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INTRAINDIVIDUAL DISPOSITIONS SUSTAINING DESIRABLE OUTCOMES (UNDER COVID-19) IN THE GENERAL AND STUDENT POPULATION

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Introduction

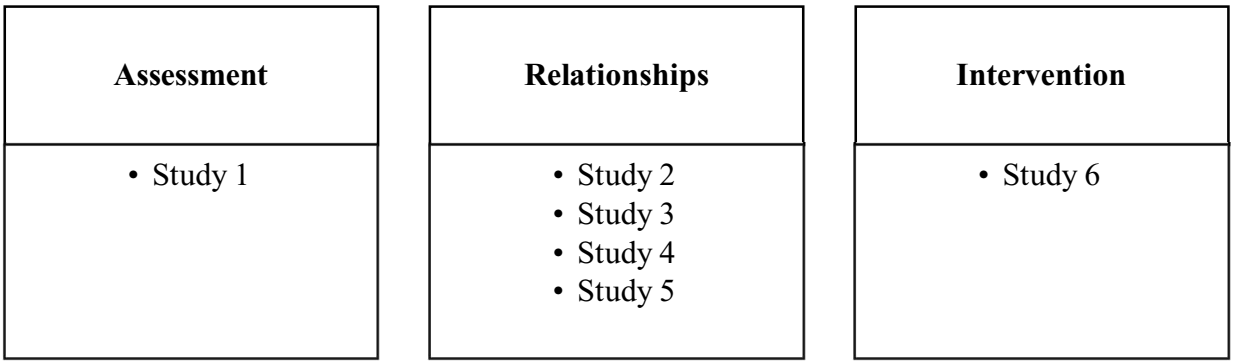
Character strengths are incrementable personal characteristics that regulate thoughts, behaviors, and emotions of individuals in all life situations, enabling them to express their full potential and positively contribute to societal well-being (Park et al., 2004; Peterson & Seligman, 2004). Since their theorization, character strengths have been subject to great attention both in research and practice (Niemiec, 2013b; Ruch & Stahlmann, 2020), and have been shown to positively affect a host of desirable outcomes both in the general population (Bruna et al., 2019) and in crucial developmental stages such as university (Karris Bachik et al., 2021; Lounsbury et al., 2009). Accordingly, international organizations such as the World Economic Forum (2015) have saluted these personal character qualities as key resources to face the current learning and labor environment. Despite this, a deep investigation of their role across populations and conditions is still missing, and previous research focused mainly on their individual associations with well-being in regular conditions, while much less attention has been paid to their relationship with mental health issues and adversity. In this sense, the COVID-19 pandemic presented itself as an abrupt and extreme case scenario to study the role of character in highly stressful and uncertain conditions, where all the Italian population was subject to strict lockdown measures and whole learning and university interactions shifted online. Moreover, research on character strengths has been completely neglected in the Italian context, overshadowing their great practical potential in this country.

Therefore, the present dissertation addresses some significant gaps in character strengths research by addressing three main objectives (see Figure 1 for a graphical representation and the next paragraph for an in-depth explanation): i) validating the Italian form of the instrument assessing character strengths, allowing it to become available to Italian researchers and practitioners interested in the field, ii) examining the relationships of character strengths (not only as single strengths, but also as second-order virtues and as a unique factor representing overall good character) with desirable outcomes (well-being and achievement) in the general population and in students, both under

COVID-19 and afterwards, and iii) evaluating the efficacy and working mechanisms of an intervention that combines character strengths and mindfulness practice.

Figure 1

The Structure of the Present Work



Structure of the thesis

The first chapter of the thesis lays the theoretical foundation of the following chapters. In particular, **Chapter 1** provides a definition and presentation of the character framework as originally proposed by Peterson and Seligman (2004), followed by more recent theorizations on their specific role. These include the six functions proposed by Niemiec (2020) and the Positive Functioning Framework (Rusk & Waters, 2015), referring to the general population. These models will be presented in detail, and they will be adopted as reference for the rest of the thesis.

The direct relationship of character strengths and well-being is then delineated, before introducing the possibility of two potential mediating mechanisms: Posttraumatic growth (adverse situations) and basic psychological needs satisfaction (regular situations).

With regard to university students, the integrated self-regulated learning model (Ben-Eliyahu, 2019; Ben-Eliyahu & Bernacki, 2015) will be introduced. A series of relevant study-related factors (in terms of self-regulated learning [SRL] strategies, motivational beliefs, study resilience, and achievement emotions) will then be defined, and their associations with character strengths, academic achievement, and well-being will be deepened.

Chapters 2 to 7 detail the six studies conducted. These chapters have a recurring structure: Rationale of the study, aims and hypotheses, methods (including participants, materials, procedure, and statistical analyses performed), results, and discussion (including limitations and future directions). An overview of the studies conducted, specifying aims, participants, variables considered, and a synthesis of the results, is available in Table 1.

Chapter 2 describes the Study 1 that examines the internal structure of the Italian form of the 120-item VIA Inventory of Strengths. Character strengths are treated as first-order variables converging in the six second-order virtues originally hypothesized.

Chapter 3 with Study 2 introduces the COVID-19 pandemic and its longitudinal impact on the Italian general population. Character strengths are considered both as direct predictors of well-being and as indirectly related to it through the mediation of posttraumatic growth.

Chapter 4 with Study 3 tries to extend the previous study to the examination of the longitudinal impact of COVID-19 on university students. In this case, character and study-related factors are treated as direct predictors of well-being and achievement over the course of the pandemic.

Chapter 5 with Study 4 introduces the idea that study-related factors mediate the relationship of character with well-being and achievement. A comprehensive cross-sectional model is fitted to test this hypothesis in a large student sample collected between 2020 and 2021.

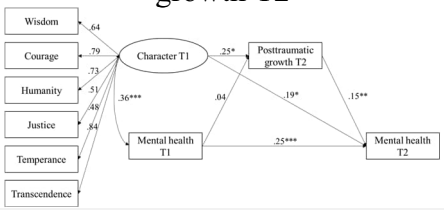
Chapter 6 with Study 5 deepens the role of character strengths with respect to a clinical population, that of students with specific learning disabilities. In this cross-sectional study, character strengths and study-related factors are considered individually as predictors of achievement, general well-being, and academic well-being.

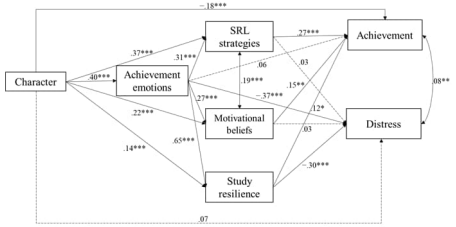
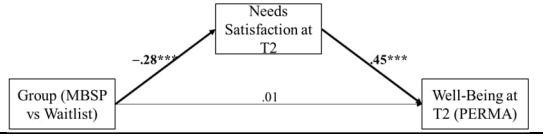
Chapter 7 with Study 6 focuses on a pre-registered randomized controlled trial evaluating the efficacy of Mindfulness-Based Strengths Practice (Niemiec, 2013a) in the Italian general population. Specific pre-post changes in character strengths and mindfulness are examined, together with the direct effect on well-being and the mediating effect of basic psychological needs satisfaction.

Lastly, **Chapter 8** presents a general discussion of the main results obtained and derives some conclusions about the role of character strengths for the general public and students.

Table 1

Overview of the Studies Conducted

	Study	Design and aims	Participants	Variables Considered	Main Results
Assessment	Study 1	Cross-sectional Examine the structure of character strengths in the Italian population through a confirmatory approach	16722 adults (4567 males)	Character Strengths	Acceptable fit for the hierarchical 24-character strengths + 6-virtues model, excluding love of learning (CFI = .90, TLI = .90, SRMR = .08)
	Study 2	Longitudinal (T1: April 2020; T2: Dec 2020-Jan 2021) Study the effects of character strengths on mental health in the general population under COVID-19	244 adults (54 males, *Mage* = 36.05 years, *SDage* = 14.04)	Character General Mental Health Posttraumatic Growth	Partial mediation of posttraumatic growth T2 
Associations	Study 3	Longitudinal (T1: Apr-Jun 2020; T2: Aug 2020; T3: Sept 2020; T4: Feb 2021) Study the associations of character and study-related factors with distress and achievement in the student population under COVID-19	107 students (22 males, *Mage* = 21.95, *SDage* = 2.02)	Character (critical thinking, creativity, curiosity, perseverance, social intelligence) Study-Related Factors (SRL strategies, academic self-efficacy, growth mindset, learning goals, study resilience) General Distress Academic Achievement	General Distress: (T2 = T3) < T1 General Distress < in students with higher study-related skills Achievement: (T2 = T4) > (T1 = T3) Achievement > in students with higher study-related skills

	Study 4	Cross-sectional Examine a general model of the relationships between character, study-related factors, achievement, and distress	606 students (153 males, *Mage* = 22.74, *SDage* = 3.72)	Character (critical thinking, creativity, curiosity, perseverance, social intelligence) Achievement Emotions SRL Strategies Motivational Beliefs Study Resilience Academic Achievement General Distress	Full mediation of achievement emotions × SRL strategies, motivational beliefs, and study resilience. 
	Study 5	Cross-sectional Explore the differences between students with or without specific learning disabilities (SLD) in terms of character, study-related factors, achievement, and satisfaction (life and academic)	318 students (79 males, 147 students with SLD, *Mage* = 22.70, *SDage* = 3.56)	Character (critical thinking, creativity, curiosity, perseverance, social intelligence) SRL Strategies Academic Self-Efficacy Growth Mindset Learning Goals Study Resilience Academic Achievement Life satisfaction Academic satisfaction	SLD students: > creativity, < academic achievement, academic self-efficacy, and study resilience Achievement: creativity (-), academic self-efficacy (+) Life Satisfaction: study resilience (+) Academic Satisfaction: academic self-efficacy (+), critical thinking (+), and curiosity(+). Model invariant between gender and diagnosis status
Intervention	Study 6	Longitudinal (T1: Pre-test; T2: Post-test after eight weeks) Analyze the efficacy and mechanisms of action of Mindfulness-Based Strengths Practice on well-being	53 (9 males, *Mage* = 32.30, *SDage* = 14.37), of which 21 were assigned to MBSP and 32 to a waitlist control group	Character Strengths Dispositional Mindfulness Basic Psychological Needs PERMA dimensions	MBSP group: character strengths and mindfulness T2 > T1, negative emotions T2 < T1 Full mediation of the satisfaction of basic psychological needs 

Chapter 1. Theoretical Background

1.1. Character Strengths: Definition and Classification

Character strengths are 24 positive trait-like individual qualities originally theorized by Peterson & Seligman (2004) after extensive philosophical and historical investigations of what constitutes a "good character" throughout different times and spaces.

The classification defines good character on two dimensions (see Figure 1.1): a vertical one, including three hierarchically organized conceptual levels (virtues, character strengths, and situational themes); and a horizontal one, as each conceptual level comprises several elements (six virtues, 24 strengths).

Vertically, on the highest level of abstraction there are six core virtues, cross-culturally recognized as the most highly valued moral characteristics. Character strengths lie on the intermediate level of abstraction and are defined as "the psychological ingredients – processes or mechanisms – that define the virtues" (Peterson & Seligman, 2004, p. 13). To qualify as such – and distinguish from other positive/personality traits – character strengths originally had to meet seven criteria (which subsequently became 10, and are now 12, see Ruch & Stahlmann, 2020 for a review), such as being measurable and trait-like, or contributing to the individual's and others' fulfilment. On the lowest level of abstraction, there are situational themes, i.e., specific habits that enable people to display a certain strength in a specific situation, thus explaining the great deal of variation we can observe in individual moral behavior.

Horizontally, the six core virtues are wisdom and knowledge (knowledge used for good); courage (willful exercise to reach goals despite adversity); humanity (fairness in relations with others); justice (fairness in community life); temperance (control over excess); and transcendence (belief in a greater meaning beyond oneself). Character strengths include 24 positive trait-like features connected to specific virtues: cognitive strengths (e.g. creativity, curiosity) relate to the virtue of wisdom and knowledge; emotional strengths (e.g. bravery, perseverance) to the virtue of courage; interpersonal strengths (e.g. love, kindness) to the virtue of humanity; civic strengths (e.g. teamwork,

fairness) to the virtue of justice; strengths such as forgiveness and modesty to the virtue of temperance; and strengths like appreciation of beauty and spirituality to the virtue of transcendence. Table 1.1 shows the six core virtues and their related character strengths.

Figure 1.1

The VIA Classification Hierarchy

Table 1.1

The VIA Classification. Adapted from Peterson and Seligman (2004, pp. 29-30)

Core Virtues	Corresponding Character Strengths
Wisdom:	Creativity [Originality, ingenuity]
Acquire and use knowledge	Curiosity [Interest, novelty seeking, openness to experience]
	Judgment [Open-mindedness, critical thinking]
	Love of learning [Systematically adding knowledge]
	Perspective [Wisdom]
Courage: Pursue goals despite	Bravery [Valor, assertiveness]
adversity	Perseverance [Persistence, industriousness]
	Honesty [Authenticity, integrity]
	Zest [Vitality, enthusiasm, vigor, energy]

Humanity: Care for other people	Love [Closeness, intimacy]
	Kindness [Generosity, nurturance, care, compassion]
	Social intelligence [Emotional intelligence]
Justice: Care for the community	Teamwork [Citizenship, social responsibility, loyalty]
	Fairness [Equity, impartiality]
	Leadership [Guidance, supervision]
Temperance: Resist excess	Forgiveness [Mercy]
	Humility [Modesty]
	Prudence [Cautiousness]
	Self-regulation [Self-control]
Transcendence: Connect with purpose	Appreciation of beauty and excellence [Awe, wonder]
	Gratitude [Thankfulness]
	Hope [Optimism, future-mindedness, future orientation]
	Humor [Playfulness]
	Spirituality [Religiousness, faith, purpose]

To be even more precise, character strengths can be seen as positive morally valued personality traits. Evidence has shown that they significantly relate to Big 5 personality traits, with small-sized correlations (Littman-Ovadia & Lavy, 2012; Macdonald et al., 2008). More recently, McGrath et al. (2020) conducted a thorough examination of the overlap between character strengths and personality traits and their relative predictive validity. The results of this study suggest that character strengths substantially overlap with the Big 5 and HEXACO models, yet cannot be reduced to these personality traits and demonstrate incremental predictive validity with respect to a host of positive outcomes. In other words, character strengths seem to represent a subset of personality traits that specifically help define what a "good" person looks like, therefore possibly accounting for the moral implications of more general personality traits such as the Big 5.

After the classification was theoretically derived, Peterson & Seligman (2004) operationalized their model and developed a measure for strengths (the Values in Action Inventory of Strengths, VIA-IS), which contains 240 positively keyed items (10 for each strength). As a last step, by means of factor analysis, they identified five factors that reflect, but do not perfectly replicate the six core virtues, which they called emotional, intellectual, interpersonal, restraint, and theological. The VIA-IS has since been used in a large number of studies and has shown significant associations with a host of positive outcomes (Niemiec, 2013b).

To summarize, character strengths are the psychological mechanisms constituting and leading to six higher-order, more abstract moral virtues (wisdom & knowledge, courage, humanity, justice, temperance, and transcendence). Together, strengths and virtues define the moral excellence that guides individuals in their daily life and especially in adversity (Niemiec, 2020).

In fact, a third level of analysis has recently been suggested, that is, an overall character factor, which describes the general dispositional positivity of individuals (Feraco et al., submitted paper; McGrath, 2022; Ng et al., 2017).

Strengths and virtues are morally valued on their own right, but they are also bound to produce positive outcomes and account for the good life.

This conceptualization of character radically influenced the field of positive psychology, starting from its very definition. Indeed, in the view of Seligman and Csikszentmihalyi (2000), positive psychology is precisely "the science of positive subjective experience, *positive individual traits*, and positive institutions" (p. 1).

1.1.1. Character Strengths' Functions

Peterson and Seligman (2004) thought long and hard about the role of character and character strengths in particular in relation to the individual and community life. They immediately made clear that, in this theorization, character strengths are morally valued on their own. However, their primary role is to contribute to the fulfillment of the individual and the achievement of a good life; moreover,

"strengths and virtues determine how an individual copes with adversity" (Peterson & Seligman, 2004, p. 17).

Building on this, recent theorizations (Niemiec, 2020) have detailed the different functions character strengths play in making individuals thrive, as well as being able to manage adversity. In this view, character strengths have three so-called "opportunity" functions that related to their strong positivity effect. More precisely, they help individuals make the most of the opportunities that present themselves and allow them to be optimized. The opportunity functions include:

- Priming: Preparing individuals to deploy their best qualities in order to make the most of the positive occasions;
- Mindfulness: Being present to potential opportunities, helping people balance their resources and effort, and adapting to the specific requirements of the situation at hand;
- Appreciation: Acknowledging the value of an opportunity after it occurred and savoring it with awareness.

Furthermore, in line with Fredrickson's (2001) broaden-and-build model, character strengths are considered to be able to expand our cognitive-behavioral skill set and support positive responses to what is present while also helping us build resources to be used on future occasions, similar to what positive emotions do.

In Niemiec's (2020) theorization, character strengths also have three main "adversity" functions, that allow individuals to deal with particularly stressful situations:

- Buffering: The use of character strengths can prevent negative responses to the adverse event;
- Reappraisal: Character strengths can help explain or positively reinterpret problems;
- Resilience: Character strengths can support recovery, or bouncing back after a negative event has taken place.

The six functions can be also schematized using a temporal perspective, in which their use is better understood in specific moments, before an event (positive or negative) has occurred, while the situation is taking place, or in the moments following it, when it is over. Table 1.2 displays an

overview of the opportunity and adversity functions of character strengths following this chronological perspective.

Table 1.2

The Six Functions of Character Strengths. Adapted from Niemiec (2020)

Valence	Type	Prior	During	Afterward
Positive	Opportunity	Priming: Preparing to engage	Mindfulness: Be present	Appreciation: Valuing what occurred
Negative	Adversity	Buffering: Prevent negative effects on well-being	Reappraisal: Positively reinterpreting the adverse situation	Resilience: Recovering from adversity

As reviewed by Niemiec (2020), each of the six functions has received empirical support in the literature, with evidence that character strengths are positively related to a host of positive outcomes and negatively related to mental health issues, both cross-sectionally and longitudinally.

Another way to theoretically frame the role of character strengths is based on the criteria proposed by Seligman (2018) to assess prospective elements of well-being. In this view, character strengths could be understood as components of well-being, based on their fulfillment of the following criteria:

- Contribute to well-being: There is consistent evidence that character strengths are significantly associated with various forms of well-being (Bruna et al., 2019; Goodman et al., 2018; Hausler et al., 2017; Wagner et al., 2020), as detailed later (see paragraph 1.3);
- Be pursued for their own sake (and not just as a means to an end): By definition, character strengths are intrinsically morally valued and are not dependent on potential positive outcomes to be classified as such (Peterson & Seligman, 2004) and evidence exists that they are generally valued by laypeople per se, even in the absence of tangible outcomes (Stahlmann & Ruch, 2020);

- Be exclusive and exhaustive: The classification of character strengths stems from an intensive historical, cross-cultural, and philosophical review, making it quite comprehensive and extensive (although not immune to criticism; see Study 1);
- Be translatable into specific interventions to build each other as well as well-being: There is a variety of interventions based on character strengths (Niemiec, 2017; Ruch et al., 2020), and there is strong evidence on their efficacy over well-being and depression (Schutte & Malouff, 2019), while their ability to increase strength trait levels is still debated (Ruch et al., 2020);
- Be parsimonious: Although 24 features are by all means quite a high number of variables to be considered, character strengths can be summarized either into the six virtues or even considered as a unique factor (McGrath, 2022);
- Be defined and measured independently: Although character strengths do correlate with each other to quite a great extent, they can be assessed separately thanks to the VIA-IS questionnaires (Peterson & Seligman, 2004) and have shown differential correlations with well-being.

To summarize, these 24 strengths may represent the bedrocks of well-being, as they are dispositional, universal features that can be cultivated to increase well-being. But how is this possible? What are the specific mechanisms connecting strengths with desirable outcomes (such as well-being)? This is still an open, yet fundamental question (Ruch et al., 2020; Schutte & Malouff, 2019).

I posit that more proximal variables may help us understand how by building strengths, it is possible to achieve a greater well-being or higher academic achievement (in the case of university students). Among them, in the present thesis, I have considered posttraumatic growth (Study 2), study-related factors (Study 5), and satisfaction of basic psychological needs (Study 6).

In the next paragraphs, character strengths will be further described as elements of well-being, in line with the Positive Functioning Framework (Rusk & Waters, 2015).

1.2. The Positive Functioning Framework: The What and How of Well-Being

Several theories of well-being exist in the positive psychology literature, with the main distinction being drawn between Subjective Well-Being (SWB) and Psychological Well-Being (PSB) (see Deci & Ryan, 2008 for an overview). Briefly, SWB represents the hedonic kind of well-being, as it focuses on the individual evaluation of what is pleasant. Instead, PWB represents the eudaimonic type of well-being and focuses on growth and optimal psychological functioning, with a greater attention to the interpersonal dimension (Ryff, 1989).

Additionally, some scholars have suggested that well-being contributes to understanding mental health as a dual-factor concept (Suldo & Shaffer, 2008) composed of both well-being and absence of ill-being, i.e., of traditional psychopathological indicators (e.g., depression, anxiety). In this view, it is important to consider both ill-being and well-being measures to fully understand what mental health looks like in any individual.

Interestingly, most of the attention has been devoted to the "what" of well-being, trying to understand its nature and define it, while there is a lack of research on the "how", or the mechanisms that lead to well-being and explain the efficacy of well-being interventions. To cover this gap, Rusk & Waters (2015) meta-synthesized more than 18,400 peer-reviewed publications through coterm analysis and empirically derived five domains of positive functioning, which represent the psychological processes, states, and events contributing to well-being, making individuals feel, function, and behave in a good way. These domains include the following: Attention and awareness, comprehension and coping, emotions, goals and habits, and virtues and relationships (see Table 1.3 for a definition and indication of the corresponding variables and study in which they were considered).

Table 1.3

The Positive Functioning Framework. Adapted from Rusk & Waters (2015), p. 7

Domain	Definition	Reference to the present work
Attention and awareness	Regulation of attention toward sensory or cognitive information (e.g., novelty) in a consciously controlled or automatic way	Mindfulness and mindfulness practice (Study 6)
Comprehension and Coping	Consciously controlled or automatic processes involved with: Identifying stimuli; determining causal relations; deductive and inductive logic; anticipating future possibilities. These processes can be applied to effectively cope with adversity	Posttraumatic growth (Study 2) Study resilience (Studies 3-5)
Emotions	Experiencing emotions in the present moment, identifying emotions and emotional associations with stimuli and memories	General mental health (Study 2) Distress (Studies 3-5) Achievement emotions (Study 5)
Goals and Habits	Enduring conscious or unconscious values, rules, principles, and aims involved in guiding the selection of behavior, and the habits and skills involved in the execution of those behaviors	Self-regulated learning (Study 3-5) Motivational beliefs (academic self-efficacy, learning goals, growth mindset, Study 3-5) Basic psychological needs (Study 6)

Virtues and Relationships	Enduring and momentary social interactions, (e.g., romantic, family, friend), and the individual virtues and behavior that influence their quality	Character strengths (all the studies)

The model can also be applied to the field of positive education (Waters et al., 2017) and provides a useful guideline to study the main variables that can lead to greater well-being according to the empirical evidence on this complex topic. Indeed, this broad, yet exhaustive framework can serve as a good approximation of the relevant variables to be addressed when studying well-being in various populations, including university students (see par. 1.4).

1.3. Character Strengths and Well-Being

Character strengths have been directly associated with a host of desirable outcomes (see Niemiec, 2013; Ruch & Stahlmann, 2020 for an overview), ranging from positive functioning at work (Dubreuil et al., 2014; Harzer & Ruch, 2013, 2015), to flourishing interpersonal relationships (Goodman et al., 2018; Lavy et al., 2014), or academic satisfaction (Lounsbury et al., 2009). Particular focus has been devoted to their relationship with subjective well-being and especially life satisfaction. A meta-analysis of 30 samples by Bruna et al. (2019) showed large effects for hope and zest, and medium effects for gratitude, love, curiosity, perspective, and perseverance; modesty, prudence, and self-regulation were the least related to life satisfaction.

Furthermore, there is a growing interest in the protective role of character strengths with respect to general mental health (Petkari & Ortiz-Tallo, 2016; Shoshani & Slone, 2016), which can be understood as an index of ill-being, as opposed to well-being.

More specifically, character strengths have been associated with fewer depressive and anxiety symptoms (indicators of distress, in opposite direction to well-being) at all three levels of analysis: single character strengths (Freidlin et al., 2017; Huta & Hawley, 2010; Kim et al., 2018; Smedema, 2020), second-order virtues (Duan, 2016), as well as overall character (Tehranchi et al., 2018). The

results of literature studies generally indicate that hope, zest, gratitude, love, and curiosity are the single character strengths that are most consistently related to mental health, while transcendence, humanity, and temperance tend to emerge as the second-order virtues most strongly associated with such symptoms. The results of the few longitudinal studies available in the literature (Duan, 2016; Hausler et al., 2017) parallel those obtained in cross-sectional analyzes, further confirming the importance of both single character strengths and virtues in relation to mental health.

Although it is of crucial importance to identify the predictors of well-being, and character strengths seem to fit well within this scope, it is even more interesting and potentially informative to deeply understand the mechanisms possibly illuminating this direct link. Character strengths can be seen as general, dispositional intraindividual features that allow individuals to reach a greater well-being through some more specific constructs, such as posttraumatic growth (if we consider adversity situations) or basic psychological needs satisfaction (if instead we are trying to capture an opportunity situation). The following paragraphs will therefore first introduce the possibility that these two psychological constructs may act as general mediating mechanisms in the relationship between character strengths and well-being. Then, the focus will shift to a specific population of interest, i.e., university students.

1.3.1. Mediating Mechanisms: Posttraumatic Growth

Posttraumatic growth (Tedeschi & Calhoun, 1996) refers to all the enduring positive changes in self-perception individuals may report after experiencing a traumatic event, i.e., a major stressor that significantly challenges or invalidates how they see the world (e.g., terrorist attacks, life-threatening accidents, or severe illnesses; Tedeschi & Calhoun, 2014).

Around one in two people experiencing trauma report moderate to high degrees of posttraumatic growth (see Wu et al., 2019 meta-analysis), and women generally refer higher growth than men (Vishnevsky et al., 2010). Meta-analytic findings show that those who display higher posttraumatic growth also tend to report better mental health (Helgeson et al., 2006; Sawyer et al., 2010).

Provided character strengths make individuals more resilient, helping them recover from adversity (Niemiec, 2020), they should also promote posttraumatic growth. Regarding this, Peterson et al. (2008) theorized that some character strengths could be specifically involved in facilitating one of the five domains of posttraumatic growth: kindness and love (improved relationships with others); curiosity, creativity, and love of learning (openness to new possibilities); appreciation of beauty, gratitude, zest (greater appreciation of life); bravery, honesty, and perseverance (enhanced personal strength); and spirituality (spiritual development). Their results suggest that all character strengths are positively related to posttraumatic growth after various traumatic life events (Peterson et al., 2008), with stronger correlations for spirituality, gratitude, kindness, bravery, and hope. The finding on spirituality is also in line with meta-analytic results on the relation of spirituality and religious coping with posttraumatic growth (Prati & Pietrantoni, 2009). Another cross-sectional study (Duan & Guo, 2015) conducted after an earthquake in China reported significant associations between virtues and posttraumatic growth in both individuals who directly and indirectly experienced the traumatic event.

Importantly, this construct is not exempt from criticism. As reviewed by Infurna & Jayawickreme (2019), posttraumatic growth, especially when measured through retrospective recalling, may be better seen as a coping strategy rather than a proxy of actual personality change. In this sense, posttraumatic growth could be better understood as a form of meaning-focused coping, capturing how individuals positively reappraise a stressful experience (see Carver & Connor-Smith, 2010). Interestingly, this kind of coping is especially likely when the stressful situation is uncontrollable, as in the context of a global pandemic. In this sense, the positive changes reported under the COVID-19 pandemic, few months after the first wave in adults and high-school graduates (R. Chen et al., 2021; Hyun et al., 2021; Kalaitzaki, 2021; Yu et al., 2021), as well as in adolescents (Waters, Allen, et al., 2021), may describe positive adaptation to the pandemic situation rather than enduring personality shifts.

Altogether, posttraumatic growth could act as a mediator in the relationship between character strengths and mental health, contributing to buffer against distress and depression, as already shown in women diagnosed with cancer (Silva et al., 2012; A. W.-T. Wang et al., 2017) and in professional helpers in Palestine (e.g., medical doctors, nurses, psychologists, Veronese et al., 2017). In other words, having higher character strengths may favor a positive reinterpreting of the traumatic event and promote growth, which in turn may positively relate to mental health following the traumatic event itself.

1.3.2. Mediating Mechanisms: Basic Psychological Needs

Although posttraumatic growth can be regarded as a valid explanatory mechanism linking character strengths with well-being, its relevance is limited to highly stressful, life-threatening situations and may therefore be less applicable to regular conditions. To better understand how character strengths can positively affect well-being, it is therefore necessary to identify other valid mediating mechanisms that may be more widely generalized across life conditions. In this sense, self-determination theory (SDT, Deci & Ryan, 1985; Ryan & Deci, 2000, 2017) can be a useful theoretical model to frame this question. More precisely, SDT identifies three basic psychological needs that are crucial for self-motivation and well-being:

- Autonomy: Being able to self-determine one's behavior in a way that is volitional and congruent with one's authentic values and interests;
- Competence: Being able to effectively interact with the environment and to express one's capacities, experiencing mastery and effectiveness;
- Relatedness: Feeling close to others and integrated in the social environment.

Empirical research has indeed supported the significant relation between the satisfaction of these needs and various domains of well-being, including life satisfaction and ill-being (J. Y. Y. Ng et al., 2012; Schutte & Malouff, 2021; Van den Broeck et al., 2016). Moreover, character strengths appear significantly positively associated with the satisfaction of these three psychological needs (Bai et al.,

2021; Brdar & Kashdan, 2010). More specifically, it seems that strengths such as zest and hope are those most tightly related to all three basic psychological needs. Furthermore, there is evidence that the relationship between character strengths use and ill-being (depression) is mediated by basic needs satisfaction (Bai et al., 2021).

1.4. The Case of University Students

University students represent a unique population to be studied in relation to positive personal individual features such as character strengths. As discussed by several authors (Lavy, 2020; Waters et al., 2017) and international bodies (Pellegrino & Hilton, 2012; World Economic Forum, 2015) students living in the 21st century face complex challenges and uncertainties, as the labor market and societal conditions are rapidly changing. Furthermore, university students are at increased risk for mental health issues, as the transition from adolescence to adulthood (ages 17-24) represent the peak period for the onset of mental disorders (Auerbach et al., 2018). These external and internal threats call for the need to develop institutional support and internal resources that may shield students and allow them to thrive and positively contribute to the society (Lavy, 2020). In this sense, it is important to adopt a strength-based approach to understand what intraindividual qualities can sustain students in their career (Linkins et al., 2015). To do so, comprehensive models specific to learning contexts are needed, as discussed in the following paragraphs.

1.4.1. The Integrated Self-Regulated Learning Model of Academic Learning

Several models have tried to picture what successful academic learning is and what it affects. Under the umbrella construct of self-regulated learning (SRL) (see Panadero, 2017 for a review of the theme), recent theoretical models such as the integrated SRL model (iSRL, Ben-Eliyahu, 2019; Ben-Eliyahu & Bernacki, 2015) acknowledge this as a complex phenomenon in which emotions play a crucial role.

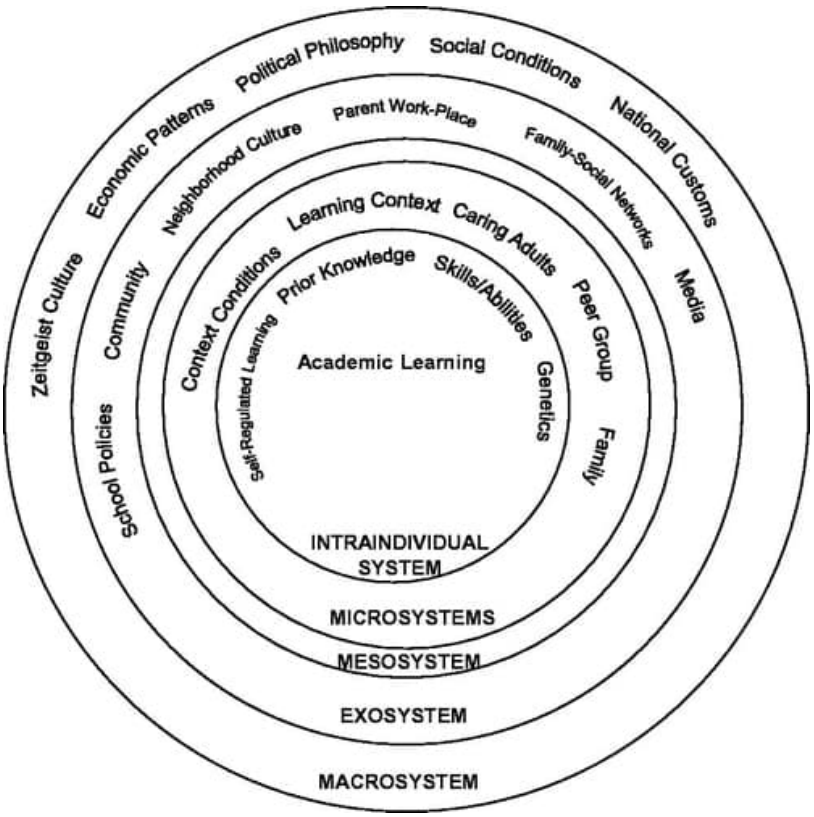
This model champions an ecological systems developmental perspective in which the "intraindividual system" – all the internal factors involved in learning – interacts with more external systems (e.g., family and institutional factors). Intraindividual factors include study-related factors

such as SRL and motivation to succeed, together with more general characteristics such as personal skills and genetics (Ben-Eliyahu, 2019).

Academic emotions, which can be defined as the positive and negative affect experienced with reference to the academic context, interact with the other intraindividual factors to support academic learning. In this view, the intraindividual system represents the "how" of academic learning, while the "what" encompasses desirable cognitive, behavioral, and emotional outcomes, examples of which can be academic achievement or well-being. It is postulated that students who succeed in cognitive, behavioral, and emotional academic learning outcomes are those who can flexibly use these intraindividual general and study-related personal dispositions. Figure 1.2 displays an overview of the model.

Figure 1.2

The Integrated Self-Regulated Learning Model (Ben-Eliyahu, 2019, p. 2)



In the next paragraphs, I will present the main study-related components of the intraindividual system. These are factors that directly pertain to the learning context, in terms of thoughts, behaviors, and emotions that are planned, monitored, and adjusted while studying and include self-regulated learning strategies (Zimmerman, 2000), motivational beliefs such as academic self-efficacy (Bandura, 1997), growth mindset, and learning goals (Dweck & Leggett, 1988), study resilience (De Beni et al., 2014) and achievement emotions (Pekrun, 2006).

1.4.1.1. Self-regulated Learning Strategies

Self-regulated learning (SRL) generally refers to the extent to which students are actively involved in the learning process, in terms of their ability to analyze a learning task, set themselves goals, plan how to achieve them by adopting specific learning strategies, monitor their progress, stay motivated, assess their own performance, reflect metacognitively on their successes or failures, and consequently adjust their studying behavior (see Panadero, 2017 for a review). More precisely, SRL strategies can be conceived as behaviors and thoughts students adopt to actively plan, monitor, and adjust their learning to achieve specific goals (Zimmerman, 2000). These include organizing one's time, elaborating the learning material, metacognitively reflecting on one's learning, and so on. Strategies are organized, deployed, and evaluated in a recursive way, throughout three main phases (Zimmerman, 2000). In a first phase, called "preparatory", students carefully consider the learning task at hand, set their goals, and plan out the activities to achieve them. Then, in the performance phase, students engage in the task and oversee their execution to see whether the strategies implemented are effective. Lastly, in the self-reflection phase, students meta-cognitively assess their performance and decide on how to approach future tasks consequently (Zimmerman, 2000).

1.4.1.2. Motivational Beliefs

Academic motivation broadly refers to what drives students to attain goals, energizing and sustaining their effort. The work of the present thesis is based on three motivational beliefs that can help understand motivation in students (Feraco et al., 2021, 2022; Mega et al., 2014), as their interplay contributes to the motivational orientation towards studying. Academic self-efficacy can be defined

as the belief that one can succeed in the academic context and successfully complete the required academic tasks (Bandura, 1997). In contrast to general self-efficacy, academic self-efficacy specifically refers to the learning context and represents a cognitive evaluation of future performance in a given academic task. Growth mindset is the belief that one's intelligence is malleable and can therefore be increased (Dweck & Leggett, 1988). Here I consider growth mindset as a continuum that spans from fixed mindset (holding the idea that intelligence is static and uncontrollable) to growth mindset (believing intelligence can be augmented throughout life through effort). Lastly, learning goals refer to the individual preference for deep mastering a topic rather than performing better than others in a given learning task (Dweck & Leggett, 1988); in this sense, they also compose a continuum from performance goals (approaching a learning task to assert one's ability over others) to mastery goals (approaching a learning task to gain knowledge and develop competence).

1.4.1.3. Study Resilience

Resilience can be briefly defined as a successful stress-coping ability (Connor & Davidson, 2003), or the ability to quickly recover from adversity. In the context of learning, it has been described as the ability to face particularly demanding studying situations and maintaining a willingness to succeed despite failures and difficulties, while being able to manage one's anxiety levels (De Beni et al., 2014). More specifically, study resilience can be seen as the ability to avoid feeling overwhelmed before a task takes place (reducing anticipatory anxiety) while also being able to recover from possible failure after the task is completed, without losing motivation and learning from the failure itself.

1.4.1.4. Achievement Emotions

Another crucial affective factor in the academic context is represented by achievement emotions, which are the positive and negative affect experienced with reference to the activities (e.g., studying, taking notes, interacting with course mates) and/or outcomes (e.g., exam results, performance in assignments) taking place in the academic context (Pekrun, 2006). More specifically,

according to the control-value theory (Pekrun, 2006), achievement emotions are influenced by the importance that students attribute to the performance (i.e., value appraisal) and the perceived sense of control over their learning tasks and situations (Pekrun & Stephens, 2010). Furthermore, according to the broaden-and-build hypothesis by Fredrickson (2001) positive (achievement) emotions bear particular importance in facilitating the enlargement of the cognitive and behavioral repertoire available to any individual (broaden) and consequently the development of new resources (build) to be used in the future. In other words, experiencing positive emotions allow students to access an increased number of options on how to respond to the situation at hand, which then promotes a positive adaptation to the environment. Moreover, this experience catalyzes the accrual of new resources for future well-being, thus generating upward spirals towards flourishing.

1.4.2. The Role of Study-Related Factors

Study-related factors may be conceived as more proximal "process" variables that are able to influence relevant academic outcomes (such as achievement) more closely and directly than general, more distal variables such as character qualities (Roberts & Yoon, 2022). In this sense, it is important to note that positive relationships have been evidenced between character strengths and several study-related factors. More specifically, perseverance has been positively related to academic emotions and self-efficacy, learning goals, and self-regulated learning (Alhadabi & Karpinski, 2020; Datu & Fincham, 2021; Muenks et al., 2017; Wolters & Hussain, 2015), and so have curiosity (Lauriola et al., 2015; Richards et al., 2013) and critical thinking (Phan, 2009; Villavicencio, 2011). Previous studies conducted with 10-18 year old students also support the mediational role of self-regulated learning and motivation in the relationship between character as a whole and academic achievement (Feraco et al., 2021, 2022). Said differently, it appears that while both character strengths and study-related factors play specific positive roles in sustaining academic and nonacademic outcomes, when considering study-related factors the role of character disappears, and these process variables fully mediate its relationship with these dependent variables.

1.4.2.1 Academic Achievement and Study-Related Factors

The study-related factors previously described have been repeatedly associated with academic achievement, and the literature on these relationships is more consistent compared to that on well-being, except for study-resilience.

Regarding SRL strategies, meta-analytical evidence has shown their positive relationship with academic achievement (Richardson et al., 2012), as well as their mediating role in the relation between achievement emotions and achievement (Mega et al., 2014).

With respect to motivational beliefs, these factors have been associated with achievement both individually (Chemers et al., 2001; A. Costa & Faria, 2018; Richardson et al., 2012; Sisk et al., 2018) and as a combined second-order factor (Feraco et al., 2021, 2022; Mega et al., 2014).

Lastly, achievement emotions have shown direct and indirect associations with academic achievement (Mega et al., 2014; Pekrun et al., 2017).

1.4.2.2. Academic Achievement and Character Strengths

Most studies have focused on studying the relationship between specific character strengths and achievement. For example, there is consistent knowledge of positive (albeit small) associations of achievement with curiosity (von Stumm & Ackerman, 2013), creativity (Gajda et al., 2017), critical thinking/judgment (Fong et al., 2017), perseverance (Credé et al., 2017; Karris Bachik et al., 2021; Lam & Zhou, 2019) and emotional/social intelligence (MacCann et al., 2020), but also hope and self-regulation (e.g., Day et al., 2010; Snyder et al., 20021120; Zimmerman & Kitsantas, 2014). When considering all 24 character strengths together, it emerged that 16 out of 24 were significantly positively related to achievement, with perseverance, judgment, self-regulation, and love of learning showing the numerically highest correlations (Lounsbury et al., 2009). More recently, Karris Bachik and colleagues (2021) reported that, in a large sample of university students, perseverance was the only character strength with a significant effect on academic achievement, after accounting for the other 23 character strengths. In a smaller sample of Spanish undergraduate students, it appeared that

only the second-order factor named inquisitiveness (composed of creativity, love of learning, and perspective) was significantly associated with academic achievement (Villacís et al., 2021).

1.4.2.3. Well-Being and Study-Related Factors

The literature on the relationships between study-related factors and well-being is somewhat sparse. Regarding the relationship of SRL strategies with well-being and mental health symptoms, there is some evidence of their inverse effect on psychological distress (Durand-Bush et al., 2015), together with some studies linking them to life and academic satisfaction (Balkis & Duru, 2016; Hofer et al., 2011; K. Li, 2019).

Meta-analytical findings support a small negative association of growth mindset and psychological distress (Burnette et al., 2020), and some evidence also suggests associations of academic self-efficacy (Grøtan et al., 2019) and learning goals (Kareshki et al., 2012) with mental health symptoms, as well as life satisfaction (Capone et al., 2020; Diseth et al., 2012; Kandemir, 2014; Lam & Zhou, 2020; O'Sullivan, 2011; Roebken, 2007; Vecchio et al., 2007; Yap & Baharudin, 2016).

Study resilience was found to be negatively associated with anxiety (De Beni et al., 2014); general resilience has been negatively related to psychological distress (Pidgeon et al., 2014) and positively to life satisfaction (T. Hu et al., 2015).

General positive and negative affect are part of the subjective well-being construct (Diener, 2012; Diener et al., 1985); achievement emotions have also been related to life satisfaction (Feraco et al., 2022; Hagenauer et al., 2018; Heffner & Antaramian, 2016; Karatzias et al., 2002; King & dela Rosa, 2019).

1.4.2.4. Well-Being and Character strengths in University Students

When considering university students, it is important to take into account both general well-being (for example, in terms of life satisfaction, or general mental health), but also academic well-being, in terms of satisfaction with university life and academic context at large (Huebner et al., 2012). In this sense, Lounsbury et al. (2009) reported 22 out of 24 character strengths (excluding

social intelligence and creativity) as significantly positively correlated with academic satisfaction, and that hope, self-regulation, and perseverance showed the numerically largest correlations. The authors also found that all 24 character strengths were significantly related to life satisfaction, with zest, love, and hope showing the highest correlations. Similarly, Karris Bachik et al. (2021) found that zest, hope, and gratitude were the strengths most related to life satisfaction, and zest was the only strength significantly negatively associated with depression. Interestingly, character strengths together explained around a quarter of the variance in depression scores, suggesting the importance of considering their joint effect.

1.4.3. Students with Specific Learning Disabilities

Specific learning disabilities (SLDs) are a group of disorders that involve difficulties in learning and the use of scholastic abilities (American Psychiatric Association, APA, 2013). Students with SLDs can have difficulties in more than one learning domain; comorbidities between different types of SLDs are quite frequent (Willcutt et al., 2019). These disorders are marked by specific neurobiological patterns that, in the actual state of research, cannot be completely eliminated by any form of treatment. This is why SLD interventions usually focus on compensating for learning impairments to reduce their negative effects on school, academic, or work success, and everyday life (see Deshler, 2005).

Although SLDs are traditionally associated with school success and most of the literature focuses on the effect of these disorders on scholastic outcomes, it has been well documented that SLD symptoms and consequences persist over the lifespan (Hatcher et al., 2002; Swanson & Hsieh, 2009). Therefore, it is crucial to expand our knowledge of learning disabilities beyond school, in the university and vocational settings.

The transition from school to university can be a life-changing challenge for any student (van der Zanden et al., 2018). This may be especially true for students who need to make greater efforts in their studies to overcome learning impairments. Many studies, mostly qualitative, have tried to identify the obstacles that university students with SLDs face and the strategies they use to overcome

them (MacCullagh et al., 2017; Mortimore & Crozier, 2006; Olofsson et al., 2012; Pino & Mortari, 2014; Sumner et al., 2021). These strategies involve expedients to help take notes and study course materials; searching for social support among peers, family, or academic tutors; and use compensatory and dispensatory devices. In this sense, character strengths and study-related factors may be seen as an important set of tools for students who struggle during their studies due to learning impairments to help them overcome obstacles and reduce the risk of developing distress, thus sustaining well-being.

1.5. Strength-Based Interventions

Character strengths were conceptualized as malleable and therefore amenable to change through intervention (Peterson & Seligman, 2004). A growing body of research (mainly conducted in the general population) is showing the positive effects that training signature strengths in particular (i.e., those strengths that are highest in each individual) has on well-being. More specifically, a recent meta-analytical review of 14 studies (Schutte & Malouff, 2019) examined the effect of signature strengths interventions on three sets of outcomes (positive affect/happiness, life satisfaction, and depression). The interventions included were quite heterogeneous in terms of duration (one week up to six months), design (waitlist/life as usual, or active control), and sample (community, students). The authors found a weighted Hedge's *g* of .42 (seven studies) for increased life satisfaction, of .32 (nine studies) for enhanced positive affect and happiness, and of .21 (seven studies) for decreased depression. Interestingly, no moderating effects emerged for features such as duration of the intervention, mean age, percentage of females, or type of comparison group (active control group vs. waitlist).

Evidence is scarce on the specific effects that strength-based interventions have on trait-level character growth (Ruch et al., 2020). In the above-mentioned meta-analysis, only two studies (Duan & Bu, 2019; Forest et al., 2012) investigated any change in character strengths use (thus not in terms of trait-level change) from pre- to post-intervention, and found a mean increase of .55, suggesting

these interventions are able to positively affect the use of signature strengths, leaving open the question about trait level changes in all 24 character strengths.

Moreover, very few studies used follow-ups, therefore long-term training effects are vastly unknown, although the existing evidence is promising (Pang & Ruch, 2019a). There is also a dearth of evidence on the mediating mechanisms explaining the training efficacy, with only one study (Pang & Ruch, 2019a) indicating increased strengths use as a potential explanatory mechanism for mindfulness-based strengths practice (an intervention combining character strengths with mindfulness practice, Niemiec, 2013a).

Scarcer, but encouraging evidence suggests that such strength-based interventions also positively affect achievement in school (Rashid et al., 2013) as well as psychological well-being and retention in undergraduates (Wingert et al., 2022; Yu et al., 2022). These different programs target character strengths use to specifically improve a range of positive outcomes (Lavy, 2020; Schutte & Malouff, 2019) but core common features that characterize them can be summarized by Niemiec AEA (Aware, Explore, Apply) model (2013a). This working model consists in the following three steps:

- Aware: As a first, necessary step, it is crucial to raise participants awareness of their strengths, by providing theoretical knowledge about this taxonomy and the fact everyone has all 24 character strengths within them in various degrees and combination;
- Explore: Once having become knowledgeable of the 24 strengths and their main characteristics, it is vital to deepen this knowledge by working on the recognition of strengths in oneself and others, connecting the use of character strengths with past, present, and future goals and achievements;
- Apply: Last, but not least, it is fundamental to transform all this knowledge and deep understanding into action, deciding how to deliberately exercise strengths in one's everyday life, establishing clear and measurable goals and action plans.

As reviewed by Ruch et al. (2020), these interventions can be either generic (the same character strengths are trained for all participants) or personalized (each participant focuses on a specific subset of strengths, for instance, signature ones), and both have shown benefits over well-being. Moreover, character strengths interventions are usually descriptive (all strengths are presented and trained, as they are all considered to be relevant for the individual) rather than prescriptive (some strengths are prioritized over others for their specific role in the target population, for instance, perseverance in university students), differently from socioemotional learning programs (Lavy, 2020; Linkins et al., 2015).

1.6. Summary of the Chapter

In this chapter, I introduced character strengths, the construct that will characterize all six studies of the present thesis, and I delineated their function with respect to well-being, collocating them within the open debate on what well-being is and how it is achieved. I then presented two potential mechanisms explaining the relationship of character strengths with well-being, that are posttraumatic growth (within the COVID-19 pandemic context) and the satisfaction of basic psychological needs (within the self-determination theory). I then contextualized the role that character strengths might play for university students' academic achievement and well-being. In particular, building on the intraindividual system of learning proposed by the integrated self-regulated learning model (Ben-Eliyahu, 2019), that underlines the importance of considering all the intraindividual factors that might support learning, and the results obtained by previous research on study-related factors (Feraco et al., 2021, 2022; Mega et al., 2014), I took into account the direct associations of character strengths with achievement and well-being, as well as the mediating role study-related factors might play. I also introduced the possibility of considerng a clinical population, i.e., students with specific learning disabilities, as an interesting case study to uncover the role of character. Lastly, I concluded with an overview of strengths-based interventions that can be carried out to improve well-being, and possibly character strengths themselves. Table 1.4 offers a synthesis of the concepts explained in the chapter with reference to the six studies conducted.

Table 1.4

Variables considered, definition, and studies in which they were considered

Variable	Definition	Study
Character Strengths	24 trait-like yet malleable intraindividual qualities regulating one's thoughts, emotions, and behaviors	1, 5, 6
Virtues	Six second-order, more abstract moral qualities achievable through the display of the corresponding character strengths	2
Character	Overall expression of what is "good" in any individual	2, 3, 4
Well-Being	The extent to which a person is satisfied with their life, does not suffer from mental health issues (ill-being) and they are able to flourish and achieve their potential	2, 3, 4, 5, 6
Posttraumatic Growth	Self-perceived personal growth following a traumatic event	2
Basic Psychological Needs	Three universal needs whose satisfaction leeds to self-motivation and well-being (autonomy, competence, relatedness)	6
Study-Related Factors	Trait-like yet malleable intraindividual factors characterizing the learning context and leading to academic success	3
Self-Regulated Learning	Active process in which students plan, carry out, monitor, and adapt their learning	4, 5
Motivational beliefs	Motivation towards studying, as represented by academic self-efficacy (belief that one can succeed at a given academic task), growth mindset (belief one's intelligence is malleable and can be incremented), and learning goals (orientation towards mastering rather than performing)	4, 5
Study Resilience	Bouncing back from academic failures and managing anxiety	4, 5

Achievement Emotions	Emotions experienced with reference to the university	4
Academic Achievement	Academic performance, as measured by grades	3, 4, 5
Mindfulness	Self-regulation of attention towards the present moment with an attitude of curiosity, openness, and acceptance	6

2. Study 1: Validation of the Italian Form of the VIA Inventory of Strengths-120

2.1. Rationale of the Study

The rationale for this first study was two-fold: First, prior to this study, there was no validated instrument to assess character strengths in the Italian population (which was instrumental to rigorously study their role in the context of my thesis). Second, there was an urgent need to contribute methodologically to the debate around the internal structure of character. Indeed, after establishing their classification on character theoretically, Peterson & Seligman (2004) went on to operationalize it and develop a measure for character strengths. The original self-report instrument was called the Values in Action Inventory of Strengths (VIA-IS) and contained 240 positively keyed items (10 for each character strength). Five factors emerged from the Exploratory Factor Analysis (EFA), partially replicating the six core virtues: Emotional, intellectual, interpersonal, restraint, and theological.

Since this first factorial analysis on the VIA-IS, its structure has been empirically investigated in multiple studies (see Table 2.1), mainly through Principal Component Analysis (PCA) and Principal Axis Factoring (PAF). As evident from the analysis of the literature, the structure of the instrument is highly unstable, with large differences in the number of factors extracted (usually three to five), in the content of the identified factors (in terms of the character strengths composing them), and even in the labels used to name the factors.

Using a data-driven approach (such EFA) usually undermines the theoretical basis behind the instrument, since any assertion made on the instrument and its relations relies on current data rather than theoretically driven hypotheses and interpretations, making it hard to generalize results and replicate findings.

Quite alarmingly, very few authors (Duan et al., 2012) adopted a confirmatory factor analysis (CFA) approach to corroborate the findings obtained with exploratory approaches. This practice led to a plethora of different and possibly unreliable models that were not adopted in subsequent studies. In fact, studies using the VIA-IS usually perform a new exploratory analysis of its internal structure,

basically ignoring all the models that have been proposed before (Heintz & Ruch, 2020; Martínez-Martí & Ruch, 2017; Peterson et al., 2008; Petkari & Ortiz-Tallo, 2016; Weber et al., 2013).

Surprisingly, very few studies (Anjum & Amjad, 2020; McGrath, 2014; V. Ng et al., 2017) used CFA to replicate the structure originally theorized by Peterson & Seligman (2004).

Furthermore, the unidimensionality of character strengths – whether each individual strength scale does represent only that strength – has been understudied (Khumalo et al., 2008; V. Ng et al., 2017), and was not confirmed in the two studies that did analyze it (Khumalo et al., 2008; Ng et al., 2016). Ignoring the unidimensionality raises issues in empirical studies that investigate the associations of second-order virtues with variables of interest, as the virtues might be composed of unreliable strengths; or even the associations of single character strengths with variables of interest because the single scales could be composed of more than one factor (i.e., they might be multidimensional) and may not represent a unique factor.

Table 2.1

Overview of Studies that Examine the Internal Structure of VIA-IS Measures

Study	*N*	Statistical Approach	# Factors	Fit indices (when available)
Peterson & Park (2004)	NA	FA	5	
Peterson & Seligman (2004)	NA	PCA (varimax)	5	
Macdonald et al. (2008)	123	PCA (varimax)	4	
Khumalo et al. (2008)	256	CPCA (obliminal) – item level	24	
		CPCA (obliminal) – virtue level	6	
		CPCA (obliminal) – virtue level	6	
		EPCA (obliminal)	2	
Ruch et al. (2010)	1674	PCA (varimax)	5	
Singh & Choubisa (2010)	123	PCA (varimax)	5	
Brdar & Kashdan (2010)	881	ML (promax)	4	
Shryack et al. (2010)	332	PCA (varimax)	3	
Duan et al. (2012)	839	EFA item level		
	420	PCA (varimax)	3	
	419	CFA 1-factor	1	CFI = .80, TLI = .78, RMSEA = .11
		CFA 2-factor (a)	2	CFI = .82, TLI = .81, RMSEA = .10
		CFA 2-factor (b)	2	CFI = .83, TLI = .81, RMSEA = .10
		CFA 2-factor (c)	2	CFI = .83, TLI = .81, RMSEA = .10
		CFA 3-factor	3	CFI = .90, TLI = .89, RMSEA = .08
Littman-Ovadia & Lavy (2012)	635	PCA (varimax)	5	
McGrath (2014)	458,998	a: PAF (promax, varimax) + PCA (varimax)	5	
		b: the same as (a) - item-level	24	
		c: same as (a) with 24 new scales	5	
		CFA based on Peterson & Seligman (2004)	6	CFI =.69, RMSEA =.14, SRMR =.10
		CFA based on (a)	5	CFI =.89, RMSEA =.10, SRMR =.05
		CFA based on (c)	5	CFI =.90, RMSEA =.08, SRMR =.05
Azañedo et al. (2014)	1060	PCA (varimax)	5	
Littman-Ovadia (2015)	726,771	PAF (promax)	5	
Seibel et al. (2015)	1975	PCA (varimax)	1	
		PCA (varimax)	3	
		PCA (varimax)	4	
Ng et al. (2017)	447,577	CFA based on Peterson & Seligman (2004)	6	CFI = .69, TLI = .69, RMSEA =.04, SRMR = .06
		CESEM-bi	6	CFI = .80, TLI = .79, RMSEA =.03, SRMR = .07
		CESEM	6	CFI = .78, TLI = .77, RMSEA =.03, SRMR = .04
		CFA 24 strengths	6	CFI = .85, TLI = .84, RMSEA =.03, SRMR = .05
		Hierarchical CFA 24-6	6	CFI = .79, TLI = .79, RMSEA =.04, SRMR = .07
		CESEM 24 strengths	6	CFI = .90, TLI = .89, RMSEA =.03, SRMR = .03
		CESEM global bifactor	6	CFI = .92, TLI = .90, RMSEA =.03, SRMR = .03
McGrath (2016)	15,540	CFA based on McGrath (2014)	5	CFI =.75, RMSEA = .12, SRMR = .08
		CFA + MI based on McGrath (2014)	5	CFI =.96, RMSEA = .07, SRMR = .05
		Multigroup CFA based on McGrath (2014)	5	CFI = .90, RMSEA = .11, SRMR = .09
Azañedo et al. (2017)	2143	PAF (promax)	5	-
Höfer et al. (2020)	1073	PAF (promax)	5	-
	685	PAF (promax)	5	
Anjum & Amjad (2020)	542	CFA based on Peterson & Seligman (2004)	6	CFI = .85, TLI =.83, RMSEA =.11, SRMR = .23
		PCA (varimax)	4	
		CFA	4	CFI = .92, TLI =.91, RMSEA =.06, SRMR = .05
Pezirkianidis et al. (2020)	909	CFA for the 24 character strengths		.90 ≤ CFI ≤ .99, .78 ≤ TLI ≤ .97, .02 ≤ SRMR ≤ .07
AlAhmadi & Bretherton (2021)	1338	PAF	5	
	1336	PAF (promax)	4	
		CFA	4	

Note. NA = not available; VIA-IS = Values in Action Inventory of Strengths; FA = factor analysis; PCA = principal component analysis; CPCA = confirmatory principal component analysis; EPCA = exploratory principal component analysis; ML = maximum likelihood; EFA = exploratory factor analysis; CFA = confirmatory factor analysis; CFI = comparative fit index; TLI = Tucker Lewis index; RMSEA = root mean square error of approximation; PAF = principal axis factoring; SRMR = standardized root mean square residual; CESEM = clustered exploratory structural equation modelling.

2.2. Hypotheses

To summarize, although widely used, the psychometric properties and factorial structure of the VIA-IS are still debated; moreover, no Italian validation of the instrument was available.

Therefore, the present study examines the structure of the Italian version of the 120-item version of the VIA-IS, trying to overcome the methodological issues mentioned above.

More specifically, the unidimensionality of the single character strengths was preliminarily assessed, and CFA (rather than EFA) was adopted to test first the convergence of character strengths in the hypothesized second-order virtue, and then the original 24 character strengths-six virtues hierarchical structure proposed by Peterson and Seligman (2004). Based on the fragmented literature available, it was not possible to develop specific hypotheses on the goodness of fit of the models. Nevertheless, I expected that the confirmatory model based on Peterson & Seligman (2004) theorization would display comparable fit indices with respect to the available exploratory models.

2.3. Materials and Methods

2.3.1. Participants

The participants were 16722 Italian adults who completed the VIA-IS-120 online, through the website of the VIA Institute on Character, between 2016 and 2020. Gender was available for 12874 participants (4567 males, 8237 females, 70 other). Age was only available in terms of age range for 173 participants (125 were between 25 and 54 years old, 10 were over 54 years old and 38 were under 25 years old).

2.3.2. Measures

Values in Action Inventory of Strengths-120 (VIA-IS-120, Littman-Ovadia, 2015; Italian translation provided by the VIA Institute)

This measure is a short version of the original VIA-IS-240 (Peterson & Seligman, 2004), composed of 120 items examining the 24 character strengths (five items each). The answers are given on a 5-point Likert scale (1 = "not at all like me" to 5 = "very much like me"). For example, curiosity and hope are measured with items such as "I am always curious about the world" and "I always look on the bright side". The original measures showed high internal consistency for every strength (Cronbach's alpha range: .67–.90 for the VIA-IS, Peterson & Seligman, 2004, and .75–.91 for the VIA-IS-120, Littman-Ovadia, 2015).

2.3.3. Procedure

To obtain data from Italian respondents, I contacted the VIA Institute on Character and asked for the single item responses to the Italian version of the VIA-IS-120 collected through their website (https://www.viacharacter.org/). I also requested information on age and gender, where available. The VIA Institute kindly provided their data and granted me permission to use them for research purposes. The VIA Institute allows individuals to freely fill out the VIA-IS measure in their language and receive feedback on their character strengths through a report that can be immediately downloaded at the end of the questionnaire. Filling out the questionnaire normally requires 10 minutes.

2.3.3. Statistical Analysis

The RStudio package lavaan (Rosseel, 2012) was used for all analyses.

First, 24 first-order measurement models (one for each of the 24 character strengths) were assessed, to inspect the unidimensionality of the strengths, using a series of confirmatory factor analyses (CFAs). Testing the item-level structure is crucial to reveal possible measurement problems and avoid including in the complete model measures (specific strengths in this case) that show unidimensionality issues.

Then, a second set of CFAs was run to assess the convergence of character strengths on the corresponding second-order virtue.

Last, a hierarchical model of the VIA-IS-120 was fitted, including all the 120 items, the 24 single character strengths, and the six virtues (considered as correlated).

In the steps mentioned above, the modification indices were calculated whenever the models showed slightly poor fit indices to better understand the fit problems and try to overcome them (Beaujean, 2014). If the fit indices were markedly poor, the model was not considered for subsequent analyses.

In all the analysis, items were treated as ordinal (Shi et al., 2020) and diagonally weighted least squares (DWLS) was therefore preferred as estimator over maximum likelihood (ML). The goodness of fit to the data for each model was examined using multiple indices: comparative fit index (CFI); the Tucker Lewis index (TLI); and standardized root mean squared residual (SRMR). This last index was preferred over the more commonly used root mean squared error of approximation (RMSEA), as recent simulation studies found the former to be more reliable when using ordinal data in large samples (Shi et al., 2020), and when considering a large number of parameters (Maydeu-Olivares et al., 2018). Chi-square (χ^2) was discarded because it is very sensitive to the complexity and sample size of the model, as well as less informative than the other indices (Schermelleh-Engel et al., 2003). Since there are no absolute standards for considering goodness of fit, and previous CFA of the VIA-IS displayed barely acceptable fit indices according to strict cutoffs (L. Hu & Bentler, 1999), I opted for a nonstringent cutoff rule. Models with CFI and TLI values of .90 or more (Bentler & Bonett, 1980), and SRMR values of .09 or less (Schermelleh-Engel et al., 2003) were thus considered adequate.

2.4. Results

2.4.1. First-Order Measurement Models

The results of the 24 character strengths measurement models indicated that all the strengths – except for love of learning – could be considered unidimensional (see Table 2.2 for details). More specifically, the fit indices were consistently acceptable, with the CFI ranging from .95 to 1, the TLI from .91 to 1, and the SRMR from .03 to .08. Love of learning only showed a very high SRMR (.19) and a barely acceptable TLI (.90); therefore, it was discarded from subsequent analyses.

For all the other character strengths, items loadings were acceptable, with their means varying from .60 (for fairness) to .79 (for creativity).

Furthermore, all character strengths showed acceptable reliability in terms of Cronbach's alpha ($.74 < \alpha < .88$).

Table 2.2

Descriptive Statistics, Reliability Coefficients, Fit Indices, and Mean of the Factor Loadings of Each Character Strength

	M	SD	Skew	Kurt	α	CFI	TLI	SRMR	M_{FL}
Appreciation of Beauty	4.04	.63	–.69	.56	.80	.99	.98	.04	.67
Bravery	3.66	.69	–.42	.06	.81	.99	.98	.04	.68
Creativity	3.74	.73	–.40	–.08	.88	.99	.98	.06	.79
Curiosity	3.61	.72	–.44	.01	.82	.99	.98	.04	.70
Fairness	3.91	.56	–.53	.73	.74	.99	.98	.03	.60
Forgiveness	3.58	.79	–.40	–.15	.83	.99	.99	.04	.71
Gratitude	3.63	.75	–.36	–.12	.86	1.00	.99	.03	.75
Honesty	4.23	.53	–.77	1.22	.79	.99	.98	.05	.66
Hope	3.45	.79	–.42	–.17	.81	.97	.95	.07	.69
Humility	3.49	.71	–.39	.11	.76	.96	.92	.07	.64

Humor	3.69	.74	–.41	–.13	.83	.99	.99	.06	.71
Judgment	4.17	.52	–.69	1.16	.75	.99	.98	.03	.62
Kindness	4.06	.57	–.66	.82	.79	1.00	1.00	.02	.66
Leadership	3.57	.63	–.20	.14	.77	.95	.91	.08	.64
Love	3.79	.73	–.59	.18	.79	.96	.92	.08	.67
Love of learning	3.63	.75	–.21	–.55	.79	.95	.90	.19	.73
Perseverance	3.64	.78	–.48	–.12	.88	.99	.99	.05	.78
Perspective	3.69	.68	–.38	.12	.82	1.00	.99	.03	.69
Prudence	3.57	.69	–.35	–.07	.79	.99	.98	.04	.66
Self-regulation	3.29	.76	–.23	–.30	.74	.99	.98	.05	.61
Social intelligence	3.76	.62	–.44	.28	.75	.97	.94	.06	.62
Spirituality	3.07	.81	.03	–.45	.78	.98	.97	.07	.65
Teamwork	3.63	.62	–.37	.32	.74	.99	.99	.03	.61
Zest	3.39	.80	–.25	–.27	.85	.99	.98	.05	.73

Note. M = mean; SD = standard deviation; Kurt = kurtosis; CFI = comparative fit index; TLI = Tucker Lewis index; SRMR = standardized root mean square residual; M_{FL} = mean factor loadings.

2.4.2. Second-Order Measurement Models

Regarding second-order virtues, all but one of the virtues hypothesized showed good fit indices (see Table 2.3), with transcendence only showing a slightly inadequate SRMR (.11), despite good CFI and TLI values (.93 and .92, respectively).

Each second-order measurement model included the character strengths theoretically related to that virtue (Peterson & Seligman, 2004), and the items loading on each character strength.

All virtues were significantly correlated with each other (see Table 2.3).

The virtue of wisdom and knowledge only included creativity, curiosity, judgment, and perspective, since love of learning was excluded from the analyses. To be precise, including it in the

model again led to unacceptable fit indices (SRMR = .10). The loadings for the virtue of wisdom and knowledge ranged from .64 to .78 (mean = .72).

The virtue of courage included bravery, honesty, perseverance, and zest. Its loadings ranged from .74 to .85 (mean = .72).

The virtue of humanity included love, kindness, and social intelligence. Its loadings ranged from .67 to .89 (mean = .79).

The virtue of justice included fairness, leadership, and teamwork. Its second-order loadings ranged from .83 to .98 (mean = .90).

The virtue of temperance included forgiveness, humility, prudence, and self-regulation. Its loadings ranged from .39 to .69 (mean .57).

Lastly, the virtue of transcendence included appreciation of beauty and excellence, gratitude, hope, humor, and spirituality. Since the SRMR for this second order model was unacceptable (.11), the modification indices were inspected, which indicated that some items had correlations between the residuals. In particular, the correlations between residuals for items 14 (“I practice my religion”, spirituality) and 71 (“My faith makes me who I am”, spirituality), for items 29 (“Despite challenges, I always remain hopeful about the future”, hope) and 30 (“My faith never deserts me during hard times”, spirituality), and for items 87 (“I have a great sense of humor”, humor) and 119 (“I am known for my good sense of humor”, humor) all displayed high modification indices (MI = 13301.80, 6615.56, and 6509.93, respectively). Therefore, I specified these correlations in the model and fitted it again; the fit indices became acceptable (SRMR = .09). The loadings of the virtue of transcendence then ranged between .45 and .91 (mean = .73). Table 2.3 summarizes all second-order models for each of the six virtues.

Table 2.3

Descriptive Statistics, Fit Indices, Mean of the factor Loadings, and Correlations (All Significant at the .001 Level) of Each Virtue

	M	SD	CFI	TLI	SRMR	M_{FL}	.1	.2	.3	.4	.5	.6
1.Wisdom	3.80	.49	.95	.94	.08	.72	-					
2.Courage	3.73	.53	.95	.94	.08	.72	.59	-				
3.Humanity	3.87	.50	.96	.96	.06	.79	.51	.57	-			
4.Justice	3.70	.50	.95	.94	.07	.90	.41	.49	.60	-		
5.Temperance	3.48	.49	.95	.94	.07	.57	.34	.37	.38	.52	-	
6.Transcendence – MI	3.58	.53	.95	.95	.09	.73	.58	.66	.67	.48	.40	-
Transcendence – No MI	-	-	.93	.92	.11	.71						

Note. MI = modification indices; CFI = comparative fit index; TLI = Tucker Lewis index; SRMR = standardized root mean square residual; M_{FL} = mean factor loadings.

2.4.3. The Hierarchical Model

A first hierarchical model (m1) was fitted, including 115 items treated as ordinal variables (love of learning items were excluded) loading on 23 strengths, loading on the corresponding six virtues. The results showed slightly inadequate fit indices (CFI = .89, TLI = .89, SRMR = .08). The modification indices were inspected, and the model was rerun, after specifying a correlation between the residuals of four strengths (perspective and prudence, MI = 11912.15; perseverance and self-regulation, MI = 10387.97) and two items (5 “I have no trouble eating healthy foods”, self-regulation; and 68 “I can always stay on a diet”, self-regulation, MI = 16230.77).

This second model (m2) showed acceptable fit indices (CFI = .90, TLI = .90, SRMR = .08).

The same model (m3) was also fitted including love of learning, but showed lower fit indices (CFI = .88, TLI =.88, SRMR = .08). Altogether, the model showing the best fit indices is the second

one (m2), i.e., the original model of 24 strengths and 6 virtues (Peterson & Seligman, 2004), excluding love of learning, but including modification indices.

2.5. Discussions and Conclusions

This study examined the internal structure of the short form of the VIA-IS at both the item- and strength-level, treating the items as ordinal, and assessing the unidimensionality of the single character strengths. Importantly, these different levels of analysis have implications that are theoretical (they tap into different hierarchical strata of character), statistical (they can help reduce the number of variables to be considered and disentangle their specific role), and practical (they can suggest what matters the most and should thus be targeted in interventions).

First, the results showed that all character strengths were unidimensional in the Italian population (except for love of learning, in which two items [17, 48] showed a high correlation between residuals), and reliable in terms of Cronbach's alphas. These findings expand the scarce knowledge of the unidimensionality of strengths (V. Ng et al., 2017; Pezirkianidis et al., 2020) and suggest that character strength subscales represent unique factors and, with the exception of love of learning, can be used as aggregate measures in future studies.

Then, it emerged that the measurement models for each of the six virtues were structurally reliable, the only exception being transcendence, for which the SRMR was poor. Thanks to the analysis of modification indices, it was possible to inspect this issue more closely, and identify those items showing similarity in content and high correlations between residuals (e.g., item 14, "I practice my religion"; and item 71, "My faith makes me who I am" for spirituality). After specifying these correlations in a second model, better fit indices could be achieved. The use of modification indices, though, questions the fit to the data of the virtue of transcendence; the character strength of spirituality strength appeared to be particularly problematic and warrants future analysis.

All the other virtues displayed good fit indices, which means that their strengths can be grouped together as a unique second-order variable.

Lastly, the analysis of the single hierarchical model of character strengths and virtues resulted in an acceptable SRMR and only slightly inadequate CFI and TLI values. Following the same procedure used for the virtue of transcendence, three main problems were identified in the model: a correlation between two items of self-regulation that could be described as "diet items" (i.e. item 5, "I have no trouble eating healthy foods"; and item 68, "I can always stay on a diet"), and between two pairs of character strengths belonging to different virtues (perspective and prudence, which should converge, respectively, to wisdom and to temperance; and perseverance and self-regulation, which should converge, respectively, to courage and temperance). Future studies should better investigate these critical points and possibly develop items that are better able to separate these character strengths. Collectively, the modified hierarchical model showed an acceptable fit, in line with studies in the previous literature using CFA (Duan et al., 2012; McGrath, 2016; V. Ng et al., 2017).

To summarize, what emerged from the analysis of the Italian VIA-IS-120 is that (apart from love of learning) character strengths can be considered unidimensional and reliable, and mainly connecting to the hypothesized virtues (again with some exceptions, as discussed earlier). Therefore, the VIA-IS-120 can be used to study single character strengths and aggregate scores of the original virtues (Peterson & Seligman, 2004), without having to explore the convergence of strengths in new components.

2.5.1. Limitations and Future Directions

It is important to keep in mind that I considered the Italian version of a short form of the VIA-IS questionnaire; thus, the present findings might not apply to the original VIA-IS, or to versions in other languages. Furthermore, it would be worth examining the external validity of the Italian VIA-IS-120 (i.e., its association with outcome measures) and its temporal stability, as these aspects could not be investigated in this sample. Lastly, gender and age effects could be interesting to explore, possibly using measure invariance.

Moving forward, as some strengths emerged as partially overlapping, and possibly pointing to multiple virtues, one solution could be to revise the items on the basis not only of correlations (as in Littman-Ovadia, 2015), but also of content, so as to measure strengths more accurately. Moreover, it would be helpful to develop even shorter measures to be used in clinical settings as a quick assessment of clients' character strengths.

However, future studies should adopt confirmatory approaches to validate existing or new theoretical proposals and investigate the structure of the VIA-IS hierarchically, considering both item and strength levels, and treating items as ordinal variables.

3. Study 2: Character, Posttraumatic Growth, and Well-Being in the General Population Under COVID-19

3.1. Rationale of the Study

The COVID-19 pandemic can be regarded as a global traumatic experience that significantly challenged the way people view the world. As such, it seems to have led to adverse effects in the general population in terms of mental health (Robinson et al., 2022; Salari et al., 2020), alongside reports of positive changes, as represented by posttraumatic growth following the first pandemic wave (e.g., Gander & Wagner, 2020; see paragraph 1.3.1.). However, few studies have examined the individual characteristics that might be associated with such outcomes and even fewer have done so longitudinally.

In this respect, character strengths may represent a good starting point to have a comprehensive idea of the positive individual qualities that sustain individuals under the COVID-19 pandemic, as they represent the main character classification in the positive psychology literature (Ruch & Stahlmann, 2020). Together, they define what constitutes "good character", or the moral excellence that guides people in their daily lives, and especially when times are hard (Niemiec, 2020).

As evidenced in the first chapter, character strengths have been theorized to fulfill three main functions in adversity situations, that is, buffering, reappraisal, and resilience (Niemiec, 2020). They represent the psychological mechanisms for exhibiting six core moral virtues identifiable throughout time and space: Wisdom and knowledge (acquisition and use of knowledge); courage (pursuit of goals despite opposition); humanity (care for others); justice (care for the community); temperance (protection against excess); and transcendence (connection and meaning).

More recently, Waters et al. (2022) have evidenced three specific functions that positive psychology, and character strengths in particular, can have in a pandemic, namely buffering, bolstering, and building.

The aim of Study 2 was precisely to investigate these positive effects in the general Italian population over the course of the pandemic. More precisely, this study tested the following:

- Bolstering/reappraisal function (maintain mental health despite the pandemic, positively reinterpreting the adversity) by assessing whether character strengths related to mental health during the first national lockdown in Italy (Time 1, April 2020);
- Buffering function (decrease or prevent adverse mental health problems during the pandemic) by examining the relationship between character strengths at Time 1 and mental health during the second wave of the pandemic (Time 2, December 2020-January 2021), and
- Building/resilience function (recover from adversity, use the pandemic in a transformative way, developing new practices, processes, and perspectives that can lead to improved mental health in the future), studying the association between character strengths at Time 1 and posttraumatic growth at Time 2, expressing the potential positive changes that occurred after the first pandemic wave (March-June 2020).

3.2. Hypotheses

Based on the literature available, I hypothesized the following:

- Hypothesis 1: Similar, low levels of general mental health at both time points, considering the enduring stressful pandemic situation (Daly et al., 2020; O'Connor et al., 2021; C. Wang, Pan, Wan, Tan, Xu, et al., 2020);
- Hypothesis 2: Character, as a single general factor composed of the six virtues (V. Ng et al., 2017), will directly relate to mental health (at both Times 1 and 2, Martínez-Martí et al., 2020; Petkari & Ortiz-Tallo, 2016) and posttraumatic growth at Time 2 (Duan & Guo, 2015; Gander & Wagner, 2021; Peterson et al., 2008);
- Hypothesis 3: Following previous evidence on traumatic events (Helgeson et al., 2006; Sawyer et al., 2010) and the SARS pandemic (Cheng et al., 2006), posttraumatic growth will be positively associated with mental health at Time 2, meaning that individuals reporting

greater positive changes following the first pandemic wave would also refer better mental health;

- Hypothesis 4: Posttraumatic growth will mediate the relationship between character at Time 1 and mental health at Time 2, meaning that character strengths help people to see a difficult situation as an opportunity to thrive, and thriving could in turn favor a greater mental health (Silva et al., 2012; Veronese et al., 2017; A. W.-T. Wang et al., 2017).

3.3. Materials and Methods

3.3.1. Participants

A total of 944 Italian adults took part of the study and completed the first phase of the study (Time 1, 7-28 April 2020), but only 484 (51.3%) agreed to be contacted for the second phase, providing their email address. Of them, 254 (52.5%) completed all measures for the second part of the study (Time 2, 20 December 2020 to 10 January 2021) and were thus included in the analysis. Therefore, the final sample comprised 254 participants (54 males, 200 females) aged 19 to 75 years (*Mage* = 36.05 years, *SDage* = 14.04). In terms of formal education, a total of 3 participants (1.18%) had not completed secondary school, 90 (35.43%) had completed secondary school, 118 (46.46%) had a bachelor's or master's degree and 43 (16.93%) had a post-graduate specialization or Ph.D. Participants who completed the first assessment only and those who completed both did not differ with respect to age, gender, work-related changes, general mental health, or virtues ($p > .05$), except for the virtue of wisdom and knowledge ($p < .01$; Cohen's $d = .21$).

To ensure sample size adequacy, a retrospective power analysis was run via simulation with 10000 iterations, specifying the main relationships hypothesized with a mean effect size of .30 (based on the literature studies previously presented). Such an analysis yielded acceptable results, with a power equal to .83 with 254 participants.

3.3.2. Measures

Sociodemographic Schedule

Participants answered some sociodemographic questions (e.g., age, gender, origin, education) and reported any job-related changes prompted by the COVID-19 pandemic at both Time 1 and Time 2 through a self-report scale (from 1 = not at all, to 5 = drastically).

Values in Action Inventory of Strengths-120 (VIA-IS-120, Peterson & Seligman, 2004; validated in Italian in Study 1)

This self-report measure consists of 120 items that assess the 24 character strengths and the six virtues, each comprising three to five strengths. This measure was administered at Time 1 only. The total scores for each character strength and virtue were calculated. The instrument showed high internal consistency for all strengths (Italian form α range: .74 – .88, Study 1; α in the present study: .65 – .90).

General Health Questionnaire-12 (GHQ-12, Goldberg, 1978; validated in Italian by Giorgi et al., 2014)

This self-report scale consists of 12 items measuring general psychological health, including anxiety, depression, and social functioning. Respondents indicate how often they felt as stated during the previous two weeks on a 4-point Likert scale (0 = "much less than usual" to 4 "more than usual"). This measure was administered at both Time 1 and Time 2. A total score was calculated. The measure showed good internal consistency in both the Italian form (α = .85, Giorgi et al., 2014) and in the present sample (α = .79 at Time 1,). The cut-off for worse mental health than usual is > 12, as indicated by Goldberg (1997).

Post-Traumatic Growth Inventory (PTGI, Tedeschi & Calhoun, 1996, validated in Italian by Prati & Pietrantoni, 2014)

This self-report measure contains 21 items that evaluate positive changes reported after a traumatic experience. For the aim of the study, the instructions were adapted to refer specifically to the first pandemic wave as the traumatic event to refer to (March-April 2020). Respondents indicate

how much they felt they had changed following this event on a 6-point Likert scale (0 = “I did not experience any change” to 5 = “I experienced change to a very great degree”). This measure was administered at Time 2 only, as I was specifically interested in measuring growth following the first pandemic wave. The original questionnaire includes five subscales (improved relationships with others, new possibilities, enhanced personal strength, increased spirituality, and greater appreciation of life). In the present study, the total score was only calculated. The score showed excellent internal consistency in the Italian validation study (α = .93, Prati & Pietrantoni, 2014) and also in the current sample too (α = .96).

3.3.3. Procedure

The study was approved by the Ethics Committee of the University of Padova (n. 3531). Participants were recruited by email, SMS, or social networks and voluntarily participated in the study. They were also informed that they would receive an invitation to a second evaluation around six months later. All questionnaires were implemented using Qualtrics.

At Time 1, participants first gave their informed consent and answered some personal information (e.g., gender, age, job-related changes under lockdown); then, they filled in the VIA-IS-120 and the GHQ-12, respectively. Lastly, they decided whether to provide an email address to be contacted for the second part of the study. At Time 2, participants answered the job-related question, the PTGI, and the GHQ-12 (in that order). The first data collection (Time 1) took place a month after the nationwide lockdown was declared in Italy due to the first pandemic wave (7-28 April 2020). The second data collection (Time 2) corresponded to the Christmas break, when the entire country was declared a “red zone”, which means strict lockdown-like restrictions were reinstated (20 December 2020 to 10 January 2021). The measures required a total of 15 minutes to be completed at Time 1 and around 10 minutes at Time 2. Table 3.1 provides an overview of the of materials and procedure.

Table 3.1

Study 2 Materials and Procedure

Time	Materials Administered
Time 1 (April 2020)	VIA-IS-120, GHQ-12
Time 2 (December 2020-January 2021)	GHQ-12, PTGI

Note. VIA-IS-120 = VIA Inventory of Strengths-120; GHQ-12 = General Health Questionnaire-12; PTGI = Post-Traumatic Growth Inventory.

3.3.4. Statistical Analysis

All analyses were performed using RStudio (RStudio Team, 2020).

First, the general state of mental health of the sample was examined, describing GHQ-12 scores at Time 1 and 2 using standardized cut-off points (Goldberg et al., 1997), and differences between the two time points were considered.

Then the internal structure of a second-order "good character" factor composed of the sum scores of the six virtues was assessed by confirmatory factor analysis, to ensure that it represented the virtues well, as suggested by Ng et al. (2017). The goodness of fit was evaluated using multiple indexes (Schermelleh-Engel et al., 2003): Comparative fit index (CFI); the normed fit index (NFI); and standardized root mean square residuals (SRMR). Values above .90 for CFI and NFI, and below .08 for SRMR can be considered acceptable (Schermelleh-Engel et al., 2003).

At this point, to evaluate the associations between character at Time 1, posttraumatic growth at Time 2, and mental health at both Time 1 and 2, a structural equation model was fitted (see Figure 3.1 for a graphical representation). The following effects were specified: i) the direct effects of character at Time 1, PTGI at Time 2, and GHQ-12 at Time 1 on GHQ-12 at Time 2; ii) the direct effect of character at Time 1 on PTGI at Time 2; and iii) the indirect effect between character at Time 1 and GHQ-12 at Time 2 through the mediation of PTGI at Time 2.

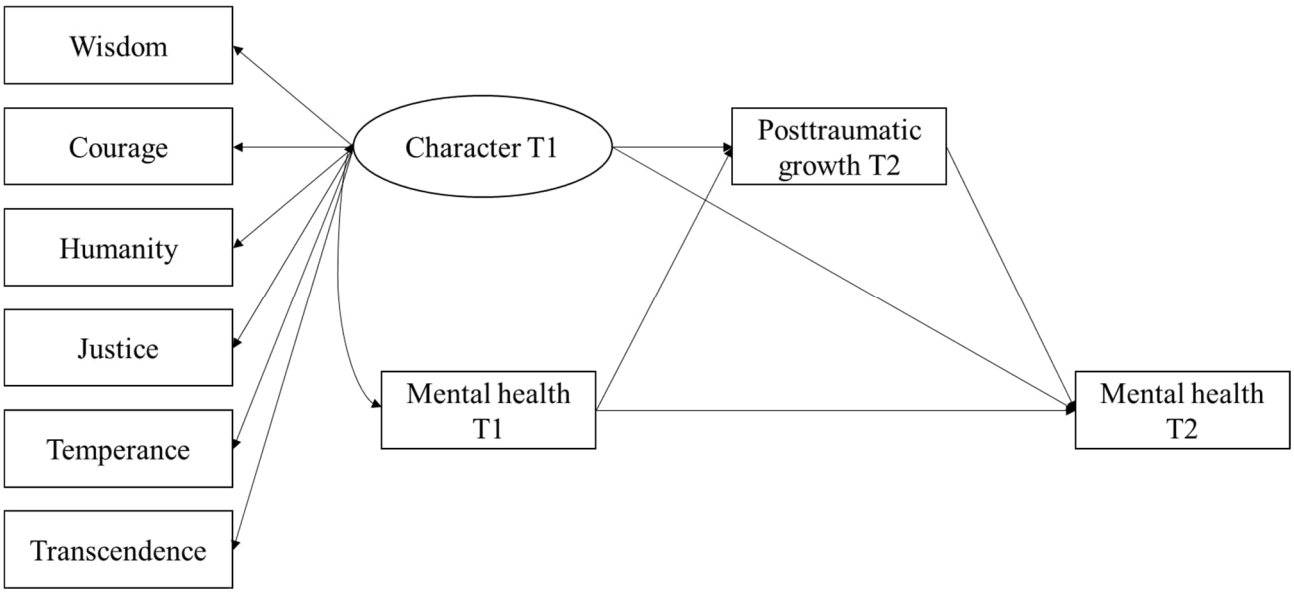
Since women seem to report posttraumatic growth more frequently (Vishnevsky et al., 2010), together with worse mental health (C. Wang, Pan, Wan, Tan, Xu, et al., 2020), and higher character

strengths (Heintz et al., 2019), gender was included as a covariate in all analyses, together with job-related changes (Brooks et al., 2020). Age was also treated as a covariate in the analyses as it appeared to have a small effect on mental health under lockdown (Salari et al., 2020; C. Wang, Pan, Wan, Tan, Xu, et al., 2020), and on character strengths (Heintz et al., 2019). The levels of general mental health reported at Time 1 were included in the analyses to account for the mental health of participants during the first wave of the COVID-19 pandemic (as in Martínez-Martí et al., 2020).

To summarize, the following covariates were also added to the model: gender and age for character; gender, age, and job-related changes for GHQ-12 at Times 1 and 2, and PTGI. The correlation between character at Time 1 and GHQ-12 at Time 1 was specified in the model.

Figure 3.1

Hypothesized Model. Gender- and Job-Related Changes are not Shown but they are Included as Covariates



Note. T1 = Time 1; T2 = Time 2. The following covariates were included in the model: Gender for Character, Mental health T1, Posttraumatic growth T2, Mental health T2; Age for Character, Mental health T1, Posttraumatic growth T2, Mental health T2; Job-related changes at T1 for mental health T1 and Posttraumatic growth T2; Job-related changes at T2 for Mental health T2.

3.4. Results

Table 3.2 shows the means, standard deviations, and correlations between the VIA-IS-120 (virtues) and the GHQ-12 at Times 1 and 2, and the PTGI.

Table 3.2

Mean (M), Standard Deviation (SD), and Correlations between VIA-IS-120 (Virtues), GHQ-12 Scores, and PTGI

	M	SD	1.	2.	3.	4.	5.	6.	7.	8.
1.Wisdom and knowledge	3.76	.43	-							
2. Courage	3.78	.51	.61	-						
3. Humanity	3.92	.45	.42	.55	-					
4. Justice	3.71	.47	.29	.37	.50	-				
5.Temperance	3.49	.46	.31	.34	.32	.39	-			
6.Transcendence	3.60	.50	.53	.66	.64	.38	.39	-		
7. GHQ-12 Time 1	1.42	.40	.20	.30	.17	.14	.20	.34	-	
8. GHQ-12 Time 2	1.50	.36	.15	.21	.20	.09	.09	.28	.34	-
9. PTGI	2.53	1.01	.12	.15	.24	.08	.13	.23	.10	.20

Note. GHQ-12 = General Health Questionnaire-12; PTGI = Post-Traumatic Growth Inventory. $r \geq .14$ are significant for $p < .05$, $r \geq .17$ are significant for $p < .01$, and $r \geq .21$ are significant for $p < .001$

3.4.1. General Mental Health During COVID-19

The results on GHQ-12 standardized cut-offs showed that 83% of the participants reported a worse general mental health than usual at Time 1; this proportion increased to 91% at Time 2. The difference between these proportions was significant (t (253) = –2.83, p = .005), meaning that general mental health was worse at Time 2 compared to Time 1.

3.4.2. Measurement Model for Character

The results of the confirmatory factor analysis (CFA) that included the sum scores of the six virtues as observed variables composing the second order factor "character" suggested satisfactory fit indices (CFI = .93; NFI = .92; SRMR = .05). The loadings were all significant for $p < .001$ and ranged from .48 for temperance to .84 for transcendence, with a mean of .67.

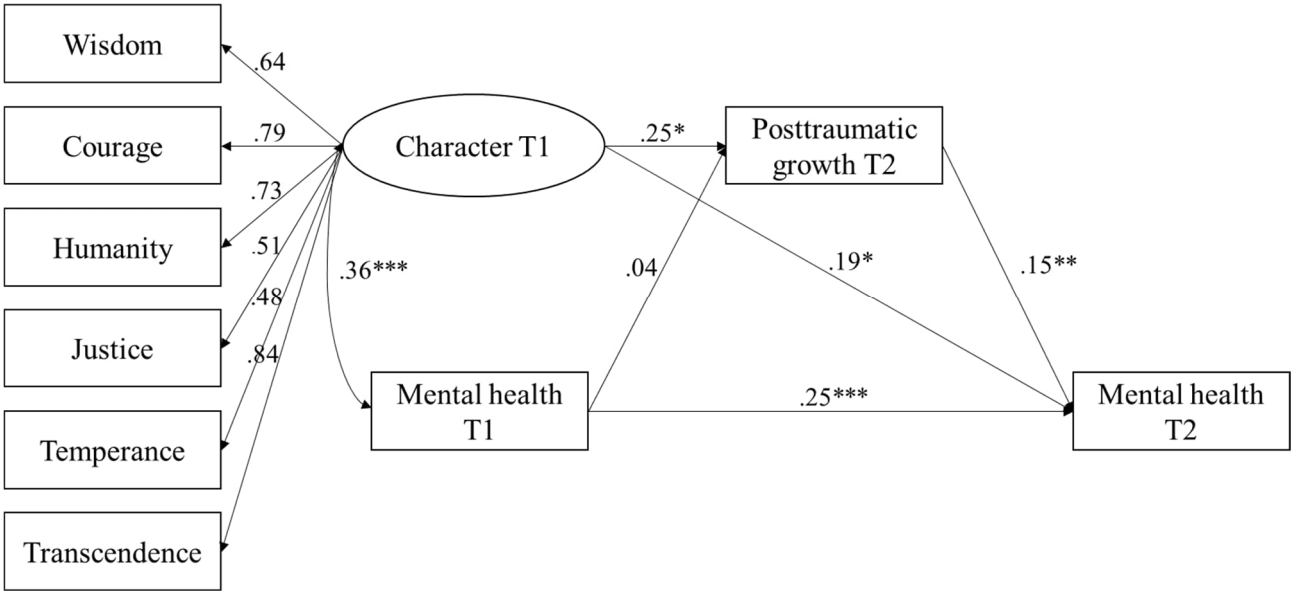
3.4.3. Associations Between Character, Posttraumatic Growth, and Mental Health

The results of the structural equation model are represented graphically in Figure 3.2. The fit of the model was acceptable (CFI = .92; NFI = .86; SRMR = .05), with the NFI only resulting in less satisfactory results.

Character at Time 1 was significantly directly related to GHQ-12 at Time 2 (β = .19), with significant effects also for GHQ-12 at Time 1 (β = .25) and PTGI at Time 2 (β = .15). Character was also significantly related to PTGI at Time 2 (β = .25) and to GHQ-12 at Time 1 (r = .36). The indirect effect of character at Time 1 on GHQ-12 at Time 2 through the mediation of PTGI at Time 1 was also significant, although small (β = .04). As for the covariates, the only significant effects emerged with respect to character, with females (β = –.21) and older individuals (β = .35) showing higher character scores; job-related changes did not show any significant effect. Overall, the model explained 9% of the variance in PTGI, and 18% of the variance in GHQ-12 at Time 2.

Figure 3.2

The Final Model



Note. T1 = Time 1; T2 = Time 2. * = $p < .05$; ** = $p < .01$; *** = $p < .001$

3.5. Discussions and Conclusions

Little is known about the qualities that sustain individuals during the course of the COVID-19 pandemic: What makes the difference in terms of mitigating negative effects on mental health on the one hand (Salari et al., 2020) and fostering a positive reappraisal of this traumatic event, as reported by some studies on posttraumatic growth following the first pandemic wave, on the other (R. Chen et al., 2021; Gander & Wagner, 2021; Stallard et al., 2021; Yu et al., 2022)?

The present study tried to answer these questions through analysis of the associations between character strengths, posttraumatic growth following the first pandemic wave (April 2020, Time 1), and general mental health during the and second (December 2020-January 2021, Time 2) waves of the COVID-19 pandemic in the Italian general population.

First of all, the results evidenced a significantly worse general mental health at Time 2 compared to Time 1. This finding is in line with our hypothesis (H1), extends previous longitudinal studies conducted during the first pandemic wave (Daly et al., 2020; O'Connor et al., 2021; C. Wang,

Pan, Wan, Tan, Xu, et al., 2020) suggesting a persistent negative effect of the pandemic on mental health of the general population months after the first nationwide lockdown was lifted.

Then, the measurement model suggested that the six virtues can be summarized as a unique second-order factor. In other words, virtues appear to jointly contribute to an overall "good character", as previously suggested by theoretical (Peterson & Seligman, 2004) and empirical work (V. Ng et al., 2017).

Using a structural equation model, it was possible to assess the buffering, bolstering, and building functions of character strengths.

As for buffering (see H2), character at Time 1 had a significant direct effect on mental health at Time 2, together with an indirect effect through the mediation of posttraumatic growth at Time 2. Previous longitudinal studies that examined the role of strengths of single characters (Gander et al., 2020; Hausler et al., 2017) had found that zest, hope, gratitude, and love are the strengths most strongly associated with well-being measures over periods of a year or two. The present results add on that by showing that good character supports mental health in difficult times, as well as facilitates the experience of posttraumatic growth (building effect) after such an intense emotional event as a pandemic. Similarly, the mediating role of post-traumatic growth in the relationship between character at Time 1 and mental health at Time 2 extends previous evidence that this construct serves as a buffer against the distress prompted by various types of trauma (Veronese et al., 2017), or a diagnosis of cancer (Silva et al., 2012; A. W.-T. Wang et al., 2017). This means that individuals generally endowed with a good character also tend to experience better mental health both during the first (bolstering) and second (buffering) Italian lockdowns, and to be better able to interpret stressful events in a positive light (building), which in turn sustains their mental health.

All in all, these findings support the idea that character strengths are personal dispositions that help people positively reinterpret an adverse situation, such as a pandemic, as an opportunity for growth (Niemiec, 2020), with benefits in terms of mental health.

Interestingly, mental health at Time 1 and posttraumatic growth at Time 2 also had significant direct effects on mental health at Time 2, in line with hypothesis (H3) and previous evidence (Helgeson et al., 2006; Martínez-Martí et al., 2020; Sawyer et al., 2010; Stallard et al., 2021).

Lastly, in terms of sociodemographic covariates, women and older people reported greater character strengths, as shown by previous metanalytic findings (Heintz et al., 2019). In contrast to previous reports (Vishnevsky et al., 2010; C. Wang, Pan, Wan, Tan, Xu, et al., 2020), no significant differences emerged in relation to posttraumatic growth and mental health in terms of age or gender.

3.5.1. Limitations and Future Directions

This study was subject to some limitations. Females were overrepresented in this study, so the results regarding gender-related differences should be interpreted with caution. Self-selection bias should also be considered as a possibility, that is, only people who were (still) experiencing mental health problems decided to participate in the second phase of the study. On the same line, the snowball recruitment approach, as well as not controlling for participants' mental health history and medication use, may both have biased the results. Since no measures of COVID-19-related stress or information on having contracted the virus were collected, this may reduce the generalizability of the findings. Character strengths were not measured at Time 2, so I could not test for the possibility of mental health and/or posttraumatic growth being influenced by an improvement in character over time, rather than the character strengths reported at Time 1.

Similarly, since I had no data on character strengths prior to the pandemic, I cannot rule out the possibility that the strengths may have already changed in response to the pandemic itself. That said, Gander & Wagner (Gander & Wagner, 2021) reported that most character strengths remained stable from before to during lockdown, making the hypothesis of character development less compelling. Future studies should rely on prospective longitudinal designs to fully understand character growth and posttraumatic growth under highly stressful conditions.

To conclude, despite the limitations mentioned above, the present study provides new evidence on the associations between character, mental health, and posttraumatic growth over time.

Fostering character strengths in the context of a pandemic, both under lockdown conditions and when such measures are lifted, may have lasting benefits on the mental health of individuals, supporting their well-being over time.

4. Study 3: Character, Study-Related Factors, Achievement, and Well-being in University students Under COVID-19

4.1. Rationale of the Study

The COVID-19 pandemic, with an abrupt shift to online learning, appears to have affected young adults, and especially students, more than older adults, in terms of mental health (Aristovnik et al., 2020; Bono et al., 2020; Cao et al., 2020; Chi et al., 2020; Datu & Fincham, 2021; Fu et al., 2021; Holzer et al., 2021; Hong et al., 2021; Y. Li et al., 2021; Y. Wang, Jing, Han, Jing, & Xu, 2020; Wathelet et al., 2020). Compared to distance learning situations without pandemic, online learning under COVID-19 was characterized by high levels of stress and uncertainty in the academic and nonacademic lives of the students. It is therefore important to consider both academic and nonacademic outcomes to have a clearer picture of academic learning during this time. Few studies considered both academic and nonacademic effects of COVID-19 (Alemany-Arrebola et al., 2020; Aristovnik et al., 2020; Cao et al., 2020), and even fewer have investigated study-related or general intraindividual factors potentially associated with these important outcomes over time (Y. Li et al., 2021). This makes it hard to identify the individuals at greater risk of struggling academically during these and similarly challenging times and, therefore, be able to support them adequately. Therefore, the present study focused on longitudinal associations of general (character) and study-related intraindividual factors identified by Ben-Eliyahu (Ben-Eliyahu, 2019) with two relevant outcomes that can help have a comprehensive picture of students' adaptation to the pandemic: achievement (self-reported grades) and general distress (emotional suffering, characterized by symptoms of depression, stress, and anxiety).

Assessing the relative role of a variety of dispositional intraindividual variables can provide evidence supporting recent theoretical frameworks such as the integrated self-regulated learning model (Ben-Eliyahu, 2019; Ben-Eliyahu & Bernacki, 2015) and inform researchers and institutions

on which one may be prioritized as target for intervention, to support students who experience difficulties and/or would like to enhance their academic learning and manage external stressors.

4.1.1. Intraindividual Factors

As mentioned in the theoretical chapter (see paragraph 1.4.1), the personal skills included in the intraindividual system of academic learning (Ben-Eliyahu, 2019) have been also referred to in the literature as character strengths (Peterson & Seligman, 2004), but also noncognitive skills (Khine & Areepattamannil, 2016), or soft skills (Heckman & Kautz, 2012).

International organizations (World Economic Forum, 2015) have recognized a subset of these acquirable character qualities as particularly relevant for 21st century students who must approach complex challenges and ever-changing environmental conditions. These include creativity, critical thinking, curiosity, perseverance and social intelligence, which have all been positively related to academic achievement in the nonpandemic literature (Gajda et al., 2017; Lam & Zhou, 2019; Richardson et al., 2012; von Stumm & Ackerman, 2013), with some indication of their importance under COVID-19 as well.

Creativity is defined here as the disposition to think of new and effective ways to do things (Peterson & Seligman, 2004). Its relationship with negative affect is controversial (Kaufman, 2014), but a meta-analytical report found a small negative association with depressed mood in university students (Baas et al., 2016).

Critical thinking, or the tendency to critically analyze learning material, has been negatively associated with mental health disorders, at least in adolescents (Su & Shum, 2019). Regarding the pandemic, in Study 1, creativity showed a negative (albeit small) correlation with general mental health, while the correlation of critical thinking with mental health was not significant.

Curiosity (a drive to know) has been positively related with successful learning (Efklides, 2017; Lauriola et al., 2015; Richter & Schmid, 2010), and negatively with anxiety and depression (Kashdan, 2007; Spielberger & Reheiser, 2009) in non-pandemic contexts, while also being related to better mental health under COVID-19 (W. W. Li et al., 2020).

Perseverance (also known in the literature as grit, or a passion for long-term goals), has emerged as negatively associated with depression in nonpandemic situations (Credé et al., 2017) and positively with subjective well-being during the pandemic (Bono et al., 2020).

Lastly, social intelligence is conceptualized here as a disposition to interact effectively with others. This appears to be directly associated with both cognitive and behavioral learning outcomes (Keefer et al., 2018) and positive affect (Martins et al., 2010), as well as with positive emotional outcomes under COVID-19 (Moroń & Biolik-Moroń, 2021).

In addition to character qualities, several study-related intraindividual factors have been related to academic achievement (Mega et al., 2014; Richardson et al., 2012) and, more rarely, to their emotions. Study-related intraindividual factors can be defined as fairly stable tendencies to approach one's studies, such as self-regulated learning, motivational beliefs (including academic self-efficacy, growth mindset, and learning goals), and study-related resilience. All in all, study-related factors are known to sustain academic learning in traditional and distance nonpandemic contexts, while less is known about their role during the COVID-19 pandemic, with indications that academic self-efficacy is negatively related to state and trait anxiety (Alemany-Arrebola et al., 2020), and to various dimensions of well-being (Capone et al., 2020). Their contribution to more general emotional outcomes (e.g., mental health, general distress) has been neglected in the literature and should deserve a closer examination.

4.1.2. Relevant Outcomes Under the COVID-19 Pandemic: Well-Being and Achievement

Research on the affective response to the COVID-19 pandemic has identified university students as at greater risk of poor mental health outcomes (e.g., anxiety, depression, stress) than older adults (Y. Huang & Zhao, 2020; C. Wang, Pan, Wan, Tan, Xu, et al., 2020). To be more specific, a large epidemiological study (n = 44,447, Z.-H. Wang, Yang, Yang, Liu, Li, et al., 2020) conducted during the first outbreak of the virus in China initially identified relatively low rates of anxiety (7.7%) and depression (12.2%) in university students. However, this was followed by several studies (Cao et al., 2020; Chi et al., 2020; Fu et al., 2021; Y. Wang, Jing, Han, Jing, & Xu, 2020; Wathelet et al.,

2020) that reported a much higher prevalence (around 25%) of self-reported distress, depression, anxiety, and stress among university students experiencing lockdown, although only slightly higher than estimated in nonpandemic situations (Auerbach et al., 2018).

Longitudinal evidence showed that these types of symptoms seem to have worsened from before to during lockdown, especially for anxiety and depression (Elmer et al., 2020; Y. Li et al., 2021; Meda et al., 2021), and they have become more severe over the course of the first pandemic wave (February-May 2020, Y. Li et al., 2021; Savage et al., 2020; Zhang et al., 2020). Subsequent studies (Fruehwirth et al., 2021; Savage et al., 2021) found similar worsening of mental health symptoms over longer time periods (October 2019-July 2020 and October 2019-October 2020, respectively). Overall, the evidence suggests that students may have difficulties emotionally adjusting to the demands of academic and life related to the pandemic. Less is known about intraindividual factors that affect emotional outcomes over time, with some evidence that male gender (Fruehwirth et al., 2021), active behavior (Savage et al., 2021), novelty-seeking (W. W. Li et al., 2020) may be longitudinally associated with better mental health.

Regarding academic achievement, the influence of the COVID-19 pandemic is unclear. Aristovnik et al. (2020) found that around 40% of students found it harder to stay focused during online lectures and felt their study performance had declined. Intriguingly, studies comparing students' performance before and after COVID-19 lockdown found either no difference (Bawa, 2020) or a significant improvement in test scores compared to previous years, regardless of the exam formats and teaching methods involved (Gonzalez et al., 2020; Iglesias-Pradas et al., 2021). Possible student-related reasons for these somewhat unexpected results include better time management and self-regulated learning strategies and a greater degree of worry and/or motivation to succeed in the face of unstable and uncertain external conditions. In other words, it may be that other factors, such as self-regulation and emotions (rather than study performance), have played an important role in student academic achievement during the pandemic.

4.2. Hypotheses

The main objective of the present study was i) to compare general distress at the different time points with normative data and ii) to assess how time, character, and study-related factors impact the outcomes of interest (achievement and distress).

More specifically, I formulated the following hypotheses:

- Hypothesis 1: Distress levels will be higher than those usually reported in nonpandemic conditions (Cao et al., 2020; Chi et al., 2020; Fu et al., 2021; C. Wang, Pan, Wan, Tan, Xu, et al., 2020; Wathelet et al., 2020);
- Hypotheses 2:
    a) Distress will be negatively associated with character (Baas et al., 2016; Bono et al., 2020; Credé et al., 2017; Datu & Fincham, 2021; Kashdan, 2007; Martins et al., 2010; Spielberger & Reheiser, 2009);
    b) Distress will be negatively associated with study-related intraindividual factors (Burnette et al., 2020; Capone et al., 2020; De Beni et al., 2014; Durand-Bush et al., 2015; Pidgeon et al., 2014);
    c) Distress will follow a V-shaped trend over time, that is, it would be higher at T1 and T4, compared to T2 and T3, also due to restrictions being lessened (Fruehwirth et al., 2021; Savage et al., 2020);
- Hypotheses 3:
    a) Academic achievement will be significantly positively associated with character (Gajda et al., 2017; Lam & Zhou, 2019; Richardson et al., 2012; von Stumm & Ackerman, 2013);
    b) Academic achievement will be positively related to study-related intraindividual dispositions (Mega et al., 2014; Richardson et al., 2012);
    c) Academic achievement will show negligible differences across time points (Bawa, 2020; Gonzalez et al., 2020; Iglesias-Pradas et al., 2021).

4.3. Materials and Methods

4.3.1. Participants

Participants were university students enrolled in Italian universities and living in Italy during the COVID-19 lockdown. I included data from respondents who completed at least one follow-up of the study (i.e., at least two assessments). The final sample included 107 students (22 males, 85 females) aged 19 to 34 years (M_{age} = 21.95, SD_{age} = 2.02). More specifically, 96 students (15 males; M_{age} = 22.01, SD_{age} = 2.12) participated in the first follow-up (T2), 87 (14 males; M_{age} = 21.81, SD_{age} = 1.74) to the second follow-up (T3) and 61 (13 males; M_{age} = 21.60, SD_{age} = 1.52) to the last follow-up (T4). In total, 30 participants (4 males; M_{age} = 21.6, SD_{age} = 1.61) completed all follow-ups.

A retrospective power analysis was performed using the package simr (Green & MacLeod, 2016) to ensure the adequacy of the sample size. It emerged that the power associated with our sample size (N = 107) was greater than .80 for all the effects considered (i.e., time, study-related factors, and character) for both DASS-21 and achievement.

4.3.2. Measures

All measures assessing intraindividual factors were administered at T1 only.

4.3.2.1. Character Strengths

I/D Epistemic Curiosity Scale – I-type Subscale (EC, Litman, 2008; translated in Italian by Litman et al. 2014)

This self-report scale contains five items measuring Type I (Interest) epistemic curiosity, that is, the pleasure associated with uncovering new information (e.g., "I enjoy exploring new ideas"). Respondents report their agreement with the statement on a 5-point Likert scale (1 = "almost never" to 5 = "almost always"). The original subscale showed good reliability indices (α = .82; Litman, 2008), and it did so in the present study too (α = .79).

Values in Action Inventory of Strengths-120 – Creativity (VIA-IS, Peterson & Seligman, 2004; validated in Italian in Study 1)

This scale involves four items that evaluate the tendency to think of new and productive ways to conceptualize and do things (e.g., “Being able to come up with new and different ideas is one of my strong points”). Responses are given on a 5-point Likert scale (1 = “not at all like me” to 5 = “very much like me”). The measure displayed a good reliability in the Italian validation study (α = .88; Study 1), as well as in the present sample (α = .91).

Motivated Strategies for Learning Questionnaire – Critical Thinking (MSLQ, Pintrich et al., 1991; Italian validation by Moretti et al., 2018)

This self-report instrument contains four items measuring the tendency to question learning material (e.g., “When a theory, interpretation, or conclusion is presented in class or in the readings, I try to decide if there is good supporting evidence”). Responses are given on a 7-point Likert scale (1 = “not at all like me” to 7 = “very much like me”). The Italian version of the questionnaire has satisfactory properties (.67 < α < .92; Moretti et al., 2018); the scale showed good internal consistency in the present sample too (α = .79).

Short Grit Scale – Perseverance of effort subscale (SGS, Duckworth & Quinn, 2009); validated in Italian by Sulla et al., 2018)

This measure involves four items that examine perseverance of effort, that is, persisting despite difficulties and plateaus (e.g., “Setbacks don’t discourage me”). Responses are given using a 5-point Likert scale (1 = “very much like me” to 5 = “not like me at all”). The subscale showed an acceptable internal consistency in the Italian version (α = .61; Sulla et al., 2018), and in the current study (α = .72).

Trait Emotional Intelligence Questionnaire-Short Form – Sociability subscale (TEIQue-SF, Cooper & Petrides, 2010; Italian version by Di Fabio & Palazzeschi, 2011)

This subscale involves six items related to assertiveness and social competence (e.g., “I can deal effectively with people”). The scores for half of the items need to be reversed to obtain the overall score. Answers are given using a 7-point Likert scale (1 = “completely disagree” to 7 = “completely

agree"). The Italian version showed a good internal consistency (α = .86; Di Fabio & Palazzeschi, 2011), and this was partially replicated in the present study too (α = .59).

4.3.2.2. Study-Related Factors

Self-regulated Learning Questionnaire – Short form (SLQ, adapted from De Beni et al., 2014)

This self-report measure contains 20 items that assess five facets of self-regulated learning (four items each): *organization* (e.g., "In the early afternoon I plan all the things I have to do"), *elaboration* (e.g., "When studying, I try to present the contents in my own words"), *self-evaluation* (e.g., "After a written exam, I know whether it went well or not"), *preparing for exams* (e.g., "I try to anticipate what kind of exam awaits me"), and *metacognition* (e.g., "When an exam goes wrong, I try to understand the reasons why I failed"). The responses are given using a 5-point Likert scale (1 = "never/totally disagree" to 5 = "always/totally agree"). Seven items need to be reversed to calculate the overall score. Only the overall score was used in the analyses because it proved more reliable than the single subscales in both the original version (α = .76, De Beni et al., 2014) and the present sample (α = .80).

Learning Goals Questionnaire (LGQ, De Beni et al., 2014)

This scale measures four items that assess learning goals. For each item, respondents choose between two options, one regarding performance (e.g., "In a study situation, you prefer … to face tasks you already know"), the other reflecting mastery (e.g., "In a study situation, you prefer… to face new tasks, that you have never encountered before"). Zero points are awarded for the option representing performance goals and one point for responses regarding mastery goals. The scale displayed good reliability both in the original version (α = .78, De Beni et al., 2014), and in the present sample (α = .71).

Academic Self-efficacy Questionnaire (ASQ, De Beni et al., 2014)

This self-report scale contains five items on academic self-efficacy (e.g., "How do you rate your study skills?"). Responses are given on a 5-point Likert scale (1 = "scarce" to 5 = "excellent").

The scale proved reliable in the original version (α = .80; De Beni et al., 2014), and in the present study (α = .77).

Theories of Intelligence Questionnaire (TIQ, De Beni et al., 2014)

This instrument consists of eight items that assess growth mindset, that is, beliefs about whether a person's intelligence is malleable or fixed (e.g., "You can learn new things, but you can't change your intelligence"). Responses are given using a 6-point Likert scale (1 = "completely agree" to 6 = "completely disagree"). The internal consistency is reported to be good (α = .88; De Beni et al., 2014), and this was mirrored in the present study (α = .90).

Anxiety and Resilience Questionnaire (ARQ, De Beni et al., 2014)

This measure consists of 14 items that examine study-related anxiety (seven items, e.g., "The very thought of taking an exam makes me panic"), and study-related resilience (seven items, e.g., "I can overcome the disappointment over an academic failure"). Responses are given on a 5-point Likert scale (1 = "totally disagree" to 5 = "totally agree"). An overall score was calculated, reversing the anxiety items, to indicate the degree to which students felt resilient in their study, while being able to manage anxiety (α = .86). The original version has satisfactory psychometric properties ($\alpha_{anxiety}$ = .86, $\alpha_{resilience}$ = .76, De Beni et al., 2014), which were replicated in the present study ($\alpha_{anxiety}$ = .87 and $\alpha_{resilience}$ = .70).

4.3.2.3. Outcome Measures

The two outcome measures were evaluated at all time points (T1-T4).

Depression, Anxiety, and Stress Scales-21 (DASS-21, Lovibond & Lovibond, 1995; validated in Italian by Bottesi et al., 2015)

This scale involves 21 items that assess three types of symptoms experienced during the last week (seven items each): *depression*, in terms of dysphoria, low self-esteem and lack of initiative (e.g., "I could not feel any positive emotion"); *anxiety*, in terms of somatic symptoms and fear responses (e.g., "I felt I was having a panic attack"); and *stress*, in terms of tension, high general arousal, irritability and impatience (e.g., "I felt stressed"). Responses are given using a 4-point Likert

scale (0 = “it never happened” to 3 “it happened almost every day”) to indicate how often the respondents felt as described in the previous week. A total general distress score was calculated, as it proved highly reliable in both the validation study (Bottesi et al., 2015) and the current sample at all four time-points (α_{T1} = .92; α_{T2} = .95; α_{T3} = .93; α_{T4} = .95). Furthermore, multigroup confirmatory factor analysis supported scalar measurement invariance across time-points (*Chisq. Difference* = 75.89, *Df difference* = 60, *p* = .08).

Academic achievement

Academic achievement was measured through self-reported mean grades. In the Italian university system, grades range from 18 to 30.

4.3.3. Procedure

All participants voluntarily took part to the study and provided their consent before filling in the measures. No compensation was given in exchange for participation. The study was approved by the Ethics Committee of the University of Padova (n. 3531).

The first data collection (T1) was conducted from April 15th (one month after national lockdown was declared in Italy) to May 29th, 2020. During the lockdown, all nonessential movement was forbidden (except for work or health reasons), and all schools and universities were closed. Gatherings in public places were suspended, as were sporting events. Only vital commercial businesses (supermarkets, pharmacies, and related shops) remained open, and public transport services were significantly reduced.

Three more data collections (T2-T4) were conducted, in which participants who left their email address (*N* = 352) were contacted again through Qualtrics to answer questions about exam sessions (e.g., grades obtained) and complete the DASS-21. Reminders were also sent after one week to participants to encourage completion of follow-ups.

The second data collection took place after the Summer exam session (T2, August 4th 2020 – August 30th 2020) during a period of less strict restrictions to movement.

The third data collection was conducted after the Fall exam session (T3, September 29th 2020 – October 15th 2020), with similar relaxed restrictions in place.

The last data collection followed the Winter exam session (T4; February 28th 2021 – March 5th 2021), after the Christmas holidays, during which the whole country was declared a "red zone", with strict lockdown-like restrictions in place.

All questionnaires were implemented in Qualtrics and took a mean of 35 minutes to complete at T1 and five minutes for each follow-up (T2-T4). A brief introduction to the study was sent to personal contacts and posted on social media, using a snowball recruitment process. If participants provided their informed consent, they first provided sociodemographic information, then completed the questionnaires in randomized order, and lastly answered questions relating to their studies (e.g., average grades). Table 4.1 resumes the study procedure.

Table 4.1

Study 3. Materials and Procedure

Time	Materials Administered
Time 1 (April-May 2020)	Character Strengths Questionnaires, Study-Related Factors Questionnaires, Distress (DASS-21), Achievement (Grades)
Time 2 (August 2020)	Distress (DASS-21), Achievement (Grades)
Time 3 (September-October 2020)	Distress (DASS-21), Achievement (Grades)
Time 4 (February-March 2021)	Distress (DASS-21), Achievement (Grades)

Note. DASS-21 = Depression, Anxiety, and Stress Scales-21

4.3.4. Statistical Analysis

The analyses were carried out in three steps.

First, I examined the levels of general distress displayed in the sample population compared with the normative sample described by Bottesi et al. (2015), calculating mean z scores for all time points.

Then, following previous studies (Feraco, Resnati, et al., 2021; Mega et al., 2014; World Economic Forum, 2015; Study 1; Zuo et al., 2018) supporting the theoretical similarity between the selected character qualities (i.e., curiosity, creativity, critical thinking, emotional intelligence and perseverance) and study-related intraindividual factors (i.e., self-regulated learning, motivational beliefs, and study resilience), two confirmatory factor analyses (CFAs) were fitted using the package lavaan (Rosseel, 2012) to inspect the possibility to consider character and study-related factors as second-order variables. The diagonally weighted least squares (DWLS) was used as the estimator. If the two second order variables proved structurally reliable, they were converted to observed variables for use in the subsequent analyses. This procedure enables the number of variables to be considered to be reduced and provides more reliable results when the sample size is small and does not allow many parameters to be estimated (Feraco et al., 2021; Köller et al., 2019).

In a third and final step, linear mixed models were run using *lmertest* (Kuznetsova et al., 2017), considering DASS-21 and grades as dependent variables, participants' code as random effect, and time and intraindividual factors (character and study-related factors) as fixed effects. Data from students who completed at least one follow-up measurement were considered to increase sample size at each time point, as previously done by other studies with multiple waves (Pierce et al., 2020). Gender was included as a covariate for distress (Chi et al., 2020; Fu et al., 2021; Y. Wang, Jing, Han, Jing, & Xu, 2020; Wathelet et al., 2020).

4.4. Results

4.4.1 Distress Levels over Time Compared to the Italian Normative Population

The mean z scores for DASS-21 at all time points were z_{T1} = 1.11 (SD = 1.47), z_{T2} = .52 (SD = 1.57), z_{T3} = .40 (SD = 1.31), and z_{T4} = .95 (SD = 1.62).

4.4.2 Measurement Model for Character and Study-Related Factors

The CFA for "character" included five observed variables: curiosity (EC), creativity (VIA-IS), critical thinking (MSLQ), perseverance (SGS), and sociability (TEIQue). All loadings were significant at the .001 level (except for perseverance, which was significant for p = .002) and the

average loading was .55. The fit indices showed an acceptable fit of the model to the data (CFI = .95, NNFI = .87, SRMR = .08).

The second CFA, which tested "study-related factors", also included five observed variables: academic self-efficacy (ASQ), learning goals (LGQ), theories of intelligence (TIQ), self-regulated learning (SLQ) and study resilience (ARQ). All loadings were significant at the level of .001, and the mean loading was .60. The fit indices were good (CFI = 1.00, NNFI = 1.02, SRMR = .04).

3.4. Associations of Character and Study-Related Factors with Distress and Achievement over Time

Correlations of character, study-related factors, distress, and grades across time points are reported in Table 4.2.

Table 4.2

Correlations Between the Variables across Time-Points. All |r| > .24 are Significant for p < .05, |r| > .37 are Significant for p < .01, and |r| > .50 are Significant for p < .001.

	.1	.2	.3	.4	.5	.6	.7	.8	.9
1. Academic Achievement T1									
2. Academic Achievement T2	.93								
3. Academic Achievement T3	.94	.99							
4. Academic Achievement T4	.92	.92	.96						
5. DASS-21 T1	–.01	.01	–.12	.03					
6. DASS-21 T2	–.24	–.29	–.56	–.46	.60				
7. DASS-21 T3	–.08	–.27	–.19	–.12	–.43	.72			
8. DASS-21 T4	–.03	–.10	.09	0	.63	.45	.43		
9. Study-Related Factors T1	.42	.46	.39	.50	–.37	–.44	–.37	–.25	
10. Chararacter T1	.14	.24	.17	.28	–.37	–.44	–.40	–.13	.64

Note. T = Time; DASS-21 = Depression, Anxiety and Stress Scales.

The results of the mixed effects model for the overall scores of DASS-21 revealed significant inverse effects of T2 ($\beta = -.38$), T3 ($\beta = -.46$), and study-related factors ($\beta = -.41$).

As for the grades, the results showed significant direct effects of T2 ($\beta = .08$), T4($\beta = .11$), and study-related factors ($\beta = .46$). Table 4.3 displays the results of both mixed-effects models.

Table 4.3

Results of the Two Linear Mixed Models

Predictors	**General distress (DASS-21)**		**Achievement (Grades)**	
	β	CI	β	CI
T2	–.38***	[–.58; –.19]	.08*	[.01; .15]
T3	–.46***	[–.66; –.26]	.06	[–.02; .14]
T4	–.04	[–.27; .19]	.11*	[.02; .19]
Character T1	.04	[–.13; .22]	–.07	[–.27; .13]
Study-Related Factors T1	–.41***	[–.58; –.24]	.46***	[.26; .66]
Gender (Male)	–.03	[–.41; .35]	–.20	[–.64; .23]
Marginal R^2	19%		19.3%	
Conditional R^2	60.4%		94.8%	

Note. The effect of T1 is not displayed as it serves as a reference point. T = Time (treated as a categorial variable). * = $p < .05$; *** = $p < .001$.

4.5. Discussions and Conclusions

As the COVID-19 pandemic persists and similarly stressful situations may arise in the future, there is an urgent need to identify the factors that can support students who have to cope with the switch to online lectures and a reduction in their social life.

Based on the integrated self-regulated learning model (Ben-Eliyahu, 2019; Ben-Eliyahu & Bernacki, 2015), the present study assessed associations of general and study-related intraindividual factors with important academic and non-academic outcomes under the COVID-19 pandemic. By

investigating a wide range of intraindividual factors, the study provides evidence of the relative role of these factors, illuminating which could be particularly valuable to address through intervention.

First, the results indicated that the levels of general distress reported by university students across time points (as measured with the DASS-21) were only slightly higher than those found in the normative Italian sample (Bottesi et al., 2015), partly in discordance with the hypotheses (H1). It should be noted that this normative sample consisted of adults of the general population, not just students, possibly making this comparison less informative. A comparison with other studies using DASS-21 during lockdown (Odriozola-González et al., 2020) revealed similar rates of reported symptoms, higher than those found early in the pandemic (Yu et al., 2020). These findings are also consistent with those obtained using other tools to assess mental health (Chi et al., 2020; Wathelet et al., 2020). The distress levels identified in our sample were similar to those found by other studies conducted during the first pandemic wave and slightly higher than those in nonpandemic situations. According to expectations (H2c), the distress levels showed a V-shaped trend, that is, they were higher at T1 and T4 and lower at T2 and T3. This result extends previous longitudinal findings (Fruehwirth et al., 2021; Y. Li et al., 2021; Savage et al., 2020, 2021) that focused on pre-post pandemic changes or on the first pandemic wave and supports the idea that distress levels mirror the pandemic situation, possibly increasing and decreasing according to the trend in restrictions and threat perceptions, i.e., appraisals of COVID-19 as more or less dangerous.

Confirmatory factor analyses supported the factorial structure of the two second-order variables hypothesized, that is, character (representing the disposition toward the acquisition and creative use of knowledge, emotional regulation, and perseverance), and study-related factors (including a tendency to approach studying effectively and functionally, in terms of self-regulated learning, motivation to learn, and resilience in the face of study difficulties). The results for character provide empirical support to the WEF model (World Economic Forum, 2015), indicating that this specific subset of character strengths can be summarized in a unique factor, possibly representing good character in students, as seen previously (Feraco et al., 2021; Zuo et al., 2018).

Similarly, the results for the study-related variables showed that these factors can be merged into one that reflects a consistent set of intraindividual characteristics in a student. Previous studies had considered these study-related intraindividual factors separately, assessing their specific influence on achievement (e.g., distinguishing between self-regulated learning and motivational beliefs, Mega et al., 2014). The present study suggests the possibility of considering them as composite factors, sharing a common function.

Having determined the factor composition of personal dispositions, linear mixed models were used to assess the relationships between intraindividual factors and the outcomes of interest, as well as the effect of time and gender.

As expected (H2c), it emerged that time significantly affected student distress: Students appeared less distressed after both the summer and fall exams. Interestingly, the Winter session did not affect the levels of distress and may indicate that students were experiencing distress at degrees similar to the first nationwide lockdown (T1).

General distress was also negatively related to study-related dispositions (in line with H2b). This finding is consistent with reports on some of the study-related intraindividual factors considered (Capone et al., 2020; Durand-Bush et al., 2015; Pidgeon et al., 2014). To the best of my knowledge, no previous studies examined several self-regulated learning dispositions together, neither in a pandemic nor in other contexts. The present results thus provide new evidence of the association between university students' mental health and different study-related intraindividual factors during a pandemic and could be extended to similar stressful distance learning contexts.

The association with character was not significant (contrarily to expectations, see H2a) and deserves further investigation, possibly indicating that its effect on distress might be indirect, through the mediation of other variables, as suggested by previous studies (Feraco et al., 2021, 2022) and as also postulated by Ben-Eliyahu (2019) in her theorization. In other words, it may also be that character is better understood as able to generally stimulate students' self-regulated learning, motivation, and resilience, which in turn closely affect academic learning outcomes by making students able to

address specific challenges that arise in the learning context (e.g., dealing with academic failures, adapting to different academic requests, etc.).

In terms of achievement (grades), it resulted in slightly better grades after the Summer 2020 and Winter 2021 exams (in line with H3c). These results may be explained by study-related factors, as their positive effect (H2b) may have helped students study more efficiently and eventually perform better, as suggested by other studies considering the impact of the pandemic on student performance (Bawa, 2020; Gonzalez et al., 2020; Iglesias-Pradas et al., 2021). In other words, intraindividual factors related to studying may partially explain why student performance did not change significantly and even slightly improved after the pandemic and the abrupt switch to online learning, despite students feeling that their performance was indeed decreased (Aristovnik et al., 2020).

4.5.1. Limitations and Future Directions

The present results need to be considered in light of some limitations.

Since both intraindividual factors and outcomes were collected during lockdown, it may be that the intraindividual factors of the respondents had already changed to some degree due to the onset of the pandemic and did not reflect their usual dispositions. However, the relationships identified in the present study are consistent with previous literature, suggesting that these personal characteristics are important in a pandemic and in other situations.

Despite the significant longitudinal relationships between intraindividual factors, distress, and achievement, the sample size was small, and future studies could strengthen these results and make them more generalizable.

It may also be that only students with specific intraindividual features decided to complete the follow-ups, leaving open the possibility that our findings are not generalizable to the entire student population experiencing the pandemic. Similarly, the lack of random sampling prevents us from generalizing the present results to the entire student population. Future studies employing this sampling methodology should be carried out to confirm and further develop the present findings. However, our findings on the relationships between intraindividual characteristics and the learning

outcomes considered appear to be in line with previous evidence in nonpandemic (Mega et al., 2007; Feraco et al., 2021; Richardson et al., 2012) and pandemic contexts using convenience sampling (Aristovnik et al., 2020; Bono et al., 2020; Chi et al., 2020; Datu & Fincham, 2021; W. W. Li et al., 2020) and with the few studies using more rigorous sampling techniques (Bakhtiarvand et al., 2011; Wathelet et al., 2020). Although this is not enough to ensure that self-selection bias did not occur, it also may indicate that our results could be extended to other student samples. On the same note, our sample was mainly composed of female students, so our results regarding gender differences may be biased.

Lastly, I was unable to assess the effects of the place of residence and type of accommodation during lockdown because most of the respondents were from Northern Italy (the area hardest hit by COVID-19 at the time) and were staying home with their families.

To conclude, despite the aforementioned limitations, this study provided support for the integrated self-regulated learning model (Ben-Eliyahu, 2019; Ben-Eliyahu & Bernacki, 2015) by identifying several intraindividual factors that seemed to support students in the new learning and life circumstances imposed by the COVID-19 pandemic. It emerged that study-related intraindividual factors appear to be more directly involved in supporting distress and achievement over time.

As future direction, nurturing these individual dispositions, through training, for instance, may help university students better approach their studies and benefit in terms of their mental health in such difficult times as the present. More specifically, researchers and practitioners could develop interventions promoting knowledge (through psychoeducation) and practice (through assignment and experiential activities) of these general and study-related intraindividual factors, presenting them as related factors that jointly contribute to several positive academic outcomes, capitalizing on the commonality of these variables. I carried out this kind of work in the last study of the present dissertation (Study 6, see Chapter 7), with promising results.

5. Study 4: A Comprehensive Model of Character, Study-Related Factors, Achievement, and Well-Being in University students

5.1. Rationale of the Study

Few studies have contemporarily investigated academic achievement and mental health symptoms as equally important outcomes for university students (Stallman, 2010), nor the relationships between general and study-related characteristics.

Building on the results of Study 3, the present study aimed to test a comprehensive model of the direct and indirect relations that occur between character, study-related factors, and these two dependent variables.

To do that, I considered the WEF (2015) character strengths (i.e., curiosity, creativity, critical thinking, perseverance, and social awareness) as individual qualities sharing a common function, that is, regulating students' emotions, cognitions, and behaviors when learning (Park et al., 2004; Roberts & Yoon, 2022; Robles, 2012). In other words, these qualities, summarized in the unique second-order factor of "character" can be seen as "distal" correlates of academic achievement and distress, influencing them through the mediation of more "proximal" process variables (i.e., study-related factors).

Moreover, following the broaden-and-build theory (Fredrickson, 2001), the role of positive achievement emotions was also taken into account. The reasoning here is that character may be associated with achievement emotions, and that experiencing more positive achievement emotions would also directly relate to the depletion of better SRL strategies, more functional motivational beliefs, and greater study resilience.

5.2. Hypotheses

Concerning the relationships between character, achievement emotions, SRL strategies, motivational beliefs, study resilience, academic achievement, and distress, I hypothesized the following.

- Hypothesis 1: Character is significantly positively related to all four study-related factors considered (i.e., achievement emotions, SRL strategies, motivational beliefs, and study resilience, Alhadabi & Karpinski, 2020; Datu & Fincham, 2021; Feraco et al., 2021, 2022; Lauriola et al., 2015; Muenks et al., 2017; Phan, 2009; Richards et al., 2013; Villavicencio, 2011; Wolters & Hussain, 2015);
- Hypothesis 2: Positive achievement emotions are significantly positively associated with SRL strategies, motivational beliefs, and study resilience (Ahmed et al., 2013; Artino & Jones, 2012; C. Huang, 2011; Mega et al., 2014; Tang, 2019);
- Hypothesis 3: Achievement emotions and the other three study-related factors mediate the relationship between character and academic achievement (Feraco et al., 2021, 2022); achievement emotions and study resilience may also mediate the relationship of character with general distress.

Lastly, gender was included as a covariate for academic achievement (Voyer & Voyer, 2014), general distress (Auerbach et al., 2018), achievement emotions (Pekrun et al., 2011), SRL strategies (Bussey, 2011), motivational beliefs (Burnette et al., 2013; C. Huang, 2013), and study resilience (Erdogan et al., 2015), expecting female students to report higher achievement, general distress, and SRL strategies, together with less positive motivational beliefs (academic self-efficacy), emotions, and study resilience.

5.3. Materials and Methods

5.3.1. Participants

The study participants were 606 university students (153 males, 453 females, *Mage* = 22.74, *SDage* = 3.72) Table 5.1 shows the sociodemographic characteristics of the sample.

Power analysis was performed using the pwrSEM Shiny app (Y. A. Wang & Rhemtulla, 2021), focusing on the four indirect relations between character (initial predictor), achievement emotions, SRL strategies, motivational beliefs, and study resilience (mediators), and academic achievement and general distress (outcomes). Parameters were set as small to medium, based on the previous literature presented in the introductory paragraphs. The power was then calculated via simulations with 10,000 iterations. The results showed that with 600 participants, power was equal to 1.00 for all four indirect effects considered (indirect path 1: Character – achievement emotions x SRL strategies – academic achievement; indirect path 2: Character – achievement emotions x motivational beliefs – academic achievement; indirect path 3: Character – achievement emotions x study resilience – academic achievement; and indirect path 4: Character – achievement emotions x study resilience – general distress).

Table 5.1

Sample Characteristics

	Entire Sample (*N* = 606)	Females (*N* = 453)	Males (*N* = 153)
Age (SD)	22.74 (3.72)	22.62 (3.67)	23.09 (3.86)
Origin			
Northern Italy	464 (76.57%)	343 (75.72%)	121 (79.08%)
Central Italy	18 (2.97%)	15 (3.31%)	3 (1.96%)
Southern Italy	124 (20.46%)	95 (20.97%)	29 (18.95%)
Cycle			

Bachelor's	362 (59.74%)	271 (59.82%)	91 (59.48%)
Master's	163 (26.9%)	114 (25.17%)	49 (32.03%)
Single-Cycle	81 (13.37%)	68 (15.01%)	13 (8.5%)
Course Year	2.57 (1.47)	2.52 (1.41)	2.7 (1.62)
Area of Study			
Health Sciences	217 (35.81%)	185 (40.84%)	32 (20.92%)
Humanities	149 (24.59%)	123 (27.15%)	26 (16.99%)
Sciences	92 (15.18%)	72 (15.89%)	76 (49.67%)
Social Sciences	148 (24.42%)	73 (16.11%)	19 (12.42%)

5.3.2. Measures

5.3.2.1. Character Strengths

Character strengths were measured using the same questionnaires from Study 3. Character strengths considered were again curiosity, creativity, critical thinking, perseverance, and emotional intelligence, which composed a unique second-order factor of character. The individual scales showed satisfactory internal consistency ($.67 < \alpha < .88$).

5.3.2.2. Study-Related Factors

Emotions Questionnaire (EQ, Carolina Mega et al., 2007)

This scale comprises 10 positive (e.g., joy) and 10 negative (e.g., shame) emotions experienced while studying. Responses are provided through a 5-point Likert scale (1 = "never" to 5 = "always"). A total score was obtained in terms of positive academic emotions by reversing the scores of the items related to negative emotions ($\alpha = .88$ in the current sample). The internal consistency was good in the original version ($\alpha_{negative} = .90$, $\alpha_{positive} = .87$, Carolina Mega et al., 2007), and in the present sample too ($\alpha_{negative} = .88$ and $\alpha_{positive} = .86$, respectively).

The other study-related factors were measured using the same questionnaires used in Study 3. More specifically, three sets of study-related factors were assessed: self-regulated learning,

motivational beliefs (including academic self-efficacy, growth mindset, and learning goals), and study resilience.

5.3.2.3. Outcome Measures

The two outcome measures considered were the same as in Study 3: Academic achievement (as measured by self-reported grades) and general distress (as measured by DASS-21).

5.3.3. Procedure

Participants voluntarily took part in the study and received no compensation for their participation. The study was approved by the University of Padova Ethics Committee for Research in Psychology (n. 3531).

Data were collected in 2020 (April–June) and 2021 (March–May). All self-report questionnaires involved in the present study were implemented in Qualtrics and took an average of 35 minutes to complete. A brief introduction to the study was sent to personal contacts and posted on social media with a link to the set of questionnaires. Participants were first asked to provide their informed consent before answering various sociodemographic information; then, they completed the questionnaires in randomized order. Finally, they answered questions related to their studies (e.g., average grades).

5.3.4. Statistical Analysis

First, following the same approach adopted in Study 3, two confirmatory factor analyses (CFAs) using diagonally weighted least squares (DWLS) as estimator were run using the package *lavaan* (Rosseel, 2012) to inspect the structures of character (composed of curiosity, creativity, perseverance, critical thinking, and social awareness) and motivational beliefs (composed of academic self-efficacy, growth mindset, and learning goals). After having ascertained their structural validity, these two latent variables were converted into observed variables by summing the corresponding scores, as also other studies previously did (e.g., Feraco et al., 2021).

Then, to assess the direct and indirect relations occurring between the observed variables (i.e., character, achievement emotions, SRL strategies, motivational beliefs, study resilience, academic

achievement, and general distress), a single path model (Figure 5.1) was fitted. Following both theoretical considerations (Fredrickson, 2001; Roberts & Yoon, 2022) and previous empirical studies (Feraco et al., 2021; Mega et al., 2014; Muenks et al., 2017), the following relationships were estimated:

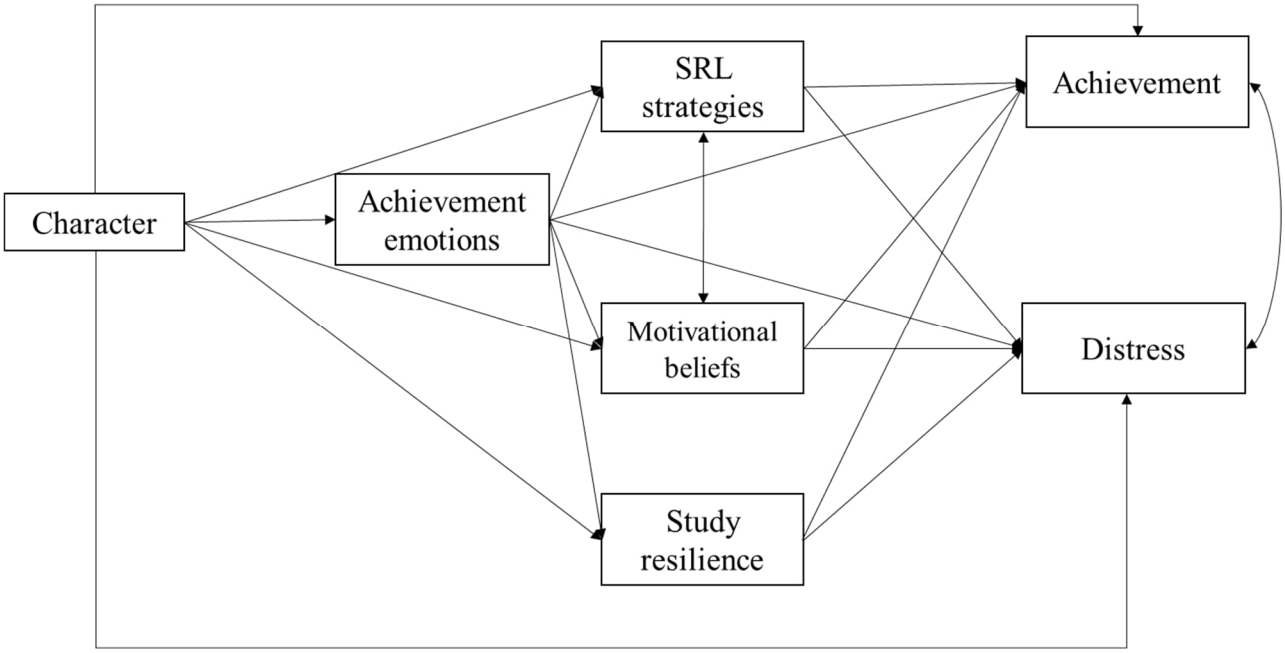
- The direct effects of character, achievement emotions, SRL strategies, motivational beliefs, and study resilience on academic achievement and general distress;
- The direct effects of character on achievement emotions, SRL strategies, motivational beliefs, and study resilience;
- The direct effect of achievement emotions on SRL strategies, motivational beliefs, and study resilience;
- All indirect effects between character and academic achievement and character and general distress through mediation of achievement emotions, SRL strategies, motivational beliefs, and study resilience.

The gender (female/male) was added as a covariate for all variables.

Lastly, multigroup confirmatory factor analysis was used to test model invariance across year of collection (2020/2021).

Figure 5.1

Hypothesized Path Model



Note. For Figures 1 and 2, the effect of gender is not displayed for the sake of readability.

5.4. Results

5.4.1. Measurement Model for Character and Motivational Beliefs

The CFA for "character" included five observed variables: epistemic curiosity (EC), creativity (VIA-IS), critical thinking (MSLQ), sociability (TEIQue subscale), and perseverance (SGS). The results showed that all factor loadings were significant at the .001 level and the mean factor loading was .53. The fit indices were acceptable (CFI = .97, NNFI = .94, RMSEA = .07, SRMR = .05).

The CFA for "motivational beliefs" included three observed variables: academic self-efficacy (ASQ), learning goals (LGQ) and theories of intelligence (TIQ). All factor loadings were significant at the 0.001 level and the mean factor loading was .46. The model was fully saturated, so no fit index was available. Full details of the CFA results are available in Table 5.2.

Table 5.2

Results of the CFAs for Character and Motivational Beliefs

Latent Variable		Observed Variable	Standardized Loading	Standard Error
Character	→	Epistemic Curiosity	.60	.16
	→	Creativity	.72	.21
	→	Critical Thinking	.53	.22
	→	Perseverance of Effort	.27	.11
	→	Sociability	.52	.24
Motivational Beliefs	→	Academic Self-Efficacy	.61	.40
	→	Growth Mindset	.35	.56
	→	Learning Goals	.42	.13

Note. **All standardized loadings are significant for $p < .001$**

5.4.2. Path Analysis

The hypothesized model showed adequate fit to the data (CFI = 1.00, NNFI = .99, RMSEA = .03, SRMR = .01). The results mostly supported the direct and indirect relations hypothesized (see Figure 5.2).

Character was directly positively related to achievement emotions (β = .40), SRL strategies (β = .37), motivational beliefs (β = .22), and study resilience (β = .14), and negatively with academic achievement (β = −.18).

Achievement emotions were directly positively associated with study resilience (β = .64), SRL strategies (β = .31), and motivational beliefs (β = .27).

SRL strategies (β = .27), motivational beliefs (β = .15), and study resilience (β = .12) directly positively related to academic achievement.

Achievement emotions (β = −.37) and study resilience (β = −.30) resulted inversely related to general distress.

An indirect significant relation between character and academic achievement was also found through the mediation of achievement emotions and SRL strategies (β = .03) also emerged, together with a significant indirect effect through achievement emotions and motivational beliefs (β = .02), and achievement emotions and study resilience (β = .03).

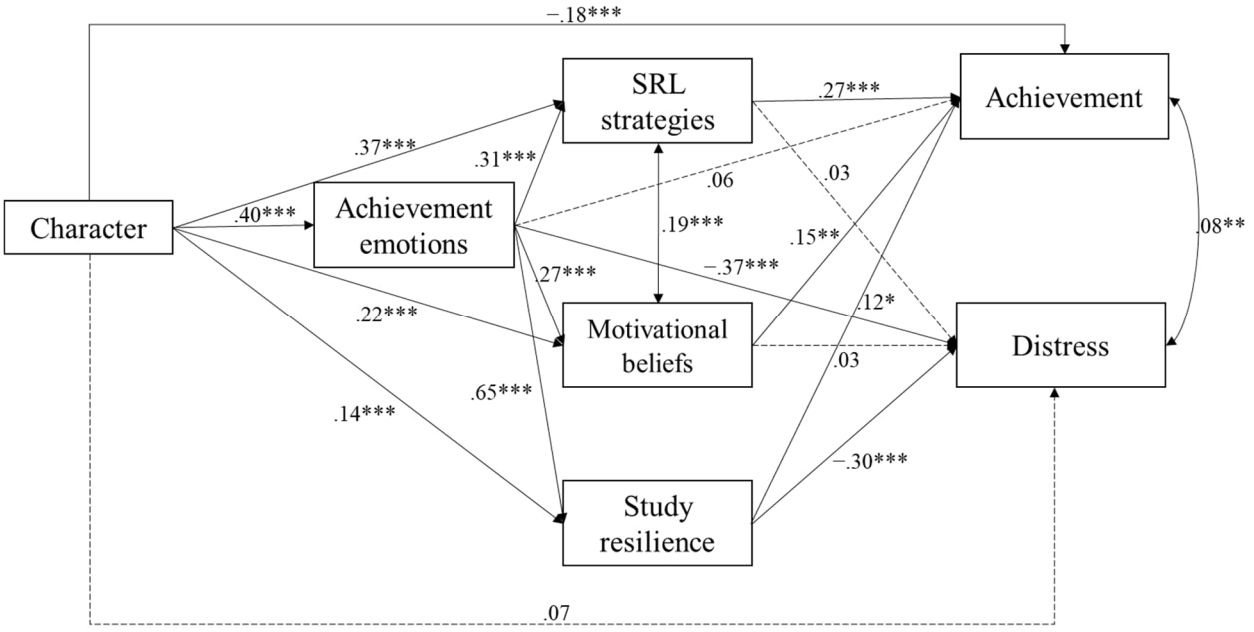
Furthermore, the indirect relationship between character and general distress through the path of achievement emotions x study resilience (β = −.08) was also significant.

The model explained 52.8% of the variance in study resilience; 35.3% of the variance in general distress; 34.4% of the variance in SRL strategies; 18.8% of the variance in academic achievement; 18.7% of the variance in motivational beliefs; and 16.2% of the variance in achievement emotions.

Gender showed significant effects for most of the measures considered (see Table 5.3). More specifically, it appeared that female students had higher scores on academic achievement, distress, SRL strategies, and motivational beliefs, while showing lower scores on study resilience. No gender effect was found for achievement emotions. Table 5.3 summarizes the results.

Figure 5.2

Final Path Model



Note. * = $p < .05$, ** = $p < .01$, *** = $p < .001$

Table 5.3

Complete Results of the Path Analysis

Dependent Variable	Predictor	β	CI
Direct Effects			
Academic Achievement	Character	−.18***	[−.27; −.08]
Academic Achievement	Achievement Emotions	.06	[−.06; .18]
Academic Achievement	SRL Strategies	.27***	[.16; .37]
Academic Achievement	Motivational Beliefs	.15**	[.05; .25]
Academic Achievement	Study Resilience	.12*	[.01; .24]
Academic Achievement	Gender[a]	−.15***	[−.54; −.17]
General Distress	Character	.07	[−.01; .16]
General Distress	Achievement Emotions	−.37***	[−.49; −.27]
General Distress	SRL Strategies	.03	[−.06; .12]
General Distress	Motivational Beliefs	.03	[−.07; .12]
General Distress	Study Resilience	−.30***	[−.40; −.20]
General Distress	Gender	−.09*	[−.37; −.04]
SRL Strategies	Character	.37***	[.23; .39]
SRL Strategies	Achievement Emotions	.31***	[.22; .38]
SRL Strategies	Gender	−.15***	[−.50; −.16]
Motivational Beliefs	Character	.22***	[.13; .31]
Motivational Beliefs	Achievement Emotions	.27***	[.18; .36]
Motivational Beliefs	Gender	−.15***	[−.54; −.16]
Study Resilience	Character	.14***	[.07; .20]
Study Resilience	Achievement Emotions	.65***	[.59; .73]
Study Resilience	Gender	.14***	[.20; .48]

Achievement Emotions	Character	.40***	[.32; .48]
Achievement Emotions	Gender	.05	[−.06; .30]
Indirect Effects			
Academic Achievement	Character × Achievement Emotions × SRL Strategies	.03***	[.02; .05]
Academic Achievement	Character × Achievement Emotions × Motivational Beliefs	.02*	[.01; .03]
Academic Achievement	Character × Achievement Emotions × Study Resilience	.03*	[.00; .06]
General Distress	Character × Achievement Emotions × SRL Strategies	.004	[−.01; .02]
General Distress	Character × Achievement Emotions × Motivational Beliefs	.003	[−.01; .02]
General Distress	Character × Achievement Emotions × Study Resilience	−.08***	[−.11; −.05]
Correlations		*r*	
SRL Strategies	Motivational Beliefs	.19***	[.12; .26]
Academic Achievement	General Distress	.08**	[.02; .15]

*$p < .05$; **$p < .01$; ***$p < .001$

Note. β = standardized beta coefficient; CI = 95% confidence intervals.

[a] Gender: 1 = Males, 0 = Females; negative beta values mean higher scores in females (compared to males).

5.4.3. Model Invariance

Since 2020 was the year the COVID-19 pandemic began, with decreasing restrictions in 2021 also due to the vaccination campaign, model invariance was calculated to ensure that the fitted model

did not differ between collections by using multigroup confirmatory factor analysis to distinguish between data collected in 2020 (N = 360) and those collected in 2021 (N = 246).

The results did not support scalar invariance (equality of factor loadings and intercepts) between the two cohorts (p = .01). The Lagrange multiplier test suggested that freeing the intercept for SRL strategies measure would result in an improved model. After freeing this parameter, partial scalar invariance was achieved (CFI = .99, NNFI = .97, RMSEA = .04, SRMR = 0.05, p = .19).

5.5. Discussions and Conclusions

The present study proposed an integrative model of the noncognitive correlates of academic achievement and general psychological distress in a large sample of university students.

More precisely, five character strengths (i.e., curiosity, creativity, critical thinking, perseverance, and social intelligence) were conceived as personal qualities that can affect achievement and distress through mediation of a series of relevant study-related factors: achievement emotions, self-regulated learning, motivational beliefs (i.e., academic self-efficacy, growth mindset, and learning goals), and study resilience.

The results preliminarily supported, once again, the structural validity of the second-order character variable, together with that representing motivational beliefs. In other words, the present study confirms the similarity of these character strengths (Feraco et al., 2021, 2022; V. Ng et al., 2017; World Economic Forum, 2015) and motivational factors (Feraco et al., 2021, 2022; Mega et al., 2014), with the possibility of considering them as unique variables, respectively, representing a series of personal qualities that can regulate emotions, behaviors, and thoughts, and functional beliefs referred to learning, respectively.

Then, the path model allowed me to test the direct and indirect relations between the variables of interest. The results were in line with the hypotheses (H1), showing that the character was significantly positively related to achievement emotions, SRL strategies, motivational beliefs and resilience to study difficulties. These results corroborate previous evidence on the relationships of single character strengths and study-related factors and support the idea that these personal qualities

help students efficiently regulate their emotions, behaviors, and cognitions when studying (Alhadabi & Karpinski, 2020; Datu & Fong, 2018; Feraco et al., 2021, 2022; Lauriola et al., 2015; Muenks et al., 2017; Phan, 2009; Richards et al., 2013; Villavicencio, 2011; Wolters & Hussain, 2015). In other words, it appears that students who are curious, creative, critically minded, perseverant, and sociable, also find studying more pleasurable, use better self-regulated strategies, feel more motivated, and are better able to recover from study-related failures.

Experiencing more positive achievement emotions was also directly related to the remaining study-related factors, in line with the broaden-and-build theory and my expectations (H2) that positive emotions favor the cognitive-behavioral repertoire of individuals and the development of personal resources (Fredrickson, 2001). Experiencing positive emotions while studying could expand the set of cognitive and behavioral study strategies students use; bolster their self-efficacy, growth mindset, and mastery goals; build their resilience. In turn, better SRL strategies, more functional motivational beliefs, and higher study resilience were all directly associated with academic achievement, in line with previous studies on SRL and motivation (Feraco et al., 2021, 2022; Mega et al., 2014; Richardson et al., 2012). The present study shows that being able to recover from academic failures can also positively influence academic performance.

Regarding general distress, achievement emotions and study resilience only emerged as significant predictors, suggesting that the role of SRL strategies and motivational beliefs may be negligible when considering factors with a stronger emotional component. Since distress is a general negative emotional state, experiencing positive emotions when studying may have an "undoing" effect on it, buffering the impact of general negative emotions students might experience in their daily lives (Fredrickson, 2001). Similarly, study resilience may protect students from anxiety, depression, and stress symptoms by making them more prone to appraise general stressful situations as opportunities for growth, rather than insuperable challenges (Connor & Davidson, 2003).

Considering the above-mentioned findings, it then emerged that achievement emotions, SRL strategies, motivational beliefs and study resilience significantly mediated the relationship between

character and academic achievement (in line with H3), while only achievement emotions and study resilience resulted as significant mediators of the relationship between character and general distress.

Some additional results deserve further comment. First, contrary to our expectations and to previous meta-analytic findings (Gajda et al., 2017; Lam & Zhou, 2019; MacCann et al., 2020; Richardson et al., 2012; von Stumm & Ackerman, 2013), character as a whole showed a negative, albeit small, association with academic achievement. This unexpected finding may be due to multicollinearity with the study-related factors (with which character had strong correlations), but might also indicate that character has a negligible role when considering also study-related processes (Feraco et al., 2021, 2022; Muenks et al., 2017).

Second, academic achievement and general distress exhibited a positive, although small, correlation. Contrary to previous findings (e.g., Stallman, 2010) reporting a negative association between these two relevant outcomes, the present results suggest otherwise: It seems that high-performing students are also those who experience slightly higher levels of psychological distress, i.e., higher levels of anxiety, depression, and stress symptoms. Intriguingly, studies using cluster analysis (van der Zanden et al., 2019) have shown that high-achieving students may be less emotionally adjusted compared to students performing at lower levels, possibly because the former prioritize their studies over their social and emotional well-being.

Lastly, the present results showed that the female students performed better, experienced higher distress, used better SRL strategies, and held more functional motivational beliefs, while reporting less study resilience compared to their male colleagues. These findings are in agreement with some previous reports (Auerbach et al., 2018; Bussey, 2011; Erdogan et al., 2015; C. Huang, 2013; Pajares, 2002; Voyer & Voyer, 2014) and may suggest that female students commit to their studies to a slightly higher degree compared to males and may consequently feel more distressed.

5.5.1. Limitations and Future Directions

The present study has some limitations. First, the results on gender differences may be biased by the higher prevalence of female participants in the sample. Similarly, the cross-sectional nature of

the study warrants further investigation to fully understand the direction of the present associations. Third, the power analysis conducted focused on the main indirect paths only; future studies with larger samples are needed to substantiate all the direct relations evidenced, also adopting a longitudinal design to examine the direction of the associations.

In general, the present study newly proposes to consider character strengths as general qualities that jointly affect achievement through various cognitive, behavioral, and emotional study-related processes. Character appears to favor study-related factors both directly and through the mediation of positive achievement emotions. Only achievement emotions and study resilience seem to mediate the association between character and general distress.

In conclusion, fostering the development and use of character can have cascading positive effects on students, potentially affecting their emotional, cognitive, and behavioral learning, ultimately favoring achievement and lowering distress.

6. Study 5: Character, Study-Related Factors, Achievement, and Satisfaction in Students with or without a Specific Learning Disability

6.1. Rationale of the Study

Recent theoretical models of self-regulated learning for students (SRL; Ben-Eliyahu, 2019; Ben-Eliyahu & Bernacki, 2015) and students with disability (Martz & Livneh, 2016) acknowledge the complexity of these phenomena and the need to adopt a strength-based approach – that is, to identify individuals' positive qualities and abilities of individuals, rather than simply focus on deficits and weaknesses. Consistent with these strength-based paradigms, in this study, I examined character strengths and study-related factors that could support academic achievement and well-being (both subjective and academic) among students with and without specific learning disabilities (SLDs). Understanding the specific factors that influence academic success and well-being of university students with SLDs can serve as a baseline to develop interventions and policies that can help students improve their careers and enjoy their study paths.

Research on character strengths (considering the WEF, 2015 framework) in students with SLDs is limited, and calls for more research into the role of each of them with respect to this clinical population. At this stage in research, it may be of peculiar importance to understand the associations of single character strengths in this population, so to better clarify their unique contribution to important outcomes and the possibility to specifically work on them to help students with SLDs thrive at the university.

Creativity's association with SLDs has been studied, as it appears that many important and brilliant personalities of the past (Picasso, Puccini, Edison, and Walt Disney to name but a few) were dyslexic (Ehardt, 2009). An Italian study of junior high school students (Cancer et al., 2016) revealed that students with dyslexia scored higher on a creative task in which different ideas were combined. Similarly, a recent review (Majeed et al., 2021) found a difference between individuals with or

without SLDs in adult samples only, possibly due to the longer experience with alternative ways of elaborating information that individuals with SLDs develop to overcome their difficulties.

Regarding perseverance, a study involving high school students with SLDs (Tuckwiller et al., 2017) reported that this character quality appears to be associated with optimism and a growth mindset, both considered predictive factors for well-being and achievement.

Research on social intelligence in individuals with SLDs has provided different outcomes: on the one hand, university students with SLDs seem to seek help from peers less frequently and to engage less in prosocial behaviors (Cavioni et al., 2017), possibly because they struggle under pressure and are less willing to take criticism (Reiff et al., 2001). On the other hand, university students with SLDs appeared to have better developed interpersonal abilities, which allowed them to interact effectively with staff members (Reiff et al., 2001).

Research on critical thinking in students with SLDs is scarce. Lombardi et al. (2015) showed that this was positively correlated with academic success in high school students without disabilities, while the relationship appeared weaker among students with disabilities (of note, this group also included autism, ADHD, and other disabilities).

Lastly, curiosity has not been adequately studied in high school or university students. Zisimopoulos and Galanaki (2009) showed that primary school students with and without SLDs shared similar levels of curiosity and interest in learning.

When considering study-related factors and achievement, students with SLDs are often characterized by emotional and motivational difficulties, possibly due to their past experiences of failures and a pessimistic view of the possibility of succeeding in the future (Mugnaini et al., 2009).

K-12 students with SLDs have been shown to display lower perceived scholastic self-efficacy, a fixed mindset, and performance goal preferences (Baird et al., 2009; Lackaye & Margalit, 2006; Tabassam & Grainger, 2002), and earn lower grades in many subjects compared to their peers without difficulties (Lackaye & Margalit, 2006). There is also evidence that university students with SLDs report lower academic self-efficacy (Hen & Goroshit, 2014), which can lead to a vicious cycle:

if the student believes they will not be able to successfully complete a task, they will most likely reduce their efforts and possibly start using inappropriate study strategies. This could lead to mediocre performance, which in turn will reinforce the student's dysfunctional beliefs about their inability to complete that task.

Concerning well-being, students with SLDs seem more likely to develop psychopathological symptoms (Mugnaini et al., 2009): In this sense, dyslexia and reading difficulties are considered risk factors for anxiety and depression at all educational levels, from primary school to university.

Such emotional malaise may arise from poor self-efficacy, loss of interest in academic tasks, mechanisms of learned helplessness, or interpersonal difficulties. However, Ghisi et al. (2016) found that university students with and without SLDs shared similar levels of general resilience, anxiety, and depressive symptoms. Students with SLDs were also characterized by lower self-esteem and reported somatic symptoms to a greater extent, together greater interpersonal difficulties, and attention/concentration issues. A similar degree of resilience may suggest that students with SLDs who decide to continue their studies at the university level may have more skills and coping abilities that make them a specific subgroup with its own characteristics within the general population of SLDs.

Little attention has been paid to life or academic satisfaction among students with SLDs. McCullough and Huebner (2003) underlined that high school students with SLDs' levels of overall life satisfaction and domain satisfaction were not significantly different from students with no SLDs. In contrast, Rabren et al. (2013) found that students with SLDs with lower status in employment and education or vocational training were less satisfied with their current situations in these areas, recognizing that this lack of satisfaction was affecting their quality of life. Furthermore, Madaus et al. (2008) suggest that graduate students with SLDs reported high levels of employment satisfaction, a positive attitude toward their ability to continue to learn on the job, and a good perceived match between their skills and their occupation. More research is needed to explore the degrees of life and academic satisfaction perceived by university students with SLDs.

6.2. Hypotheses

Based on previous literature, I hypothesized the following:

- Hypothesis 1: Students with SLDs would display higher creativity (Cancer et al., 2016; Majeed et al., 2021), lower academic achievement (Lackaye & Margalit, 2006), lower academic self-efficacy (Baird et al., 2009; Hen & Goroshit, 2014; Lackaye & Margalit, 2006; Tabassam & Grainger, 2002), and a more fixed mindset (Baird et al., 2009); No specific hypotheses could be formulated regarding potential differences in academic and life satisfaction due to mixed evidence (Madaus et al., 2008; McCullough & Huebner, 2003; Rabren et al., 2013).
- Hypothesis 2:
  a) All individual character strengths will have small-to-medium effects on academic achievement (Credé et al., 2017; Fong et al., 2017; Gajda et al., 2017; Lam & Zhou, 2019; MacCann et al., 2020; von Stumm & Ackerman, 2013);
  b) Single study-related factors will be positively associated with academic achievement, with small-to-medium effects (Mega et al., 2014; Richardson et al., 2012; Sisk et al., 2018; Study 3);
- Hypothesis 3:
  a) All character strengths will have small to medium effects on life satisfaction (Lounsbury et al., 2009);
  b) All study-related factors will have small to medium associations with life satisfaction (Capone et al., 2020; Diseth et al., 2012; Hofer et al., 2011; T. Hu et al., 2015; Kandemir, 2014; Lam & Zhou, 2020; O'Sullivan, 2011; Vecchio et al., 2007; Yap & Baharudin, 2016);
- Hypothesis 4:
  a) All character strengths will show small associations with academic satisfaction (Lounsbury et al., 2009);

b) SRL (Balkis & Duru, 2016; Li, 2019) and mastery goals (Roebken, 2007) only will be positively related to academic satisfaction.

6.3. Materials and Methods

6.3.1. Participants

A total of 730 people opened the link to the study questionnaires, but only 318 (43.6%) completed all measures and were included in the analyses. The final sample (79 males, 239 females M_{age} = 22.70, SD_{age} = 3.56; age range = 19–45 years) was quite varied: Participants were enrolled in bachelor's (58.80%), master's (26.73%), and single cycle (14.47%) degree programs from different areas of study (145 in the life sciences, 88 in the social sciences, 44 in the hard sciences, and 41 in the humanities). All participants were enrolled in public Italian universities, mainly in Northern Italy (83 from the University of Turin, 57 participants from the University of Padova, 24 from the University of Trieste, and 120 from other Italian universities; 34 participants did not specify their universities, but only their departments).

Among the participants, 147 were students with valid self-reported SLD diagnoses. On average, students with SLDs were diagnosed at the age of 13 (*SD* = 5.33; range: 3–30). More specifically, 105 students (71.43%) indicated that their diagnosis was received or updated during university, high school senior year, or otherwise after 2016, while 38 students (25.85%) indicated that their diagnosis was received or updated before high school senior year or otherwise before 2016. Four students (2.72%) did not specify when they received their diagnoses.

A total of 69 students (46.94%) indicated two or more learning disabilities, 40 students (27.22%) self-reported a valid diagnosis of dyslexia, 14 students (9.52%) indicated dyscalculia and 9 students (6.12%) indicated a learning disorder with impaired written expression. Lastly, 15 students (10.2%) did not specify their diagnoses. Table 6.1 summarizes the sample characteristics.

To ensure sample size adequacy, we performed power analysis using the pwrSEM Shiny app (Y. A. Wang & Rhemtulla, 2021). We estimated small to medium parameters based on our literature review. Power was then calculated through simulations with 5,000 iterations. With 300 participants,

the power ranged from .79 to .99 for all effects of our predictors of interest on our three outcomes of achievement, life, and academic satisfaction.

Table 6.1

Sample Characteristics

Characteristics	Entire Sample	Students with SLD	Students without SLD
Age	22.75 (3.6)	22.49 (3.29)	22.92 (3.78)
Gender		42 M, 105 F	37 M, 134 F
Male	79 (24.84%)	42 (28.57%)	37 (21.64%)
Female	239 (75.16%)	105 (71.43%)	134 (78.36%)
Cycle			
Bachelor's	187 (58.81%)	110 (74.83%)	77 (45.03%)
Master's	85 (26.73%)	25 (17.01%)	60 (35.09%)
Single-Cycle	46 (14.46%)	12 (8.16%)	34 (19.88%)
Course Year	2.25 (1.14)	2.13 (1.1)	2.34 (1.17)
On Track			
Yes	256 (80.5%)	108 (73.47%)	148 (86.55%)
No	62 (19.5%)	39 (26.53%)	23 (13.45%)

6.3.2. Measures

At the beginning of the survey, participants completed an introductory demographic questionnaire in which they provided information on age, gender, type of coursework, earned credits, course year, and use of university services. Then, they completed self-reported measures. For all of them, responses were given on a 5-point Likert scale (1 = never/not at all like me to 5 = always/very much like me) for readability. The Cronbach's alpha coefficients calculated on the present sample were acceptable and ranged between .55 (for learning goals) and .90 (for creativity).

6.3.2.1. Character Strengths

Character strengths were measured using the same questionnaires as Study 3, except for social intelligence, which was measured using VIA-IS-120 (validated in Study 1, five items, e.g., "I know how to handle myself in different social situations", $\alpha = .75$). Therefore, five single character strengths were considered, namely curiosity, creativity, critical thinking, perseverance, and social intelligence.

6.3.2.2. Study-Related Factors

Study-related factors were measured through the same questionnaires from Study 3. Therefore, five single study-related factors were assessed, including academic self-efficacy, growth mindset, learning goals, self-regulated learning, and study resilience.

6.3.2.3. Cognitive Abilities

Cattell Test – Scale 3A (Cattell, 1940)

This task measures fluid intelligence using four different kinds of timed problem, with a total of 60 items and 12 min 30 s of time. First, in the Series subtest, participants must correctly complete a sequence of images (13 items, theree minutes). In the classifications subtest, participants are asked to spot the two images that differ from the others in a series of five (14 items, four minutes). In the Matrices subtest, participants are required to correctly complete a matrix (13 items, three minutes). Lastly, in the conditions subtest, participants indicate which image fit specific spatial relationships (10 items, two minutes and a half). Correct answers are awarded one point, while zero points are awarded in the case of wrong or missing answers. A total score was calculated summing all correct answers.

6.3.2.4. Outcome Measures

Academic achievement

As in Study 3, students self-reported their average grades. In the Italian university system, grades range from a minimum of 18 to a maximum of 30.

Satisfaction

Satisfaction with Life Scale (SWLS, Diener et al., 1985; Italian validation by Di Fabio & Gori, 2016)

This scale includes five items that investigate overall contentment with one's life conditions (e.g., "The conditions of my life are excellent"). The scale showed good internal consistency in the Italian validation study (α = .85, Di Fabio & Gori, 2016) and in our study (α = .83).

Academic satisfaction (adapted from the Multidimensional Students' Life Satisfaction Scale – Short Form – School subscale, Huebner et al., 2012; Italian version by Zappulla et al., 2013)

This self-report measure consists of five items evaluating satisfaction with university life (e.g., "I enjoy being at the university"). The scale displayed good internal consistency in the original Italian version (α = .81, Zappulla et al., 2013) and in the present adaptation (α = .87).

6.3.3. Procedure

Participants with SLDs were recruited through the SLD university services of three public Italian institutions in Northern Italy (University of Padova, University of Trieste, and University of Turin) and through a snowball procedure, advertising the study on social media and through personal contacts. Students without SLDs were instead recruited through a snowball procedure only. The study was approved by the University of Padova Ethics Committee (n. 3883).

Data collection was carried out in the first months of 2021 (January-May). All participants took part in the study voluntarily and provided informed consent before completing the self-reported measures and the fluid intelligence task. All questionnaires and tasks were implemented in Qualtrics and took an average of 30 minutes to complete.

Participants were first asked for various demographic information, then completed the questionnaires in randomized order; last, they answered questions related to their studies (e.g., average grades, number of credits, academic year).

6.3.4. Statistical Analysis

First, to explore potential differences between students with and without SLDs with respect to our variables of interest (i.e., character strengths, study-related factors, fluid intelligence, earned credits, achievement, life, and academic satisfaction), independent *t*-tests were performed and the dimensions of the differences in terms of Cohen's (Cohen, 1988) *d* were assessed. We considered *d*

= .20 small, d = .50 medium, and d = .80 large. Following Bonferroni's correction for the number of comparisons, differences were only considered significant when $p \leq .003$.

Then multivariate regression models were run on the whole sample using lavaan (Rosseel, 2012) to examine the effect of individual character strengths (i.e., creativity, curiosity, critical thinking, perseverance, and social intelligence) and study-related factors (i.e., academic self-efficacy, growth mindset, learning goals, SRL strategies, and study resilience) on the outcome variables (i.e., academic achievement, satisfaction with life, and academic satisfaction). Fluid intelligence (Cattell test scores) was included as a covariate only for academic achievement (Richardson et al., 2012).

Finally, multigroup confirmatory factor analysis (CFA) was used to test the invariance of the model by gender (male vs. female) and diagnosis (with vs. without an SLD).

6.4. Results

6.4.1. Differences Between Students with and without SLDs

The results of the independent *t*-tests showed some significant differences between students with and without SLDs with respect to academic self-efficacy (d = –.54), academic achievement (d = –.49), studying resilience (d = –.3), and creativity (d = .38). More specifically, students with SLDs reported lower academic self-efficacy, lower grades, lower study resilience, and greater creativity (p_s < .001). The effect sizes were medium for academic self-efficacy and small for the other variables. Table 6.2 contains the results of the t-test for all variables.

Table 6.2

Results of the Independent t-tests

Variable	SLD	Non-SLD	*t*	*p*	*d*
Creativity	3.66 (.83)	3.35 (.8)	3.41	**.001**	**.38**
Critical Thinking	3.45 (.85)	3.4 (.78)	.51	.61	.06
Curiosity	4.07 (.72)	4.03 (.7)	.52	.61	.06
Perseverance	3.37 (.76)	3.43 (.73)	–.69	.49	–.08
Social Intelligence	3.33 (.78)	3.32 (.76)	.07	.94	.01
Academic Self-Efficacy	3.46 (.62)	3.78 (.59)	–4.77	**< .001**	**–.54**
Growth Mindset	3.4 (.8)	3.61 (.74)	–2.49	.01	–.28
Learning Goals	3.65 (.64)	3.68 (.63)	–.47	.64	–.05
SRL Strategies	3.51 (.44)	3.58 (.4)	–1.47	.14	–.17
Study Resilience	2.96 (.7)	3.26 (.68)	–.3.81	**< .001**	**–.43**
Fluid Intelligence	21.77 (5.97)	23.32 (6.09)	–2.28	.02	–.26
Life Satisfaction	3.08 (.75)	3.11 (.79)	–.40	.69	–.04
Academic Satisfaction	3.51 (.83)	3.6 (.82)	–.95	.34	–.11
Academic Achievement	24.8 (2.83)	26.23 (2.97)	–4.38	**< .001**	**–.49**
Credits	68.27 (53.76)	87.06 (65.22)	–2.77	.006	–.31

6.4.2. Associations Among Character Strengths, Study-Related Factors, and Outcomes

Table 6.3 summarizes the correlations among all variables.

Table 6.3

Correlational Analysis in Students with and without SLD. Values below the diagonal refer to students with SLD; values above the diagonal refer to students without SLD. |r| > .20 is Significant for p < .01, |r| > .26 for p < .001

	.1	.2	.3	.4	.5	.6	.7	.8	.9	.10	.11	.12	.13
1. Creativity		.38	.50	.22	.39	.11	.20	.25	.27	.09	–.06	.21	.20
2. Critical Thinking	.41		.43	.21	.15	.31	.26	.40	.29	.28	.04	.27	.46
3. Curiosity	.55	.47		.30	.41	.26	.15	.44	.42	.20	.08	.20	.41
4. Perseverance	.25	.10	.18		.33	.61	.27	.41	.53	.45	.03	.31	.21
5. Social Intelligence	.30	.08	.13	.38		.25	.12	.32	.20	.25	.07	.29	.34
6. Academic Self-Efficacy	.28	.32	.22	.27	.25		.36	.35	.47	.51	.12	.45	.40
7. Growth Mindset	.20	–.01	.08	0	.12	.08		.29	.26	.26	.06	.15	-26
8. Learning Goals	.32	.20	.41	.28	.12	.27	.16		.44	.41	.09	.27	.31
9. SRL Strategies	.43	.38	.33	.34	.27	.52	.14	.43		.43	.22	.29	.31
10. Study Resilience	.14	.18	.11	.26	.13	.43	.15	.46	.40		.08	.48	.32
11. Fluid Intelligence	–.03	.09	.18	–.27	–.10	.03	–.03	.09	–.06	.04		.12	.06
12. Life Satisfaction	.22	.14	.09	.31	.14	.20	–.04	.11	.19	.28	–.11		.36
13. Academic Satisfaction	.26	.46	.29	.18	.10	.52	.12	.22	.27	.34	.11	.28	
14. Academic Achievement	–.02	.17	.17	–.07	.03	.14	–.08	0	.10	.09	.13	–.09	.11

The model considering character strengths and study-related factors as predictors of achievement, life satisfaction, and academic satisfaction showed good fit indices (CFI = 1.00, NFI = 1.15, RMSEA = .00, SRMR = .00).

The results for academic achievement indicated a significant positive effect of academic self-efficacy ($\beta = .21$, $p < .01$), together with a negative effect of creativity ($\beta = –.19$, $p < .01$). The model explained 13.3% of the variance.

As for life satisfaction, the results indicated a significant positive effect for study resilience only ($\beta = .29$, $p < .001$). The model explained 22.4% of the variance.

Regarding academic satisfaction, critical thinking ($\beta = .30$, $p < .001$), academic self-efficacy ($\beta = .30$, $p < .001$), and curiosity ($\beta = .17$, $p < .01$) all emerged as significant predictors. The model explained 36% of the variance.

A significant small positive correlation emerged between life satisfaction and academic satisfaction ($r = .11$, $p < .01$). Table 6.4 shows the complete results of the multivariate regression models.

Table 6.4

Results of Multivariate Regression Models

	Academic Achievement		Life Satisfaction		Academic Satisfaction	
	β	CI	β	CI	β	CI
Creativity	**–.19***	[–.32; –.06]	.13	[.01; .26]	–.06	[–.17; .06]
Critical Thinking	.05	[–.08; .17]	.08	[–.04; .20]	**.30****	[.20; .41]
Curiosity	.08	[–.06; 22]	–.04	[–.17; .09]	**.17***	[.06; .29]
Perseverance	.03	[–.10; .16]	.14	[.02; .26]	–.06	[–.17; .05]
Social Intelligence	–.06	[–.17; .06]	.07	[–.05; .18]	.09	[–.01; .19]
Academic Self-Efficacy	**.21***	[.08; .34]	.12	[–.01; .25]	**.30****	[.18; .42]
Growth Mindset	.05	[–.06; .16]	–.07	[–.17; .04]	.08	[–.02; .17]
Learning Goals	–.06	[–.19; .07]	–.05	[–.17; .07]	–.02	[–.13; .09]
SRL Strategies	.06	[–.08; .19]	–.03	[–.15; .10]	–.05	[–.17; .07]
Study Resilience	.05	[–.08; .18]	**.29****	[.17; .41]	.11	[–.01; .22]
Fluid Intelligence	.12	[.01; .23]	-		-	

Note. β = standardized beta coefficient; CI = 95% confidence intervals; * = $p < .01$, ** = $p < .001$.

6.4.3. Model Invariance

Model invariance was assessed to ensure that the model did not differ between gender (male vs. female) and diagnosis (with vs. without SLD) using multigroup CFA.

For gender invariance, the results suggested scalar invariance (equality of factor loadings and intercepts) between female and male participants (CFI = .98, NNFI = .79, RMSEA = .07, SRMR = 0.01, p = .053).

For the diagnosis status, our results did not support full scalar invariance between students with and without SLDs (p = .01). A Lagrange multiplier test suggested that freeing the intercept for academic achievement would result in an improved model. After freeing this parameter, partial scalar invariance was achieved (CFI = 1.00, NNFI = 1.01, RMSEA = .00, SRMR = .00, p = .38). This means that the patterns of relationships between predictors and outcomes in students with and without SLDs can be considered similar, except for a difference in academic achievement, which was higher for students without SLDs.

6.5. Discussions and Conclusions

Understanding the intraindividual characteristics affecting important academic and nonacademic outcomes is crucial for developing interventions aimed at supporting both students with and without SLDs throughout their career. In doing so, recent theoretical models suggest the adoption of a strength-based approach rather than a deficit one – that is, focusing on the resources and favorable dispositions displayed by individuals and nurturing them to positively affect outcomes of interest (Lavy, 2020; Linkins et al., 2015; Niemiec et al., 2017; Ruch et al., 2020).

Based on the iSRL theory (Ben-Eliyahu, 2019), I first explored the differences in various intraindividual factors (both general and related to study) and three relevant outcomes (achievement, life satisfaction, and academic satisfaction) in a sample of students with and without SLDs. Then, I studied the associations between intraindividual factors and outcomes in a multivariate regression model fitted to the whole sample, controlling for diagnosis invariance.

Regarding group differences between students with and without SLDs, the results showed that, in line with the hypotheses (H1), students with SLDs reported greater creativity, but lower academic self-efficacy, study resilience, and academic achievement. These findings are consistent with some previous evidence (Baird et al., 2009; Cancer et al., 2016; Hen & Goroshit, 2014; Lackaye & Margalit, 2006; Majeed et al., 2021; Tabassam & Grainger, 2002) and may indicate that students with SLDs do show a specific profile in terms of resources and issues displayed, compared to their peers. More specifically, it appears that students with SLDs struggle with feeling confident in their academic abilities and the ability to bounce back from academic difficulties, which may partially explain why they tend to perform worse than their peers (Hen & Goroshit, 2014). On the other hand, students with SLDs may also possess greater dispositional creativity and be better able to produce original ideas and find new ways to do things, in line with previous findings (Majeed et al., 2021).

Interestingly, no other differences emerged, meaning that students with and without SLDs were similar in terms of the other character strengths considered (curiosity, critical thinking, perseverance, and social intelligence) as well as with respect to the remaining study-related factors (SRL strategies, growth mindset, and learning goals) and life and academic satisfaction. This indicates that university students with or without SLDs are similarly equipped in terms of character qualities and study abilities, but also when it comes to subjective and academic well-being.

Multivariate regression models further illuminated the relationships between these intraindividual factors and the academic and nonacademic outcomes in the entire sample.

Academic self-efficacy stood out as the most relevant intraindividual factor, as it was significantly positively related to both academic achievement and academic satisfaction. This result is consistent with expectations (H2b and H4b) and several previous studies (Mega et al., 2014; Richardson et al., 2012), reiterating the importance of this variable for student performance and extending its relevance to academic well-being.

On the contrary, and quite unexpectedly (H2a) considering previous meta-analytical findings (e.g., Gajda et al., 2017), creativity was negatively, although weakly, related to academic

achievement. Taken together, these two findings may actually help explain the significant difference in academic achievement observed between students with and without SLDs: Students with SLDs reported higher creativity (which negatively affected achievement) and lower academic self-efficacy (which instead positively affected achievement). It could be that, within a highly prescriptive and conforming context like a university, creativity may be de-incentivized and represent a sort of hindrance to performing well, which could negatively affect students with SLDs in particular.

Interestingly, critical thinking and curiosity, which are conceptually related to creativity (in Peterson & Seligman, 2004 taxonomy, they all belong to the second-order virtue of wisdom & knowledge) emerged as significant predictors of academic satisfaction (H4a), as in Lounsbury et al. (2009). This would suggest that being able to critically analyze and even dispute learning material, as well as eagerness to learn, are both positively associated with being satisfied at the university.

Consequently, although students with SLDs might be penalized for being creative when it comes to performing in a certain way to get higher grades, these two related dispositions may help them feel more at ease with the university context at large.

In particular, fluid intelligence was not significantly related to achievement, strengthening the importance of considering noncognitive factors when examining psychological correlates of performance (Heckman & Kautz, 2012; Khine & Areepattamannil, 2016).

Finally, study resilience was found to be the single positive predictor of life satisfaction, in agreement with the hypotheses (H3b) and previous studies on general resilience (e.g., Hu et al., 2015). Therefore, being able to overcome study difficulties and manage study-related anxiety could positively influence the subjective well-being of students more than other character strengths or study-related factors.

Related to this, it is important to note that not all the hypothesized effects emerged as significant. This lack of significance may be due to the covariance between the intraindividual factors examined; on the other hand, considering them all at the same time can provide useful information on their specific roles. Future studies could expand on this by trying to disentangle the roles of general

and study-related factors, for example, considering study-related factors as mediators in the relationships between character strengths and outcomes (Feraco et al., 2021, 2022; Muenks et al., 2017).

Lastly, the three outcomes considered in this study were mostly unrelated to one another, confirming the need to judge them as equally important contributors to what success looks like for university students rather than focusing on performance or well-being alone. Moving forward, this kind of comprehensive look could lead to the development of integrated intervention programs aimed at fostering multiple important dimensions in students.

6.5.1. Limitations and Future Directions

The present study has some limitations. First, its cross-sectional nature does not allow any causal inferences on the direction of the relationships assessed; future studies could adopt a longitudinal design to better assess these.

The presence of SLDs was self-reported; therefore, it was not possible to analyze how the severity of SLDs may have affected the relationships among the variables considered. In addition, the gender imbalance in our sample may limit the generalizability of the results. Last but not least, it may be that only SLD students who were highly motivated and endowed with good character strengths decided to take part in the study, thus causing self-selection bias. Future studies should adopt random sampling to ensure the sample is representative of the SLD population.

Notwithstanding these limitations, this study contributes to the literature on associations and differences in a host of intraindividual factors possibly related to various dimensions of academic success in terms of both achievement and well-being in students with and without SLDs. Identifying the specific positive resources that students with and without SLDs may draw upon can support the importance of noncognitive factors in the education field, as recently suggested both theoretically and empirically (see Lavy, 2020). This approach can then lay the foundations to develop strength-based intervention programs (Ruch et al., 2020).

As future directions, having found that the relationships between predictors and outcome variables were similar for students with and without SLDs, it could be argued that services or interventions can have positive consequences for both students with and without SLDs. Providing universal support can also increase the number of students with SLDs who access services, overcoming the need to self-disclose their condition. Self-disclosure may indeed be particularly problematic, considering that a low percentage of students with SLDs report their difficulties at enrollment, with a negative effect on their academic careers (Lightner et al., 2012).

To conclude, our results could guide researchers and practitioners interested in a strength-based approach to SLDs to devise interventions and expand the research to more deeply examine the positive qualities that sustain students throughout their academic careers.

7. Study 6: Mindfulness-Based Strengths Practice: Combining Character Strengths and Mindfulness to Improve Well-Being

7.1. Rationale of the Study

The mutual support model (Pang & Ruch, 2019b) empirically supports the bidirectionality of the relationship between character strengths and mindfulness, defined as a curious, open, and accepting self-regulation of attention to the present moment (Bishop et al., 2004). According to this conceptual model, certain character strengths (e.g., creativity, curiosity) can facilitate the practice of mindfulness (i.e., people higher in these character strengths are more willing to engage in mindfulness meditations), thereby leading to strong mindfulness (i.e., character strengths can strengthen mindfulness practice and help individuals overcome obstacles to practicing, Niemiec, 2013) while mindfulness practice has an impact on the cultivation of particular character strengths (e.g., curiosity, perspective) and can lead to a more mindful use of character strengths. This reciprocal relationship has been translated by Niemiec (2013a) into Mindfulness-Based Strengths Practice (MBSP), an 8-week training program integrating mindfulness and character strengths to specifically promote positive outcomes such as well-being.

Previous research has suggested MBSP's efficacy in benefiting various dimensions of well-being in the general population (Ivtzan et al., 2016; Whelan-Berry & Niemiec, 2021), employees (Monzani et al., 2021; Pang & Ruch, 2019a), and working undergraduate students (Wingert et al., 2022). Nevertheless, the psychological mechanisms underpinning these positive effects are still poorly understood, and large, rigorous studies examining MBSP are lacking.

The basic psychological needs mini-theory, within the larger self-determination theory (SDT, Deci & Ryan, 1985; Ryan & Deci, 2000, 2017) may help bridge this gap and help researchers and practitioners better understanding the pathways connecting strength-based practice and mindfulness to well-being. Empirical research has indeed supported the positive relation between the satisfaction of these needs and various domains of well-being (J. Y. Y. Ng et al., 2012; Schutte & Malouff, 2021;

Van den Broeck et al., 2016). Moreover, both character strengths and mindfulness seem to be significantly positively associated with the satisfaction of these three psychological needs and both mindfulness and character strengths (Bai et al., 2021; Brdar & Kashdan, 2010; J.-H. Chang et al., 2015; W. H. Chang et al., 2018; Pratscher et al., 2018). Recent meta-analytical reviews (Donald et al., 2020; Ryan et al., 2021) support the possibility for mindfulness-based interventions to increase autonomous motivation, with cascading positive effects on well-being. Similarly, there is evidence that the relationship between character strengths use and ill-being (depression) is mediated by basic needs satisfaction (Bai et al., 2021). Altogether, it could be that mindfully bringing forth what is best in each individual (mindful strengths use), as well as sustaining their mindfulness practice through strengths (strong mindfulness) enable the satisfaction of basic psychological needs; this in turn could lead to greater well-being.

In particular, each basic psychological need may have its own specific mediating role in the relationship between character strengths and mindfulness practice and well-being.

Bringing forth strengths and mindfulness may increase autonomy by making it more salient to individuals that they can proactively use their inner resources to make meaningful changes in their life, thereby experimenting a sense of agency which is then instrumental to a perception of contentment and positive affect (in terms of subjective well-being) as well as the possibility of flourish (in terms of psychological well-being).

By experimenting that they can actively influence their environment through this kind of practices, individuals may also obtain a higher sense of competence and/or be able to optimize their capabilities by mindfully exploiting their best qualities and be mindful to the areas of improvement needed to increase one's expertise. This increased mastery would in turn positively affect, once again, the subjective perception of well-being while contributing to the flourishing of the person.

Last but not least, character strengths and mindfulness practice can directly impact interpersonal relationships, by making the person well aware of the needs of others and helping them take interpersonal interactions to the next level, which in turn should greatly benefit well-being.

Furthermore, there is a lack of knowledge in the literature about specific trait level changes in character strengths following intervention (Ruch et al., 2020). Therefore, also as manipulation check, in this study I evaluated pre-post changes in character strengths and mindfulness.

The aim of the present study is to adapt MBSP into Italian and evaluate i) its specific effects on character strengths and mindfulness trait levels and ii) its transfer effects on basic psychological needs satisfaction and overall well-being. More specifically, the mediating role of satisfaction of basic psychological needs in the relationship between the intervention condition and well-being will be examined. To this aim, a pre-registered randomized controlled trial comparing an intervention group (MBSP group) with a waitlist group (passive control group) was conducted, and both groups were assessed in terms of character strengths (VIA-IS-120), dispositional mindfulness (FFMQ), basic psychological needs satisfaction (BPNSS) and well-being (PERMA) at two time points, baseline (T1) and post-test, after eight weeks (T2).

7.2. Hypotheses

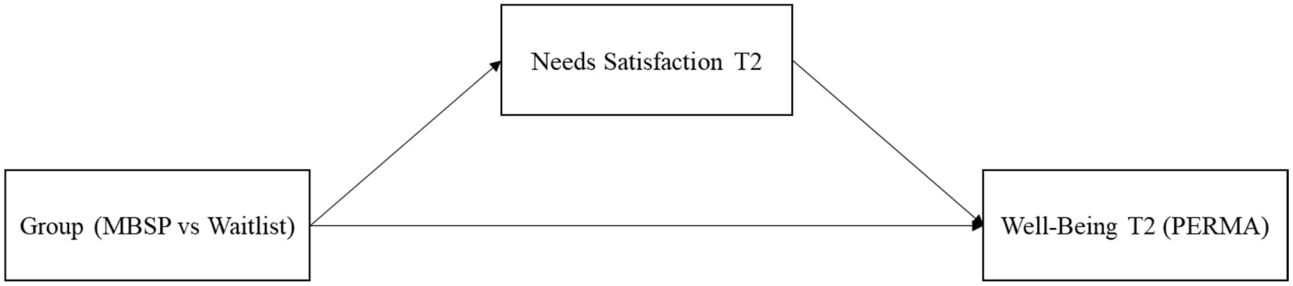
Based on my review of the literature on MBSP and basic psychological needs, I hypothesized the following:

- Hypothesis 1: Participants in the MSBP condition will report an increased level of well-being at post-intervention (Time 2), as compared with participants of the waitlist control condition;
- Hypothesis 2: The effect of MSBP on well-being will be mediated by the satisfaction of basic psychological needs (see Figure 7.1 and 7.2 for a visual representation of the two hypothesized models, one considering overall needs satisfaction, and the other considering the three needs as separate), i.e., MBSP will positively impact the satisfaction of basic psychological needs, which in turn will influence well-being.

Exploratorily, specific effects on character strengths and mindfulness trait levels will be investigated. It may be anticipated that participants in the MBSP group only will experience growth with respect to their strengths and dispositional mindfulness.

Figure 7.1

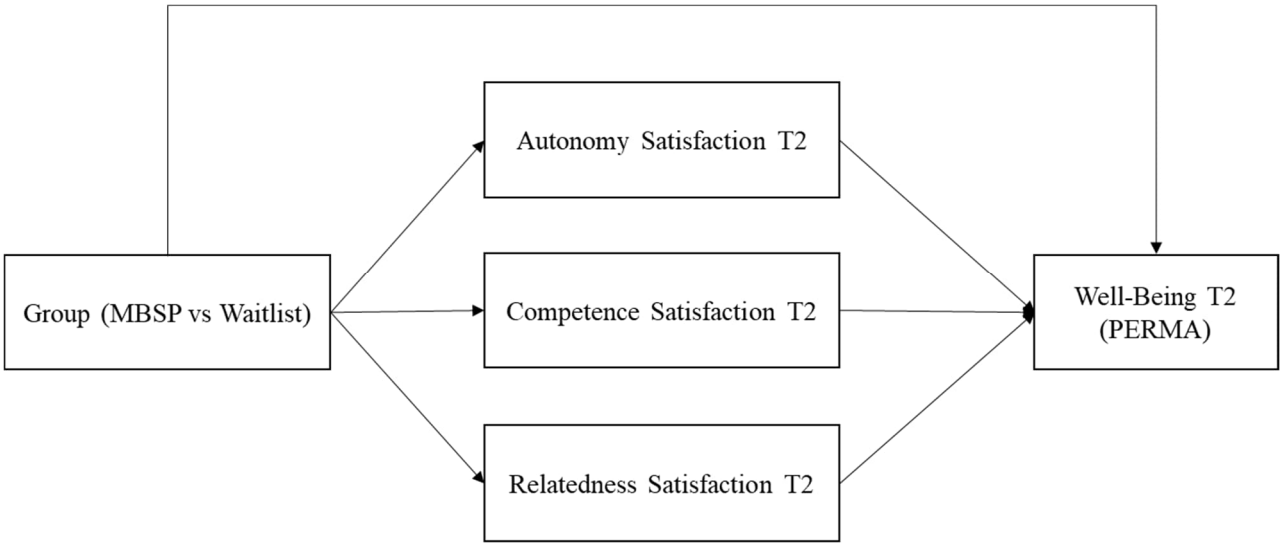
The first hypothesized mediation model (m1)



Note. Satisfaction of basic psychological needs at T1 and well-being at T1 were added as covariates in the model (not showed in this figure).

Figure 7.2

The second hypothesized mediation model (m2)



Note. Satisfaction of basic psychological needs at T1 and well-being at T1 were added as covariates in the model.

7.3. Materials and Methods

7.3.1. Participants

A total of 53 participants aged 20 to 70 years old (9 males, 43 females, one other, M_{age} = 32.3, SD_{age} = 14.37) completed all measures at both pre- and post-intervention and were thus considered in the analyses. Of them, 22 participated in MBSP and 33 to the waitlist group.

Participants in the two groups did not differ in terms of age, gender distribution, or occupation. Table 7.1 displays the sample baseline characteristics. Of note, the sample size should be considered with caution, as prospective design analysis using the package PRDA (Callegher et al., 2021) had indicated that to obtain a power of 80% with an effect size of .45 (Monzani et al., 2021) the required sample size was N = 124 (i.e., 62 participants for each group). Also the results of a power analysis conducted for the mediation model using the Shiny app pwrSEM (Y. A. Wang & Rhemtulla, 2021) showed that with 120 participants, power is equal to .84 for the indirect effect of interest.

Table 7.1

Characteristics of the entire sample, MBSP, and Waitlist groups

Variable	**Entire Sample**	**MBSP Group**	**Waitlist Group**	**Statistic**	***p* Value**
Age (SD)	32.3 (14.37)	31.62 (12.43)	32.75 (15.68)	$t = -.28$	$p = .78$
Gender					
Female	43 (81.13%)	15 (71.43%)	28 (87.5%)	$\chi^2 = 2.88$	$p = .24$
Male	9 (16.98%)	5 (23.81%)	4 (12.5%)		
Other	1 (1.89%)	1 (4.76%)	0 (0%)		
Occupation					
Employee	20 (37.74%)	8 (38.10%)	12 (37.5%)	$\chi^2 = 2.14$	$p = .34$
Student	30 (56.60%)	13 (61.90%)	17 (53.13%)		
Retired	3 (5.66%)	0 (0%)	3 (9.32%)		

7.3.2. Measures

The following self-report measures were administered to all participants at both Time 1 and 2. Four measures were used to test MBSP specific and transfer effects.

7.3.2.1 Specific Effects Measures

The *VIA Inventory of Strengths-120* (VIA-IS-120, Littman-Ovadia, 2015; validated in Italian in Study 1) was used to assess the 24 character strengths pre- and post-intervention.

The *Five Facet Mindfulness Questionnaire* (Baer et al., 2006; Giovannini et al., 2014) is a 39-item self-report questionnaire assessing five dimensions of dispositional mindfulness:

- Observing: Noticing and attending to external and internal experiences, such as sensations, thoughts, or feelings (eight items, e.g. "When I'm walking, I deliberately notice the sensations of my body moving");
- Describing: Labeling internal experiences with words (eight items, e.g., "I'm good at finding words to describe my feelings");
- Acting with awareness: Consciously attending to one's activity in the present moment (eight items, e.g., "When I do things, my mind wanders off and I'm easily distracted");
- Non-judging of experience: Adopting a nonevaluative attitude towards thoughts and feelings (eight items, e.g. "I criticize myself for having irrational or inappropriate emotions");
- Non-reactivity to inner experience: Accepting one's thoughts and feelings can come and go, without getting caught up in them (seven items, e.g. "I watch my feelings without getting lost in them").

Answers are provided on a 5-point Likert scale (1 = "Never or very rarely true" to 5 = "Very often or always true"). The instrument has showed adequate psychometric properties in both the original version (Cronbach's alpha range: .67–.91, (Baer et al., 2006) and the Italian validation study (Cronbach's alpha range: .75–.89 and .86 for the overall score, (Giovannini et al., 2014).

7.3.2.2 Transfer Effects Measures

The *PERMA-Profiler* (Butler & Kern, 2016; Giangrasso, 2021) is a self-report instrument composed of 23 items assessing five dimensions of well-being (three items each) put forward by Seligman (2011):

- Positive emotions: General tendency to feel emotions of contentment and joy (e.g., "In general, how often do you feel joyful?");
- Engagement: Being deeply absorbed and involved in activities or the world itself (e.g., "How often do you become absorbed in what you are doing?")
- Relationships: Feeling loved and appreciated by other people (e.g., "How satisfied are you with your personal relationships?");
- Meaning: Having a sense of purpose in life and connecting to something greater than oneself (e.g., "In general, to what extent do you lead a purposeful and meaningful life?");
- Accomplishment: Subjective evaluation of one's ability to complete tasks and achieve goals (e.g., "How much of the time do you feel you are making progress towards accomplishing your goals?").

Answers are given on a 10-point Likert scale (0 = "Not at all" to 10 = "Completely"). An overall score measuring flourishing can be calculated summing these 15 items. Furthermore, an overall well-being score can be obtained by including eight additional items that assess overall happiness (one item), negative emotions (three items), loneliness (one item), and self-perceived physical health (three items). The instrument presents acceptable psychometric properties in both its original version (Cronbach's alpha range: .72–.90 and .94 for the overall score, (Butler & Kern, 2016) and the Italian one (Cronbach's alpha range: .57–.86 and .92 for the overall score, (Giangrasso, 2021).

The 12 satisfaction items of the *Basic Psychological Needs Satisfaction and Frustration* (B. Chen et al., 2014; S. Costa et al., 2018) were used to assess the satisfaction of the three basic psychological needs of autonomy (e.g., "I feel a sense of choice and freedom in the things I undertake"), competence (e.g., "I feel confident that I can do things well"), and relatedness

satisfaction (e.g., “I feel that the people I care about also care about me”). Answers are given on a 5-point Likert scale ranging from 1 (completely disagree) to 5 (completely agree). The original version displayed satisfactory internal consistencies (Cronbach’s alpha range: .65–.87 across four countries(B. Chen et al., 2014), and so it did in the Italian validation study (Cronbach’s alpha range: .79–.88; (S. Costa et al., 2018).

7.3.2.3. Training

The MBSP training was delivered following the manual by Niemiec (2013a). It is organized in eight two-hour sessions to be held once a week (16 hours in total). Each session has a specific topic (see Table 7.2) and a recurring internal structure. This internal structure typically includes the following elements:

- Opening meditation: Brief guided meditation that allows participants to leave behind the day and start the session after refocusing on the present moment;
- What went well: Group discussion reviewing the homework assigned for the week, discussing positive insights as well as doubts or difficulties with the practice;
- Theoretical input: Introduction of new concepts and materials on the topic of that session;
- Practice: Exercise or practice on the topic presented, usually on mindfulness, character strengths, or a combination of both;
- Virtuous circle: A structured closing moment where participants can freely share any thoughts on the course, the session, or their insight;
- Homework: Presentation of the exercises and practices suggested for the week;
- Closing meditation: Brief guided meditation to conclude the session by either reinforcing the concepts of the current session (e.g., proposing a shortened version of the opening meditation) or anticipating the upcoming one (e.g., introducing a new meditation, to be practiced during the week and to be fully explained in the following session).

Homework (everyday 20–40 minutes) invited participants to voluntarily repeat certain mindfulness/strengths practices and/or engage in new ones. To do so, they could access additional ad-hoc materials including an overview of the session, an explanation of the exercises, self-monitoring schedules and audio tapes containing the guided meditation (see Figure 7.3 and 7.4 for some examples). Exercise completion was object of the next group discussion and participants self-reported the frequency of homework completion at post-test.

Table 7.2

The Themes of MBSP's Sessions. Adapted from Niemiec (2013)

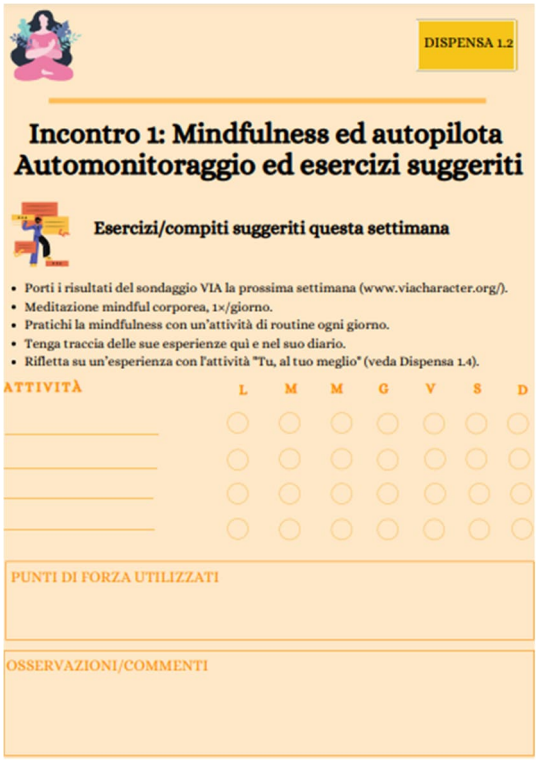
Session	Core Topic/Theme	Description
1	Mindfulness and Autopilot	Introduction to mindfulness, limiting autopilot by returning to the present moment
2	Signature Character Strengths	Introduction to character strengths, identifying signature strengths
3	Obstacles are Opportunieites	Using strengths to overcome barriers to mindfulness
4	Strong Mindfulness	Integrating strengths into mindfulness practice
5	Valuing Relationships	Turning strengths inward (relationship with oneself) and outward (relationship with others)
6	Mindful Strengths Use	Integrating mindfulness into strengths use, balancing strengths underuse and overuse
7	Authenticity and Goodness	Aware-Explore-Apply model, maintenance
8	Engagement with Life	Review and commitment to practice

Figure 7.3

The course's webpage

Figure 7.4

Example of self-monitoring schedule



7.3.3. Procedure

The study was approved by the Ethical Committee of the University of Padova (n. 4491) and pre-registered on the Open Science Framework (https://doi.org/10.17605/OSF.IO/CVP9W). The training was delivered online, through the platform Zoom, and led by me after attending the original MBSP training from the author himself (September-November 2021).

Participants were recruited through advertisement on social media and personal contacts; their attendance was completely free, and they did not receive compensation in return for their participation. All the questionnaires were implemented on Qualtrics, and a website was also predisposed for participants to access all course materials. First, participants received a link containing the informed consent; after agreeing to it, they completed socio-demographic information and then the four questionnaires (VIA-IS-120, FFMQ, BPNSS, and PERMA) in randomized order (T1). The questionnaires required around 25 minutes to be completed. After the baseline assessment, participants were randomized to receive either the MBSP training or to be included in a waitlist group. Participants in the intervention group were then divided in two parallel groups (around ten people each), one held on Tuesdays 20.30-22 p.m. and the other one on Thursdays 18.00-20.00 p.m., allowing to best accommodate participants' needs. The MBSP group was then invited to attend the eight weekly online sessions, that took place between March and May 2022. At the end of the course, all participants (MBSP and waitlist) were invited to complete all the questionnaires once again (T2). The waitlist received the intervention between May and June 2022. I personally led the groups after having experienced the original course led by Dr. Niemiec.

7.3.4. Statistical analyses

As a manipulation check, to test MBSP's specific effects on character strengths and mindfulness, mixed ANOVAs considering time (i.e., pre versus post-test) as within group variable, and group (i.e., intervention versus waitlist) as between group variable were conducted for each character strength and for mindfulness scores (overall score plus the five subdimensions). Bonferroni post-hoc tests were conducted if a principal effect emerged as significant. Cohen's *d* were also calculated to compare pre- and post-test scores in the two groups in terms of magnitude of the effect.

Then, linear mixed effects models were applied to evaluate MSBP's effect on PERMA total score (outcome variable) and subdimensions, considering time and group as fixed effects and participants (i.e., subjects' code) as random effect.

Lastly, two SEM models were tested to evaluate the indirect effect of the group (intervention/waitlist) on PERMA total score at post-test through the mediation of the satisfaction of the three basic psychological needs at post-test (BPNSS total score in the first model, the three subscales in the second model), considering PERMA and BPNSS scores at pre-training as covariates.

7.4. Results

Figures 7.6 and 7.7 display the correlations between the variables at the two time points separately.

Figure 7.6

Correlations at Time 1

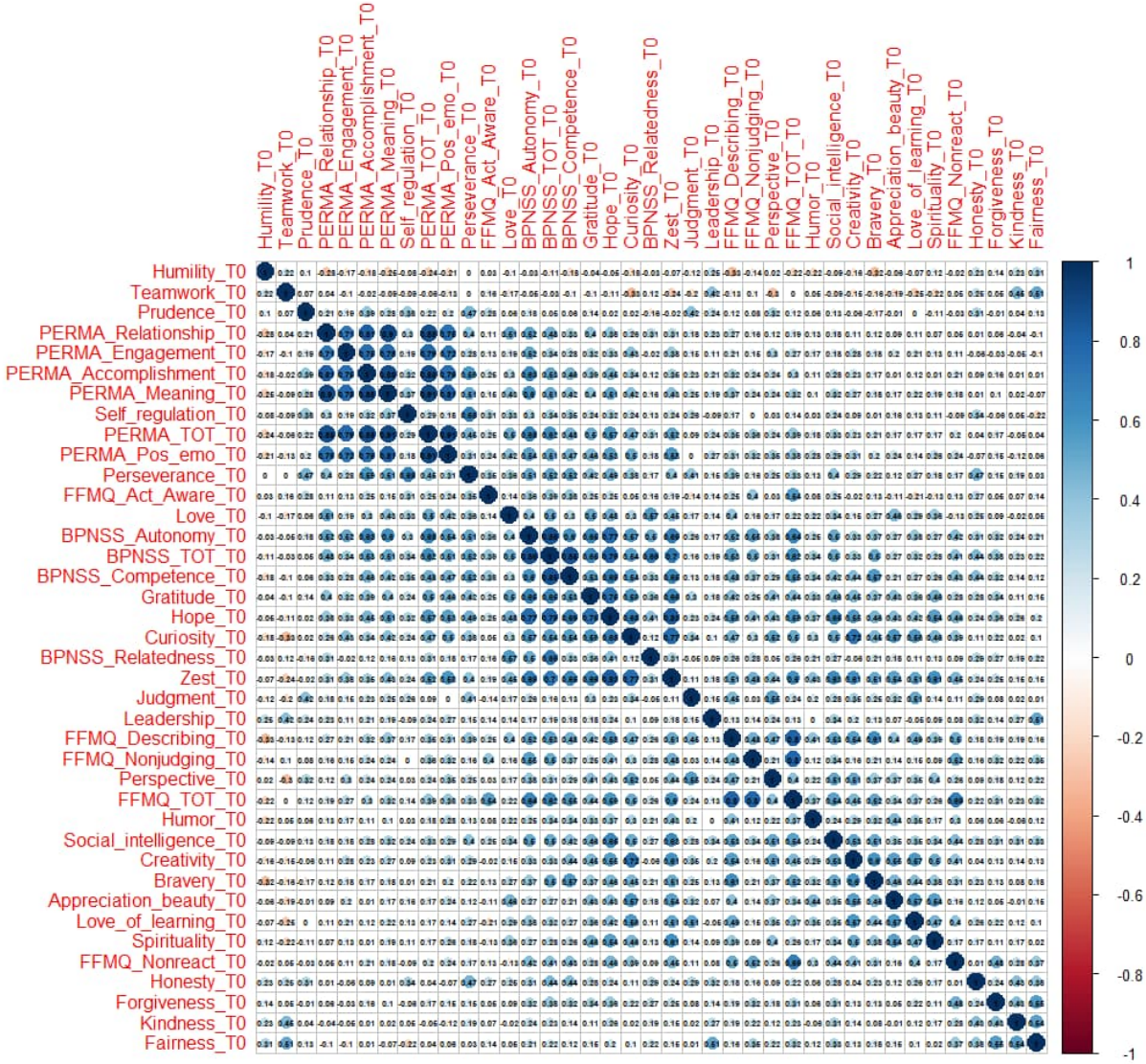
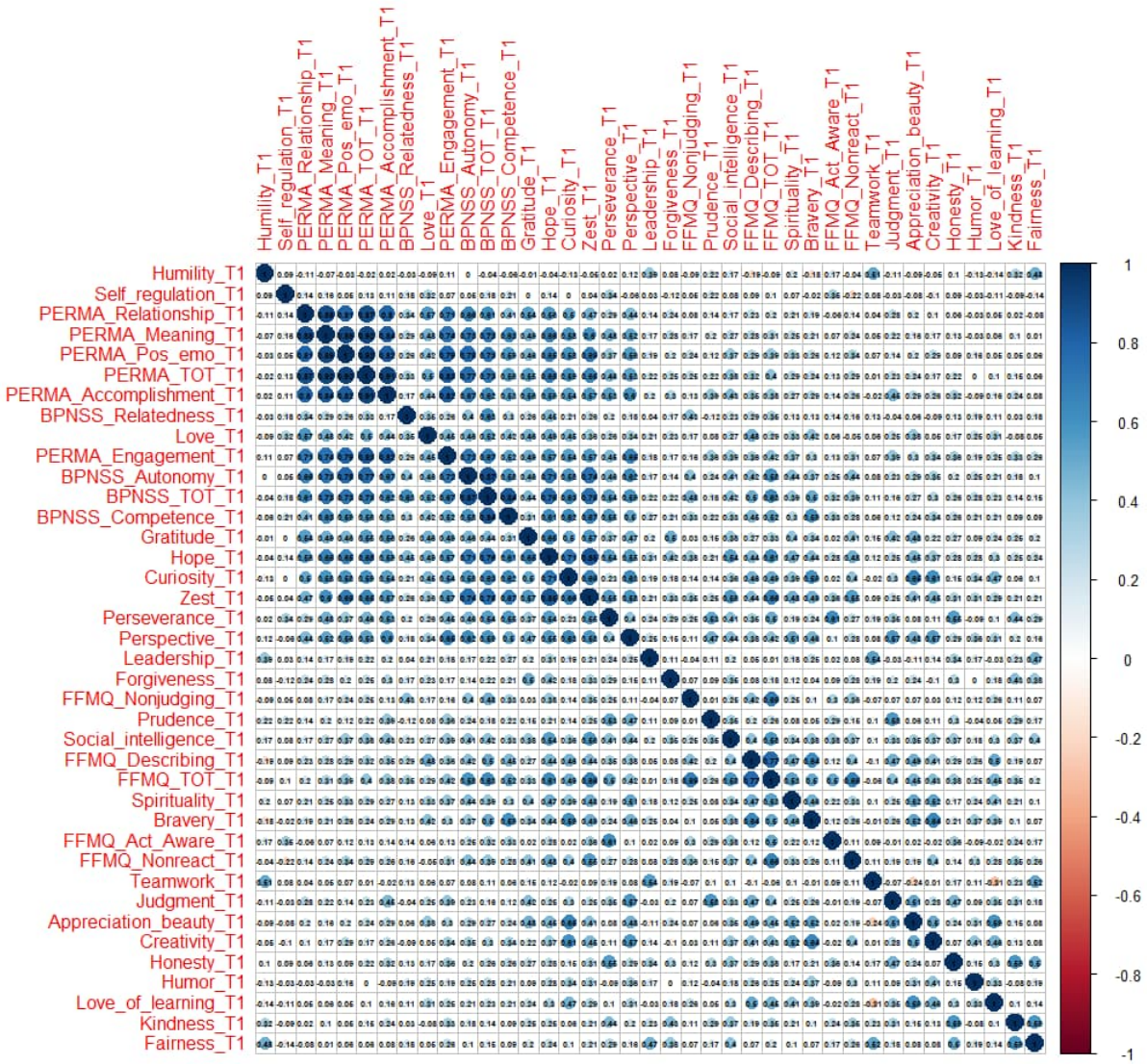


Figure 7.7

Correlations at Time 2



7.4.1. Changes in Character Strengths and Mindfulness

Preliminarily, baseline (T1) differences in character strengths between the MBSP group and the Waitlist group were calculated; no significant differences emerged for any of the 24 character strengths (all *ps* > .05). Then, the results of the mixed ANOVAs for character strengths indicated that in the MBSP group only, there were significant pre-post changes in eight out of 24 character strengths, with small to medium effect sizes, ranging from .28 for curiosity to .60 for humor.

More specifically, significant time × group interactions emerged for curiosity ($F = 7.91$, $p = .007$), gratitude ($F = 8.25$, $p = .006$), hope ($F = 11.30$, $p = .001$), humor ($F = 18.18$, $p < .001$), love

($F = 5.80$, $p = .02$), perseverance ($F = 5.55$, $p = .022$), perspective ($F = 5.09$, $p = .028$), self-regulation ($F = 10.02$, $p = .003$), and spirituality ($F = 9.70$, $p = .003$). The post-hoc tests indicated that participants in the MBSP group only reported significant improvements in curiosity ($p = .02$), gratitude ($p = .008$), hope ($p = .002$), humor ($p < .001$), love ($p = .004$), perspective ($p = .03$), self-regulation ($p = .002$), and spirituality ($p = .005$), while changes in perseverance resulted non-significant ($p > .05$).

Additionally, the results showed a significant effect of Time for humility ($F = 6.97$, $p = .011$) and prudence ($F = 14.21$, $p < .001$), indicating that in both groups there were significant pre-post improvements in these strengths ($p = .01$ for humility and $p < .001$ for prudence).

All the principal effects of group resulted non-significant, indicating no group differences in character strengths. Table 7.3 shows the means, standard deviations, and Cohen's *d* for the two groups.

Table 7.3

Pre-Post Changes in Character Strengths in the Two Groups

Variable	**MBSP Group**		***d***	**Waitlist Group**		***d***
	T1	**T2**		**T1**	**T2**	
Appreciation of Beauty	3.82 (.61)	3.96 (.69)	.22	4.00 (.66)	3.95 (.60)	–.08
Bravery	3.41 (.68)	3.59 (.80)	.24	3.44 (.61)	3.46 (.70)	.03
Creativity	3.34 (.84)	3.52 (1.02)	.19	3.51 (.83)	3.49 (.90)	–.01
Curiosity	3.30 (.82)	3.53 (.89)	**.28***	3.56 (.77)	3.51 (.66)	–.07
Fairness	3.94 (.71)	3.99 (.54)	.08	3.89 (.51)	3.9 (.48)	.01
Forgiveness	3.80 (.69)	3.78 (.69)	–.03	3.54 (.79)	3.62 (.67)	.11
Gratitude	3.34 (.65)	3.7 (.63)	**.56*****	3.71 (.61)	3.68 (.68)	–.04
Honesty	4.14 (.4)	4.3 (.43)	.37	4.29 (.40)	4.28 (.40)	–.02
Hope	3.28 (.78)	3.7 (.63)	**.59*****	3.54 (.82)	3.49 (.74)	–.07

Humility	3.33 (.73)	3.53 (.98)	.24	3.59 (.68)	3.7 (.55)	.18
Humor	3.43 (.78)	3.88 (.71)	**.60*** **	3.69 (.68)	3.54 (.74)	–.21
Judgment	4.12 (.46)	4.1 (.52)	–.04	4.28 (.40)	4.19 (.51)	–.19
Kindness	4.11 (.52)	4.24 (.48)	.25	4.18 (.46)	4.13 (.39)	–.10
Leadership	3.47 (.55)	3.58 (.66)	.19	3.53 (.57)	3.48 (.53)	–.09
Love	3.7 (.82)	4.1 (.67)	**.53****	3.84 (.71)	3.88 (.61)	.05
Love of Learning	3.38 (.88)	3.54 (.97)	.17	3.42 (.67)	3.41 (.64)	–.02
Perseverance	3.53 (.74)	3.72 (.73)	.25	3.86 (.66)	3.74 (.70)	–.17
Perspective	3.5 (.54)	3.82 (.64)	**.53****	3.63 (.73)	3.62 (.68)	–.02
Prudence	3.35 (.56)	3.58 (.62)	**.39***	3.6 (.61)	3.79 (.49)	**.34***
Self-Regulation	3.34 (.71)	3.42 (.75)	.10	3.49 (.75)	3.46 (.64)	–.05
Social Intelligence	3.57 (.44)	4 (.38)	**.37*****	3.72 (.58)	3.71 (.50)	–.03
Spirituality	2.85 (.94)	3.18 (1.01)	**.34****	3.08 (.91)	3.02 (.92)	–.06
Teamwork	3.54 (.53)	3.6 (.53)	.11	3.54 (.39)	3.66 (.40)	.30
Zest	3.1 (.75)	3.3 (.78)	.26	3.3 (.78)	3.25 (.84)	–.06

Note. d = Cohen's d, * = $p < .05$, ** = $p < .01$, *** = $p < .001$

A similar procedure was adopted for dispositional mindfulness. There were no baseline (T1) differences in overall mindfulness nor mindfulness subdimensions between the MBSP group and the Waitlist group (all $ps > .05$). Similarly, the intervention group only showed large pre-post improvements in overall mindfulness ($d = .73$), Non reacting ($d = .95$), Non judging ($d = .78$), and medium change in Describe ($d = .46$).

More precisely, significant time × group interactions emerged for overall dispositional mindfulness ($F = 10.12$, $p = .002$), and the subdimensions describe ($F = 8.32$, $p = .006$), non judge ($F = 4.74$, $p = .034$), and non react ($F = 8.66$, $p = .005$). The post-hoc tests indicated that participants in

the MBSP group only reported significant improvements in overall mindfulness ($p < .001$), specifically in the subdimensions describe ($p = .002$), non judge ($p = .004$), and non react ($p < .001$).

All the principal effects of group resulted non-significant, indicating no group differences in dispositional mindfulness. Table 7.4 shows the means, standard deviations, and Cohen's *d* for the two groups.

Table 7.4

Pre-Post Changes in Mindfulness in the Two Groups

Variable	MBSP Group		*d*	Waitlist Group		*d*
	T1	T2		T1	T2	
FFMQ-Total	3.13 (.57)	3.52 (.5)	**.73*** **	3.26 (.47)	3.3 (.43)	.08
FFMQ-Observe	3.32 (.80)	3.57 (.72)	.33	3.46 (.51)	3.48 (.72)	.03
FFMQ-Describe	3.35 (1.02)	3.76 (.79)	**.46****	3.62 (.71)	3.62 (.74)	0
FFMQ-Act with Awareness	3.13 (.88)	3.38 (.80)	.30	3.39 (.63)	3.39 (.66)	–.01
FFMQ-Non Judge	3.17 (.84)	3.77 (.70)	**.78*** **	3.02 (.94)	3.12 (.81)	.11
FFMQ-Non React	2.61 (.43)	3.07 (.55)	**.95*** **	2.74 (.61)	2.83 (.61)	.15

Note. d = Cohen's *d*, * = $p < .05$, ** = $p < .01$, *** = $p < .001$

7.4.2. Direct Effects of MBSP on Well-Being

The results of the linear mixed effects model showed no significant effects of time, group, or the time x group interaction on PERMA overall score, nor its subdimensions, except for negative emotions, where there was a significant effect of time (B = –.73, $p = .01$) and a significant time x group interaction (B = 1.03, $p = .005$). More specifically, it appeared that participants in the MBSP group only reported a significant pre-post decrease in their negative emotions. Table 7.5 shows the complete results.

Table 7.5

Linear Mixed Models Results

Variables	Time (T2)	Group (Waitlist)	Time*Group
	B	**B**	**B**
PERMA Total	.27	–.32	–.16
Positive Emotions	.33	–.58	–.07
Engagement	.24	–.43	–.06
Relationships	.32	–.44	.01
Meaning	.33	–.46	–.21
Accomplishment	.11	–.40	.18
Negative Emotions	**–.73***	–.29	**1.03****
Health	–.11	–.67	.34
Loneliness	–.10	–.75	.79
Happiness	.36	.33	.27

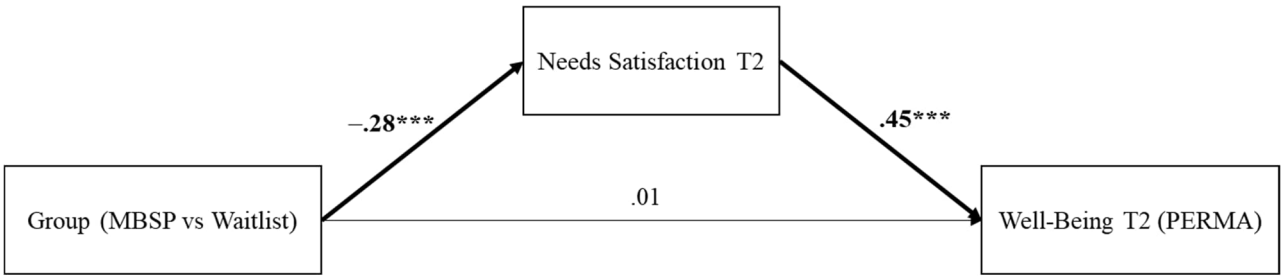
Note. B = Unstandardized beta values; * = $p < .05$, ** = $p < .01$

7.4.2. Indirect Effects of MBSP on Well-Being

The results for m1 (see Figure 7.6), the mediation model with PERMA overall score at Time 2 as dependent variable, group (MBSP vs waitlist) as independent variable, and BPNSS overall score at Time 2 as mediator, showed a significant negative effect of the waitlist group ($\beta = –.28$, $p < .001$) and of BPNSS at Time 1 ($\beta = .71$, $p < .001$) on BPNSS at Time 2 and a significant positive effect of BPNSS at Time 2 ($\beta = .45$, $p < .001$) and PERMA at Time 1 ($\beta = .50$, $p < .001$) on PERMA at Time 2. The indirect effect of the group on PERMA through the mediation of BPNSS was also significant ($\beta = .13$, $p = .01$). The model displayed good fit indices (CFI = .94, TLI = .77, SRMR = .05), except for TLI. Overall, the results suggest that the effect of MBSP on well-being is fully mediated by the satisfaction of basic psychological needs. Figure 7.8 shows the results for m1.

Figure 7.8

The Results for m1

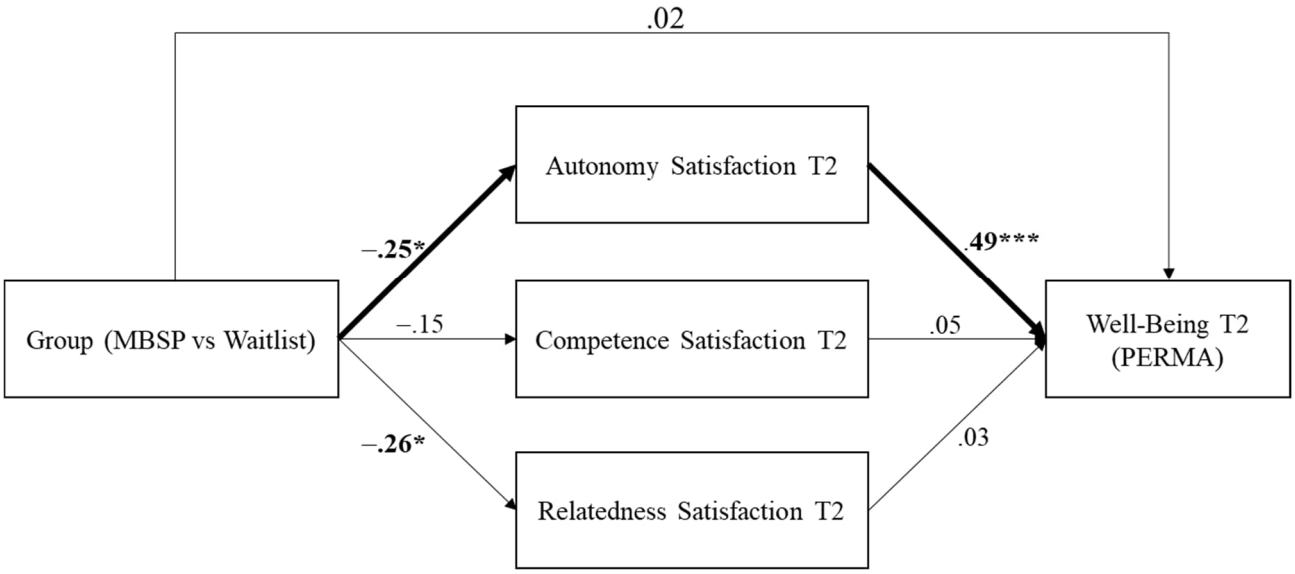


*** = $p < .001$

The results for m2 (see Figure 7.9), the mediation model with PERMA overall score at Time 2 as dependent variable, group (MBSP vs waitlist) as independent variable, and BPNSS subscales at Time 2 as mediators, showed a significant negative effect of the waitlist group ($\beta = –.25$, $p < .05$) and of Autonomy at Time 1 ($\beta = .67$, $p < .001$) on Autonomy at Time 2 and a significant positive effect of Autonomy at Time 2 ($\beta = .49$, $p < .001$) and PERMA at Time 1 ($\beta = .45$, $p < .001$) on PERMA at Time 2. The indirect effect of the group on PERMA through the mediation of Autonomy was also significant ($\beta = .12$, $p = .02$). There were also significant effects of the waitlist group ($\beta = –.26$, $p < .05$) and Relatedness at Time 1 ($\beta = .49$, $p < .001$) on Relatedness at Time 2, and of Competence at Time 1 ($\beta = .74$, $p < .001$) on Competence at Time 2. Overall, the results suggest that the MBSP effect on well-being is specifically mediated by the satisfaction of the autonomy need. The model displayed barely acceptable fit indices (CFI = .88, TLI = .79, SRMR = .09). Figure 7.9 shows the results for m2.

Figure 7.9

The Results for m2



* = $p < .05$, *** = $p < .001$

7.5. Discussions and Conclusions

The literature on strength-based interventions is flourishing (Schutte & Malouff, 2019), yet there are still open questions to be answered, namely whether character strengths themselves can be improved through intervention (in terms of trait-level changes) and which mechanisms can account for the beneficial effect that may stem from training them (Ruch et al., 2020; Schutte & Malouff, 2019). In this randomized controlled trial, I tried to answer to these questions by examining i) the pre-post changes in character strengths and mindfulness in a group participating to the manualized Mindfulness-Based Strengths Practice (MBSP, Niemiec, 2013a) as compared to a waitlist group, and ii) the mediating role of basic needs satisfaction.

The results suggest that MBSP was effective in specifically improving roughly half of the character strengths, with humor being the strength showing the highest change (as also previously suggested by the longitudinal study by Gander et al., 2020), followed by hope and gratitude. These results are in line with a study by Pang & Ruch (2019b) comparing Mindfulness-Based Stress Reduction (MBSR, an 8-week intervention solely focused on mindfulness training) with a waitlist

control group, in which it was found that love, appreciation of beauty, gratitude, and spirituality significantly improved in the MBSR group only. In both that study and the present one, it appeared that character strengths belonging to the transcendence virtue may be those with the highest potential for change, possibly because of mindfulness interventions being focused on enlarging participants perspective and enable them to have a wider outlook on their life, similarly to the content of transcendence strengths (i.e., connecting the self to a wider purpose or meaning).

Similarly, overall mindfulness increased in MBSP participants only, in line with previous evidence (Kiken et al., 2015; Pang & Ruch, 2019b). More precisely, large effects emerged for the tendency to accept inner sensations without impulsively reacting to them and assume a non-judging stance; a medium effect was seen for the tendency to detail one's feelings and sensations. These results speak to the ability of such a short intervention to modify dispositional mindfulness, possibly in a durable fashion.

Contrary to the expectations (H1), MBSP did not have a significant direct effect on overall well-being, contrary to previous evidence on both working undergraduates (Wingert et al., 2022) and employees (Monzani et al., 2021) showing a positive effect on overall PERMA and positive affect. The only significant effect of the intervention emerged for negative emotions, which reduced in the MBSP group only from pre- to post-intervention. This discrepancy in findings may be due to several factors, including small sample size and different population of interest. The result regarding negative emotions is encouraging, and reinforces the idea that working on character strengths does not only help individuals thrive and make the most of their opportunities, but also manage difficulties (Niemiec, 2020).

The results on the mediating role of basic psychological needs satisfaction were instead in line with my hypothesis (H2) and showed that MBSP had a beneficial effect on the overall satisfaction of the three basic needs, which was in turn positively related to overall well-being. In other words, it seems that only those individuals whose needs satisfaction improved as a result of the intervention benefited from it in terms of general well-being. This important finding extends previous studies

suggesting that needs satisfaction is a crucial explanatory mechanism in understanding the relationship of well-being with mindfulness (J.-H. Chang et al., 2015; W. H. Chang et al., 2018) and character strengths use (Bai et al., 2021), considered separately. In particular, autonomy emerged as the single basic psychological need able to drive MBSP's effect. This result is in line with recent evidence that points to the prominence of this need in relation to well-being (Donald et al., 2020; Ryan et al., 2021): It seems that the intervention was able to promote participants' sense of agency and personal responsibility over their well-being, allowing them to feel they could actively do something about it, by cultivating their best qualities and being mindfully present to them. It may also be that by promoting autonomy, competence and relatedness might also be supported, thereby not diminishing their role for well-being.

7.5.1. Limitations and future directions

The present results should be interpreted with caution, in light of some limitations. First, the sample size was rather small, also according to the power analysis. Therefore, the results should be considered preliminary (though encouraging) and future studies should try and replicate them. Also, the sample was characterized by gender imbalance. Notwithstanding this, gender has shown only small effects on my variables of interest, with females scoring higher than males in non-reacting (Pang & Ruch, 2019b), and some character strengths (Heintz et al., 2019; Wagner et al., 2020), and lower with respect to competence satisfaction (B. Chen et al., 2014). Furthermore, data on maintenance and durability of effects, assessed with follow up, is missing. Future studies should therefore conduct follow-ups and also try to decompose the effect of mindfulness and character strengths, by comparing a strength-only, mindfulness-only, combined character strengths and mindfulness, and passive control groups.

Despite these limitations, the present study points to the possibility of increasing character strengths and mindfulness through brief interventions, as well as to enhance needs satisfaction, especially autonomy, which in turn also leads to increased overall well-being.

8. General Discussion and Conclusions

Character strengths are 24 general, trait-like, but malleable individual qualities that have been theorized as aggregating in six second-order virtues (Peterson & Seligman, 2004) and, more recently, into a general "good character" factor (V. Ng et al., 2017). Although morally valued on their own (Peterson & Seligman, 2004; Stahlmann & Ruch, 2020), they have been suggested to play a key role in sustaining individuals through good and bad times, supporting their well-being (Niemiec, 2020). Furthermore, they have recently been indicated as components of positive functioning, explaining the "how" of well-being (Rusk & Waters, 2015; Waters et al., 2017) and therefore may be considered as elements of well-being, which constitute psychological pathways to better functioning, greater satisfaction, and higher mental health (Niemiec, 2013b; Peterson & Park, 2004). Increasing interest is being paid in their trainability, and a plethora of strengths-based interventions have been developed with the specific aim of increasing well-being by exercising participants (signature) strengths (Niemiec, 2013a, 2017; Ruch et al., 2020; Schutte & Malouff, 2019).

These points each represent an area of inquiry in the character strengths literature, and each of them has unanswered questions to be investigated.

In terms of assessment, the hierarchical structure of character is poorly understood and presents several shortcomings in the statistical methods that are usually applied to test it. More precisely, do the 24 character strengths converge in the six second-order virtues hypothesized? Can each character strength subscale be considered unidimensional, that is, uniquely representing the strength at hand? Can character strengths be successfully summarized in a single general factor that represents overall good character?

Regarding the associations that character strengths entertain with desirable outcomes such as well-being, they should directly and indirectly favor well-being: directly, because they represent its "building blocks" (M. Seligman, 2018), but also indirectly, since they can regulate more specific cognitive, emotional, and behavioral processes which allow greater well-being to be experienced (Park et al., 2004; Roberts & Yoon, 2022). However, these direct and indirect associations connecting

character strengths and well-being in regular and adverse times have not been thoroughly investigated. In other words, do character strengths directly relate to well-being? Are there any mediating mechanisms capable of further elucidating this relationship and better understanding the regulatory properties of character strengths?

Relatedly, two main questions remain open with regard to strengths-based interventions. Are they able to specifically increase character strengths trait-levels (even though they are usually developed to enhance well-being)? Which are the working mechanisms that can explain the success (or inability to be effective) of such interventions?

The present Ph.D. project aimed at systematically tackling these questions not only in the general population, but also in university students and students with learning disabilities. Indeed, university students represent a fascinating case study for studying character strengths, as they are at increased risk for developing mental health issues and in a specific phase characterized by intense learning and the need to capitalize internal resources to be able to succeed at it. Students with learning disabilities may be particularly in need of such internal qualities to compensate for their impairments. University students were examined under the integrated self-regulated learning model (Ben-Eliyahu, 2019; Ben-Eliyahu & Bernacki, 2015), a recent theorization that comprehensively includes personal skills (such as character strengths) and various study-related factors (self-regulated learning, emotions, motivation) as crucial explanatory variables of successful learning.

To this end, Study 1 first aimed to investigate the internal structure of the Italian form of the VIA-IS-120, with the aim of validating it using a more rigorous statistical approach (confirmatory factor analysis, treating items as ordinal) compared to the one commonly used in the literature (exploratory factor analysis, using classic maximum likelihood). This procedure allowed me to demonstrate that all character strengths (except for love of learning) appeared to be unidimensional in a large Italian sample recruited through the VIA Institute website and that, with few adjustments, character strengths adequately and reliably represent the hypothesized second-order virtues. The hierarchical model (24 character strengths converging into six correlated virtues) showed an

acceptable fit, comparable to that of previous exploratory models proposed in the literature. As such, VIA-IS-120 proved a reliable measure that I could use in my subsequent studies.

In Study 2, the hierarchical model was replicated in a smaller sample, in which I also added a third layer of inquiry, i.e., the overarching character. This general factor appeared reliable and was therefore adopted in the two following studies (Studies 3 and 4).

The aim of this second study was to longitudinally examine the direct and indirect associations of character with well-being, with the potential mediation of posttraumatic growth reported after the first wave of the COVID-19 pandemic. This study was carried out under highly stressful conditions when Italy became the first western country to be badly affected by this global pandemic. The results lend support to character strengths fulfilling three main functions under a pandemic: Buffering (character during the first pandemic wave was directly longitudinally related to greater well-being during the second pandemic wave, therefore acting as protective factors in the longer run), bolstering (character was directly cross-sectionally associated with greater well-being, meaning they helped lowering the immediate impact of the pandemic and maintaining mental health despite the crisis), and building (character was positively related to increased posttraumatic growth after the first pandemic wave, which in turn was positively linked to greater well-being, suggesting character may have supported individuals in using the crisis in a transformative way, developing a more positive outlook).

In Study 3, the impact of COVID-19 on university students was evaluated. To this end, the direct relative longitudinal effect of character and study-related factors (considered as single factors) on well-being and achievement was compared. It emerged that study-related factors, rather than character, played a key role in supporting student well-being and performance during the course of the pandemic, above and beyond time fluctuations. The lack of a direct effect of character may be explained by their more general nature, meaning that they may rather influence study-related factors than at their same level of explanation. To test this hypothesis, in Study 4 I assessed a model in which character was considered an initial predictor, potentially affecting well-being and achievement through the double mediation of achievement emotions × study-related factors. The findings of this

cross-sectional study showed that all three study-related factors (self-regulated learning, motivational beliefs, and study resilience) fully mediated the relationship between character and achievement, while only emotions and study resilience fully mediated the relationship between character and well-being. This model offers a new way to look at character strengths as general regulatory factors capable of positively influencing study-related processes, thus favoring important outcomes in student life. In doing this, it replicates previous knowledge gained in K-12 students (Feraco et al., 2021, 2022), extending it to university students.

Study 5 aimed to take a further step in the understanding of the role character strengths, by examining their unique contribution to achievement, general well-being, and academic well-being in two groups, students with and without specific learning disabilities. This cross-sectional investigation pointed out few differences between the two groups in terms of character strengths and study-related factors trait levels: Among all factors considered, students with learning disabilities only showed greater creativity and lower academic self-efficacy, study resilience, and academic achievement. Furthermore, the pattern of associations of character strengths and study-related factors with achievement and well-being appeared to be similar between the two groups, suggesting that these intraindividual factors are equally important for students with or without learning impairments.

Overall, Studies 2–5 addressed the questions related to the role character strengths play with respect to important outcomes such as well-being and achievement. Together, the results speak for both a direct and an indirect effect of character strengths, suggesting that they are able to influence these outcomes specifically, but also through mediating processes (including posttraumatic growth and study-related factors). Importantly, these associations were evident both at the onset of the pandemic (2020) and in the following year (2021), in agreement with Niemiec's theoretical claim (2020) that character strengths fulfill both “adversity” and “opportunity” functions.

Lastly, Study 6 addressed the third set of open questions, that is, those related to strengths-based interventions. In this pre-registered randomized controlled trial, a group participating in Mindfulness-Based Strengths Practice (Niemiec, 2013a), an eight-week manualized training that

combined the practice of the 24 character strengths with mindfulness practice, was compared to a waitlist group. The study tested specific trait-level changes in character strengths and dispositional mindfulness, direct effects on well-being, as well as the potential mediating role of basic psychological needs satisfaction. The results showed that the training is capable of sparking trait-level changes in character strengths and dispositional mindfulness, with effect sizes ranging mainly between medium and large. In terms of direct effects, only negative emotions were positively affected, in the sense that MBSP participants only reported significant pre-post changes in this subdimension of well-being. Interestingly, satisfaction of basic psychological needs (and autonomy in particular) fully mediated the effect of the intervention on overall well-being, meaning that those participants in the MBSP group who felt their basic psychological needs were more satisfied after the intervention also reported a higher overall well-being at post-test.

8.1. Implications

The present dissertation has theoretical and practical implications.

From the theoretical point of view, this body of studies provides empirical support to Peterson and Seligman (2004) original theorization of character strengths and virtues, inviting future researchers to adopt a confirmatory, theory-driven approach to the study of the internal structure of character. Furthermore, the present findings suggest the possibility of expanding the original classification by adding a third level of analysis, that of a general, overarching character factor, as previously suggested by other scholars (V. Ng et al., 2017). This general factor may represent a "positivity" orientation and may bear important practical implications in our understanding of character, for example, in the way strengths-based interventions are conceived (see next paragraph).

Similarly, my results lend support to another important theorization, that of the six functions proposed by Niemiec (2020). This account posits that character strengths emerge to support individuals through both positive and negative life events, helping them to make the most out of opportunities while also being able to manage adversity. In my studies, I have indeed found that character strengths are positively related to well-being and negatively to ill-being, and play a role

both in stressful situations (such as COVID-19 lockdown) and in regular ones (long after quarantine measures were lifted). On the same note, findings in Studies 3–5 are well in line with the integrated self-regulated learning model (Ben-Eliyahu, 2019) and the importance of considering both personal resources (such as character strengths) and study-related factors, with a special role of emotions. When dealing with peculiar populations such as undergraduates, it is paramount to consider not only character, but also specific thoughts, behaviors, and emotions that can occur in the learning environment and that character can help modulate.

Regarding practical implications, the present findings champion the possibility of nurturing character (and study-related factors) to promote well-being and performance in both general and student populations. Intriguingly, such interventions can work on all character strengths (as it seems that character as a whole, not only single character strengths, has meaningful associations with these outcomes) and could be equally effective for both students with and without specific learning disabilities.

8.2. Limitations and Future Directions

Although the present investigation contributes to the existing literature both theoretically and practically, future studies should consider and possibly overcome some general limitations.

First of all, half of the studies (Study 1, 4, and 5) conducted are cross-sectional and therefore do not allow one to derive any conclusion on the causality of the hypothesized associations. Future studies should adopt a longitudinal design or include experimental manipulations to replicate the present findings and disentangle the directionality of the relationships.

Second, most of the measures used across the studies were self-reports, which are well-known sources of bias and social desirability. Although informant-report do exist for character strengths, allowing one to obtain additional sources (e.g., partners, friends) for their assessment, no Italian validation is available to date. Future studies could validate such measures in the Italian context and then include them in the character assessment. Similarly, objective measures of academic performance (e.g., actual student records) could be included. To avoid social desirability and test-

retest effects (for example, when evaluating interventions' effects), subgroups of items could be randomly administered to participants, so that each individual answers to different items assessing a certain strength at any time.

Last but not least, most studies suffered from gender imbalance, possibly due to the kind of recruitment strategy (snowball procedure via personal contacts, no compensation). Future studies should consider obtaining funds to be able to reimburse participants (thus enlarging the audience for the study) and/or recruit participants through professional services such as Prolific, that allow to control for some sociodemographic features (including gender).

8.3. Concluding Remark

The present dissertation aimed to answer open questions in the field of character strengths, regarding their assessment, their relationship with desirable outcomes such as well-being, and the possibility to increase them through training. The results obtained highlight the importance of rigorously studying the internal structure of character, their key role as direct predictors of well-being both in pandemic and nonpandemic situations, but also the need to consider mediating mechanisms to fully understand their role. Importantly, character strengths were shown to be positively related to study-related factors such as achievement emotions or self-regulated learning, which in turn positively influence achievement and well-being. Teaching individuals how to use their character strengths mindfully can also drive trait level changes and increase their needs satisfaction, thereby fostering well-being. Future studies may overcome the present limitations by further expanding on these lines, i.e., improving assessment, longitudinally studying character strengths' role, and assessing the long-term efficacy of strengths-based interventions.

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