The criteria for compilation inclusion were:

    - more than 20+ individual SEL interventions

    - distinct descriptions and reporting for each intervention

    - evaluation studies reported for each intervention, including number of studies and their methodologies (randomised control trial, quasi-experimental)

    - summary of findings of each study

    - reported in English

    - published in 2015 or later.

    8. First, compilations were identified through citation chaining in reviews identified for Section 3. This included systematic reviews, meta-analyses and evidence reviews by think tanks or foundations. This produced 3 compilations that met the criteria in Step 2 (Jones et al., 2021[69]; Grant et al., 2017[71]; Clarke et al., 2015[98])

9. Second, Google Scholar, Scopus and ERIC database were searched. These did not produce any results for these types of compilations (searches yielded meta-analyses, systematic reviews or studies of individual programmes). Consequently, Google Search was used to identify a) online databases of interventions websites of SEL-related organisations and b) compilation reports missed in Step 3. The results were:

- One online database was identified that met the criteria in Step 2 (The "Program Guide" from CASEL (2023[70]).

- Two reports were identified that discussed the malleability of particular SES using experimental evidence rather than interventions (Gutman and Schoon, 2013[73]; Lamb, Maire and Doeke, 2018[90]).

10. Finally, Steps 1-4 revealed geographic gaps, since the compilations and databases focused on programmes in the United States and United Kingdom. Sources were supplemented by meta-analyses and systematic reviews identified for Section 3 that a) studied non-Anglophone countries and regions and b) systematically identified and discussed specific interventions. These were:

- Two additional reviews (Kim, Lim and An, 2022[105]; Fernández-Martín et al., 2021[114])

- Two reports that did not meet the criteria above but gave an overview of SEL-related policies and programmes in the EU (Cefai et al., 2018[72]) and interventions in the US and Sweden (Belfield et al., 2015[131]).

11. A forthcoming OECD review of 21st century competencies was recommended by experts and included (OECD, Forthcoming[55]).

Phase 2: Mapping SSES framework onto existing intervention frameworks

Phase 2 of Section 4's review used ExploreSEL to analyse the exact definitions of SSES skills and compare these to CASEL and other frameworks. This was done to mitigate the "jingle-jangle fallacy" and ensure that, when reviewing SEL programme evaluations, we know they are targeting the same skills as SSES.

The Ecological Approaches to Social and Emotional Learning (EASEL) Lab at Harvard University has created a detailed taxonomy and mapping of 40 SEL frameworks, publicly available on their ExploreSEL website. This mapping includes the SSES framework. EASEL identifies six overarching domains, 22 sub-domains and over 100 specific skills across the various frameworks.

ExploreSEL supports effective comparison by providing detailed checklists of sub-domain components, so that the specific interpretations of skills can be accurately compared across frameworks. For example, "Responsibility" appears in the SSES and in CASEL frameworks. However, the OECD 2015 definition from SSES emphasises keeping commitments to others, such as finishing assignments on time. It does not explicitly address planning skills or broader, ethical senses of "taking responsibility for one's actions", as CASEL does.

In this phase, the mapping occurred as follows:

1. The OECD 2015 definitions of SES that supplied the definitions for the SSES framework were mapped onto EASEL's six SEL domains and 22 sub-domains, using the mapping tool on ExploreSEL's website (EASEL Lab, 2023[133]). This allowed for SSES skills to be compared to the 40 other frameworks included in ExploreSEL's taxonomy. Additionally,

the SSES Round 2 student assessment instrument were consulted to help check the SSES interpretations. These instruments are the most recent iteration of the SSES framework.

12. SSES was also compared with the taxonomies of Schoon (2021[17]) and Casillas et al (2022[270]), but these are general and thus not appropriate for the detailed skill mapping required for this task.

13. The SSES skills were mapped onto CASEL in addition to ExploreSEL's own domains.

Phase 3: Identifying evidence of the teachability/malleability of SSES skills

The analyses and mapping from Phase 2 were then used to identify interventions from Phase 1 that explicitly target SSES skills. The Phase 2 analysis helped ensure precise alignment and avoid unintended "jingle-jangle fallacies", in which interventions do target SSES skills but call them something else, or they target seemingly related skills that do not, in fact, align to theOECD definitions. For example, while many interventions target "Responsible decision-making" per CASEL and this overlaps somewhat with SSES's skill of "responsibility", the overlap is not complete. Some interventions define "responsibility" quite differently to SSES – and thus their evidence base is less relevant for determining the teachability of "responsibility" as SSES defines it.

1. SEL interventions that explicitly targeted SSES-aligned skills were identified in the programme compilations and sources from Phase 1. Qualifying programmes were:

   • school-based programmes targeting ages 5 and up

   • had at least one RCT or QE evaluation with student-focused outcomes

   • had outcome evidence sufficiently detailed to map onto the SSES skills.

14. The terminology used for evaluation outcomes was coded and mapped onto SSES skills. This was because it often differed from the SSES skills or skills targeted in the interventions and was often broader. The coding was determined using ExploreSEL's taxonomy and standard definitions of terms (e.g. "hostile attribution bias"). Key coding terms are listed below.

Table 10: Key SEL evaluation terms and their coded SSES skill match

Terms/phrases in evaluations	SSES skill match
Hostile attribution bias	Trust
Attention/inhibitory control	Self-control
Trustworthiness	Responsibility
Prosocial skills	Co-operation
Resistance to bullying/reduced victimisation	Assertiveness (provided sufficient details are given)
Emotional self-expression	Assertiveness
Reduced aggression / externalising behaviour / emotional regulation	Emotional control
Reduced anxiety/ depressive symptoms/ emotional dysregulation/ internalising symptoms	Stress resistance
Coping skills	Stress resistance
Reduced social withdrawal	Sociability
Improved self-concept/image	Optimism (depending on details)
Positive affect	Optimism (depending on details)

Academic motivation	Achievement motivation
Mastery skills	Achievement motivation
Emotional literacy / Emotional knowledge	Emotional intelligence
Perspective-taking	Theory of mind
Self-esteem, self-worth, self-competence, confidence	Self-efficacy
Emotion identification	Self-awareness, Emotional intelligence
Emotional understanding	Self-awareness, Emotional intelligence
Self-regulation	Self-control, Emotional control, Metacognition
Social information processing	Social problem solving, Theory of mind, Emotional Intelligence
Formulation of prosocial goals	Co-operation, Social problem solving
Improved social contact	Sociability
Goal setting (social or academic)	Metacognition
Improved decision-making	Metacognition
Improved communication	Co-operation, Social problem-solving

15. Strength of teachability evidence for each SSES skill was determined using the ranking below. These rankings were based on the evidence standards set the by the compilation authors. The criteria consider:

- the quality and quantity of the effectiveness evidence
- the scope of programme impact
- durability of impact (follow-up effects).

The ranking criteria for **Table 5** are listed in the introduction to the table.

Annex B

This table presents an overview of the major meta-analyses of the effects of "universal school-based" (USB) SEL interventions conducted since 2015. It also includes, for comparison, the findings of Durlak et al. (2011[99]) meta-analysis, which is often cited in policy circles (Cipriano et al., 2023[97]). This table results from a systematic search of 118 papers using Scopus and Google Scholar databases (see Annex A for methodology).

Table 11: Overview of recent meta-analyses of universal school based SEL interventions (2015-2022)

Review	Number and location of studies[1]	Age range	Date range of primary studies	Type of intervention	Criteria for selection of studies or interventions[2]	Timing of outcome measure	Main outcomes and effect sizes (ES)	Notes on evidence
Boncu et al. (2017[101])	37 (n/r)	3-18	2008-2015	Not reported	English or Spanish articles. Studies included control group. Studies included 1+ intervention specific to SEL.	Post	Total positive ES 0.31, with largest effects on SES (ES 0.36) and externalizing problems (ES 0.37), followed by prosocial behaviour (ES 0.20), attitudes (ES 0.19), and internalising problems (ES 0.17). Effects were significantly larger for ages 3-12 compared to 13-18.	Age was a significant moderator, with moderate effect sizes for ages 7-12 (ES 0.38) and 3-6 (ES 0.31), but statistically insignificant for ages 13-18 (ES 0.13). Heterogeneity was low for ages 3-6, suggesting other moderating factors.

Review	Number and location of studies[1]	Age range	Date range of primary studies	Type of intervention	Criteria for selection of studies or interventions[2]	Timing of outcome measure	Main outcomes and effect sizes (ES)	Notes on evidence
Cipriano et al. (2023[97])	258 (53 countries)	5-17	2008-2020	Universal school-based	Studies must address one or more intrapersonal and interpersonal skills. RCT or QE design and control group. Involved 6+ sessions if classroom based and 4+ months for whole school.	Mix of post and follow-up 6+ months	SEL skills (ES 0.22), positive attitudes (ES 0.21), prosocial behaviour (ES 0.18), externalizing behaviour (ES 0.16), civic attitudes (ES 0.26), peer relationships (ES 0.22), emotional distress (ES 0.14), school functioning (ES 0.12) and school climate (ES 0.29). Disciplinary outcomes (ES 0.18), family relationships (ES 0.06) and physical health (ES 0.16) were not significant. Positive effects sustained at least 6 months for SEL skills, attitudes, peer relationships and reduced emotional distress and externalizing behaviour.	252 different SEL interventions were assessed. 47 (11%) reported follow-up data. 233 assessed in country of origin. Programs that met SAFE criteria, had high quality implementation, were delivered by classroom teachers, focused on school climate, used a multicomponent approach, taught intrapersonal skills first, and integrated SEL into academic content, and those studies with high quality designs, differentially improved student's skills, attitudes, beliefs, and academic outcomes.
Corcoran et al. (2018[271])	40 (USA with 1 exception)	5-18	1998-2015	Universal school-based	Studies must address 1+ of the SEL domains. RCT design with pre- and post-test.	Post	SEL had a positive effect on reading (ES 0.25), maths (ES 0.26), and (though small) science (ES 0.19). Mean effect size for quasi-experimental studies was larger, though non-significant, than that for randomised studies for reading and mathematics.	No significant difference between high and low socio-economic groups for reading or maths; no significant difference between high- and low-intensity programmes for reading or maths; larger studies produced smaller effect sizes than smaller studies for maths (probably related to fidelity issues with the larger studies)

Review	Number and location of studies[1]	Age range	Date range of primary studies	Type of intervention	Criteria for selection of studies or interventions[2]	Timing of outcome measure	Main outcomes and effect sizes (ES)	Notes on evidence
Durlak et al. (2011[99])	213 (USA)	3-18	1955-2007	Universal school-based	Studies included control group. Emphasised at least one SE domain per CASEL. Targeted students without identified learning problems or adjustments.	Post + follow-up 6+ months	SEL skills (ES 0.57), positive attitudes (ES 0.23), prosocial behaviour (ES 0.24), academic achievement (ES 0.27), reduction in conduct problems (ES 0.22) and emotional distress (ES 0.24). Positive effects sustained at least 6 months. Effective for all children including children from ethnic minorities and low socio-economic status.	SAFE approach. Quality implementation had larger effects. Teacher implementation: no need for external staff.
Durlak et al. (2022[100])	523* (n/r, "worldwide")	3-18	1955-2018	Universal school-based	Review of meta-analyses. Interventions focus on 1+ SES, with separate analysis for universal school-based ones. Primary studies use RCT or QE design.	Mix of post and follow-up 6+ months	Post-test outcomes were positive but with a wide range, depending on study: SES (ES 0.15-0.70), attitudes (ES 0.17-0.93), conduct problems (ES 0.11-0.39), prosocial behaviour (ES 0.20-0.39), emotional distress (ES 0.10-0.42) and academic performance (ES 0.18-0.46). Follow-up effects were positive but smaller, with largest effects for academic performance (ES 0.26-0.33) and SES (ES 0.07-0.26) and effects ranging ES 0.12-0.20 for other measures.	Not all main effects were statistically significant for all studies. Furthermore, comparison between studies yielded inconsistent results on most moderating factors. These included sociodemographic factors (e.g. ethnicity, gender), implementation and programme elements, and social-ecological variables like country. Only student age showed consistent larger effects for younger children.

Review	Number and location of studies[1]	Age range	Date range of primary studies	Type of intervention	Criteria for selection of studies or interventions[2]	Timing of outcome measure	Main outcomes and effect sizes (ES)	Notes on evidence
Goldberg et al. (2019[103])	45 (20 USA + Australia, Austria, Belgium, Canada, Finland, Hong Kong, New Zealand, Norway)	4-16	1998-2017	Universal school-based with whole-school approach	Studies use RCT or QE design with control group. Interventions focused on reducing problem behaviours through SES development.	Post	Significant but small improvements in participants' social and emotional adjustment (ES 0.220), behavioural adjustment (ES 0.134), and internalising symptoms (ES 0.109). No impact on academic achievement.	Inclusion of community component were significant moderators. Interventions in the US had higher ES than those in other countries (0.45 vs. 0.12). Studies of weaker quality reported greater effects than "good" quality studies.
Kim, Lim and An (2022[105])	22 (South Korea)	3-18	Up to 2020	Curricular and extra-curricular	Interventions assess CASEL competencies.	Mix of post and follow-up	Positive effect sizes showed ES 0.32 for SES overall. Largest ES reported for social awareness (0.58) followed by academic skills (0.32), responsible decision-making (0.31), self-control (0.29), self-awareness (0.25) and relationship skills (0.20). Group composition was significant moderator. Inclusive groups mixing students with and without disabilities had larger ES (0.58) than only students without disabilities (0.32)	7/22 studies had no control group. High variation in study quality. Significant moderators were the length and number of sessions, but not student age or curricular/extra-curricular format.
Rowe & Trickett (2018[115])[3]	117 (USA)	5-18	1955-2007	Universal school-based	Studies included control group. Emphasised 1+ SES. Excluded studies targeting students with pre-existing problems.	Post	41 out 117 studies conducted moderation analysis by sub-group. Either alone or in combination, 37 studies (90%) analysed by gender, eight (20%) by ethnicity, three (7%) by socio-economic status, three (7%) by disability. 19 out of 50 moderation tests were significant on 1+ outcome. Only 13 moderation tests were explained.	Analysis focused on sub-group representation in Durlak et al. (2011) data, hence no effect sizes. For all groups except disability, results split evenly between significant and null findings.

Review	Number and location of studies[1]	Age range	Date range of primary studies	Type of intervention	Criteria for selection of studies or interventions[2]	Timing of outcome measure	Main outcomes and effect sizes (ES)	Notes on evidence
Taylor et al. (2017[102]) [3]	82 (44 USA, 38 other)	5-18	1981-2014	Universal school-based	Each included intervention had to target at least one of the five CASEL competency domains	Follow-up 6+ months	Experimental participants showed significant impact. Mean ES were social and emotional skills (.17), improved attitudes (.17), better academic performance (.22), less emotional distress (.12) and reduced drug use (.12) Positive effects persisted at follow-up, with strong effects for academic achievement (.33, 13% improvement at 3.8 years post) and weakest for attitudes and prosocial behaviour (.13, 5% improvement at 1.5-2 years post)	89% of the interventions were rated as having sequenced, active, focused, and explicit (SAFE) practices (Durlak et al., 2011).
Van de Sande et al. (2019[106])	40 (10 USA, Australia, Canada, China, Germany, Netherlands, New Zealand, Portugal, Spain, Sweden, Taiwan, UK)	11-19	2014-2018	Universal school-based	Studies in Dutch, German and English. Interventions targeted 2+ SEL competencies per CASEL. Studies used RCT or QE design.	Post	Significant positive effects for all SEL domains, with largest being social awareness (ES 0.58) and self-awareness (ES 0.42), followed by self-management (ES 0.39), decision-making (ES 0.34) and relationship skills (ES 0.24). Positive effects for psychosocial measures: substance use (ES 0.39), aggression (ES 0.33), depression (ES 0.31) and anxiety (ES 0.27).	Although self-management and relationship skills are often core foci of programmes, studies showed largest effects on other domains. Not all studies reported on all measures, and only few studies assessed measures that were targeted.
Wiglesworth et al. (2016[104])	89 (n/r)	4-18	1995-2013	Universal school-based	Intervention focused on 1+ SEL competency defined by Denham (2005). Study included control group.	Mix of post and post and follow-up 6+ months	SEL skills (ES 0.53), prosocial behaviour (ES 0.33), academic achievement (ES 0.28), reduction in conduct problems (ES 0.28) and emotional distress (ES 0.19). Impact on attitudes not significant.	Studies conducted in 'real-world' settings showed weaker effects. Involvement of intervention developers was not statistically significant. Studies implemented outside country of development showed weaker effects.

Review	Number and location of studies[1]	Age range	Date range of primary studies	Type of intervention	Criteria for selection of studies or interventions[2]	Timing of outcome measure	Main outcomes and effect sizes (ES)	Notes on evidence

Note: [1] n/r = locations not reported; [2] Only studies in English unless otherwise reported; [3] These analyses re-examine the studies from Durlak et al.'s (2011[99]) with new focuses.

* Durlak et al. (2022[100]) is a review of reviews, combing results from 12 meta-analyses.

Annex C

Table 12: Detailed version of Table 5 with corresponding ExploreSEL terms, countries of evaluation and recommended SEL programmes

OECD domain	Sub-domains (skills)	Corresponding ExploreSEL sub-domains	OECD definition[1]	Evidence of teachability	Number of interventions with aligned significant outcomes[2]	Number of countries where relevant interventions have been evaluated[3]	Evidence of significant follow-up effects (1 year<)[4]	School level for which evidence exists[5]	Top SEL programmes (incl. primary and secondary school)
Task performance	*Self-control*	Attention control, Inhibitory control	Able to avoid distractions and sudden impulses and focus attention on the current task in order to achieve personal goals.	Very high	31	Australia, Belgium, Brazil, Canada, Chile, Estonia, Germany, Iran, Ireland, Jamaica, Lebanon, Netherlands, Norway, Portugal, Sweden, South Korea, Spain, Turkey, United Kingdom, USA	Yes	Primary, lower secondary, upper secondary	4Rs, Good Behavior Game (PAX), PATHS, Positive Action, Second Step
	Persistence	Performance values	Able to persevere in tasks and activities until they get done	High	10	Australia, Canada, Germany, Norway, USA	Yes	Primary, lower secondary	Connect With Kids, Second Step, Social Skills Improvement System (SSIS)

OECD domain	Sub-domains (skills)	Corresponding ExploreSEL sub-domains	OECD definition[1]	Evidence of teachability	Number of interventions with aligned significant outcomes[2]	Number of countries where relevant interventions have been evaluated[3]	Evidence of significant follow-up effects (1 year<)[4]	School level for which evidence exists[5]	Top SEL programmes (incl. primary and secondary school)
	Responsibility	Performance values	Able to honour commitments and be punctual and reliable.	Moderate	8	Australia, Canada, Portugal, United Kingdom, USA	Yes	Primary, lower secondary	Positive Action, SSIS
Open-mindedness	*Curiosity*	Intellectual values	Interested in ideas and love of learning, understanding and intellectual exploration; an inquisitive mindset.	Unclear	0	n/a	n/a	n/a	n/a
	Tolerance	Empathy/ Perspective-taking, Emotional knowledge and expression, Intellectual values, Ethical values	Is open to different points of view, values diversity, is appreciative of foreign people and culture.	Moderate	7	Germany, Iran, Norway, USA	Yes	Primary, lower secondary, upper secondary	4Rs, Facing History and Ourselves, Connect With Kids
	Creativity	Intellectual values	Generates novel ways to do or think about things through exploring, learning from failure, insight and vision.	Unclear	0	n/a	n/a	n/a	n/a

OECD domain	Sub-domains (skills)	Corresponding ExploreSEL sub-domains	OECD definition[1]	Evidence of teachability	Number of interventions with aligned significant outcomes[2]	Number of countries where relevant interventions have been evaluated[3]	Evidence of significant follow-up effects (1 year<)[4]	School level for which evidence exists[5]	Top SEL programmes (incl. primary and secondary school)
Engaging with Others	*Sociability*	Prosocial/Cooperative behaviour	Able to approach others, both friends and strangers, initiating and maintaining social connections.	Limited	4	Canada, United Kingdom, USA	No	Primary, lower secondary	Al's Pals, Making Choices, Success for Kids
	Assertiveness	Emotional knowledge and expression, Prosocial/Cooperative behaviour	Able to confidently voice opinions, needs, and feelings, and exert social influence.	Very high	28	Australia, Austria, Brazil, Canada, Chile, Finland, Germany, Iran, Jamaica, Lebanon, Norway, Spain, South Korea, Turkey, United Kingdom, USA	Yes	Primary, lower secondary, upper secondary	4Rs, Lion's Quest: Adolescence, PATHS, Responsive Classroom, Second Step, SSIS
	Energy	Enthusiasm/Zest	Approaches daily life with energy, excitement and spontaneity.	Unclear	0	n/a	n/a	n/a	n/a
Collaboration	*Empathy*	Empathy/ Perspective-taking, Prosocial/Cooperative behaviour	Understands and cares about others, and their well-being. Values and invests in close relationship	Very high	19	Australia, Canada, Finland, Germany, Iran, Norway, Portugal, Spain, United Kingdom, USA	Yes	Primary, lower secondary	4Rs, Facing History and Ourselves, KiVa, MindUP, RULER, Second Step, SSIS
	Trust	Prosocial/ Cooperative behaviour, Ethical values	Assumes that others generally have good intentions and forgives those who have done wrong	Moderate	7	Iran, South Korea, United Kingdom, USA	Yes	Primary	4Rs, Lion's Quest: Elementary, Making Choices, PATHS

OECD domain	Sub-domains (skills)	Corresponding ExploreSEL sub-domains	OECD definition[1]	Evidence of teachability	Number of interventions with aligned significant outcomes[2]	Number of countries where relevant interventions have been evaluated[3]	Evidence of significant follow-up effects (1 year<)[4]	School level for which evidence exists[5]	Top SEL programmes (incl. primary and secondary school)
Emotional Regulation	*Co-operation*	Prosocial/ Co-operative behaviour	Lives in harmony with others and values interconnectedness among all people.	Very high	42	Australia, Austria, Belgium, Brazil, Canada, Chile, Estonia, Germany, Iran, Ireland, Jamaica, Lebanon, Netherlands, Norway, Portugal, Sweden, South Korea, Spain, Turkey, United Kingdom, USA	Yes	Primary, lower secondary, upper secondary	4Rs, PATHS, Positive Action, Responsive Classroom, RULER, Second Step, SSIS, Zippy's Friends
	Stress resistance	Emotional and behavioural regulation	Effectiveness in modulating anxiety and able to calmly solve problems (is relaxed, handles stress well).	Very high	26	Australia, Canada, Finland, Germany, Jamaica, Iran, Ireland, Norway, Portugal, South Korea, Turkey, United Kingdom, USA	Yes	Primary, lower secondary	4Rs, b Mindfulness Programme, MindUP, PATHS, Responsive Classroom, Second Step, Zippy's Friends
	Optimism	Optimism	Positive and optimistic expectations for self and life in general.	Moderate	8	Canada, Jamaica, Portugal, Turkey, United Kingdom, USA	Yes	Primary, lower secondary	Girls on the Run, The Incredible Years, MindUP, Positive Action

OECD domain	Sub-domains (skills)	Corresponding ExploreSEL sub-domains	OECD definition[1]	Evidence of teachability	Number of interventions with aligned significant outcomes[2]	Number of countries where relevant interventions have been evaluated[3]	Evidence of significant follow-up effects (1 year<)[4]	School level for which evidence exists[5]	Top SEL programmes (incl. primary and secondary school)
Additional SSES skills	***Emotional control***	Emotional and behavioural regulation	Effective strategies for regulating temper, anger and irritation in the face of frustrations.	Very high	38	Australia, Belgium, Brazil, Canada, Chile, Estonia, Germany, Iran, Ireland, Jamaica, Lebanon, Netherlands, Norway, Portugal, Sweden, South Korea, Spain, Turkey, United Kingdom, USA	Yes	Primary, lower secondary, upper secondary	4Rs, Good Behavior Game (PAX), PATHS, Positive Action, Violence Prevention Project (The Leadership Program)
	Achievement motivation	Performance values	Sets high standards for oneself and works hard to meet them.	High	12	Australia, Canada, Finland, Ireland, Norway, United Kingdom, USA	Yes	Primary, lower secondary	KiVa, Positive Action, SSIS, Zippy's Friends
	Self-efficacy	Self-efficacy/ Growth mindset	Beliefs in one's capabilities to mobilise the motivation, cognitive resources, and courses of action needed to meet given situational demand	Very high	20	Australia, Finland, South Korea, United Kingdom, USA	Yes	Primary, lower secondary, upper secondary	Friends: Girls on the Run; KiVa; Positive Action; Responsive Classroom; SPARK (Speaking to the Potential, Ability & Resilience inside every Kid)

OECD domain	Sub-domains (skills)	Corresponding ExploreSEL sub-domains	OECD definition[1]	Evidence of teachability	Number of interventions with aligned significant outcomes[2]	Number of countries where relevant interventions have been evaluated[3]	Evidence of significant follow-up effects (1 year<)[4]	School level for which evidence exists[5]	Top SEL programmes (incl. primary and secondary school)
Additional skills from literature	*Critical thinking*	Critical thinking	Thinking for yourself; grounding beliefs, attitudes, and values on a critical analysis through independent thought	Unclear	0	n/a	n/a	n/a	n/a
	Metacognition	Critical thinking	Awareness of inner processes and subjective experiences, such as thoughts and feelings, and possessing the ability to reflect on and articulate such experiences.	Very high	17	Australia, Brazil, Canada, Chile, Germany, Norway, Portugal, Spain, South Korea, Turkey, United Kingdom, USA	Yes	Primary, lower secondary, upper secondary	I Can Problem Solve, MindUP, Positive Action, RULER, Student Success Skills, SPARK
	Social problem-solving / Conflict resolution	Conflict resolution/Social problem-solving	Ability to identify and enact solutions to social life situations in an effort to resolve problems, conflicts and/or one's relation to these (Adrian et al., 2011[134])	Very high	33	Australia, Brazil, Chile, Germany, Iran, Jamaica, Lebanon, Norway, South Korea, Turkey, United Kingdom, USA	Yes	Primary, lower secondary, upper secondary	4Rs, I Can Problem Solve, PATHS, Positive Action, Social Decision-Making/Problem-Solving (SDM/PS)
	Emotional intelligence	Understanding social cues, Emotional knowledge and expression, Emotional and behavioural regulation, Empathy/ Perspective-taking	Ability to recognise one's own and others' emotions and to use emotional information to guide thinking and behaviour (Kankaraš, 2017[78])	High	14	Australia, Ireland, Norway, Spain, South Korea, United Kingdom, USA	Yes	Primary, lower secondary, upper secondary	Making Choices, PATHS, RULER, SSIS, Zippy's Friends

OCD domain	Sub-domains (skills)	Corresponding ExploreSEL sub-domains	OECD definition[1]	Evidence of teachability	Number of interventions with aligned significant outcomes[2]	Number of countries where relevant interventions have been evaluated[3]	Evidence of significant follow-up effects (1 year<)[4]	School level for which evidence exists[5]	Top SEL programmes (incl. primary and secondary school)
	Grit	Performance values	Persistence and passion for reaching long-term goals (Gutman and Schoon, 2013[73])	Unclear	0	n/a	n/a	n/a	n/a
	Perspective-taking / Theory of mind / Mentalizing	Empathy/ Perspective-taking	The ability to accurately perceive the thoughts, experiences and feelings of others and how these might differ from one's own (OECD, Forthcoming[55])	Moderate	9	Australia, Canada, Germany, Lebanon, Norway, United Kingdom, USA	Yes	Primary, lower secondary, upper secondary	Making Choices, Second Step, SSIS, SPARK

Notes: 1 - Definitions come from the SSES conceptual framework and the international report on Round 1 of the SSES (Chernyshenko, Kankaraš and Drasgow, 2018[10]; OECD, 2021[9]); (2 - This reports the number of SEL interventions with positive outcomes aligned to a given skill, out of a total 74 interventions reviewed from across the compilations. One intervention might have several positive outcomes aligned to several skills. 3 - This refers to all the evaluation countries for a relevant intervention, even if some of those evaluations do not measure the skill listed. For example, if intervention A was evaluated in three countries and one of those evaluations measured skill X, then all three countries are still counted for skill X, because intervention A was found to align with skill X. 4 - This includes any significant follow-up outcome for a relevant intervention, even if that follow-up outcome does not measure the corresponding skill. For example, if intervention A shows significant outcomes for skill X and any of A's evaluations showed any significant follow-up effects, then this column is marked "Yes" – regardless of whether the follow-up effect measures skill X. This was because precise follow-up outcomes were not always reported. 5 - School level: Primary school = ages 5-10 or grades Kindergarten-5; lower secondary = ages 11-15 or grades 6-10; upper secondary = ages 16-18 or grades 11-12.

Table 13. Definition of social and emotional skills in the outcome research

	Social and emotional skills	Definition
Task performance	***Achievement motivation***	Achievement motivation is defined as "the desire to do a task and achieve results, pursuing it with enthusiasm, determination, and autonomy" (Lippman et al., 2015, p. 95[187]), which is in line with the OECD definition: "Setting high standards for oneself and working hard to meet them" (Chernyshenko, Kankaraš and Drasgow, 2018, p. 111[10]).
	Persistence	Persistence is present only in one longitudinal study and is estimated using measures of "orientation towards goal achievement, rigorousness and meticulousness" (OECD, 2015, p. 50[6]). This definition seems to be broader than the OECD definition of persistence as "persevering in tasks and activities until they get done" (Chernyshenko, Kankaraš and Drasgow, 2018, p. 110[10]).
	Responsibility	Responsibility is present only in one longitudinal study of SES and is "estimated using measures of impulsiveness, despondency and apprehensiveness" (OECD, 2015, p. 48[6]). It does not match with the OECD definition of responsibility: "able to honour commitments, be punctual, and reliable" (Chernyshenko, Kankaraš and Drasgow, 2018, p. 110[10]), as the former encompasses aspects of self-control, energy and optimism.
	Self-control	Self-control describes "individual differences in the tendency to override proximal, sometimes more immediate, responses in favor of more distal, sometimes delayed, responses when the two conflict with each other" (Andrade and Hoyle, 2023, p. 1[222]). While it is consistent with the definition provided by the OECD, it overlaps with emotional control which is defined as "effective strategies for regulating temper, anger and irritation in the face of frustrations" (Chernyshenko, Kankaraš and Drasgow, 2018[10]). It may be conceptualised as both a state and a trait (Lian et al., 2017[210]).
Open-mindedness	***Creativity***	Creativity appears in only one review article and is defined as "Capacity to generate new ideas" (Sewell et al., 2023, p. 3[241]). This definition of creativity is narrower than the OECD definition, which emphasises "novel ways to do or think about things through exploring, learning from failure, insight and vision" (Chernyshenko, Kankaraš and Drasgow, 2018, p. 111[10]).
Engaging with others	***Assertiveness***	According to Wilmot and colleagues (2019[212]), assertiveness "reflects motivation for social status and leadership, and is theoretically linked to incentive reward sensitivity, which refers to a wanting for and drive toward desired objectives" (p. 3[212]). This definition partly overlaps with the OECD definition of assertiveness: "Able to confidently voice opinions, needs, and feelings, and exert social influence" (Chernyshenko, Kankaraš and Drasgow, 2018, p. 111[10]) and achievement motivation.
	Sociability	The OECD defines sociability as the ability "to approach others, both friends and strangers, initiating and maintaining social connections" (Chernyshenko, Kankaraš and Drasgow, 2018, p. 111[10]). In Wilmot and Ones (2022[213]), sociability is discussed as a facet of extroversion, but no definition is provided.
Emotion regulation	***Emotional control***	The OECD concept of emotional control is defined as "Effective strategies for regulating temper, anger and irritation in the face of frustrations" (Chernyshenko, Kankaraš and Drasgow, 2018[10]). Emotional control bears close resemblance to the concept of emotion reaction modification which is defined as "changing the quality, intensity and/or duration of an emotional response in

Social and emotional skills	Definition
	a desired direction with the help of strategies and other skills" (Andrés et al., 2017, p. 300[183]). However, unlike the OECD definition, emotional control encompasses the ability to change both positive and negative emotions.
Optimism	Optimism is generally defined as a mindset or a tendency "to think that good things will happen in the future" (Rozanski et al., 2019, p. 2[223]), which is fully consistent with the OECD definition. A subset of optimism, career optimism refers to the same tendency within the domain of personal career development (Eva et al., 2020[217]).
Stress resistance	According to the OECD, stress resistance refers to the "effectiveness in modulating anxiety and ability to calmly solve problems" (Chernyshenko, Kankaraš and Drasgow, 2018, p. 110[10]). This concept shares a high degree of conceptual overlap with distress or frustration tolerance which is defined as "persisting in an activity to achieve an objective despite an unpleasant emotional state" (Andrés et al., 2017[183]) and stress regulation defined as the "capacity to regulate anxiety, fear, and stress" (Sewell et al., 2023, p. 3[241]).
Co-operation	The OECD defines co-operation as "Living in harmony with others and valuing interconnectedness among all people" (Chernyshenko, Kankaraš and Drasgow, 2018, p. 110[10]), while Wilmot and Ones (2022[213]) consider it a facet of agreeableness but do not provide a definition.
Empathy	While the OECD defines empathy as a general care for others and their well-being, the reviewed literature distinguishes between negative empathy defined as "one's emotional reactivity toward the social or physical pain of others" (Aival-Naveh, Rothschild-Yakar and Kurman, 2019, p. 5[235]) and positive empathy defined as "sharing and understanding others' positive emotions" (Morelli, Lieberman and Zaki, 2015, p. 57[221]). In contrast to perspective taking, empathy focuses on feeling what others feel rather than merely understanding other people's emotional states. Just like mentalising, empathy consists of both trait (an overall capacity) and state (subject to temporary influences) features (Clark, Robertson and Young, 2019[219]).
Trust	The OECD defines trust as "Assuming that others generally have good intentions and forgiving those who have done wrong" (Chernyshenko, Kankaraš and Drasgow, 2018, p. 110[10]). In Wilmot and Ones (2022[213]), trust is discussed as a facet of agreeableness, but no definition is provided.
Locus of control	Locus of control has been introduced by Julian B. Rotter and refers to "a generalized attitude, belief, or expectancy regarding the nature of the causal relationship between one's own behaviour and its consequences" (Rotter, 1966, p. 2[272]). External locus of control means attributing life outcomes to external factors, while internal locus of control refers to one's own efforts (Cobb-Clark, 2015[203]). According to the author, while locus of control can be distinguished from self-efficacy as a general (rather than a domain specific) belief in one's ability, both concepts form a part of core self-evaluations – assessment of one's ability.
Self-efficacy	A classic definition of self-efficacy has been introduced by Albert Bandura – "an individual's judgement of their capabilities to organise and execute courses of action required to achieve desired performances" (Honicke and Broadbent, 2016, p. 64[165]). It is generally agreed that measures of self-efficacy should be domain specific since individuals' perceptions of their own abilities fluctuate across different tasks and domains (Zee and Koomen, 2016[216]). Accordingly,

Collaboration (row group label, left side spanning Co-operation, Empathy, Trust)

Other skills (row group label, left side spanning Locus of control, Self-efficacy)

Social and emotional skills	Definition
	analyses may focus on academic, coping, professional and other types of self-efficacies. In the OECD's longitudinal analyses of SES, self-efficacy is estimated using measures of "confidence in one's capacity to solve difficult problems when making efforts", "confidence in handling whatever comes in his/her way" and "confidence in dealing efficiently during unexpected events" (OECD, 2015, p. 50[6]). The latter measures conceptualise self-efficacy as a domain general construct and thus are closer to "locus of control".
Emotional intelligence	In terms of assessment methodology, two main streams of emotional intelligence can be distinguished: • Ability emotional intelligence – "the ability to regulate one's feelings and emotions, understand them, and use the information provided to guide actions" (Quílez-Robres, Moyano and Cortés-Pascual, 2021, p. 3[177]) • Self-report (trait) emotional intelligence – "an umbrella term that encompasses a constellation of personality traits, affect, and self-perceived abilities, rather than actual aptitude" (Joseph et al., 2015, p. 299[211]). Trait emotional intelligence can be considered a compound skill since it is made of different constructs such as self-control, self-efficacy, emotional control and sociability (Joseph et al., 2015[211]).
Grit	Grit is commonly defined as "perseverance and passion for long-term goals" (Duckworth et al., 2007, p. 1087[155]), corresponding to its two facets – "perseverance of effort" and "consistency of interests". In the OECD analyses of SES (OECD, 2015[6]), grit is not defined.
Self-awareness	Self-awareness and related terms such as self-concept and self-knowledge are defined as "the individual's understanding and perception of themselves" (Ferreira et al., 2022, p. 11[237]).
Social problem-solving	Krause and colleagues (2021[225]) adopt the following definition of social problem-solving: "the self-directed process by which individuals attempt to identify […] adaptive coping solutions for problems, both acute and chronic, that they encounter in everyday living" (p. 2[225]). The rest of the articles do not define social problem-solving.
Perspective taking / Theory of mind / mentalising	According to Imuta and colleagues (2016[257]), theory of mind is synonymous with the concept of perspective taking, specifically the ability to perceive what others see, think and feel (respectively, visual, cognitive and affective perspective taking). A conventional definition of theory of mind suggests that it's an "insight into other people's minds and reasoning about how mental states influence behaviour" (Imuta et al., 2016, p. 1192[257]). Another construct related to theory of mind is mentalising which is defined as an "imaginative mental activity that entails perceiving and interpreting human behaviour in terms of intentional mental states (e.g. needs, desires, feelings, beliefs, goals, purposes, and reasons)" (Asen and Fonagy, 2017, p. 8[273]). Mentalising can have both trait and state features as its level will depend on emotional arousal and interpersonal context. Given the conceptual closeness of mentalising, theory of mind and perspective taking, these skills are treated as synonymous.

Skills that are not part of the SSES framework

Annex D

Table 14. Predictive value of all social and emotional skills

Type of outcomes	Outcomes	Perspective-taking / Theory of mind / Mentalising	Social problem-solving	Grit	Persistence	Achievement motivation	Responsibility	Self-awareness
Academic outcomes	*Performance*	++	X	X	X	X	X	X
	Attainment, enrolment	X	X	0	+	X	X	X
Labour market outcomes	*Employment*	X	X	X	+	X	X	X
	Earnings	X	X	0	X	X	X	X
	Job performance	X	X	X	X	++	X	++
	Subjective outcomes	X	X	X	X	X	X	X
Quality of life outcomes	*Life satisfaction*	X	X	X	+	X	X	X
	Health	++++	++++	X	+	X	X	X
Societal outcomes	*Civic engagement*	+	X	X	X	X	X	X
	Antisocial behaviour	X	++++	X	X	X	X	++

Type of outcomes	Outcomes	Assertiveness	Sociability	Trust	Co-operation	Emotional control	Stress resistance	Creativity
Academic outcomes	*Performance*	X	X	X	X	++	++	X
	Attainment, enrolment	X	X	X	0	X	X	X
Labour market outcomes	*Employment*	X	X	X	X	X	X	X
	Earnings	X	X	X	X	X	X	X
	Job performance	+++	++	++	++	X	X	X
	Subjective outcomes	X	X	X	X	X	X	X
Quality of life outcomes	*Life satisfaction*	++	++	X	++	X	X	X
	Health	X	X	X	X	X	X	X
Societal outcomes	*Civic engagement*	X	X	X	X	X	+	X
	Antisocial behaviour	X	X	X	X	X	X	X

Note: **Very high (++++)** = Three review articles or at least seven primary studies all showing a positive or negative relationship; **High (+++)** = Two review articles or five to six primary studies all showing a positive or negative relationship; **Moderate (++)** = One review article or three to four primary studies all showing a positive or negative relationship; **Limited (+)** = One to two primary studies all showing a positive or negative relationship; **Unclear (X)** = Mixed findings – similar number of articles showing diverging relationships (null, positive or negative) or no articles identified; **Null (0)** = most studies indicating null findings.