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DISCUSSION PAPER SERIES

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Barbara Belfi
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ABSTRACT

The Importance of Socio-Emotional Skills for Multiple Life Outcomes and the Role of Education*

In this paper, we explore the interplay between personality traits, socio-emotional skills, and key life outcomes across education, employment, social connectedness, health, and civic participation. Drawing on a rich body of research, we highlight the significant impact of socio-emotional skills, as defined by the Study on Social and Emotional Skills (SSES) framework developed by the Organization for Economic Co-operation and Development (OECD), on various aspects of life. From academic achievement to job performance, social relationships, health indicators, and civic engagement, socio-emotional skills emerge as crucial predictors of success and well-being. Moreover, we examine the effectiveness of educational interventions in fostering socio-emotional skills, considering optimal timing and intervention strategies. Through meta-analyses and empirical studies, we uncover insights into the developmental trajectory of these skills and their malleability over time. These findings have profound implications for policymakers, practitioners, and researchers, emphasizing the importance of integrating socio-emotional skill development into educational curricula and broader societal initiatives. By aligning interventions with the OECD framework and adopting evidence-based practices, stakeholders can empower individuals to navigate life's challenges with resilience and thrive in an increasingly complex world.

JEL Classification: I20, I31

Keywords: socio-emotional skills, personality traits, education, interventions, life outcomes

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1. Introduction

Success in life extends beyond mere theoretical knowledge, cognitive ability, and offered opportunities. It is also deeply intertwined with socio-emotional skills. These encompass a person's capacity to manage emotions, foster and maintain social relationships, chase and realize aspirations, and draw lessons from experiences. Essentially, these skills stand apart from cognitive skills assessed by traditional achievement and intelligence tests (Duckworth & Jaeger, 2015) and are shaped by biological predispositions as well as environmental influences (De Fruyt et al., 2015). Moreover, they evolve through both formal and informal learning and play a pivotal role in determining various outcomes throughout one's life (Abrahams et al., 2019).

Socio-emotional skills have always been held in high regard. Take, for instance, Thomas Edison's insight from 1903: “Genius is 1% inspiration and 99% perspiration.” Fast forward to today, and we find policy makers and education officials placing an even greater emphasis on these skills. This enhanced focus is driven by a widespread recognition that today's multifaceted global challenges cannot be tackled by cognitive abilities alone. For example, the rapid increases in complexity of technological innovation’s means that people have to constantly adopt to new circumstances and learn new technical knowledge and skills to keep up to date. Due to the technological evolution, the primary focus of many occupations has shifted from technical expertise to socio-emotional aptitudes (Deming, 2017). As technology becomes increasingly adept at handling precise tasks, complex computations, and repetitive processes—areas where humans often encounter difficulties—the emphasis in numerous professions has pivoted towards enhancing creativity, communication, and interpersonal connections (Allen, Belfi, & Borghans, 2020; Autor, Levy, & Murnane, 2003; Borghans, Ter Weel, & Weinberg, 2008). Moreover, in a world characterized by rapid transformations and significant population migrations, there is a compelling need for robust communication and collaboration skills. To thrive in this environment, proficiency in socio-emotional skills is essential, although cognitive skills remain complementary (Deming, 2017). Due to their significance, socio-emotional skills have also been termed "the skills essential for navigating education and the workplace in the current century" (Brinkley et al., 2012).

This leads to the question what implications this has for schools. Education plays an important role in shaping an individual’s skills and knowledge. One of the primary theories that underscores the importance of education in developing skills and determining future outcomes is the Human Capital Theory, introduced by Becker (1962). The Human Capital Theory suggests that by attending school, individuals acquire essential skills and knowledge, equipping them for future challenges and opportunities. Traditionally, empirical research has focused on the impact of education on wages, but

the underlying theory recognizes a wider range of benefits. These include improved health, enhanced personal relationships, and further educational achievements.

Historically, human capital was predominantly linked with cognitive skills like mathematical ability and linguistic proficiency. However, later studies have emphasized the importance of non-cognitive skills, such as problem solving and communication (Heckman & Kautz, 2012). Heckman's research, for instance, underscored this shift. His study on the Perry pre-school program, an intervention to boost the cognition of children from disadvantaged families at pre-school, indicated that while the program initially seemed ineffective in enhancing the intended cognitive skills, it had a long-term impact on non-cognitive, socio-emotional skills (Heckman et al., 2010). Similarly, Heckman's work on the General Educational Development (GED), an alternative route to earning a high-school diploma for dropouts in which students don't attend school but instead prepare for an exam equivalent to a regular high school diploma, found that while GED recipients matched regular high school graduates in cognitive abilities, they fell behind in non-cognitive aspects. This lack of non-cognitive skills in GED recipients led to outcomes in their lives (such as employment opportunities, earnings, or social behaviors) that are more similar to those of high school dropouts, who also might lack these non-cognitive skills, rather than to those of regular high school graduates (Heckman & Rubinstein, 2001). Such findings accentuate that while cognitive skills are undoubtedly crucial, socio-emotional skills have an equally paramount role in determining future life outcomes.

To promote socio-emotional skills among their students, many schools and educational institutions have been starting to integrate specific socio-emotional learning (SEL) programs into their curricula. However, despite their growing popularity, there is still limited understanding of their actual effectiveness. There is also ongoing debate about which socio-emotional skills have the most profound impact on specific life outcomes. Furthermore, determining the optimal approach to weave these skills into the curriculum is an active area of research and innovation.

In this paper, we will offer more clarity about these issues by presenting an overview of the most recent literature on the links between socio-emotional skills, five crucial life outcomes (namely, school success, job performance, social connecters, health and civic participation) and the role of education. First, we will explore at the various definitions and classifications of socio-emotional skills. Next, we will investigate how they relate to the five key life outcomes. We will then examine the role of education in developing these skills. The paper will conclude with a comprehensive discussion and suggestions for future research.

2. *Socio-emotional skills: an overview of different paradigms and models*

Socio-emotional skills have been extensively studied across various fields, including psychology, economics, sociology, and education, and are recognized as playing a crucial role in essential life outcomes such as academic achievement, labour market success, health, social relationships, and overall well-being (Bleidorn et al., 2019; Kautz et al., 2014). While there is consensus on the broad domains of abilities related to socio-emotional skills, there exists significant variability in the specific terms, labels, and taxonomies used to define and categorize them. In recent years, terms such as "soft skills", "non-cognitive skills", "character skills", "21st-century skills", "employability skills", "non-routine skills", and "life skills" have all been employed to describe socio-emotional skills. Furthermore, numerous taxonomies and models have been developed, subdividing main skill domains into more specific sub-skills. The terminologies and classifications primarily used depend on the discipline and field. Although there is considerable overlap among these taxonomies, they differ in their labels, objectives, and scope. Below, we provide an overview of five prominent and well-established models. Some of these taxonomies also include parts of what we consider cognitive skills.

2.1. *The Collaborative for Academic, Social, and Emotional Learning skills taxonomy*

The Collaborative for Academic, Social, and Emotional Learning (CASEL, 2012) has proposed a five-factor model to distinguish between socio-emotional skills based on studies investigating the impact of development and interventions on various intrapersonal and social skills. The CASEL model has been established to articulate what students should know and do for academic success, civic engagement, health, and fulfilling occupational careers. The five core competencies of the CASEL model are: (a) Self-Awareness, or the ability to recognize one's emotions and accurately assess one's strengths and weaknesses; (b) Self-Management, or the ability to regulate thoughts, emotions, and behaviors; (c) Responsible Decision-Making, or the ability to make plans for the future, follow moral/ethical standards, and contribute to the well-being of others; (d) Social Awareness, or the awareness of culture, beliefs, and the feelings of the people and world around them; and (e) Relationship Skills, or the ability to effectively communicate, work well with peers, and build meaningful relationships.

2.2. *The Positive Youth Development framework*

The Positive Youth Development (PYD) framework (Lerner, Dowling & Anderson, 2019) has been developed based on direct observations of adolescents' behavior and development. This model primarily focuses on the dynamic nature of adolescent development and how it affects their socio-emotional functioning. Similar to the CASEL model, the PYD framework consists of five main factors,

often referred to as the Five C's. These are: (a) Competence, which refers to positive views and performance in social, academic, cognitive, health, and vocational domains; (b) Confidence, which refers to an overall sense of positive self-worth; (c) Connection, which refers to positive and reciprocal relationships with friends, family, school, and community members; (d) Character, which refers to acting within moral, societal, and cultural expectations; and (e) Caring, which refers to showing compassion to others. In this framework, the first factor Competence, reflects cognitive rather than socio-emotional skills.

2.3. The World Health Organization's Life Skills model

The World Health Organization (WHO, 2003) has also highlighted the socio-emotional skills that significantly impact life outcomes, referring to them as "life skills". The WHO defines life skills as the abilities or competencies for adaptive and positive behavior that enable individuals to manage the demands and challenges of everyday life effectively. These skills equip individuals to navigate various aspects of life, such as education, work, family, and health, and can be categorized into three overarching domains: (a) Cognitive skills; (b) Social skills, and (c) Negotiation skills. As such, the Life Skills model contains both cognitive skills and socio-emotional skills. Cognitive skills encompass the mental processes involved in solving problems, making decisions, and thinking critically and creatively. This domain includes the underlying skills of creativity, critical thinking, and decision-making. Social skills are necessary for effective communication, forming social relationships, self-awareness, and compassion, and consist of communication skills, interpersonal relationship skills, self-awareness, and empathy. Finally, negotiation skills pertain to an individual's ability to adapt to the needs of society. This domain includes coping with stress and managing emotions.

2.4. The Occupational Information Network classification of skills

Skills have also been defined and categorized through the identification by experts involved in the Occupational Information Network (O*NET) project (Peterson et al., 1997). This project was established with the primary goal of aligning specific job profiles with the necessary skills required. O*NET encompasses a comprehensive database containing information on 965 occupations, organized around a "content model". This model delineates occupations based on various dimensions, including worker characteristics (such as abilities, interests, work values, and work styles) and requirements (like skills, knowledge, and education). In addition to two cognitive ability-related domains of skills – Content skills, which encompass basic skills in reading comprehension, writing, mathematics, and science, and Technical skills, which include operations analysis, programming, installation, and repairing – the O*NET classification incorporates five socio-emotionally oriented

domains: (a) Processing skills, involving active learning, the application of diverse learning strategies, monitoring, and critical thinking; (b) Social skills, which encompass social perceptiveness and, more concretely, the ability to instruct, negotiate, persuade, and coordinate; (c) Resource management skills, referring to the management of time, as well as financial, material, and personal resources; (d) Systems skills, which include analyzing, judgment, decision-making, and evaluation skills; and (e) Problem-Solving skills, encompassing the identification and analysis of problems, alongside the development of varied solutions.

2.5. The OECD's Study on Social and Emotional Skills framework

The Study on Social and Emotional Skills (SSES) framework developed by the Organisation for Economic Co-operation and Development (OECD; Chernyshenko, Kankaraš, & Drasgow, 2018) is based on a well-known framework in the field of personality research, the Big Five model, providing a general outline of how socio-emotional skills should be structured. Although the Big Five model is dominant as a classification of personality traits, only recently the awareness is growing that this categorisation, with a skill rather than a traits interpretation, is very useful for socio-emotional skills. The SSES framework differs from the Big Five model in that it focuses more on specific lower-level skills underlying the five main factors. The SSES framework categorizes socio-emotional skills into the following five main domains, each associated with corresponding underlying skills: (a) Engagement with Others, aligned with the Big Five personality characteristic Extraversion, includes skills such as sociability, assertiveness and energy; (b) Collaboration, related to the Big Five characteristic Agreeableness, comprises skills such as empathy and trust; (c) Task Performance, linked to the Big Five characteristic Conscientiousness, encompasses skills like achievement, responsibility, self-control and persistence. (d) Emotion Regulation, associated with the Big Five trait Emotional Stability, includes skills such as stress resistance and emotional control; and (e) Open-Mindedness, connected to the Big Five trait Openness to Experience, consists of skills such as tolerance and creativity.

2.6. Towards a unifying framework for organizing socio-emotional skills

The above mentioned frameworks for categorizing socio-emotional skills, while diverse, share a common pursuit of understanding and improving human behavior and outcomes. The CASEL model, with its emphasis on academic success and civic engagement, tends to focus on skills that are directly applicable in educational and social contexts. The Positive Youth Development framework, meanwhile, closely aligns with the developmental aspects of adolescents, focusing on traits that foster growth and well-being during this critical period. The WHO's life skills approach broadens the scope to encompass everyday life challenges, emphasizing adaptability and positive behavior across various

life stages. The O*NET project, diverging somewhat from the others, approaches socio-emotional skills from an occupational perspective, linking them closely to job performance and workplace success. This approach underscores the importance of socio-emotional skills in professional settings, highlighting how these skills are integral not just in personal development but also in contributing effectively in the workforce. Finally, the OECD's SSES framework, grounded in the Big Five personality model, offers a more holistic view. It bridges the gap between personality traits and socio-emotional skills, suggesting that while traits are more about consistent patterns, skills can be developed and applied as needed. This framework's alignment with the Big Five provides a useful bridge between personality psychology and socio-emotional skill development, facilitating a more comprehensive understanding of how these skills manifest and can be nurtured across different life domains.

Recognizing the limitations in addressing socio-emotional skills through fragmented frameworks, the shift towards the Big-Five personality model by the OECD signifies an effort to create a more comprehensive and unified approach. It is for these reasons that several researchers have advocated for the adoption of the Big-Five personality model as a unifying framework for organizing socio-emotional skills (Kylonen et al., 2012; Primi et al., 2016; Soto et al., 2022[a,b]). A shared understanding of socio-emotional skills, achieved through common conceptual and operational definitions, offers numerous advantages. A robust framework not only aids in identifying and addressing early skill deficiencies in children and adolescents but also facilitates the integration of socio-emotional skills into educational curricula (Abrahams et al., 2019). Moreover, a taxonomy of socio-emotional skills that parallels the Big Five enables researchers to synthesize insights from studies on skills and traits, while also exploring the distinctions between these two constructs (Soto et al., 2022[a,b]). While personality traits represent consistent patterns of thought, emotion, and behavior across various situations and over time, skills pertain to one's capabilities in specific contexts. In this regard, skills can be regarded as tools in a toolbox—readily available when needed and stowed away when not, whereas traits encapsulate individuals' average tendencies. Therefore, a person may generally be quiet and reserved (trait level), yet be assertive and open as the situation demands (skill level) (Soto et al., 2023).

// Table 1 about here//

Table 1 provides an overview of various classifications for socio-emotional skills. We match the various taxonomies using the original names of their components. The first column lists the Big Five personality traits, while the subsequent columns list the corresponding category of the frameworks outlined above. While there are some variations in meaning, the CASEL and PYT

categories align well with the Big Five framework. However, the PYT framework lacks a category for Openness to Experience and includes Competence, which is more akin to cognitive skills. The WHO classification, with only three categories, must be distributed across the Big Five. In the WHO framework, cognitive skills encompass both Openness to Experience and Conscientiousness, as well as traditional cognitive skills. Social skills include Extraversion and Agreeableness. Additionally, Negotiation skills align closely with emotional stability. The O*NET classification of socio-emotional skills is more challenging to fit within the Big Five framework. We placed Processing skills and Problem-Solving skills under Openness to Experience, though they also encompass aspects of Conscientiousness. Resource Management skills align with Conscientiousness, and Social skills include Extraversion and Agreeableness, as in the WHO classification. We placed Systems skills under Emotional Stability, although it also incorporates elements of Conscientiousness.

To clearly differentiate between the Big-Five model used for personality traits and its application for socio-emotional skills, throughout this paper and subsequent sections, we will adopt the skill classification of the OECD's SSES framework and present our findings in line with it. These are: Engaging with Others, Collaboration, Task Performance, Emotion Regulation and Open-Mindedness.

3. Link between socio-emotional skills and different life outcomes

Over the past few decades, the interplay between socio-emotional skills and quintessential life outcomes—such as school success, job performance, social connectedness, health, and civic participation—has been rigorously scrutinized in academic research. Recently, this field of study has undergone significant transformations. Traditionally, the primary framework for analyzing these life outcomes has been the Big Five personality traits. However, there has been a notable shift in perspective, with a growing recognition of the crucial role that socio-emotional skills play in shaping these life outcomes. In this section, we present an overview of the most recent literature on this topic. Initially, we explore the established correlations between the five key life outcomes and the Big Five traits. Subsequently, we delve into recent papers that examine their associations with socio-emotional skills, reflecting the evolving trajectory of this research. Given the substantial body of literature exploring the connection between the Big Five personality traits and various outcomes, our discussion on the role of traits is grounded in meta-analyses published since 2007. Where multiple meta-analyses are available, we have aggregated the findings through a small meta-regression of these meta-studies. We use a meta-regression (Palmer & Sterne, 2016) for this aggregation, based on the reported correlations of these traits and a set of outcomes and their standard errors. A limitation of this approach is that there could be underlying papers that are included in more than one meta-study. These are then counted double. However, applying a meta-meta-analysis can still be useful as it allows

for a more comprehensive integration of data, providing a more robust and reliable picture of the overall trends and patterns across multiple studies, despite the potential issue of double counting. Within a meta-meta-analysis, the standard error of the new aggregate correlation depends on the standard errors of the meta-analyses that are included and the difference in the correlation reported in the various studies. When meta-studies report rather different average correlations that are all significant, it could be the case that the new aggregate is insignificant. We report the correlations of each meta-study and this new aggregate. For outcomes for which only one meta-study is available only the correlations of that study are reported as the new aggregate would be identical.

Next, we delve into literature focusing specifically on socio-emotional skills, distinct from the traits identified in the Big Five. Given the relatively sparse evidence on these skills, we do not present correlations but instead discuss the outcomes in context with the findings related to traits. It is important to note that all results pertain to bivariate correlations and, as such, do not imply causation. When considering personality traits, it is impossible to establish causal relationships, as one cannot – even not in a thought experiment – experimentally alter these traits. Further on, in paragraph 4, we will explore some findings concerning causality in relation to socio-emotional skills.

3.1. School success

Numerous studies have established a connection between school success and both personality traits and socio-emotional skills. A series of meta-analyses exploring the relationship between the Big Five personality traits—Conscientiousness, Openness to Experience, Agreeableness, Emotional Stability, and Extraversion—and secondary school success have consistently found that Conscientiousness is the strongest predictor of high grades across all school levels and geographic regions, even when controlling for previous achievement and cognitive ability (Mamadov, 2022; Meyer et al., 2023; Poropat, 2009). Moreover, also comprehensive literature reviews by Borghans et al. (2008) and Almlund et al. (2011) found that both Conscientiousness and Openness to Experience were predictive of secondary school achievement test performance. The first panel of Table 2 displays the bivariate correlations between the Big Five personality traits and school grades, often referred to as Grade Point Average (GPA). The table also includes the weighted average of the correlations from the three studies, calculated through meta-regression. The average correlation is 0.25 for Conscientiousness, 0.17 for Openness to Experience, 0.07 for Agreeableness, and 0.02 for Emotional Stability. The correlation for Extraversion is deemed insignificant. Two other meta-studies provide estimates for the relationship between the Big 5 personality traits and GPA in post-secondary education (O'Connor & Paunonen, 2007; Richardson, Abraham & Bond, 2012). Largely, their results are in line with the findings for secondary education (see Table 2). The average correlation for

Conscientiousness is 0.23, and for Agreeableness, it is 0.06. However, for Openness to Experience, the average correlation with GPA is 0.09, which is substantially lower than that in secondary education. There is no significant correlation between Emotional Stability and GPA. Moreover, while Extraversion was insignificant for secondary education, it has a significant negative correlation (-0.03) with GPA in post-secondary education.

//Table 2 about here//

When examining socio-emotional skills, a similar picture emerges. Recent research by Soto et al. (2022, 2023, 2024) focuses on the Big Five categories of socio-emotional skills in relation to various school outcomes, revealing that certain skills, particularly Task Performance (which is akin to the trait Conscientiousness), are strongly correlated with secondary school grades, academic engagement, and other measures of academic success. The overlap between personality traits and socio-emotional skills becomes particularly evident when considering their predictive power for academic achievement. The 2023 study highlights that while controlling for student characteristics such as gender, grade level, ethnicity and parental education, both Conscientiousness (a personality trait) and Task Performance (a socio-emotional skill) correlate similarly with GPA (respectively: 0.18 and 0.16) and school attendance (respectively: 0.05 and 0.08) . Additionally, this study points out that traits and skills often provide overlapping predictive value for academic achievement, suggesting that both are crucial, potentially interchangeable predictors for key educational outcomes. While the 2022 and 2024 studies also come to the conclusion that task performance is the strongest predictor of GPA, they also find it to be the strongest predictor of other school outcomes such as academic engagement and school attendance.

In summary, while personality traits like Conscientiousness and Openness to Experience have long been recognized as predictors of academic success, socio-emotional skills, especially those akin to these traits, also play a significant role. The convergence in the predictive power of traits and skills underscores the importance of considering both when evaluating factors contributing to school success. This integrated view highlights the complexity of academic achievement and the multifaceted nature of the attributes that influence it.

3.2. Job performance

Job performance is linked to both personality traits and socio-emotional skills as excelling in any profession requires the ability to focus on crucial tasks, communicate efficiently, demonstrate collaborative behavior, come up with new ideas and regulate one's emotions. It is therefore not

surprising that meta-analyses highlight the correlation between the Big Five personality traits and job performance measures. In recent years, numerous meta-analyses have explored the connection between the Big Five personality traits and various indicators of job performance, such as earnings, job, and career satisfaction. Focusing on the link between personality traits and earnings, there are two recent meta-analyses (Rudolph, Lavigne, & Zacher, 2017; Alderotti, Rapallini, & Traverso, 2023), with their estimates provided in the third panel of Table 2. Both studies find that Agreeableness is inversely related to earnings. According to Rudolph et al. (2017), this is the strongest predictor of the five traits. Simply put, individuals who are friendly, helpful, and cooperative tend to earn less than their more sceptical, competitive, and critical counterparts. This discrepancy could be because agreeable people may not negotiate their wages or new positions as effectively as others, or it could be that agreeable individuals often work in jobs that emphasize teamwork over competition. The study by Alderotti et al. (2023) also finds a notable, albeit lower, significant negative correlation. However, due to substantial differences in the reported correlations across these studies, the overall correlation calculated through meta-regression turns out to be insignificant, despite each study showing significant individual correlations. Additionally, when averaging these results, there are discernible positive correlations between earnings and traits such as Emotional Stability (0.09), Conscientiousness (0.06), and Openness to Experience (0.05). The correlations with Extraversion and Agreeableness are insignificant. Intriguingly, the findings of Alderotti et al. (2023) take on a new dimension when controlling for variables like cognitive abilities, educational level, and job position. In this adjusted analysis, Openness to Experience emerges as the most significantly linked trait to earnings, followed by Emotional Stability, Conscientiousness, Agreeableness, and Extraversion.

Two other key indicators of job success linked to personality traits, included in Table 2, are job satisfaction and career satisfaction. In a comprehensive review of approximately 45 studies exploring the connection between personality and job satisfaction, Steel et al. (2019) found a significant positive association with all five personality traits. Similarly, Rudolph et al. (2017) analysed five studies through a meta-analysis and found significant correlations between job satisfaction and all five personality traits. In both studies, the average correlations with Extraversion (0.21), Conscientiousness (0.20), and Emotional Stability (0.20) are strong. Steel et al. (2019) report a substantial correlation with Agreeableness, which is much smaller in Rudolph et al. (2017). For Openness to Experience, they find small opposite correlations, where the calculated average Openness to Experience is insignificant. When considering career satisfaction, Rudolph et al. (2017) noted a pattern akin to job satisfaction. Here too, Extraversion and Emotional Stability, as well as Agreeableness, showed the strongest relations, while Conscientiousness and Openness had a much smaller impact.

Soto et al. (2022, 2024) explored the connections between occupational interests and the Big Five socio-emotional skills, taking into account gender and grade level. Both studies consistently linked Engaging with Others to enterprising interests (0.34 in the first study and 0.27 in the second), and Collaboration to social interests (0.36 in the first, 0.34 in the second), indicating a stable relationship across different samples. However, discrepancies were observed in the strength of these correlations, particularly with artistic interests, where Open-Mindedness showed a stronger correlation in the second study (0.44) compared to the first (0.28). These variations highlight that while certain socio-emotional skills consistently align with specific occupational interests, the extent of these relationships can vary depending on the sample.

In summary, the correlation between personality traits and socio-emotional skills with job performance indicators is evident. Traits like Conscientiousness and Openness to Experience align with skills such as Task Performance and Open-Mindedness, respectively, demonstrating how both personality and skills contribute to professional success.

3.3. Social connectedness

Social connectedness is another vital aspect of life closely related to both socio-emotional skills and personality traits. This relationship between social connectedness and socio-emotional skills has been described as mutual. Fundamental abilities such as empathizing, cooperating, and engaging in conversations are essential for establishing and sustaining social bonds. Conversely, these bonds serve as significant emotional safeguards, paving the way for fresh insights, enhanced empathy, and boosted self-confidence (Chernyshenko et al., 2018).

Buecker et al. (2020) conducted a meta-analysis that synthesized findings from various studies investigating the relationship between personality traits and the absence of social relationships, particularly loneliness. Their results showed a strong negative correlation of loneliness with the Extraversion trait (−0.40), followed by Emotional Stability (−0.39), Agreeableness (−0.27), Conscientiousness (−0.22), and Openness to Experience (−0.12). Importantly, aside from Openness to Experience, all other traits continued to show significant associations with loneliness when controlling for other personality traits. Moreover, Thielman, Spadaro, and Balliet (2020) in another meta-analysis found that prosocial behaviors, crucial for the functioning of a broad spectrum of relationships, were positively linked with Agreeableness (0.10) and Openness to Experience (0.07), but not with Extraversion, Conscientiousness and Emotional Stability, as shown in Table 3.

// Table 3 about here//

In parallel, Soto et al. (2022, 2024) delved into the Big Five socio-emotional skill categories and their relation to various aspects of social connectedness, including peer acceptance, friendship quality, and romantic relationship quality. Initially, they found that peer acceptance was associated with all five skill domains, notably Engaging with Others (0.50) and Emotion Regulation (0.39). Subsequently, however, the connection was observed to be primarily with Engaging with Others (0.55) and Collaboration (0.43). For friendship quality, while linked to all five domains, both studies found the strongest association with Collaboration (respectively: 0.42 and 0.32) and Engaging with Others (respectively: 0.35 and 0.33). Notably, no significant link was found between the Big Five skill categories and the quality of romantic relationships.

This comprehensive combination of insights from the meta-analyses conducted by Buecker et al. (2020) and Thielman et al. (2020) along with the empirical investigations by Soto et al. (2022; 2024), illuminates a nuanced landscape where specific personality traits and their socio-emotional counterparts intricately intertwine in the context of social connectedness. Predominantly, it becomes clear that the personality traits of Agreeableness and Extraversion exhibit a profound link with the experience of loneliness. Parallel to this, their socio-emotional equivalents—namely, Engaging with Others and Collaboration—are prominently associated with peer acceptance and the quality of friendships. Notably, Agreeableness emerges as a pivotal trait, having a strong correlation not only with loneliness but also with prosocial behaviors.

3.4. Health

Over recent years, socio-emotional skills and personality traits have been closely associated with several health indicators, including longevity, stress, physical activity, and life satisfaction. Results are included in Table 3. For instance, Roberts et al. (2007) conducted a thorough review of 34 studies on the relation between Big Five personality traits and longevity, considering factors like cognitive abilities, gender, and socioeconomic status (SES). Their research identified robust correlations between longevity and Conscientiousness (0.09), Extraversion (0.07), Emotional Stability (0.05) and Agreeableness (0.04).

Additionally, a recent meta-analysis by Luo et al. (2023) that focused on the relationship between personality and stress concluded that Emotional Stability was very strongly and negatively linked to stress (−0.31). Agreeableness (−0.13), Conscientiousness (−0.12) and Extraversion (−0.11) also have a substantial negative correlation with stress. The negative correlation with Openness to Experience is very small although also significant.

Another meta-analysis by Wilson and Dishman (2015) investigating personality's association with physical activity found substantial positive correlations with Extraversion (0.11), Conscientiousness (0.10), and Emotional Stability (0.07) and a smaller correlation with Openness to Experience (0.03).

As for life satisfaction, a study by Rudolph et al. (2017) based on a meta-analysis of 90 studies found that Emotional Stability (0.36) is the strongest predictor of life satisfaction, followed by Extraversion (0.29) and Conscientiousness (0.17). For Openness to Experience (−0.06) they report a small negative correlation. For Agreeableness no significant result was found.

Soto et al.'s studies (2022 and 2024) underscore the significant relationship between the Big Five socioemotional skills and health, revealing notable correlations. Their initial study (2022) found that Engaging with Others is primarily linked to physical activity (0.34), and life satisfaction is most influenced by Emotion Regulation (0.36). The follow-up study (2024) confirmed these findings, noting that physical activity is positively correlated with Engaging with Others (0.27). Moreover, it showed that Emotion Regulation is strongly correlated with life satisfaction (0.52), depression (-0.62), and anxiety (-0.55). These studies considered gender and grade level as covariates in their analysis.

In summary, these findings demonstrate a clear alignment between personality traits and their equivalent socio-emotional skills in influencing health indicators like longevity, stress, physical activity, and life satisfaction. Open-Mindedness and Openness to Experience show a positive impact on health, though varying in degree. Collaboration and Agreeableness, along with Engaging with Others and Extraversion, consistently promote interpersonal skills beneficial for health. Task Performance and Conscientiousness strongly correlate with physical activity and life satisfaction, highlighting the importance of goal-oriented behavior. Most notably, Emotion Regulation and Emotional Stability are crucial in managing mental health and life satisfaction.

3.5. Civic participation

The final significant life outcome discussed in this paper, in connection with socio-emotional skills and personality traits, is civic participation. Civic participation refers to behaviors and attitudes that align with the ideals of good citizenship within a given society or community. This encompasses respecting laws, engaging in democratic processes such as voting, and contributing to the communal welfare.

Regarding the association between civic participation and pro-environmental behavior (i.e., environmentally friendly actions in conservation, food, and transportation) and the Big Five personality traits, Soutter, Bates, & Mõttus (2021) conducted a meta-analysis of 38 studies. They found (see Table 3) Openness to Experience (0.22) had the strongest connection to pro-environmental behavior, followed by Agreeableness (0.15, Conscientiousness (0.12), and Extraversion (0.09). The correlation with Neuroticism was non-significant. Another form of civic engagement examined in

relation to the Big Five personality traits is volunteerism. Lodi-Smith and Roberts (2007) assessed the results of 6 studies and deduced that only the trait of Conscientiousness correlated with volunteer behavior (0.15).

Turning our attention to the connection between civic participation and the five socio-emotional skill domains, we reference the twin studies by Soto et al. (2022, 2024). In their first study, Soto and his colleagues investigated the correlation between the five skill domains and volunteerism. Here, they discovered that volunteerism was most strongly correlated with Collaboration (0.29) and Task Performance (0.27) and the least with Emotion Regulation skills (0.18). In their subsequent study, they explored seven forms of civic participation with a different student population, namely: social responsibility values, civic skills, voting intention, involvement in civic organizations, activism, informal helping, and volunteerism. Interestingly, social responsibility values showed the strongest connection to Collaboration (0.55). Civic skills (0.59), volunteerism (0.28), and voting intentions (0.21) were predominantly linked with Engaging with Others. Civic organization involvement (0.22) and activism (0.16) aligned most with Open-mindedness, while informal helping had a significant association with both Task Performance (0.34) and Collaboration (0.34).

In conclusion, among the Big Five personality traits, Conscientiousness stands out as the primary trait associated with volunteerism, while Extraversion and Openness to Experience exhibit negative correlations with pro-environmental behavior. Socio-emotional skills show varied connections with different aspects of civic engagement, emphasizing the importance of Collaboration and Engaging with Others in promoting active citizenship. Open-mindedness aligns with civic organization involvement and activism, Task Performance and Collaboration connect with informal assistance, and Emotion Regulation skills negatively relate to volunteerism. Interestingly, although a positive correlation was observed between volunteerism and the personality trait Conscientiousness, a similar correlation was not evident for Task Performance, the socio-emotional skill equivalent of this trait.

4. Impact of education on socio-emotional skills development

The evidence reviewed in the previous section underscores the significance of socio-emotional skills in shaping a multitude of life outcomes. This raises the question of whether education can play a role in the development of socio-emotional skills, and how schools can facilitate this process. The first question to consider is whether there are effective educational interventions designed to foster socio-emotional skills, and if so, what teaching methods can effectively contribute to the growth of these skills. A second pertinent question is the optimal timing for implementing such school-based activities.

Cunha and Heckman (2007) discuss the importance of critical and sensitive periods in a child's development, as well as self-productivity and dynamic complementarity in skill development. Critical and sensitive periods refer to specific age ranges during which children are more apt to acquire certain skills; for example, there are optimal and less optimal times for learning to read. Self-productivity and dynamic complementarity suggest that the acquisition of certain skills enhances the development of subsequent skills, such as how literacy facilitates the learning of other subjects. Cunha and Heckman (2007) further note that both cognitive and non-cognitive skills acquired in one period can stimulate the acquisition of skills in later periods. This interconnectedness implies that the optimal timing for skill acquisition is influenced not only by the critical and sensitive periods but also by the prerequisite skills necessary for and the subsequent skills benefited from the skill in question.

Building on this notion of optimal timing, recent research has examined the developmental trajectory of personality traits and their impact on skill acquisition. Although personality traits are typically perceived as stable, more recent research indicates that they can evolve over time. Bleidorn et al. (2022) found that while Conscientiousness and Agreeableness remain relatively constant throughout life, Extraversion and Emotional Stability tend to fluctuate more significantly. Specifically, all personality traits tend to increase until around age 25, followed by a decline in Extraversion and Openness to Experience, while Emotional Stability continues to grow. Conscientiousness peaks at around age 45 and then declines, whereas Agreeableness remains stable from age 35 onwards. This developmental trajectory suggests that certain skills may be more easily acquired at specific ages, depending on the associated personality traits required. An example of this is that young children may still lack the conscientiousness to take the full responsibility for their learning and need to be guided more than older children.

Educational interventions can further support children in acquiring socio-emotional skills, thereby improving their capacity to handle various school tasks. It is noteworthy that particularly during preschool and early elementary school years, socioemotional skills are highly malleable (Heckman et al., 2010; Taylor et al., 2017). The growing recognition of the significance of pre-school education in enhancing the school readiness of children, especially those from lower socio-economic backgrounds, is grounded in these findings. The Perry Preschool Program, as mentioned earlier, exemplifies such an initiative.

Over the years, numerous studies have explored the efficacy of school-based socio-emotional learning (SEL) programs. These programs aim to teach students how to recognize and manage their emotions, set and achieve goals, respect the perspectives of others, build and maintain positive relationships, and make responsible decisions (Collaborative for Academic, Social and Emotional Learning, 2005). A meta-analysis by Durlak et al. (2014) examined 213 in-school SEL programs across

120 elementary schools, 66 middle schools, and 27 high schools. Their research revealed that programs that are SAFE—i.e., those that employ a Sequenced, step-by-step approach, incorporate Active forms of learning, allocate Sufficient time for skill development, and have Explicit learning goals—proved to be the most effective in facilitating SEL. Importantly, these programs demonstrated efficacy across all three educational levels.

In a subsequent meta-analysis, the same research team investigated the long-term impacts of SEL programs and identified the specific student demographics that benefit the most (Taylor et al., 2017). This time, they analysed follow-up outcomes collected 6 months to 18 years post-intervention from 82 studies examining the long-term effects of school-based SEL interventions. The results of this meta-analysis showed that participants in SEL interventions exhibited significantly higher levels of socio-emotional skills and well-being compared to non-participants. While significant improvements were observed in self-awareness, self-management, social awareness, relationship skills, and responsible decision-making, no notable gains were made in attitudes towards oneself (e.g., self-confidence), others (e.g., prosocial attitudes rejecting violence), or school (e.g., feeling connected to teachers). These outcomes remained consistent across varying socio-economic backgrounds, races, and school locations. However, age emerged as a factor influencing the success of interventions, with primary school children (ages 5-10) exhibiting significantly higher follow-up outcomes compared to early adolescents (ages 11-13) and adolescents (ages 14-18).

Immordino-Yang, Darling-Hammond, and Krone (2019) further identified the optimal ages for teaching specific socio-emotional skills, drawing on neurobiological research. They determined that skills related to collaboration and engaging with others are most effectively taught from early childhood onward, as team play and social interaction are integral to social development. From late childhood onward, children undergo significant growth in self-management skills (such as planning and self-direction) and open-mindedness skills (such as association and abstract thinking). These skills can be cultivated by providing opportunities for independent learning. In early adolescence, the frontal lobes—which play a crucial role in planning and decision-making (i.e., Task Performance skills)—undergo rapid development. Simultaneously, the onset of puberty brings about hormonal changes that usher in a period of neural plasticity. This renders the brain more vulnerable to emotional instability and stress, highlighting the importance of Emotion Regulation skills. During this critical developmental stage, educational environments that foster strong student-teacher relationships through personalized instruction are particularly beneficial.

In addition to the optimal age for learning certain socio-emotional skills, the learnability of socio-emotional skills is a crucial factor to consider as well when designing educational interventions. In a systematic review, Roberts and colleagues (2017) investigated which personality traits were most

amenable to change through interventions. Naturally, the majority of intervention studies featured in this overview were aimed at individuals exhibiting somewhat extreme traits, as these are typically the people who seek assistance. However, it is important to note that all studies consistently compare a treatment group with a control group. They discovered that interventions targeting Emotional Stability were the most effective, with a high effect size of 0.57, while those focusing on Openness to Experience were the least effective, with a low effect size of 0.13. Interventions cantered on Extraversion, Conscientiousness, and Agreeableness had effect sizes of 0.23, 0.19, and 0.15, respectively. In terms of intervention effectiveness, supportive intervention types and cognitive behavioral therapies yielded the highest effect sizes, with values of 0.49 and 0.46, respectively. In contrast, pharmacological interventions and hospitalization were the least effective, with effect sizes of 0.31 and 0.16, respectively.

In conclusion, the literature indicates that education plays a crucial role in the development of socio-emotional skills. The effectiveness of educational interventions is influenced by various factors, including the timing of the intervention in relation to the child's developmental stage, the teaching methods used and the specific socio-emotional skills targeted. These findings have significant implications for the design and implementation of educational programs aimed at fostering socio-emotional development, as they highlight the need to tailor interventions to the unique needs and developmental stages of children to optimize outcomes.

5. Conclusion

In this paper, we examined the relationship between socio-emotional skills, significant life outcomes, and education. In Section 2, we explored various classification schemes employed for socio-emotional skills. We opted to utilize the SSES framework as introduced by the OECD to organize the findings in this paper. The SSES framework aligns with the Big Five classification of personality traits. It is important to differentiate between socio-emotional skills and personality traits. While the latter characterize individuals' typical behavioral patterns, socio-emotional skills are potentially trainable. The Big Five classification turned out to be a convenient framework, but also the vast majority of empirical literature is based on data concerning personality traits. Attention to skill measures is still in its early stages.

In Section 3, we provided an overview of the relationship between socio-emotional skills and several significant life outcomes. Since much of the literature is grounded in the Big Five personality framework, we primarily discussed these findings. However, we also addressed how recent research, based on measures of socio-emotional skills, supports these conclusions. The life outcomes most strongly associated with the skill of Open-Mindedness (Openness to Experience in the Big Five

framework) were pro-environmental behavior (0.22), grades in secondary education (0.17), not feeling lonely (0.12), grades in post-secondary education (0.09), and pro-social behavior (0.07). This suggests that Open-Mindedness is primarily important for civic participation, school work and social connectedness, it is less significant for work and health.

Task Performance (Conscientiousness in the Big Five framework) had the strongest relationship with school- and work-related outcomes, even stronger than those found for Open-Mindedness. The highest correlations were observed for grades in secondary education (0.25), postsecondary education (0.23), not being lonely (0.22), job satisfaction (0.20), and life satisfaction (0.17). Moreover, the correlations for outcomes where Task Performance is less important were more pronounced compared to those for Open-Mindedness.

Engagement with others (Extraversion in the Big Five framework) has been found to be primarily relevant for health and social outcomes. The strongest correlation is with not feeling lonely (0.40), followed by life satisfaction (0.29), career satisfaction (0.21), job satisfaction (0.21), and not experiencing stress (0.11). This strong association with satisfaction outcomes and the absence of loneliness and stress indicates that the ability to engage with others is more central to a fulfilling and meaningful life than Open-mindedness and Task Performance, which play a more instrumental role in navigating life successfully.

Collaboration (Agreeableness in the Big Five framework) generally had weaker relationships with life outcomes. The primary exceptions are not feeling lonely (0.27), pro-environmental behavior (0.15) and experiencing less stress (0.13). Pro-social behavior (0.10) and grades in secondary education exhibited lower correlations. Finally, Emotion Regulation (referred to as Emotional Stability in the Big Five framework) exhibited some robust relationships. The strongest correlations were found with not feeling lonely (0.39), life satisfaction (0.36), lack of stress (0.31), career satisfaction (0.30), and job satisfaction (0.20). Task performance and Open-mindedness are therefore the socio-emotional skills most relevant for school, while Emotional Stability and Engagement with others are the key socio-emotional skills for enhancing satisfaction in various aspects of life. Collaboration skills were found to have the smallest impact on the studied life outcomes.

//Table 4 about here//

Building upon the groundwork laid in Sections 2 and 3, Section 4 explored the impact of education on the development of socio-emotional skills. It was found that there are optimal periods in a child's development when certain socio-emotional skills are more easily acquired. In practice, this suggests that educational interventions should be tailored to the unique developmental stages of

children to optimize outcomes. Schools can play a pivotal role in fostering socio-emotional skills by implementing well-designed socio-emotional learning (SEL) programs that are sequenced, active, sufficiently timed, and have explicit learning goals. Such programs have been proven effective across various educational levels, from elementary to high school. Moreover, the learnability of socio-emotional skills varies, and educators should be mindful of this when designing and implementing interventions. Certain skills, such as Emotional Stability, are more amenable to change through interventions, while others, such as Openness to Experience, are less so. It is therefore critical for educators to adopt a holistic approach that encompasses a range of socio-emotional skills to ensure the comprehensive development of students.

To summarize, the evidence presented in this paper highlights the significant relevance of a broad spectrum of socio-emotional skills, and emphasizes the potential benefits for schools to actively foster the development of these skills in their students. Task Performance and Open-Mindedness are particularly crucial for success in academic and professional settings. While it is unclear how much emphasis schools currently place on the development of socio-emotional skills, our observation is that Task Performance tends to receive more attention than Open-Mindedness. This is particularly evident in the case of children who struggle with reading, writing, and math, including many from low socio-economic backgrounds, where schools often prioritize these foundational skills at the expense of projects that foster curiosity. Another concern is that schools may focus on developing socio-emotional skills primarily to improve functioning within academic and work environments. While Engagement with Others and Emotion Regulation are critical skills with broad relevance for life outcomes, their primary importance may not be specifically tied to school or work. While schools might emphasize Engagement with Others to facilitate better interactions among students, they often overlook the broader importance of these skills. Similarly, while Collaboration is promoted to ensure students listen attentively to teachers, this focus may inadvertently neglect the skill's relevance to other outcomes, including its potential negative impact on wages and career satisfaction. Moreover, Emotion Regulation, despite its importance for a range of life outcomes, has often not a central focus in school curriculums. As such, striking a balance in the educational curriculum to holistically nurture both academic and socio-emotional skills is imperative for the comprehensive success of our students in the modern world.

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Tables

Table 1. Comparative Analysis of Traits, Skills, and Competencies Taxonomies.

Big 5	SSES (OECD)	CASEL	PYD	WHO	O*NET
Openness	open-mindedness	self-awareness		cognitive skills	processing skills, problem solving skills
Conscientiousness	task performance	self-management	character	cognitive skills	resource management skills
Extraversion	engagement with others	relationship skills	connection	social skills	social skills
Agreeableness	collaboration	social awareness	caring	social skills	social skills
Emotional stability	emotion regulation	responsible decision-making	confidence	negotiation skills	systems skills
*			competence	cognitive skills	

* In this additional row we placed competencies in the taxonomies that are cognitive in nature.

Table 2. Findings in Meta-Studies about the Correlation between the Big Five Traits and School Grades, Income, Job Satisfaction and Career Satisfaction.

	Openness to experience	Conscien-tiousness	Extraversion	Agreeableness	Emotional Stability	N
Grades Secondary education						
Poropat (2009)	0.12*	0.22*	−0.01*	0.07*	0.02*	109-138
Mamadov (2022)	0.16*	0.27*	0.01	0.09	0.02*	227-263
Meyer et al. (2023)	0.21*	0.24*	0.02	0.04*	0.05*	110
Average	0.17*	0.25*	0.00	0.07*	0.02*	
Grades Post-secondary education						
O'Connor et al. (2007)	0.06	0.24*	−0.05	0.06*	0.03	19-23
Richardson (2012)	0.09*	0.23*	−0.03*	0.06*	−0.01	47-69
Average	0.09*	0.23*	−0.03*	0.06*	−0.01	
Income						
Rudolph, Lavigne, & Zacher (2017)	0.03*	0.09*	0.10*	−0.17*	0.12*	3
Alderotti, Rapllini, & Traverso (2023)	0.07*	0.03*	0.02*	−0.03*	0.06*	85-90
Average	0.05*	0.06*	0.06	−0.10	0.09*	
Job satisfaction						
Rudolph, Lavigne, & Zacher (2017)	−0.04*	0.20*	0.21*	0.04*	0.20*	5
Steel et al. (2019)	0.04*	0.20*	0.23*	0.16*	0.26*	40-58
Average	−0.02	0.20*	0.21*	0.04*	0.20*	
Career satisfaction						
Rudolph, Lavigne, & Zacher (2017)	0.04*	0.07*	0.21*	−0.02*	0.30*	8

* : $p<0.05$

Table 3. Findings in Meta-Studies about the Correlation between the Big Five Traits and Social Relationships, Health and Civic Participation.

	Openness to experience	Conscien-tiousness	Extraversion	Agreeableness	Emotional Stability	N
Loneliness						
Buecker et al. (2020)	−0.12*	−0.22*	−0.40*	−0.27*	−0.39*	141-234
Pro-social behavior						
Thielman, Spadaro and Balliet (2020)	0.07*	-0.01	0.01	0.10*	0.00	68-173
Longevity						
Roberts et al. (2007)	Not studied**	0.09*	0.07*	0.04*	0.05*	34
Stress						
Luo et al. (2023)	−0.03*	−0.12*	−0.11*	−0.13*	−0.31*	205-559
Physical activity						
Wilson and Dishman (2015)	0.03*	0.10*	0.11*	0.00	0.07*	51-88
Life satisfaction						
Rudolph, Lavigne, & Zacher (2017)	−0.06*	0.17*	0.29*	0.01	0.36*	11
Pro-environmental behavior						
Soutter, Bates, & Mõttus (2020)	0.22*	0.12*	0.09*	0.15*	0.08	38
Volunteerism						
Lodi-Smith and Roberts (2007)	Not studied **	0.15*	Not studied **	0.02	0.09	1-6

* : $p<0.05$

**: Roberts et al. (2007) did not examine the domain of Openness to Experience as there were only two studies in their meta-analyses that tested the association with longevity. Similarly, Lodi-Smith and Roberts (2007) did not study the domains of Openness to Experience and extraversion due to limited studies available.

Table 4. Overview of the Correlations reported in this paper.

	Openness to experience	Conscien-tiousness	Extraversion	Agreeableness	Emotional Stability
Grades (secondary education)	0.17	0.25	0.00	0.07	0.02
Grades (post-secondary education)	0.09	0.23	−0.03	0.06	−0.01
Income	0.05	0.06	0.06	−0.10	0.09
Job satisfaction	−0.02	0.20	0.21	0.04	0.20
Career satisfaction	0.04	0.07	0.21	−0.02	0.30
Loneliness (inv)	0.12	0.22	0.40	0.27	0.39
Pro-social behavior	0.07	-0.01	0.01	0.10	0.00
Longevity	Not studied	0.09	0.07	0.04	0.05
Stress (inv)	0.03	0.12	0.11	0.13	0.31
Physical activity	0.03	0.10	0.11	0.00	0.07
Life satisfaction	−0.06	0.17	0.29	0.01	0.36

Pro-environmental behavior	0.22	0.12	0.09	0.15	0.08
Volunteerism	Not studied	0.15	Not studied	0.02	0.09