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A New Understanding of the “What”, the “Why”, and the “How” of Happiness

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ABSTRACT

This paper reports on a simple but profound equation that could reshape our understanding of *what* makes people happy, and more importantly, *why*, and *how*? This equation, dubbed the *Triple-H Equation*, does not only clarify why and how our achievements, relationships, income, spirituality, etc., make us happy, it has also made it possible, for the first time, to quantify happiness by inspiring *The Edo Questionnaire*— a very unique twelve-item self-assessment tool – that can instantly identify happy people, unhappy people, very happy, very unhappy, flourishing, or languishing individuals in any cohort, correctly. The common pathway by which every episode of happiness seems to ultimately ensue is proposed, applications and implications of this equation and its consequential questionnaire are discussed, several emerging findings, and groundbreaking results are reported.

KEYWORDS: happiness, hope, hunger, equation, questionnaire.

INTRODUCTION

During my thirty-five years of research on hope and happiness, I made three scientific original findings and one unexpected discovery—about which I am writing to share. In the first section of this two-part article, I shall present new information that is reshaping my understanding of “what” makes us humans happy, (or happier), “why”, and “how”, based on the Triple-H Equation. In the second part, I report on the Edo Questionnaire, a unique self-assessment tool, inspired by the Triple-H Equation.

To begin, allow me to start with the three original findings that preceded my incidental discovery:

MY THREE ORIGINAL FINDINGS

Finding No. 1

Each of us has five essential human assets. These five assets are:

1. Intrinsic Assets
2. Human Family Assets
3. Economic Assets
4. Educational Assets, and
5. Spiritual Assets

These assets (real or potential) are the FIVE SOURCES OF HUMAN HOPE. This finding was originally reported in the Journal of National Medical Association (Obayuwana & Carter, 1982).

Finding No. 2

There are five compelling human desires (or hungers). These hungers are inborn and the primary motives (or drives) behind every action that we take in life. These INBORN HUMAN HUNGERS are:

1. Hunger for inclusion and acknowledgment.
2. Hunger for intimacy and trusted companionship.
3. Hunger for food and comfort.
4. Hunger for information and answers.
5. Hunger for continuity and certainty.

This finding was originally reported in Journal of Psychology and Behavioral Science, (Obayuwana, 2016).

Finding No. 3

There are basically five situations in life that commonly trigger a feeling of happiness in human individuals. These FIVE TRIGGERS OF HAPPINESS are:

1. Personal achievements, victories, and accomplishments.
2. Advancement or enhancement in personal relationships, human family connection, or connectedness.
3. Increase in income, material possessions, and personal comfort.
4. Acquired new knowledge, new skill, expertise, or capability.
5. Pleasant spiritual experience, event, or occurrence

This finding was made following a series of interviews conducted in US, Canada, Nigeria, Jamaica, and Central America, during which individuals told their personal stories of happiness. For example:

- Allen, a 17-year-old American, a senior in high school, got a perfect score on the SAT, and he was “very happy”.
- Izoduwa, a 28-year-old Nigerian teacher, got an engagement ring from Ben, her boyfriend of three years, and she became “happier”.
- Marcus, a 45-year-old supervisor in Costa Rica, got promoted to the position of vice president with a substantial salary increase; Marcus was “grateful and happy”.
- Helen, a 36-year-old Canadian attorney, who had been taking flying lessons, and finally became licensed to fly without supervision. She became “happy”.
- Virginia, a 54-year-old American nurse, got baptized by a pastor in the biblical river Jordan while on a pilgrimage to Israel. She became “so happy”.

These international interviews were conducted between 2010 and 2015 but never reported or published in a peer review journal.

INCIDENTAL DISCOVERY

When the above three separate and independent findings, made several years apart, were eventually reviewed together, very surprising and striking relationships were discovered:

1. The five triggers of happiness and the five sources of human hope were very similar contextually and highly suggestive of positive correlation.
2. The five triggers of happiness, in essence, seemed to be the desired answers (or solutions) to the five inborn human hungers.
3. The five sources of human hope (or assets) and the five inborn human hungers were basically opposite sides of same coin.

The most accurate phrase or language that I could find to precisely express these fascinating relationships was a mathematical one—in the form of a very simple equation that says,

$$\frac{\text{HOPE}}{\text{HUNGER}} = \text{HAPPINESS}$$

This equation, which I dubbed the *Triple-H Equation*, was essentially claiming and predicting that:

- Happiness is assured when Hope is high, and Hunger is low.
- Happiness will increase when Hope gets higher, or Hunger gets lower.
- Happiness is not possible at all, in the absence of Hope.

When I considered the implications, applications, and practical utility of this simple but profound equation, it was a moment of eureka.

DISCUSSION

If we define happiness as a feeling of joy or satisfaction, the face validity of this equation is very strong since hunger should decrease happiness while hope is expected to increase happiness.

Beyond face validity, literature overview and empirical analysis (Pleeging, *et al*, 2019) show a strong positive relationship between Hope and Happiness. Also, it has been demonstrated (Worthington, 2020) that more hopeful people are indeed happier and healthier than the less hopeful. Additionally, the Desire-Fulfillment Theory (Heathwood, 2016) which holds that the fulfillment of a desire results in happiness—strongly corroborates the Triple-H Equation.

Experientially, we all know that a hopeful disposition usually makes one feel happier, and a happy feeling strengthens our hope for the future, whereas unfulfilled desires (or hungers) make us unhappy.

Considering the face validity, support from literature, and the experiential evidence cited above, the Triple-H Equation seems very scientifically authentic and true.

DECONSTRUCTION AND ANALYSIS

When the Triple-H Equation was deconstructed and its three variables were defined, broken down to their elements, and juxtaposed, as shown on the *Mega Chart* below, the “what”, the “why”, and “how” of happiness became easier to discern and appreciate:

1. **“What”** make people happy are clearly shown in column III, e.g., Allen, the 17-year-old, who got a perfect score on SAT, and became “happy” because of that *achievement*; Izoduwa, who became “happier” because of an advancement in *relationship*; Marcus, who was “grateful and happy” because of a *rise in income*; Helen, who was “happy” because of a *new skill*; and Virginia, who was “so happy” because of a *pleasant spiritual experience*.

The Mega Chart

I HOPE	II HUNGER	III HAPPINESS
HOPE is the belief and feeling that one's desires and aspirations are indeed achievable. Your hope comes from you and your five essential human assets. These FIVE ASSETS are:	HUNGER is a compelling desire or a burning aspiration. The most compelling of all human desires are our five inborn hungers. These FIVE INBORN HUNGERS are:	HAPPINESS is the unmistakable feeling of joy, delight, satisfaction, fulfillment, or contentment. Five life situations are known to trigger happiness in us. These FIVE TRIGGERS OF HAPPINESS are:
1. Intrinsic Assets [ego strength, self-esteem, signature strength, and other virtuous natural attributes]	1. Hunger for inclusion and acknowledgment	1. Personal achievements, victories, triumphs, and accomplishments [E.g., ALLEN]
2. Human Family Assets [help, love, support, understanding, and assistance from others]	2. Hunger for intimacy and trusted companion	2. Advancement or enhancement in personal relationships, human family connection, or connectedness [E.g., ZELDA]
3. Economic Assets [your income, savings, material possessions, and overall sense of material adequacy and sufficiency]	3. Hunger for food and comfort	3. An increase in income, material possessions, and personal comfort [E.g., MARCUS]
4. Education Assets [your intellect, awareness, skills, knowledge, and curiosity]	4. Hunger for answers and information	4. Acquired new knowledge, a new skill, expertise, or capability [E.g., HELEN]
5. Spiritual Assets [the benefits and dividends of your faith, spirituality, and religious beliefs]. These assets, (real or potential), are the FIVE SOURCES OF HUMAN HOPE. Reference: <i>The Anatomy of Hope. Journal of National Medical Association. Vol. 74, No. 3, (and 8) 1982.</i>	5. Hunger for continuity and certainty. Every action we take in life is to relieve these five hungers. Reference: <i>Extra-Uterine Adaptation Theory. Journal of Psychology and Behavioral Science. Vol. 4, 2016</i>	5. Pleasant spiritual experiences, events, or occurrences [E.g., VIRGINIA] Reference: <i>The Happiness Formula. (Obayuwana, 2024)</i>

Everyone had a specific *trigger* for his or her episode of happiness and these five triggers are the known principal situations or occasions (in everyday life) that make people happy in every culture—across the globe.

2. **“Why”** these triggers ultimately resulted in happiness is explained by a rise in HOPE and a fall in HUNGER—as the Triple-H Equation claims and predicts. **“How”** HOPE rose, and HUNGER fell in each case is exactly clarified when the Mega Chart is fully analyzed:
 - In the case of Allen, his *achievement* made him proud of himself, which means a rise in *self-esteem*. Consequently, his HOPE rose because self-esteem is a source of HOPE (see Column I). Simultaneously, Allen’s HUNGER for inclusion and acknowledgment decreased proportionately in intensity (see Column II). The increase in HOPE and the decrease in HUNGER resulted in HAPPINESS.
 - In the case of Izoduwa, the engagement ring meant an enhanced *relationship* (see Column III). This boosted her *human family assets* and consequently HOPE (see Column I). Proportionately, a decrease in the intensity of her HUNGER for intimacy and trusted companionship occurred (see Column II). The increase in HOPE and the accompanying decrease in HUNGER resulted in HAPPINESS.
 - In the case of Marcus, the *rise in income* boosted his *economic assets* and therefore a rise in HOPE (see Column I) with a simultaneous and proportionate decrease in the intensity of HUNGER for food and personal comfort (see Column II). The increase in HOPE and the simultaneous decrease in HUNGER resulted in HAPPINESS.

As shown, when the Triple-H Equation is deconstructed and analyzed, it confirms that Allen, Izoduwa, Marcus, Helen, and Virginia similarly had a rise in HOPE and a decrease in HUNGER to become happier— suggesting that there is only one singular pathway for happiness to ensue— despite the specific trigger.

Since the advent of positive psychology approximately thirty years ago, **what** seems to make people happy, (e.g., money and wealth, love and relationships, faith and religion, success and accomplishments etc.), have become common knowledge. However, very little is known about **why** and **how** these factors make us happy or happier. In this paper, the *Triple-H Equation* has provided compelling evidence linking an increase in HOPE and a decrease in HUNGER to the emergence of happiness—as demonstrated in the five cited case reports. Consequently, the following is my new understanding of what makes people happy, why, and how:

- There are five principal categories of situations or occasions in life that make us happy—
 1. Personal achievements and accomplishments;
 2. Advancement in human connections

- and connectedness; 3. Increase in income, material possessions, and personal comfort; 4. Knowledge, new information or new skill; 5. Pleasant spiritual experiences.
- These situations (or triggers of happiness) boost our human assets, leading consequently to a rise in hope.
 - Simultaneously, and proportionately, a corresponding hunger (or hungers) automatically gets lowered (or decreased).
 - With a rise in HOPE and a decrease in HUNGER, HAPPINESS ensues—as more positive emotions than negative emotions are consequently generated. See Figure I.

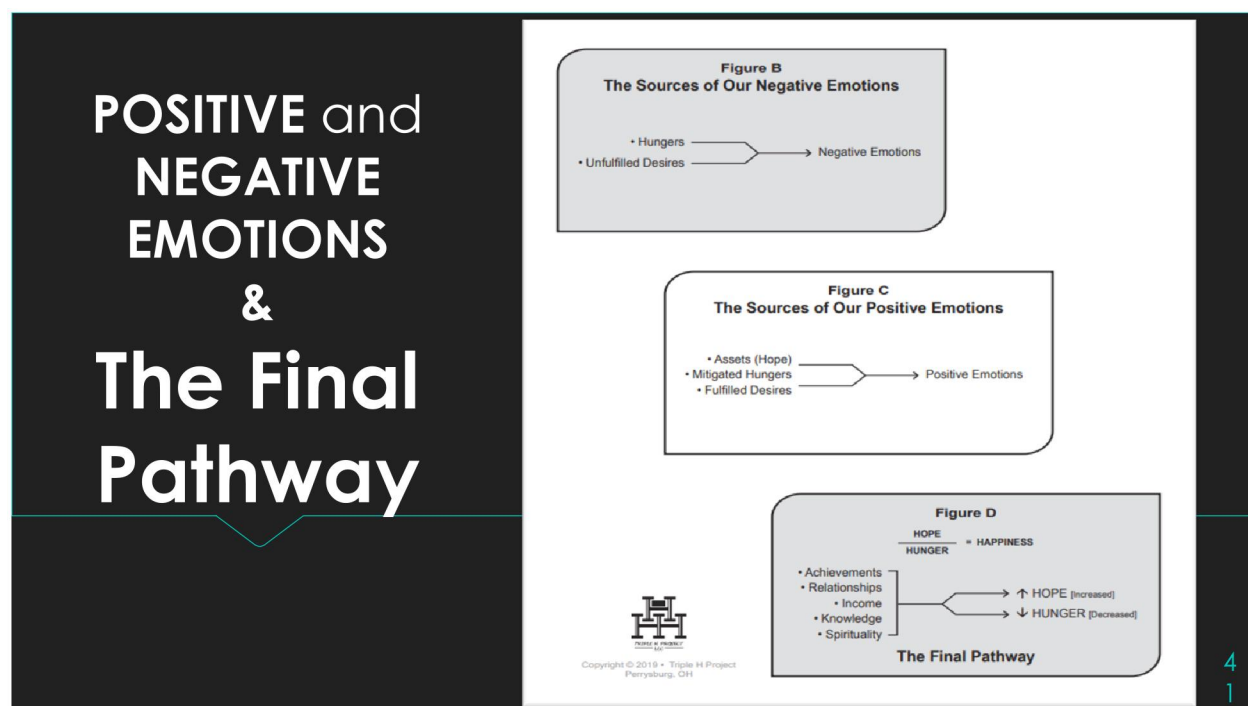


Figure I: The Final Pathway

PART TWO

IMPLICATIONS AND APPLICATIONS

The Triple-H Equation, $\frac{\text{HOPE}}{\text{HUNGER}} = \text{HAPPINESS}$, has several implications, claims, and possible applications. Fundamentally, it implies that:

1. As individuals, we become happier when our HOPE is increased and our HUNGER is decreased.
2. If we can accurately measure HOPE and HUNGER, HAPPINESS becomes quantifiable and reportable as an authentic happiness score (not the score of a mere corollate).
3. Consequently, those who are *happy*, or *very happy*, *unhappy*, *very unhappy*, *flourishing*, or *languishing*, can be accurately identified in any cohort—by their scores.

Inspired by these implications, **Edo Questionnaire**, (aka Personal Instant Self-Assessment Scale or **PISA Scale**), a twelve-item self-assessment tool, was developed. Six items were constructed to measure HOPE and six designed to measure HUNGER. Using this questionnaire, testing has been carried out in the US, Canada, Nigeria, Ghana, Jamaica, Bahamas, and Cost Rica. with plans to do some more testing, in Asia and Europe — particularly Finland

The content validity ratio (or CVR) of the Edo Questionnaire is 0.85, its internal consistency has an alpha value of 0.88, and test-retest reliability is 0.95. Thus, the PISA Scale is a valid and authentic instrument for measuring HAPPINESS. The questionnaire takes approximately five minutes to administer, score, and interpret. Scores range from 1.0 to 8.0 with PHI (or Personal Happiness Index) used as the unit of measure. Individuals with PHI of 1.0 or above are regarded as “happy”; PHI of 2.0 or above is classified as “very happy”; PHI of 4.0 or above is classified as “flourishing”. PHI of less than 1.0 means “unhappy”, PHI of 0.5 means “very unhappy”, PHI score of 0.25 or less means “languishing”. See Figure II.

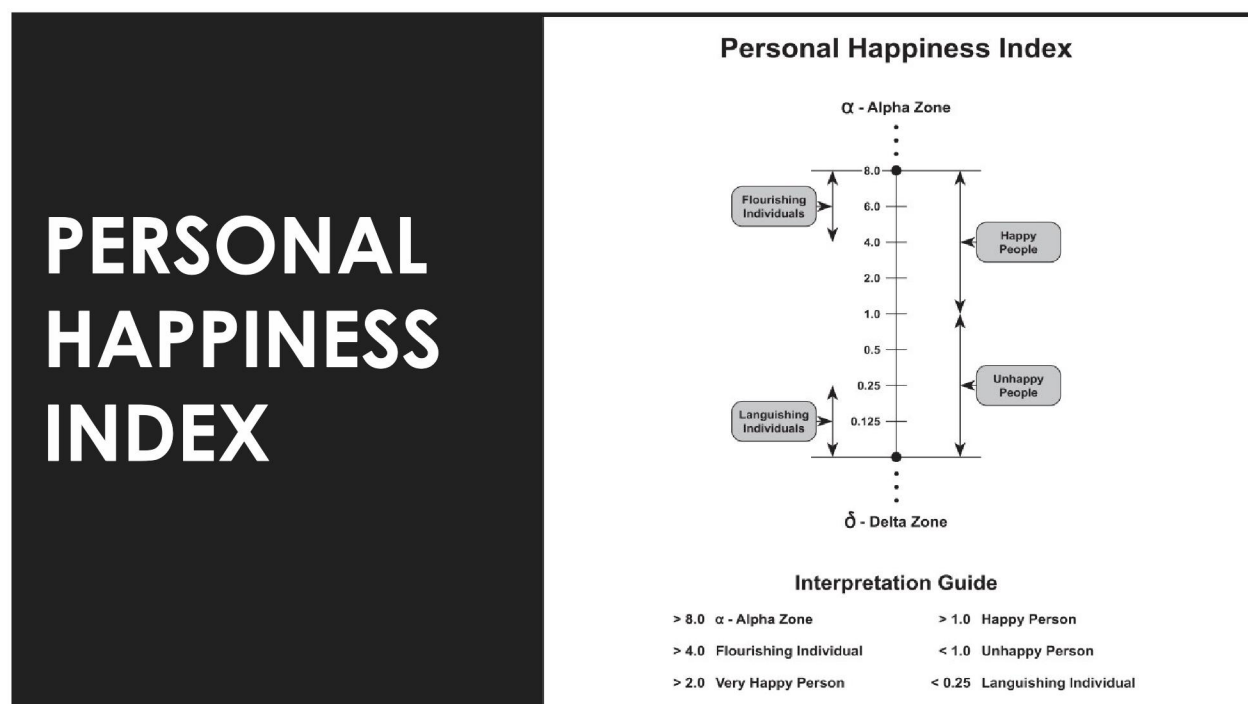


Figure II: Personal Happiness Index

The Edo Questionnaire (aka PISA Scale) is fully presented and explained in a book entitled, *The Happiness Formula: A Scientific, Groundbreaking Approach to Happiness and Personal Fulfillment* (Obayuwana,2024).

EMERGING FINDINGS AND DATA

When testing with the PISA Scale was carried out in the United States, Canada, Nigeria, Costa Rica, Bahamas, and Jamaica, emerging results suggest and confirm that there are essentially three types of individuals expected to be found in every nation, community, or cohort:

1. Those who have *high* HOPE and *low* HUNGER scores
2. Those who have *average* HOPE and *moderate* HUNGER scores
3. Those who have *low* HOPE and *high* HUNGER scores

Respectively, these have been named Zone A individuals, Zone B individuals, and Zone C individuals, as shown in Figure III.

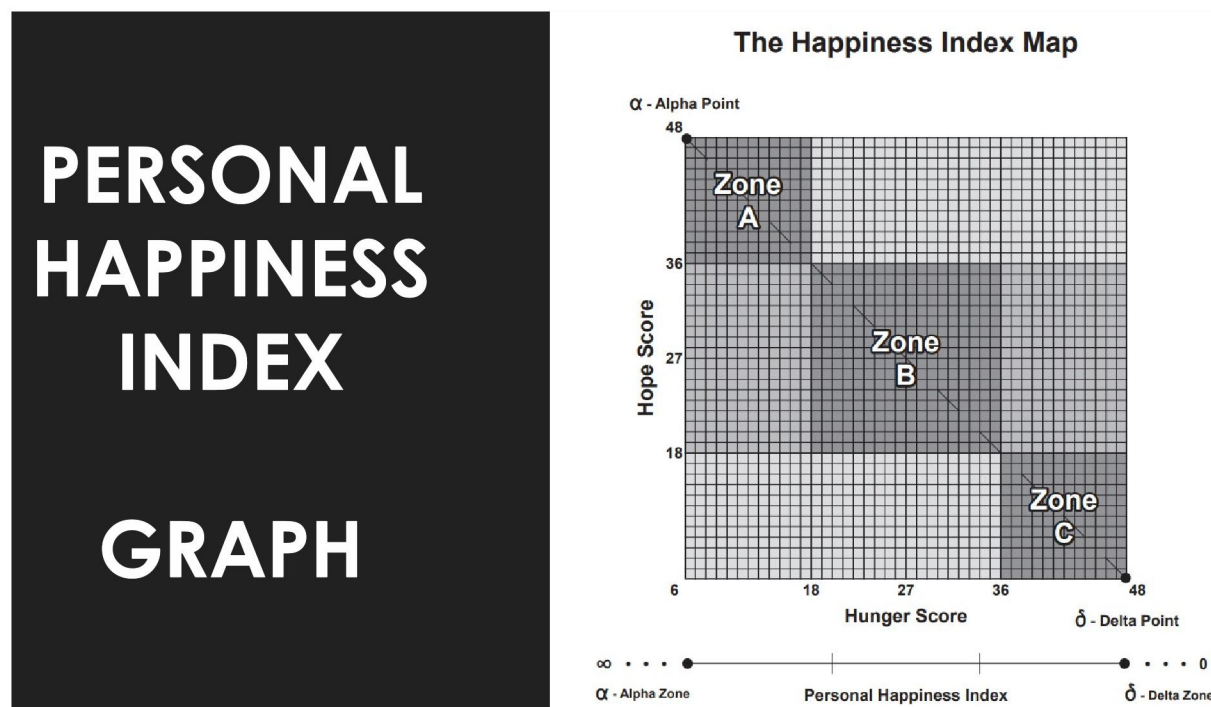


Figure III: The PHI Graph

Based on the graphic categories in Figure III, it is reasonable to assume that citizens from a utopian cohort (or nation) could have 95% or more of its citizens in Zone A, 5% or less in Zone B, and 0% in Zone C; whereas in the most unhappy nation (or cohort), there will be 0% of the citizens in Zone A, while 95% or more could be in Zone C.

When prospective studies were in fact performed, 20% of 500 randomly selected Nigerian citizens were found to be in Zone A, compared to 35% of randomly selected 500 US citizens—suggesting that the US is a happier country than Nigeria. See Figure IV.

Using this method and criteria, universities, cities, or workplaces could be similarly assessed and *accurately* ranked.

Figure IV: The Ranking of Cohorts

COHORTS	Zone A %	Zone B %	Zone C %
1. Utopian Cohort	95%	5%	0%
2. U.S. Citizens (N = 500)	35%	50%	15%
3. Nigerien Citizens (N = 500)	20%	65%	15%
4. Finland Citizens	?	?	?
5. University Cohort (N = 385)	44%	—	—
6. Happiness Conference Attendants (N = 250)	58%	—	—

SUMMARY

In this article, I have shared my incidental discovery of the Triple-H Equation,

$$\frac{\text{HOPE}}{\text{HUNGER}} = \text{HAPPINESS},$$

which has been determined to be well-corroborated by literature. This equation has made it possible, for the first time, to calculate the happiness score of individuals (based on their hopes, assets, hunger, and desires) with results reportable in a universal unit of measure called *Personal Happiness Index* (or PHI). Consequently, it is now possible to accurately differentiate, and identify happy people, unhappy people, very happy, very unhappy, flourishing or languishing individuals in any given cohort.

Since HOPE and HUNGER are universal determinants of HAPPINESS in every culture, scientific researchers, clinicians, and life coach working in different parts of the globe or in culturally diverse settings, may now be able to collaborate, compare, and exchange results directly using PHI as their common unit of measure.

Important and central in determining the PHI of an individual is the *Edo Questionnaire*, (aka PISA Scale), a twelve-item self-assessment tool that was inspired by the Triple-H Equation. This very meticulously constructed questionnaire helps to assess the five essential human assets (or HOPE) and the five compelling human desires (or HUNGERS) of the respondent and incorporates the findings into the calculation of PHI. Because HOPE generates positive emotions (e.g., the feelings of excitement, joy, anticipation, enthusiasm, interest, exhilaration etc.), whereas HUNGER generates negative emotions (e.g., feelings of sadness, fear, anxiety, anger, annoyance, guilt, despair, etc.), PHI is in essence the ratio of positive emotions to negative emotions of the respondent—a true measure of HAPPINESS. The Edo Questionnaire takes five minutes or less to administer, score, and interpret. It has none of the flaws of other happiness tools regarding length or brevity, assumptions and imaginations, difficulty in administration, translation, scoring, or interpretation. Eurocentricity and other social desirability biases that plague many tools are minimal.

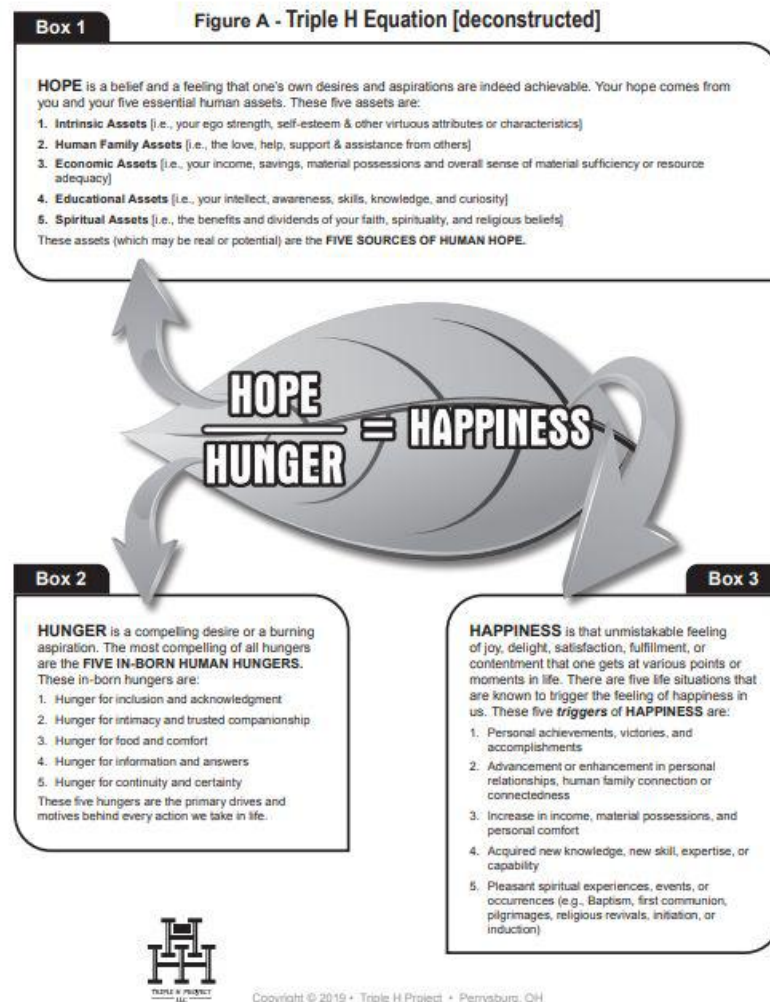
Compared to *life satisfaction surveys*, the Edo Questionnaire is a preferred tool for measuring happiness and for ranking nations, based on the happiness of their citizens. The latter is also more sensitive in monitoring progress and more informative, qualitatively.

CONCLUSION

Based on the discussion, findings, results, and the data presented in this article, **two conclusions** can reasonably be made:

1. *Achievements, relationships, resources, knowledge, and spirituality* make us happy (or happier) by increasing our **HOPE** and diminishing our **HUNGER**—and the former generates positive emotions while the latter generates negative emotions.
2. The **Edo Questionnaire**, (aka PISA Scale), is a valid new tool for measuring HAPPINESS very accurately, for any purpose, anywhere, within or without a multicultural setting.

Figure V, below, presents the Triple-H Equation (deconstructed); shows hungers and unfulfilled desires, as the main sources negative emotions; hope and assets, as the main sources of positive emotions; and the proposed Final Pathway— on the same page to emphasize or summarized **The Big Picture**.



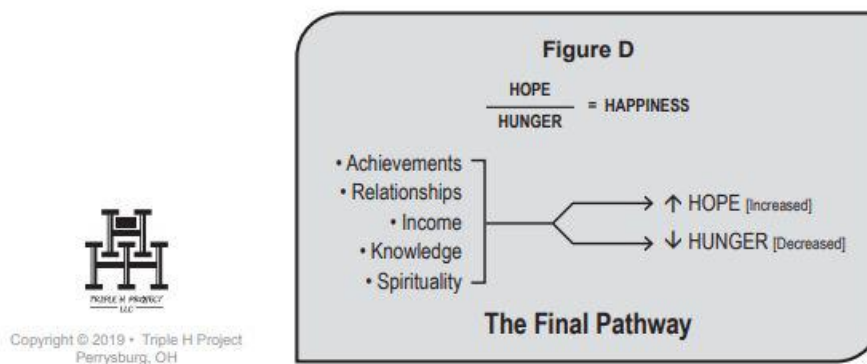
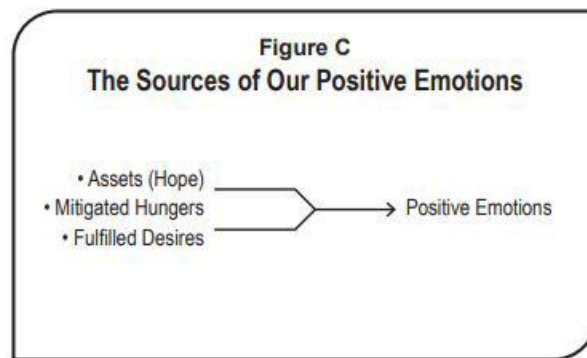
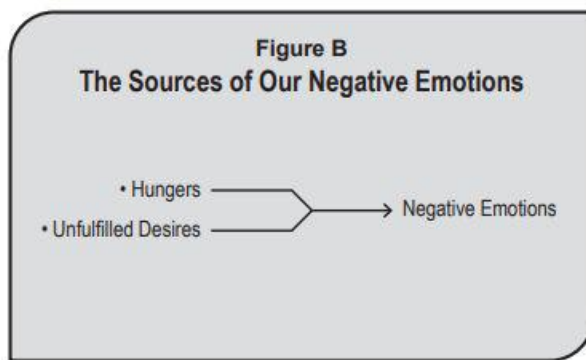


Figure V: The Big Picture

[Adopted from **The Happiness Formula (Obayuwana, 2024)**, with permission]

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Minimalism in the Digital Age: Exploring the Connection Between Intentional Reduction of Media Consumption and Well-Being

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ABSTRACT

The increasing digitalization of daily life has led to information overload, often straining cognitive capacities and contributing to mental health challenges such as sleep problems and depression. In response, minimalistic lifestyles and digital detox trends have emerged, encouraging intentional media consumption to support well-being. This research aims to identify triggers that lead individuals to practice digital minimalism and the impact on their well-being.

The study draws on two sets of qualitative interviews in Germany. The first involved 20 self-identified minimalists, exploring consumer behavior and media use. These interviews revealed that purposefully reducing digital media intake enhanced well-being and helped align actions with personal values. Analog experiences—reading physical books, spending time in nature, and in-person conversations—were particularly valued for their restorative effects. Building on these findings, the second set of interviews focused on restricted media use, with 10 participants who had intentionally reduced their media consumption. Triggers for reducing media consumption included stress, restlessness, dissatisfaction with social media, concentration difficulties, FoMO, and concerns about data privacy.

Participants who deliberately reduced digital media use reported increased self-control, greater presence in daily life with personal interactions, a more mindful engagement with digital content and improved creativity. Overall, participants identified enhanced mental clarity, less stress, and a stronger sense of control and well-being. In conclusion, reducing digital media consumption appears to increase life satisfaction and mental well-being. Digital minimalism is not just a temporary tactic but an intentional lifestyle choice promoting balance and healthy engagement with technology.

KEYWORDS: well-being, life satisfaction, minimalism, digital detox, media use, intentional reduction, lifestyle

1 INTRODUCTION

The rapid digitalization of daily life has led to constant stream of information, affecting people in both their personal and work environments. Although digital technologies have developed rapidly in recent years, the evolution of the human brain has naturally progressed at a slower pace; our brains are still largely oriented toward processing analog information, which can present certain challenges in adapting to the demands of the digital world (Velten, 2021, pp. 77–79). For example,

to illustrate the scale of information growth, a week's edition of the New York Times contains more information than a person in the 17th century was exposed to in their entire lifetime (Munzinger & Musiol, 2008, p. 21). The overwhelming presence of digital content has led to the emergence of the term 'digital incompetence', referring to individuals who lack the necessary skills to effectively navigate and manage digital technologies (Kreutzer, 2020, p. 3). Reflecting growing concerns, Oxford University Press selected "brain rot" as its word of the year for 2024, highlighting the worrying decline in memory performance linked to overconsumption of digital stimuli (Heaton, 2024).

People also overconsume media due to the fear of missing out on something. Fear of missing out (FoMO) is the persistent worry that others are enjoying rewarding experiences without you (Przybylski et al., 2013, p. 1841). It reflects the urge to stay constantly updated on others' activities and the anxiety of missing out (Brown & Kuss, 2020, p. 2; Eitan & Gazit, 2024, pp. 1003–1004; Otto, 2022, p. 3). To cope, many turn to smartphones and social media, since being disconnected can trigger negative emotions like anxiety, depression, or anger. FoMO is a stressful, unpleasant feeling that can reduce self-esteem and negatively impact mental health (Eitan & Gazit, 2024, p. 1015). The overwhelming amount of information available further intensifies the fear of missing out and the pressure to stay informed (Ternès & Hagemes, 2018, p. 133).

These developments illustrate the current relevance of mental health in the context of digitalization. If digital media is not used mindfully, there is a risk of an increasing number of mental illnesses. The resulting impact on mental health is referred to as "digital overload" (Walther, 2024, p. 34). This media saturation can strain cognitive capacities and contribute to mental health issues such as stress and exhaustion. In response, there has been increasing interest in minimalist lifestyles and practices such as digital detox, which promote conscious and limited engagement with digital media (Doppler & Steffen, 2024, p. 67) to support psychological well-being. The objective of this research is to identify the triggers that lead consumers to practice digital minimalism and the consequences for their well-being.

2 LITERATURE REVIEW

This section begins by introducing minimalism as a lifestyle, highlighting its key ideas and practical applications. It then moves on to explore digital minimalism and digital detox as modern ways of applying minimalist principles in the digital age. Finally, the section considers how these approaches connect with overall well-being.

2.1 Introduction to Minimalism as a Lifestyle

Until recently, literature did not offer a universally applied definition of *minimalism*, partly due to its broad and unspecific usage and the diverse forms of *consumer minimalism* (Wilson & Bellezza, 2022, p. 797). Derwanz (2015) highlights the role of minimalism as a consumption-altering lifestyle, while Wilson and Bellezza (2022, p. 800) emphasize the number of possessions, a strict aesthetic, and a consciously curated approach to consumption. Doppler & Steffen (2024) conducted interviews with minimalists to define the term. Minimalism as a lifestyle is defined the following way:

"Minimalism is a consumer-changing lifestyle and attitude that transforms consumer habits by encouraging individuals to simplify their lives and concentrate only on the essentials, regardless of societal consumption trends and pressures. The essentials refer to what individuals perceive as bringing happiness and meaning, what is needed in everyday life and what is valued by the individual. Minimalism is a tool for generating order, time,

freedom, meaning and happiness and it manifests itself individually and, in a needs-oriented manner in an ongoing process” (Doppler & Steffen, 2024, p. 12).

People who live a minimalistic lifestyle typically avoid spending money on items lacking clear personal utility or on products that can be borrowed or rented (Wilson & Bellezza, 2022). Their motivations frequently include simplifying life, reducing stress, practicing ecologically and ethically responsible consumption, spending time meaningfully, and saving money (Yulianti, 2021; Wilson & Bellezza, 2022; Steffen et al., 2023; Doppler & Steffen, 2024, pp. 16–20), with hedonistic motives generally outweighing altruistic ones (Doppler & Steffen, 2024, p. 17).

Minimalists also tend to avoid short lived products, status goods, and impulsive purchases, instead aligning consumption with personal values and broader social considerations (Doppler & Steffen, 2024, p. 10; Wilson & Bellezza, 2022). In dietary habits, they often avoid fast food and excessive stockpiling, with some favoring simple, mostly plant-based meals prepared with minimal ingredients and utensils (Doppler & Steffen, 2024, pp. 34–35, 42, 62). Travel and mobility are approached deliberately, favoring bicycles, cargo bikes, public transport, and car sharing (Doppler & Steffen, 2024, p. 34). The same principle guides daily tasks: engaging only in activities perceived as meaningful and aligned with personal values, while eliminating unnecessary obligations (Wilson & Bellezza, 2022; Yulianti, 2021; Doppler & Steffen, 2024, p. 14; Otto, 2022, p. 39).

In their approach to digital engagement, minimalists strive to ensure that both smartphone use and general media consumption are restricted to activities perceived as meaningful. Digital minimalism and digital detox are explained in the next section.

2.2 Introduction to Digital Detox and Digital Minimalism

To protect mental health, it is important to counteract the negative effects of digitalization. In this context, the concept of a “digital detox” has emerged as a lifestyle movement (Otto, 2016, p. XII). The idea is to switch off from digital media to recharge your batteries and regain your full performance capacity. While digital detox does not necessarily involve complete abstinence, Otto (2021, p. 36) suggests that it involves using digital media more consciously. However, other authors associate it with abstaining from digital technologies altogether for a period of time (Radtke et al., 2022, p. 192). Digital minimalism, on the other hand, describes a lifestyle in which online activities are greatly reduced, and only those online activities are consciously selected that add real value (Trepesch, 2022, pp. 123–124). To summarize, both concepts involve the reduction of media consumption, whereas digital detox is a complete media abstinence for some time or for some media and digital minimalism describes a conscious lifestyle of reduced media consumption.

Digital media use can be reduced for a number of reasons. Some people are concerned about their privacy and the possible misuse of personal data, while others are worried about addiction, as well as its negative impact on productivity (Vally & D'Souza, 2019, p. 753). Consequently, there are various approaches to reducing digital media consumption. Some people refrain from using social media for a certain period of time, for example, while others avoid it completely. The following are examples of practices that younger people use to set limits on their use of digital media (Waldenburger & Wimmer, 2024, p. 154):

- Reducing the technologies used or the amount of media content consumed
- Classification of technologies or media content over the course of a day or week
- (Temporary) withdrawal from certain media
- Temporary or permanent renunciation of digital communication
- Distancing oneself from the expectations of third parties

According to Radtke et al. (2022, pp. 192–193) and Meier and Reinecke's (2021, p. 1185) hierarchical taxonomy of computer-mediated communication, digital detox should not only involve abstaining from technical devices, but also include the consideration of the following digital activities: Types of apps in use (e.g. social media and email) and certain app providers (e.g. Facebook and Instagram), specific functions (e.g. chats), interactions (e.g. WhatsApp) and messages (e.g. voice messages). As experts warn of the negative consequences of social media use, it is important to not only consciously use or to give up certain technologies, but also certain types of apps (such as social networks; Coyne & Woodruff, 2023, pp. 2–3). Furthermore, smartphones are now firmly integrated into everyday life making deliberately avoiding certain apps rather than completely avoiding the device a more realistic and effective method of maintaining health benefits and reaching well-being.

2.3 Introduction to The Concept of Well Being and Consumer Well Being

The scientific concept of “well-being” describes the state and condition of an individual or a group within various contexts, such as psychological, physical, social, or economic domains (Lee & Ahn, 2016). “Consumer well-being” is the term used when discussing well-being in connection to consumption. There is no universally agreed-upon definition of this term in academic literature (see, for example, the literature reviews by Zhao & Wei, 2019 or Lee & Ahn, 2016). However, it is generally assumed that consumer well-being refers to the satisfaction or welfare that a person derives from their consumption decisions (Lee & Ahn 2016; Burroughs & Rindfleisch, 2002). Grzeskowiak and Sirgy (2007, p. 281) define consumer well-being as the overall perception of how a product or service impacts the consumer’s quality of life. An increase in consumer well-being is usually associated with a higher perceived quality of life, including factors such as a high level of life satisfaction, general contentment, absence of illness, and greater societal welfare (Grzeskowiak & Sirgy, 2007, p. 291).

People often feel happier when they have money but once their basic consumption needs are met, additional wealth and further purchases do not necessarily lead to greater happiness. In fact, too much materialism can create inner conflicts, which may diminish overall well-being (Burroughs & Rindfleisch, 2002). As a consequence, some individuals choose to reduce their consumption. Conversely, this raises the question to what extent the concept of consumer well-being as well as overall life satisfaction are affected when consumers intentionally refrain from consumption. Research in this field is limited to few sources (for example: Lee & Ahn; 2016, p. 34; Steffen et al. 2023, Doppler & Steffen, 2024). While financial resources can increase well-being up to a certain degree, continually higher consumption levels do not guarantee greater well-being (Balderjahn, 2024, p. 18). In industrialized societies, where basic needs are largely met, people often seek life satisfaction and quality beyond material possessions, as self-actualization cannot be fulfilled through consumption (Zavestoski, 2002).

The objective of the study is therefore to explore how minimalistic principles, in particular reduced media consumption, can increase consumer well-being.

3 INTERVIEWS WITH MINIMALISTS

3.1 Methodology

To better understand how a minimalist lifestyle is lived, the researchers conducted twenty interviews involving 12 female (f) and 8 male (m) participants. The interview sessions were held online via Zoom in Spring 2022 and lasted approximately one hour each. The sample mainly contained minimalist bloggers who self-identified as minimalists. Some posted the search for participants for this study on their blogs so that more participants who self-identify as minimalists could be recruited. As outlined in Table 1, participants were 20 to 55 years old at the time of data

collection, with an average age of 37 years. All participants were German-speaking and all but two also lived in Germany at the time the interview was recorded. One participant lived in Switzerland, and one was travelling the world.

Table 1 Sample of Study with Minimalists

Participant	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Gender	f	f	f	m	m	m	m	f	f	f
Age	20	29	43	35	55	30	46	33	28	38
Participant	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20
Gender	f	m	m	m	f	m	f	f	f	f
Age	30	29	50	38	31	44	41	32	42	55

The participants were asked about their motivation for living a minimalistic lifestyle, their consumption practices, their routines in keeping a minimalistic household and the personal and financial consequences of living a minimalistic lifestyle like for example well-being.

3.2 Results: Initial Results for the Impact of Practicing Minimalism on Well-Being

Many interviewees noted that reducing digital input allowed them to better align their lives with personal values. Analog experiences—such as reading physical books, spending time in nature, or engaging in face-to-face conversations—were especially valued for their grounding and restorative effects. Participants report that adopting a minimalist lifestyle greatly reduces stress, helping them feel calmer and less emotionally burdened. Minimalism provides order and peace, decreases time pressure, and lowers financial stress by encouraging less consumption (P1, 30 y., f.; P6, 30 y., m.; P8, 33 y., f.). Minimalism also offers freedom from ownership burdens and social pressures, increasing decision-making freedom (P2, 29 y., f.; P3, 43 y., f.). Physical and mental health improve as stress symptoms ease (P11, 30 y., f.; P19, 42 y., f.). Many describe a spiritual dimension and greater happiness through freedom and deeper connections to self, others, and nature (P2, 29 y., f.; P3, 43 y., f.; P18, 32 y., f.).

Related to the use of digital media and well-being, participants reported that they only consume information very selectively.

“Minimalism also extends to TV consumption, i.e., information consumption. I don't subscribe to any newspapers, and we don't even have a TV. We spend a lot of time outdoors, but when the weather is bad, we like to sit down for an hour and watch a movie on Netflix. But we don't have constant background noise in the form of radio or TV” (P13, 50 y., m.).

However, on the contrary, adopting a minimalist lifestyle can also increase stress because participants make more deliberate, planned purchases, especially for sustainable products. Some feel burdened by this responsibility and the limited impact they have beyond their “bubble” (P11, 30 y., f.). Living strictly by minimalist principles and differing consumption habits in mixed households (containing minimalists and people who are not minimalists) also cause stress (P20, 55 y., f.; No. 6, 30 y., m.). Spending money requires careful thought, and rigid non-consumption rules can add pressure (P15, 31 y., f.). Still, minimalism breaks the cycle of fleeting happiness from consumption and eases status-related pressures, offering relief from the “status game” (P2, 29 y., f.).

To gain more insights, a second set of interviews was conducted to explore how practicing digital minimalism or digital detox influences well-being.

4 INTERVIEWS WITH DIGITAL MINIMALISTS / PEOPLE WHO PRACTICE DIGITAL DETOX

4.1 Methodology

Ten further interviews were conducted in January and February 2025 and lasted 37 minutes on average. The online interviews were completed via Zoom with eight female (f) and two male (m) participants. The participants were 23 to 38 years old at the time of data collection, with an average age of 30 years. In this second sample set (see Table 2), all interviewees lived in Germany. The interview participants were recruited in the researcher's personal surroundings using a snowball system based on the criteria that they practice digital minimalism and/or digital detox.

Table 2 Sample of Study with Digital Minimalists

Participant	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Gender	f	m	f	f	f	f	f	m	f	f
Age	23	29	27	24	38	32	36	27	31	33

The study participants were interviewed about their media usage patterns, triggers, habits, difficulties, and the impacts of engaging in digital minimalism or digital detox. The following sections analyze only the portions of these interviews that address relevant aspects for answering this research question.

4.2 Results: Triggers for Practicing Digital Detox or Digital Minimalism

Table 3 provides a summary of the triggers found in the interview responses. The response shows that there are a variety of triggers which are outlined and explained in more detail in this section.

Table 3 Summary of Triggers for Reducing Screen Time

Participant	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	Sum
Excessive consumption	x	x	x	x	x	x		x	x		8
Stress/anxiety					x					x	2
Illusory world/staging		x					x				2
Concentration problems	x										1
FoMO/social comparison						x					1
Privacy/data protection							x				1

Most participants (all except P7 and P10) cited excessive consumption of digital media and the resulting waste of time as the trigger for their decision to live a life of digital minimalism.

“And then at some point I realized that I was sometimes on my cell phone for half an hour in the morning, and it bothered me so much. Yes, so I said, ‘No, I have to think of something so that I can switch it off a bit and minimize it’. Because I noticed that it was also causing me to lose my focus a bit, to put it bluntly” (P1, f., 23 y.).

Other triggers that led to conscious consumption of digital media are highly individual. For P5 and P10, digital media was associated with a great deal of stress and anxiety—for P5, because they saw content that was not good for them, and for P10, because of the urge to share something.

“And the reasons were simply that I actually woke up at some point and realized that it didn't have to be that way. I don't have to be stressed every day because of an app. It's an app on my smartphone, and there's a nice solution: just delete it. And life goes on. And (..) yes, the realization alone was difficult. But at some point, it came” (P10, f., 33 y.).

P2 and P7 were motivated by the perceived illusion and self-promotion on social media to refrain from using it. The participants explain this as follows:

"I've always found the whole social media world a bit strange. It's always so fake and overly cheerful. Of course, I'm talking about those stereotypical influencers who just bothered me so much and this fake life that is presented to you. This illusion that everything is perfect, everything is beautiful, everyone is constantly traveling. And then at some point you start comparing yourself to them" (P2, m., 29 y.).

"I always feel like it's just not real. And I like to interact with people. I like talking to each other and seeing each other truly, genuinely and authentically, and also just seeing what someone's face looks like with all the things they think might be flaws or something, but that's just what makes people who they are" (P7, f., 36 y.).

Other reasons cited for practicing digital minimalism included concentration problems (P1), FoMO or social comparison (P6), and privacy and data protection (P7). It is also interesting to learn in what context the participants decided to adopt this lifestyle. P2, for example, made the decision in the course of self-reflection. The decision to delete a specific app was made spontaneously by three participants (P4, P9, and P10) and was therefore not planned in advance. Three participants (P2, P4, and P10) initially planned to delete (an) app(s) for a limited time (digital detox) but decided to continue practicing this lifestyle. This aspect is illustrated by the following statement:

"But after three days, it actually felt so good that I no longer have the app and will no longer use it privately either" (P10, f., 33y.).

4.3 Results: Implementation of Digital Detox or Digital Minimalism

Participants described several strategies for reducing overconsumption of digital devices. One common approach was the conscious examination of personal screen time. Four participants (P2, P3, P8, and P9) reported that they increasingly questioned their media use:

"And to reflect on that and not do it anymore, but instead think about what my needs actually are right now and how I actually want to satisfy them" (P3, f. 27).

Such critical reflection resulted in changes in individual behavior. Table 4 provides an overview of these outcomes.

Table 4 Implementation of Reducing Media Consumption

Participant	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	Sum
Deleted / unused apps		x	x	x	x	x	x	x	x	x	9
Set screen time frame	x		x	x				x	x	x	6
Puts mobile away	x		x	x	x	x		x			6
Unfollows / unsubscribes	x			x		x			x		4
Questions own use		x	x					x	x		4
Mutes push messages / device	x				x	x				x	4
Turns mobile off								x	x	x	3
Re-installed some apps				x			x		x		3
Uses digital tracking tools	x		x					x			3
Uses analog tracking tool	x			x				x			3
Uses fewer devices				x							1

Almost all participants (except P1) chose to delete certain apps, while P7 emphasized that they had never installed Facebook or Instagram in the first place. Instagram emerged as the most frequently deleted app, followed by Facebook. Additional deleted apps included TikTok, Snapchat, and WhatsApp. However, some participants later reinstalled apps. For instance, P4 explained that

she missed social media to communicate with friends and seek inspiration, while P9 reinstalled an app to promote a new business and connect with her target audience.

Another widely adopted strategy was limiting media usage to create a healthier balance between screen time and other activities, thereby reducing distraction:

“And I would say that I'm now really good at blocking it out, because when I'm reading, I often leave my cell phone in another room. And then the impulse to reach for it, even if it's there, is immediately dissolved, so to speak. And that brings me back into a real state of flow... and my creative results are much, much better, of course.” (P3, f., 27y.)

Many participants introduced dedicated screen-free time slots. Six respondents (P1, P3, P4, P8, P9, P10) practiced this in different ways, such as answering WhatsApp only once per day (P10), turning off the phone on weekends or during exercise (B9), avoiding phone use for one hour after waking up or before sleep (P1, P3, P8), or restricting usage to afternoons or evenings (P4). According to P9, such breaks provide effective relief from sensory overload.

Some participants also used apps or tools to monitor and regulate device use. P1 and P8 relied on the screen time features on their mobile phone, while P3 used the apps *Focusmate* and *Forest*. Others turned to analog methods; for example, P1, P4, and P8 used a simple alarm clock instead of their phones. Additional strategies included turning off push notifications (P1, P5, P6, P10) or muting their phone completely (P5), unfollowing channels or unsubscribing from newsletters (P1, P4, P6 and P9), and reducing the number of devices in everyday use (P4).

Even though there are various approaches to conscious consumption of digital media and some participants cannot imagine returning to their old habits, giving up or reducing digital media can be difficult in some cases. Yet, most participants reported that reducing media use has had a positive impact on their well-being.

4.4 Results: Impact of Practicing Digital Detox on Well-Being

The ways in which digital minimalism is practiced are as diverse as the effects it produces on participants' well-being and everyday lives. In sum, the study participants made 30 comments about the effects of practicing digital minimalism on their lives and on their well-being. The responses were coded and are summarized in Fig. 1.

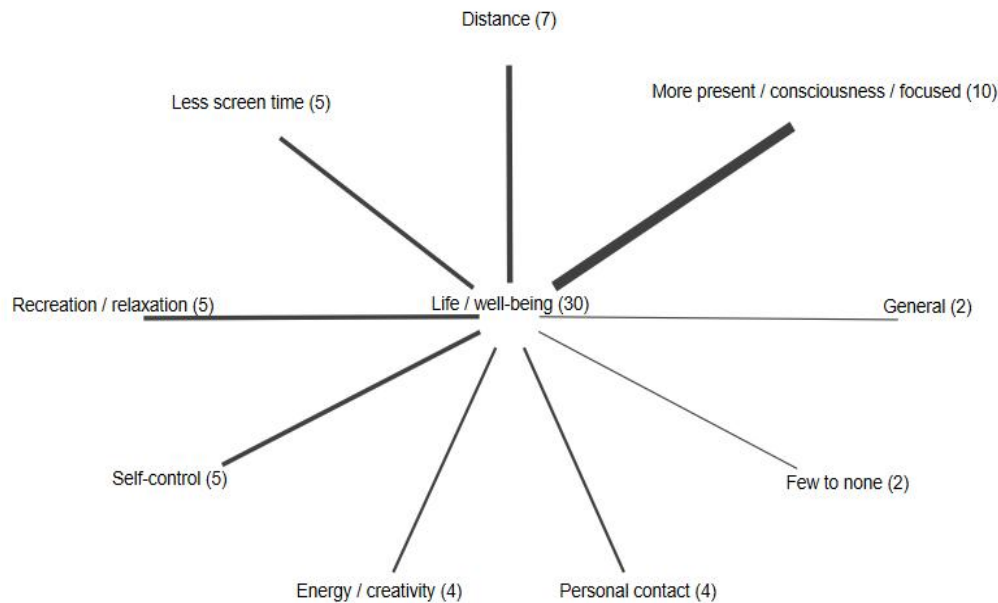


Figure 1: Effects of Living with Reduced Screen Time

As a result of digital minimalism, all participants except P1, P7 and P9 reported that they developed distance and self-control towards digital media. Distance refers to the ability to remain less emotionally influenced by digital media, such as fear of missing out or social comparison. They have thus found a way to deal with it more rationally.

“In any case, I’ve noticed that I’m no longer so emotionally burdened by it all, I’d say. And now it’s more like ‘Oh, it’s a nice inspiration, you could do that too’. And that I see all this digital media use more as inspiration and joy than I compare myself all the time” (P4, f, 24y).

By keeping their distance, P3, P4, P8 and P10 were also able to develop self-control over digital media. This means that they can decide more consciously which media are consumed to what extent :

“So I can totally control how, with whom and what and how and at what frequency and at all or simply live in the moment”(P10, f, 33y.).

Furthermore, four participants (P1, P5, P9 and P10) feel more present in life, which enables them to enjoy it more consciously and with more focus:

“And I do think that you then perceive moments somehow more consciously and differently” (P10, f, 33y.).

P10 illustrates the desire to focus on something specific using a situation with friends, who are looking at their cell phones while a film is playing on TV:

“This second screening, which many people do. (...) I’m totally out of it and I’d prefer not to do anything at all, instead of watching a movie and doing something else on my cell phone at the same time and then not actually getting that much out of both media or missing half of it” (P10, f, 33y.).

P10 adds that this makes him realize how much time everyone around him spends on their cell phones, which leads to a more mindful use of his own time. According to P9, digital detox

helps to make people more aware of many things, but the effects do not last long and the consumer is quickly caught up in addictive Instagram usage. P1 and P5 in turn try to enjoy moments more consciously by paying attention to their surroundings on.

“And (...) yes, apart from that, it's a habit that I now (...) try to be really mindful in situations like that, just to take in the situation and see what my sensory organs can perceive. Sounds a bit funny (laughs), but the example with the streetcar stop. Then you just notice what I can hear right now ? Or (.) is the air fresh right now? Or is it not fresh? Has it been raining? What kind of people are standing around me? So that you're aware of your surroundings a little bit, so to speak, instead of always scrolling on your cell phone” (P1, f, 23y.).

For P1, digital minimalism has created a morning routine dedicated to writing in a mindfulness diary, which has helped improve focus and generally brought relief and positive feelings. Similarly, P10 uses the morning to start the day with mindful practices like meditation. P5, P6 and P7 also appreciate having more personal contact with others since they have reduced their consumption of digital media or deleted certain apps. From the point of view of P6, it is good not to always know everything:

“... it is perhaps sometimes not so good to always be aware of everything that is happening around you and what everyone is doing. It's actually nicer to be told about it personally” (P6, f, 32y.).

For P5 and P7, it is important to make appointments with others to maintain contact. It is accepted that contact with some people breaks off. P5 assumes that their own WhatsApp use has increased after deleting social media, as personal relationships are maintained more intensively through it and it is necessary to engage with people to interact with them. P5 explains that information is better remembered as a result, as specific inquiries are necessary to receive news from contacts.

In addition, three participants (P3, P8 and P9) perceive more rest and relaxation through the conscious consumption of digital media:

“The way you feel when you leave your cell phone at home and go for a walk in the forest for an hour or two” (P8, m, 27y.).

P3 feels that his sleep has improved because he is exposed to less blue light.

P1, P2 and P10 do not substitute the renunciation or reduction of digital media with other digital activities and therefore report less screen time. As a result, P2 no longer finds the cell phone as interesting, which means it is less often in his hand.

Furthermore, the conscious consumption of digital media enables three participants (P3, P9 and P10) to recharge their batteries and/or boost their creativity:

“And of course, what I also really appreciate is that I have more creativity in me again as a result. Because ...boredom promotes creativity. And if you constantly have the opportunity to consume content, then you no longer give yourself the opportunity to be bored” (P3, f, 27y.).

For P5, well-being in general has developed positively. In addition to the positive effects on mental health, P4 also mentions the effects on physical health, as he invests more time in sport as a result. Participants P2 and P6 would have expected a greater effect or reported that they could feel neither a positive nor a negative effect from digital minimalism. For P2 and P5, the decision to adopt this lifestyle was accompanied by other changes, so that not all effects can be attributed to the conscious consumption of digital media.

5 DISCUSSION AND PRACTICAL IMPLICATIONS

The rapid progress of digitalization is leading to a shift from analog to digital media, which in turn results in increasing consumption of digital media. The saturation of everyday life with digital content has introduced the notion of “digital incompetence,” describing individuals who lack the proficiency to effectively engage with and adapt to digital technologies (Kreutzer, 2020, p. 3). Unmindful use of digital media can contribute to a rise in mental health issues, a phenomenon described as “digital overload” (Walther, 2024, p. 34). Digital minimalism is a practice or philosophy that aims to counteract the negative consequences of digital overload. Digital minimalism refers to the conscious reduction to selected digital activities that provide real value to the individual (Trepesch, 2022, p. 123).

The interviews with minimalists in study 1 showed that minimalism creates a sense of calmness and order while easing time and financial pressures by promoting reduced consumption. It also lessens the weight of ownership and social expectations, giving individuals more freedom and control over their decisions. Study participants reported that reducing digital input helped them realign their lives with personal values. They appreciated analog activities like reading, spending time outdoors, and direct social interactions for their calming and restorative impact. Overall, a minimalist lifestyle was described as easing stress and promoting emotional balance. These findings are in line with Gatterer & Horx (2020, p. 52–61) who propose that minimalism can be understood as a post-capitalist lifestyle that promotes a new form of consumer culture focused on sustainability and meaningful use of resources.

In study two, almost most participants (except two) reported excessive consumption of digital media and the resulting waste of time as the trigger for their decision to live a life of digital minimalism. All other triggers were only mentioned once or twice (e.g. FoMO, concentration problems, stress or anxiety, etc.). Ways of reducing media usage most often include strategies like deleting apps, setting a screen time frame or consciously putting the mobile away. Unfollowing people or newsletters and questioning one's own use were also practiced by several people. The results indicate that FoMO does not seem to be as strong of a worry for digital minimalists than assumed for traditional consumers by other authors (e.g. Otto, 2022, p. 3). However, some participants still describe FoMO as a challenge within digital minimalism. FoMO reflects the urge to stay constantly updated on others' activities and the anxiety of missing out (Eitan & Gazit, 2024). Instead, it confirms the research of Eitan & Gazit (2024) that JoMO- the Joy of Missing Out exists for digital minimalists.

Although the research is still limited, the findings from this research suggest that even short periods of media reduction can have positive impacts on mental health. If awareness of mental health continues to increase in the coming years, it can be assumed that a growing number of people will choose digital minimalism as a lifestyle and reduce their digital media consumption. For this shift towards sustainability and meaningful use of resources to take place, companies need to address changing consumption patterns, as reducing overconsumption requires behavioral adjustments not only from consumers but also active involvement from businesses, industry leaders, non-profit organizations, marketers, and policymakers (Doppler & Steffen, 2024, p. 75).

There are several implications for companies particularly concerning the use of their marketing communication. In recent years, digital media has become an indispensable tool for companies. Brands use them to communicate with (potential) customers, offer and sell products, and build and maintain long-term customer relationships.

While it can be challenging for brands to design understated advertising banners that still get noticed, the increased focus of digital minimalists on the physical world opens up new opportunities. Most digital minimalists reduce their overall screen time by limiting the intensity of media use, while some replace certain apps with alternative digital activities, as observed by Collis & Eggers (2022). Their lifestyle fosters a more conscious and controlled engagement with digital media,

making them less susceptible to emotional influence from digital brand communication. A conscious reduction of digital media could make it more difficult for brands to reach their target groups and, in the long run, affect their success. If cell phones are switched off or put aside more often in the wake of digital minimalism, this can pose a risk for brands, as users are exposed to less media content. Steffen & Doppler (2025) propose that media companies should re-consider their frequency of interaction with consumers.

Some digital minimalists in study 2 noted that they use the time they have gained for themselves (e.g., for meditation or sports). A stronger focus on mindfulness topics could therefore be relevant for many users and lead to them feeling more connected to the brand. If such content is linked to the brand, this can create a significant basis for the continued success of the customer relationship, e.g., through greater awareness and attractiveness. This finding is in line with Steffen & Doppler (2025) who propose that the content needs to be relevant for consumers. Companies should increasingly focus on value-creating content that is not only informative but also well-researched and problem-oriented. A less frequent but more relevant communication that is tailored to the customer's needs is significantly more effective. In addition, the study results propose that companies could integrate essential mental health topics (e.g., mindfulness) into digital brand communication.

The interviews with people who practice digital minimalism show that consumers deactivate push notifications (cell phone notifications) or permanently mute their cell phone. This means that brands reach fewer people in the short term and are therefore less likely to trigger spontaneous, impulsive reactions. Steffen & Doppler (2025) propose that companies should allow consumers to determine both how often they want to receive information and which communication channel they prefer. Then they don't feel the urge to deactivate their cell phone. Companies should design their communication strategies in a way that avoids being intrusive during such periods, for example by clearly distinguishing between informational and promotional messages and offering recipients a choice between them. While users like to control what they see online, this self-control can sometimes result in distorted views and make people vulnerable to emotionally charged and manipulative content chosen by algorithms (Kreutzer, 2020, pp. 67–68).

When the smartphone is switched off, participants from study 2 reported more intensive and personal contact with family and friends. This increases the likelihood that brands will be discussed during personal exchanges, which in turn increases brand recall. To reinforce this effect, brands could specifically engage (potential) customers by creating special experiences.

At the same time, the findings from the interviews show that digital media remain an integral part of everyday life, and it is hardly possible to give them up completely and permanently.

6 CONCLUSION AND LIMITATIONS

Two sets of interviews were conducted to explore the effect of reducing media consumption on well-being. The first set of interviews consisted of 20 minimalists who emphasized that minimizing digital input and adopting a minimalist lifestyle helped them live more in line with their values, reduce stress, and experience greater calm, order, and freedom from social and material pressures. They valued analog experiences and selective information use for their grounding effect, improved well-being, and deeper sense of connection to self, others, and nature.

Afterwards ten people who consciously reduce their consumption of digital media were interviewed. It was possible to gain a deep understanding of the associated feelings, perspectives, and individual approaches to this issue. The study also examined the motives behind the decision to embrace digital minimalism and the effects this has on the lives and well-being of those interviewed. The results of this study provide a better understanding of the negative effects of excessive digital media consumption on health. The available results indicate that even short periods of reduced

media consumption can have positive effects on mental health. Digital minimalists reduce their use of digital media and thereby establish a distance from digital communication. At the same time, however, they perceive certain information more consciously and can improve their memory (e.g., information about their environment or from personal conversations).

Both studies have limitations that future research could address. Since they were conducted exclusively with German-speaking participants, the findings cannot be generalized to consumers in other cultural contexts. As it is assumed that media consumption habits vary across countries, future studies should include international samples to enhance comparability and generalizability. A cross-cultural comparative study would also be an interesting direction for future research. Sampling was another limitation in both studies. The first study sample consisted mainly of minimalism bloggers and a few people living in tiny houses, who are probably both quite strict about their adoption of minimalist principles. Due to space restrictions, people living in tiny houses are probably also very restrictive in their consumption. In the future, a study involving minimalists who adopt the lifestyle less consistently than bloggers and authors actively sharing content on social media could offer insights into how the broader population might integrate minimalist principles when motivated to do so. The participants in study 2 were individuals who had either practiced digital detox or consciously limited their online activities. Recruitment was quick, yet it raises concerns about whether the definition of digital minimalism was precise enough. Selecting participants based on the intensity of practicing digital minimalism might have uncovered additional brand-related risks. It is also likely that participants align with the principles of digital minimalism without explicitly identifying as “digital minimalists”. Recruiting such self-identified minimalists would have been more time-intensive but potentially offered deeper insights.

Future research should further explore the emerging phenomena of digital minimalism and digital detox and their implications for branding. Studies involving advertising agencies and media companies are also recommended to provide valuable insights from the media production perspective on these topics.

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Rebuilding the Inner Compass: How Martial Arts Shape Meaning, Identity, and Sustainable Intensity

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Abstract

Many high-functioning adults maintain external competence while experiencing an internal loss of direction, meaning, or stability. Psychological well-being research shows that meaning in life, identity coherence, and the ability to regulate one's effort are central to eudaimonic well-being, yet these qualities are not automatically present even in successful individuals. This paper proposes that traditional martial arts practice can serve as a practical, embodied pathway for restoring this lost orientation and well-being.

Using the metaphor of the inner compass or lighthouse, the paper integrates literature from well-being psychology, identity theory, and martial arts studies with qualitative insights from the author's doctoral research on traditional Chinese martial arts practitioners. Findings suggest that martial arts provide routine, structure, ethical codes, and embodied practices that align identity, meaning, and regulation in daily life. Practitioners describe training as a stable reference point during periods of adversity, stress, shaping life decisions, health behaviors, and emotional responses beyond the training context.

Identity-Based Motivation theory helps explain how the identity of "martial artist" becomes action-ready. Research on growth values, meaning in life, and burnout further supports the role of structured practice in fostering psychological coherence and sustainable regulation.

Martial arts thus emerge not merely as physical training, but also as an integrated system through which individuals rebuild orientation, reconnect to meaning, and learn to regulate intensity in a sustainable way.

Keywords:

martial arts; meaning in life; identity; eudaimonic well-being; burnout; self-regulation; embodied practice; sustainable intensity

Rebuilding the Inner Compass: How Martial Arts Shape Meaning, Identity, and Sustainable Intensity

1. Introduction

According to Galanis et al. (2024) the amount of working adults experiencing burnout rose to 60% following COVID-19. Many high-functioning adults may experience a loss of direction, meaning, and inner stability despite maintaining external competence. This disconnected state reflects a central concern in psychological well-being research. Core dimensions of well-being, meaning, purpose in life, and identity coherence, are not automatically present even in objectively successful individuals.

Eudaimonic approaches to well-being emphasize personal growth, self-realization, and purposeful living (Ryff, 1989; Ryff & Singer, 2008). It has been shown that meaning in life mediate the relationship between psychological functioning and overall well-being (Steger et al., 2008; Steger, 2012). Similarly, the PERMA model situates meaning as a fundamental pillar of well-being (Seligman, 2011).

This paper asks the question whether martial arts practice can offer a practical pathway for restoring well-being. Using the metaphor of the inner compass or lighthouse, it proposes that martial arts provide a structured, embodied pathway through which identity, meaning, and regulation can become aligned again and support the general well-being of the person.

2. Results

Traditional martial arts systems were historically not designed only to produce fighters, but also integrated individuals. They include self-defense, forms and drills, philosophy, and spiritual development (Nosanchuk & MacNeil, 1989; Trulson, 1986; Theeboom & Van Stiphout, 1993). Although this paper is not aiming to deepen the research in specific martial arts stream, it should be noted that the author's research focuses specifically on traditional Chinese martial arts (kung fu, traditional wushu).

Research connecting martial arts and psychotherapy highlights how training provides a safe environment to explore the self, release tension, and develop adaptive responses (Weiser et al., 1995; Gleser & Brown, 1988). Codes of behavior and ethics within martial arts serve as practical tools for self-regulation (Twemlow & Sacco, 1998).

In the light of how martial arts help in the daily life, in author's PhD research (Partikova, 2019) a specific theme of a "light house" or an inner compass was uncovered. For many practitioners, martial arts become this lighthouse through routine, structure, and meaning embedded in daily practice.

"Yes, it is like a solid rock in my life... For example, my mother died and in this period afterward, the training was there and it's unconditional, although the training is very strict, behind it this is very important. You are expected to be there, it's in my system." (p. 140)

The training and the routines do not disappear when life becomes unstable. They remain. This consistency creates an external structure that gradually becomes an internal orientation.

Another practitioner describes how this structure shaped life decisions far beyond the gym:

"My background was very rough and kung fu kept me like a straight arrow. It was rough and everywhere it gets rough you have gangsters, a lot of drugs. It's always sensible to stay away from drugs, I've never done them. I never socialized with anyone who did them. And that's part of kung fu as well, to appreciate yourself, keeping yourself healthy. [Kung Fu] definitely helped me, to see

what's good, what's right, what should I do from a model aspect. Without kung fu, I would have a different life.” (p. 138)

The martial arts here, beside the movement routine, provides a clear sense of what is right, what is valuable, and how to act. This is where identity and meaning become embodied. Identity-Based Motivation theory helps explain this process. Oyserman (2009) suggests that people are motivated to act in ways that feel congruent with identities that come to mind in a given moment. When the identity of “martial artist” is active and feels connected to the present self, behaviors aligned with this identity feel natural and worthwhile. One journals, rests, trains, eats well, or avoids harmful behaviors not because of discipline alone, but because these actions are congruent with who one is

This process is further supported by another research showing that endorsing growth-oriented values is positively associated with higher levels of eudaimonic well-being and a deeper sense of fulfillment (Bojanowska & Czerw, 2020). Martial arts embed these growth values into routine practice through repetition, ethics, and long-term progression.

Traditional martial arts, such as kung fu, historically integrated spiritual or philosophical development. Forms (routines) function as moving meditations embedded within philosophical frameworks (Nosanchuk & MacNeil, 1989; Trulson, 1986). However, the philosophical meaning attached to these practices is not fixed.

Columbus and Rice (1991) wrote about how that practitioners reconstruct the psychological and cultural meaning of martial arts within their own contexts. Brownell’s (1995) analysis of modern wushu illustrates how movements can be stripped of original philosophical content. She described the case of traditional martial arts being used during the Cultural revolution and refilled with new values like nationalism. This is a building ground for how people can take Western philosophies for their own: the meaning is highly individual and can be affected by location and culture of the practitioner. The “Gentle Warrior” is a layer of universally good behavior, described in Vlachos (2015). What traditions called “spirit” may have been describing a highly trained relationship between body, mind, meaning, and behavior.

Twemlow and Sacco (1998) emphasize the role of ethical codes in fostering self-regulation. Physical activity has also been linked to reduced burnout through improved emotional self-regulation (Xu et al., 2025). As the Job Demands–Resources model explains burnout as arising from an imbalance between demands and resources (Demerouti et al., 2001). Martial arts teaches regulation on daily basis. Practitioners regularly face pressure, demands and even pain. A specific area of research has been oriented around the “animal”, a common word in the martial arts vocabulary. Sheridan (2008) described the animal side of his coach, both aggressive when fighting, but wise and calm otherwise. Bowman (2017) noted that (Chinese) martial arts frequently use animals to describe the principles of the moves. Farrer (2013) researched the awakening the intent of the martial artist, awakening the animal. The animal here is not only a metaphor for assertiveness or aggression but also of the ability to regulate one’s energy and emotions.

Through embodied mindfulness—attention placed in breath, posture, and tension—practitioners learn to detect over-activation early and regulate it in real time. This skill doesn’t prove useful in the gym only, but also in the daily situation.

3. Discussion

The concept of the inner compass (or lighthouse) integrates three psychological dimensions: The meaning — what matters (Ryff; Steger; Seligman), the identity — who I am in action (Oyserman; McAdams; Erikson) and finally regulation — how I manage intensity (Demerouti et al.)

Martial arts function as a system where these dimensions are practiced simultaneously. Identity is shaped through embodied action (Channon & Jennings, 2014). Animal metaphors frequently used in martial traditions illustrate the ability to access strength when needed and return to calm afterward; to regulate (Bowman, 2017; Farrer, 2013; Sheridan, 2008). Practitioners describe becoming less reactive, more adaptable, and more coherent in their responses to challenges (Partikova, 2019).

Thus, martial arts can provide a structured pathway for rebuilding psychological orientation in individuals who feel adrift despite external competence.

4. Methodology

This paper employs a conceptual and integrative approach, synthesizing literature from psychological well-being, identity theory, and martial arts studies. It uses existing theoretical and empirical findings to build an interdisciplinary framework explaining how embodied practice contributes to meaning, well-being and sustainable regulation.

5. Conclusion

Martial arts provide an embodied system through which individuals reconnect to meaning, rebuild identity coherence, and learn to regulate intensity sustainably, thus offer more to the modern person than just physical training. Rebuilding the inner compass is not a cognitive exercise but a lived, embodied process. This makes martial arts a valuable and still underexplored pathway for fostering sustainable intensity, meaning, and restoring well-being in modern life.

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Return as Medicine: Cultural Memory, Narrative Identity, and the Future of Global Health Equity

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ABSTRACT

Cultural memory—ancestral, narrative, ritual, culinary, and intergenerational—plays a critical yet understudied role in women’s cognitive and emotional wellbeing. Return Theory is a global health framework that positions cultural memory as health infrastructure capable of strengthening identity coherence, emotional regulation, and resilience. This paper introduces the theoretical foundations of Return Theory, outlines its five modalities, and presents prototype case examples illustrating how cultural memory can be operationalized through the Cultural Memory Intervention Toolkit (CMIT). Using a design-based research approach, the paper integrates credible population-level data from the Behavioral Risk Factor Surveillance System (BRFSS) and other public health sources to contextualize the urgency of women’s cognitive health disparities. While empirical testing of CMIT is forthcoming, the prototypes presented here offer a conceptual and methodological foundation for future implementation and evaluation. Return Theory contributes a culturally rooted, community-centered model for global women’s health and proposes cultural memory as a vital determinant of wellbeing.

KEYWORDS:

Cultural memory; women’s cognitive health; global health equity; narrative identity; ritual studies; intergenerational knowledge; diaspora health; Return Theory.

1 INTRODUCTION

Women—particularly Black, Indigenous, and diasporic women—experience disproportionate cognitive decline due to structural sexism, chronic stress, and cultural fragmentation. According to BRFSS data (CDC, 2023), women report subjective cognitive decline at higher rates than men, with Black women reporting the highest levels of memory-related functional limitations. These disparities are compounded by social determinants of health, including discrimination, cultural displacement, and loss of intergenerational knowledge.

Despite these realities, cultural memory remains largely absent from global health frameworks. Return Theory addresses this gap by reframing cultural memory as health infrastructure and proposing a structured, culturally grounded intervention model. This paper introduces Return Theory, outlines its five modalities, and presents prototype case examples demonstrating how cultural memory can be operationalized in health and community settings.

2 BACKGROUND AND SIGNIFICANCE

2.1 Women’s Cognitive Health Crisis

BRFSS data (CDC, 2023) show significant disparities in subjective cognitive decline (SCD) across gender and racial groups.

Table 1. Prevalence of Subjective Cognitive Decline (SCD) by Gender and Race (BRFSS 2023)

Group	SCD Prevalence (%)
Women (overall)	12.3
Men (overall)	10.1
Black women	14.9
White women	11.8
Hispanic women	13.2

These disparities reflect structural inequities, chronic stress exposure, and cultural fragmentation.

2.2 Cultural Memory as a Missing Determinant

Cultural memory influences:

- Identity coherence
- Emotional regulation
- Intergenerational belonging
- Cognitive resilience

Yet it is rarely integrated into public health interventions.

Return Theory positions cultural memory as a measurable determinant of wellbeing.

3 THEORETICAL FRAMEWORK: RETURN THEORY

Return Theory proposes that individuals and communities strengthen wellbeing by “returning” to cultural memory through five modalities:

Figure 1. The Five Modalities of Return Theory

Visual Hierarchy of Cultural Return Pathways

Narrative Return: Story as identity repair
↓
Ritual Return: Embodied practices that regulate stress
↓
Culinary Return: Foodways as sensory memory and grounding
↓
Intergenerational Return: Elders as living archives and lineage keepers
↓
Mythic Return: Archetypes for meaning, courage and transformation

Note. This figure illustrates five interconnected layers of cultural return arranged in a vertical hierarchy, progressing from Narrative Return to Mythic Return.

3.1 Narrative Return

Story as identity repair.

3.2 Ritual Return

Embodied practices that regulate stress.

3.3 Culinary Return

Foodways as sensory memory.

3.4 Intergenerational Return

Elders as living archives.

3.5 Mythic Return

Archetypes for meaning and transformation.

4 METHODS: DESIGN-BASED RESEARCH APPROACH

Because Return Theory is in early implementation, this study uses:

- Prototype case examples
- Personas and journey maps
- Logic models
- Cultural asset mapping
- Anticipated outcome measures
- Public health datasets (BRFSS, CDC, NIH) for contextual grounding

This approach ethically demonstrates feasibility without claiming empirical results.

5 RESULTS: PROTOTYPE CASE EXAMPLES

5.1 Narrative Return: Reclaiming the Story of Self

Persona: Tameka, 37, social worker

Prototype Activity: Guided narrative session using passages from *He Shall Return*

Cultural Memory Asset: Diasporic storytelling traditions

Anticipated Outcomes:

- Increased identity coherence
- Reduced emotional fragmentation
- Strengthened sense of belonging

5.2 Ritual Return: “The Ugwu Humble Leadership Practice”

Persona: Cheryl, 45, community health worker

Prototype Activity: A humility centered grounding ritual from the Ugwu Leadership Sessions

Cultural Memory Asset: Ethos on humility and dignity. Storytelling.

Anticipated Outcomes:

- Stress regulation
- Increased emotional clarity
- Strengthened leadership presence

5.3 Culinary Return: “The Healing Cosmos of West African Cuisine”

Persona: Earnika, 62, grandmother and retired nurse. Experiencing dementia.

Prototype Activity: Cooking a dish from the West African culinary manuscript (emphasis on plant forward, healthy meals paired with origin stories and proverbs).

Cultural Memory Asset: Ancestral foodways

Anticipated Outcomes:

- Sensory based memory activation
- Emotional grounding
- Increased intergenerational connection
- Reconnection to identity
- Improved mood and increased social engagement

5.4 Intergenerational Return: “The Last Keepers Listening Circle”

Persona: Chidi, 19, first generation college student

Prototype Activity: Elder interview using The Last Keepers question set

Cultural Memory Asset: Ecological and medicinal knowledge from elders

Anticipated Outcomes:

- Increased cultural continuity
- Strengthened sense of lineage
- Reduced loneliness and identity confusion

5.5 Mythic Return: “Facing the Dragon”

Persona 1: Amara, 29, early career physician

Persona 2: DeShaun, 16, youth at risk

Prototype Activity: Mythic reframing exercise using “Here Be Dragons” – a literary device from *He Shall Return*

Cultural Memory Asset: Archetypes of courage, fear, and transformation

Anticipated Outcomes:

- Increased resilience
- Reframing of fear
- Strengthened purpose orientation
- Purpose clarity

6 TABLES AND FIGURES

6.1 Unified Logic Model

Table 2. Unified Logic Model for Return Theory

Inputs	Activities	Outputs	Short-Term Outcomes	Long-Term Outcomes
Cultural texts, rituals, recipes, elders, archetypes	Narrative sessions, rituals, cooking, interviews, mythic exercises	Stories, rituals, dishes, recordings, personal myth maps	Identity coherence, emotional grounding, stress reduction	Cognitive resilience, belonging, cultural continuity

6.2 BRFSS Indicators Relevant to Return Theory

Table 3. BRFSS Indicators Relevant to Cultural Memory and Cognitive Health (2023)

Indicator	Description	Relevance to Return Theory
Subjective Cognitive Decline	Self-reported worsening memory	Baseline vulnerability is addressed by Narrative, Ritual, Mythic Return
Social Isolation Index	Frequency of social/emotional support	Intergenerational Return reduces isolation
Poor Mental Health Days	Days mental health was “not good”	Ritual and Narrative Return support emotional regulation
Chronic Stress Exposure	Stress frequency and intensity	Ritual Return reduces stress load
Fruit/Vegetable Intake	Dietary patterns	Culinary Return leverages foodways for sensory memory

6.3 Outcome and Process Measures by Modality

Table 4. Outcome and Process Measures by Modality

Modality	Outcome Measures	Process Measures
Narrative Return	Identity coherence; emotional grounding	Session completion; narrative depth; participant engagement
Ritual Return	Stress reduction; emotional clarity	Fidelity to ritual steps; acceptability; cultural resonance
Culinary Return	Sensory memory activation; intergenerational bonding	Recipe adherence; replication at home; qualitative reflections
Intergenerational Return	Cultural continuity; lineage awareness	Elder participation; interview duration; reciprocity indicators
Mythic Return	Resilience; purpose clarity	Prompt engagement; metaphor usage; reflective depth

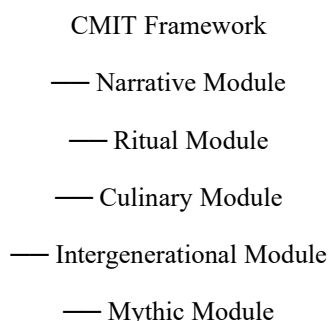
6.4 Outcome Pathway Diagram

Table 5. Return Theory Outcome Pathway Diagram

Stage	Description
Cultural Memory Inputs	Cultural texts, rituals, recipes, elders, archetypes
Five Modalities of Return	Narrative, Ritual, Culinary, Intergenerational, Mythic
Cultural Memory Activation	Story, ritual, foodways, lineage, archetype engagement
Short-Term Outcomes	Identity coherence, emotional grounding, stress reduction
Long-Term Outcomes	Cognitive resilience, belonging, cultural continuity

6.5 CMIT Structure

Figure 3. Cultural Memory Intervention Toolkit (CMIT) Structure



7 DISCUSSION

Return Theory offers a culturally grounded, community- centered model for women’s cognitive and emotional health. The prototype case examples demonstrate how cultural memory can be

operationalized into interventions that are low-cost, scalable, and culturally resonant. Public health datasets underscore the urgency of addressing cognitive decline among women, particularly those in diasporic communities.

8 CONCLUSION

Cultural memory is a vital yet overlooked determinant of health. Return Theory reframes memory as infrastructure and offers a new paradigm for global women's health—one that honors lineage, restores identity, and strengthens resilience.

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CONFLICT OF INTEREST

The author declares no conflict of interest.

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TRENDS AND GENDER DIFFERENCES IN STUDENTS' SUBJECTIVE WELL-BEING (SWB): AN INTERNATIONAL COMPARATIVE ANALYSIS

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ABSTRACT

This research verifies the main factors determining the well-being of 15 and 16-year-old students, drawing on data from the Programme for International Student Assessment (PISA) 2018 and 2022, the analysis covers five countries, The United Arab Emirates, Spain, Hong Kong (China), Mexico, and Panama, selected due to the availability of comparable well-being indicators across both assessment cycles. Students' life satisfaction is employed as the core indicator of well-being and analyzed through Ordered Logit models, complemented by Oaxaca–Blinder decomposition to examine gender disparities and their underlying mechanisms. The results indicate that school-related factors, particularly bullying, sense of belonging, and school location, play a central role in shaping adolescents' life satisfaction. Family support and socioeconomic resources are also positively associated with well-being, while mental health variables, especially anxiety and body image, emerge as increasingly influential over time. Furthermore, the analysis identifies persistent gender gaps in life satisfaction, with girls systematically reporting lower levels of well-being than boys. The study reveals that these gaps are predominantly driven by factors beyond observable characteristics that remain unexplained. These findings underscore the complex interplay of school climate, family environment, and individual mental health in shaping adolescent well-being, highlighting the need for targeted, gender-sensitive educational policies.

KEYWORDS: Subjective well-being. Satisfaction with life. Adolescence. Happiness. Gender differences.

1 INTRODUCTION

Adolescence is characterized by cognitive, emotional, and neurochemical changes that affect social relationships and executive functions, making teenagers more prone to depression (Andersen & Teicher, 2008; Blakemore & Mills, 2014; Patton & Viner, 2007). Studies indicate that subjective well-being worsens at the end of adolescence compared to the beginning, showing a significant impact of disruption on well-being during adolescence (Casas et al., 2007; Chui & Wong, 2016; Goldbeck et al., 2007; Liu et al., 2016; Ronen et al., 2016; Tomy & Cummins, 2011).

Consequently, studies show that adolescents with high well-being and life satisfaction are less likely to act aggressively in stressful situations, have better relationships with peers and parents, a greater sense of personal control, lower levels of depression and anxiety, and higher school performance (Gilman & Huebner, 2006; Kaplan, 2017; Suldo & Huebner, 2004). Moreover, Arslan and Renshaw (2018) show that students' subjective well-being predicts risk behaviours, such as alcohol use, tobacco use, poor diet, antisocial behavior, and school dropout.

In addition, evidence from the literature shows that mental disorders in adults originate in childhood or adolescence (Jones, 2013; Kessler et al., 2007; Kieling et al., 2011; Paus et al., 2008), yet the treatment is often delayed due to stigma and lack of awareness. About half of first episodes of depressions occur during adolescence (Kessler et al., 2005). It is estimated that 1 in 7 young people aged 10 to 19 have mental health problems, but these are often overlooked (World Health Organization, 2021). Adults who attempted suicide in adolescence are more likely to have recurrent mental health problems, impaired physical health, and risky behaviours (Goldman et al., 2016). Therefore, it is important to identify these issues early to avoid chronic conditions (Morgan et al., 2008; OECD, 2015).

Therefore, it is important to understand the relationship between students' well-being at this age and its influence on education. This has led to policies aimed at improving and monitoring student's well-being. Consequently, the concept of school performance is now broader. In addition to grades, social skills, emotions, and well-being are considered when assessing students, as academic performance is affected by emotional aspects (Baker et al., 2004; Parhiala et al., 2018; Scheerens & Hendriks, 2014). Indeed, it has been shown that programs that aim to improving student's well-being are linked to better school outcomes (Bonell et al., 2014).

Therefore, governments are aware that the social determinants of adolescents' health and well-being currently have a huge impact on their academic success. They are now showing greater interest in learning how to work with students to understand well-being from their perspective and how to take actions to improve it (Matthews et al., 2015). It should be noted that analysing and promoting students' well-being would not only have a positive impact on education but also on the economy of any country, as education also contributes to economic growth (Barro, 2001).

In this context, the main objective of this study is to assess the of 15 and 16-year-old adolescents through the variable that identifies students' life satisfaction, included in the latest PISA reports, analysing how it has changed over time, especially in a comparative perspective across countries, and whether there are specific factors influencing well-being changes, such as students' sociodemographic data and information about their learning context, including the support they perceive from teachers, the disciplinary climate at school, as well as specific variables related to well-being and health, such as Body Image and Feelings of Anxiety. A particular focus is placed on examining gender disparities in well-being. Furthermore, the study aims to investigate the extent to which these gender differences can be explained by the set of independent explanatory variables through the application of the Oaxaca-Blinder

decomposition. This research utilizes data from the PISA 2018 and 2022 cycles, focusing on five countries, The United Arab Emirates, Spain, Hong Kong (China), Mexico, and Panama, selected for their availability of comparable well-being variables across both assessment years.

2 LITERATURE REVIEW

To enhance student well-being, it is important to understand how to measure it and the factors that influence it. The concept of well-being is broad due to its multidisciplinary nature (Kern et al., 2015; Salvador-Carulla et al., 2014). Three major areas stand out in this work: objective well-being, which includes aspects such as income, health, education, and freedom for a full life (Western & Tomaszewski, 2016); and two psychological theories, Eudemonism and Hedonism. In Eudemonism, well-being is linked to self-realization, purpose, and human development, while Hedonism seeks to maximize pleasure or happiness (Ryan & Deci, 2001). Thus, subjective well-being is constructed methodologically, encompassing three areas: life satisfaction, positive emotions, and absence of negative emotions (Diener et al., 1999). In this sense, this work focuses on the cognitive dimension of subjective well-being, which is more stable over time (Eid & Diener, 2004). Life satisfaction, in particular, is related to happiness (Diener, 1984; Diener et al., 1999), being a common indicator in research with children and adolescents (Proctor et al., 2009). Despite the significant number of studies on well-being, the majority focus on adults, with less comprehensive research on adolescents (Casas, 2011; OECD, 2019).

In the literature, studies carried out to verify the determinants of adolescents' well-being show that well-being is defined by personal, family, socioeconomic, and school factors, with in some cases a limited ability of families to influence the well-being of their children (Cho, 2019; Chung et al., 2022). Studies carried out in different countries show the importance of variables related to immigrant status, student failure, and gender differentiation (Borchers & Cunha, 2023; Esidio, 2021; Marquez & Long, 2021; Rudolf, 2020).

Additionally, recently, studies have investigated the relationship between variables related to students' ICT and life satisfaction. The results of Kardefelt-Winther et al. (2020) showed that, in Bulgaria and Chile, high-frequency internet use is weakly associated with lower life satisfaction. In Ghana and the Philippines, this pattern was not observed. There was no evidence that the relationship between frequency of internet use and life satisfaction differed by gender. In all four countries, the quality of children's intimate relationships showed a much stronger relationship with their life satisfaction than time spent online.

The family context is also addressed in research and highlights the importance of social relationships with parents, parents emotional support, along with family socioeconomic characteristics in adolescents' well-being (Borchers & Cunha, 2023; Cho, 2019; Chung et al., 2022; Kuhn et al., 2021) emphasizing the crucial need to implement policies that increase parents' own contribution and support parents in their children's school lives.

For school-related characteristics, most studies observe that negative school experiences, such as peer victimization (bullying), can influence adolescent' life satisfaction (Navarro et al., 2015), a finding supported by recent studies by González-Gallardo et al. (2021), Borchers and Cunha (2023), Tang (2019) and Varela et al. (2018), which found substantial negative effects of bullying on life satisfaction, highlighting the need to promote anti-bullying measures.

However, in terms of school belongingness, Borchers and Cunha (2023), Guess and McCane-Bowling (2016), Huang (2020), and Kuhn et. al (2021) found that the sense of belonging to school, along with perceived teacher support, were the aspects most closely linked to students' perception of life satisfaction, suggesting that youth life satisfaction was mainly linked to positive personal relationships, followed by school relationships. The authors emphasize the

need to consider policies aimed at increasing students' sense of belongingness to school and positive school relationships among students, and also with staff. Some studies also consider the school's location as a possible explanation of students' well-being. However, the results of the study by Marquez and Long (2021) show inconclusive evidence regarding the relationship between urban/rural location and students' life satisfaction. Given the great heterogeneity of the results, the authors suggest that the association between urban/rural context and life satisfaction varies depending on the country of interest. Furthermore, studies highlight the importance of educational policies and different school climates on student health (Marquez & Main, 2021; Su & Lee, 2023). Marquez and Main (2021) analyzed the connections between educational policy and students' life satisfaction, finding relevant associations and emphasizing the role of schools in shaping students' life satisfaction, highlighting the importance of comparative research. The work of Su and Lee (2023) investigated how different school climates affect the holistic development of children in Eastern and Western school systems. The results indicated that East Asian systems are more effective in academic performance but less effective in students' well-being. Disciplinary climate is perceived more positively in East Asia, while teacher support is less positive in these countries compared to the West.

2.1 Gender Differences in Adolescent Subjective Well-Being (SWB)

A deeper analysis of the literature reveals important nuances in gender differences in adolescent SWB. Longitudinal and cross-sectional studies show that while boys generally report higher levels of life satisfaction and lower negative affect, girls show higher scores in some school-related domains, such as satisfaction with school relationships (Chen et al., 2020; Casas & González-Carrasco, 2019).

A robust and recurring finding within this literature is the existence of systematic gender differences in adolescent SWB. Meta-analyses and large-scale international assessments, such as the Programme for International Student Assessment (PISA), consistently report that adolescent girls, on average, score lower than boys on measures of overall life satisfaction (Chen et al., 2020; Rudolf, 2020). This gap is observed across a wide range of countries, though its magnitude varies cross-nationally (Borchers & Cunha, 2023; Marquez, 2023). Beyond life satisfaction, research indicates a gendered emotional profile: while girls may experience positive emotions intensely, studies find they also report significantly higher levels of negative affect (e.g., sadness, fear) and lower levels of positive affect compared to boys (Esidio et al., 2023). Importantly, sophisticated decomposition analyses reveal that a substantial portion of this gender gap, particularly in negative affect, remains "unexplained" by standard observable variables like family socioeconomic status, academic performance, or even self-reported body image and school belonging (Esidio, 2021; Esidio et al., 2023; Marquez & Long, 2021; Rudolf, 2020). This suggests that unobserved factors, potentially including internalized gender norms, differential emotional socialization, biological changes linked to puberty, or stigma-related reporting biases, play a significant role in shaping these disparities (Batz & Tay, 2018; Orben et al., 2022).

The relationship between SWB and academic achievement further illustrates this gender complexity. Longitudinal research challenges the assumption of a simple, positive synergy between well-being and school performance. Bortes et al. (2021) found a gendered bidirectional relationship: for girls, higher SWB predicted better subsequent grades, but conversely, higher academic achievement predicted a decline in subsequent SWB. This pattern was not observed for boys. This indicates that the pursuit of academic success may carry a unique emotional cost for girls, possibly related to heightened anxiety, perfectionism, or pressure, which can erode their well-being over time.

The school context itself is a key arena where these gendered experiences and outcomes are shaped. Boys often report more frequent exposure to certain negative school experiences, such as bullying and perceived unfair treatment by teachers, which are strongly associated with lower SWB (Marquez, 2023). For girls, however, schoolwork-related anxiety emerges as a particularly salient and detrimental factor, showing a stronger negative association with their life satisfaction than it does for boys (Marquez, 2023).

Furthermore, evidence suggests that the school environment can act as a moderator; in some countries, the size of the gender gap in SWB varies significantly from one school to another, implying that specific school policies, climates, and practices can either mitigate or exacerbate these disparities (Marquez, 2023).

Adding to this complexity, recent studies have explored the mechanisms underlying gender differences in SWB. Liu et al. (2024) used PISA 2018 Canadian data to investigate psychological well-being, finding that boys had higher self-efficacy and lower fear of failure than girls, highlighting gender-specific emotional and cognitive profiles. Li et al. (2020) examined the mediating roles of emotion regulation and prosocial behavior in the relationship between social support and SWB among Chinese adolescents. They found that while social support directly increased SWB for girls, for boys, the effect was fully mediated by cognitive reappraisal and prosocial behavior. This suggests that gender-specific pathways exist through which social and emotional resources translate into well-being.

Recent research from Peru by Tomás et al. (2020) underscores the gendered nature of social support and school adaptation. Their study found that girls reported better school adaptation and subjective well-being than boys, a result mediated by stronger perceptions of school adjustment. This contrasts with some earlier findings and highlights how cultural and contextual factors, such as family dynamics and school climate, may differentially shape well-being across genders. In Germany, Steffes (2024) examined adolescent SWB during the COVID-19 pandemic and found that girls consistently reported lower subjective well-being compared to boys, even when controlling for social resources and school-related factors. Notably, girls' SWB was more negatively affected by disruptions in school belonging and peer relationships during lockdowns, suggesting that relational aspects of school life are particularly crucial for girls' well-being in times of crisis. Both studies reinforce the idea that gender differences in SWB are not uniform but are influenced by intersecting social, educational, and situational factors.

In conclusion, the determinants of adolescent SWB are multifaceted, spanning individual, familial, and educational spheres. Within this landscape, gender differences are a persistent and nuanced feature. Girls generally report lower SWB, a gap not fully explained by conventional metrics and intricately linked to a bidirectional, sometimes costly, relationship with academic achievement.

The school environment plays a critical role, presenting distinct risk factors for each gender, such as bullying for boys and academic anxiety for girls. Therefore, effective interventions and policies aimed at promoting adolescent well-being must move beyond a one-size-fits-all approach. They should be gender-sensitive and context-aware, designed to address the specific emotional and social challenges faced by boys and girls within their educational settings.

This review underscores that adolescent subjective well-being is shaped by a complex interplay of individual, familial, and school-level factors, with gender differences emerging as a persistent and nuanced pattern. Evidence indicates that gender gaps in well-being, particularly lower life satisfaction among girls, are not fully accounted for by conventional observable variables, pointing to the role of internalized norms, differential emotional socialization, and distinct school dynamics. Against this backdrop, the present study aims to deepen the understanding of these disparities by examining life satisfaction across five

countries in comparative perspective and applying Oaxaca-Blinder decomposition to disentangle the explained and unexplained portions of the gender gap. This approach intends to provide a clearer basis for designing gender-sensitive and context-aware educational policies.

3 METHODOLOGICAL APPROACH AND DATABASE

This research utilizes as its information source the databases published by the OECD's PISA for the years 2018 and 2022. Countries that administered a specific questionnaire regarding the well-being of participating students were considered. This questionnaire was distributed to thirteen countries. However, for this comparative analysis across the two time points, only five countries provided the necessary comparable set of variables related to student well-being and its potential determinants. This dataset includes specific indicators of well-being and health, such as Body Image and Feelings of Anxiety, allowing for a more comprehensive analysis. Consequently, the analysis focuses on the following five countries: The United Arab Emirates, Spain, Hong Kong (China), Mexico, and Panama.

To analyze the relationships between students' Well-Being (Y_i) and the independent explanatory variables (X_i) summarized in Table 1, equation (1) was estimated using an Ordered Logit Model, using the Maximum Likelihood method, according to Greene (2012). This model is justified by the use of an ordinal qualitative dependent variable, the student's life satisfaction, which is measured on a scale from 0 (zero) to 10 (ten), and is constructed from a latent regression for the variable Y_i , called Y_i^* .

$$Y_i^* = \beta X_i + \varepsilon_i \quad (1)$$

Where X_i is a vector representing all independent variables for the i -th student and ε_i consists of the error term. After knowing the coefficients β , we arrive at:

$$Y_i = \alpha \leftrightarrow \mu_{\alpha-1} \leq Y_i^* \leq \mu_\alpha \quad (2)$$

Where $\mu_{\alpha-1}$ and μ_α are the cutoff points in each range of values with the probabilities calculated by:

$$\text{Prob}(Y_i = \alpha | X_i) = \Lambda(\mu_\alpha - \beta X_i) - \Lambda(\mu_{\alpha-1} - \beta X_i) \quad (3)$$

Being $\alpha = 0, \dots, 10$, distributed in the intervals $-\infty = \mu_{-1} \leq \mu_0 = 0 \leq \dots \leq \mu_n = \infty$; $\Lambda(\cdot)$ represents the Logit function. In this way, the variable Y_i is estimated from the variable Y_i^* using the following rule:

$$Y_i = \begin{cases} 0 & \text{if } Y_i^* < \tau_0 \\ 1 & \text{if } \tau_0 \leq Y_i^* < \tau_1 \\ 2 & \text{if } \tau_1 \leq Y_i^* < \tau_2 \\ 3 & \text{if } \tau_2 \leq Y_i^* < \tau_3 \\ 4 & \text{if } \tau_3 \leq Y_i^* < \tau_4 \\ 5 & \text{if } \tau_4 \leq Y_i^* < \tau_5 \\ 6 & \text{if } \tau_5 \leq Y_i^* < \tau_6 \\ 7 & \text{if } \tau_6 \leq Y_i^* < \tau_7 \\ 8 & \text{if } \tau_7 \leq Y_i^* < \tau_8 \\ 9 & \text{if } \tau_8 \leq Y_i^* < \tau_9 \\ 10 & \text{if } Y_i^* \geq \tau_9 \end{cases}$$

Where τ_0 a τ_9 are the cutoff limits within the levels of $\mu_{\alpha-1}$ and μ_α .

Table 1 Description of the variables used

Variable	Description
Individual characteristics	
Gender	Equal to 1 if female.
Age	Age in years and months.
Repetition	Equal to 1 if the student has repeated any school year.
Family characteristics	
Socio-Economic Status	HOMEPOS: Summary index of all household items and possessions in the student residence. Positive values in this variable mean that the student's family has more assets and household items than the student's family, on average, in OECD countries.
Immigration	Immigration status is a categorical variable that indicates the immigration status of the student, including native students, first-generation immigrant students (those students and their parents born outside of Canada), and second-generation immigrant students (those born in Canada, but with at least one parent born in another country).
Mother's years of schooling	Index of highest education level for mother
Father's years of schooling	Index of highest education level for father
Emotional support from parents perceived by the student	Index that measures the emotional support of parents perceived by the student. Positive values on this variable mean that students perceived higher levels of emotional support from their parents than the average student in OECD countries.
Family support	Index that measures family support. Positive values in this variable mean that students considered their family to be more supportive than students, on average, in OECD countries.
Family support for self-directed learning	Index that measures family support for self-directed learning. Positive values in this variable mean that students considered their family to be more supportive of self-directed learning than students, on average, in OECD countries.
Friends	Number of close friends
School Characteristics	
Medium City	Equal to 1 if the school is located in a city that has between 100,000 and 1 million inhabitants.
Large City	Equal to 1 if the school is located in a city that has between 1 and 10 million inhabitants.
Megacity	Equal to 1 if the school is located in a city that has more than 10 million inhabitants.
Public	Equal to 1 if the school is public.
Class Size	Equal to 1 if the classroom has more than 30 students.
Bullying	Student's experience of being bullied. Students with positive values on this index were more likely to be bullied than students, on average, in OECD countries.
Sense of belonging to the school	Index that measures the sense of belonging to the school. Positive values on this variable mean that students reported a greater sense of belonging at school than the average student in OECD countries.
Feedback from teachers perceived by the student	Index that measures teacher feedback perceived by students. Positive values on this scale mean that students perceive their teachers to provide feedback more frequently than the average student in OECD countries.
Quality of student-teacher relationships	Quality index of student-teacher relationships. Students with positive values on this index perceived student-teacher relationships at school as more positive than students on average in OECD countries.
Disciplinary climate in test language lessons	Positive values on this scale mean that the student enjoyed a better disciplinary climate in language-of-instruction lessons than the average student across OECD countries.
Wellness and Health characteristics	
Body Image	Body image perception index
Feeling anxious	Equal to 1 if the student felt anxious at least once a week.
Regional Characteristics	
Panama	Equal to 1 if the student resides in Panama.
Mexico	Equal to 1 if the student resides in Mexico.
Spain	Equal to 1 if the student resides in Spain.
Hong Kong (China)	Equal to 1 if the student resides in Hong Kong (China).
United Arab Emirates	Equal to 1 if the student resides in the United Arab Emirates.

Source: Own elaboration.

For the estimates, a set of variables was selected, which, according to the literature, may influence adolescents' well-being. The independent variables used seek to reflect the individual characteristics of the children, the family context, school structure and climate,

well-being and health, and those that show the student's nationality taking into account the variables available in PISA.

All cases with missing values in any of the analyzed variables were excluded, assuming that all that all missing values are completely random. Thus, the final samples resulted in 27,157 and 25,545 students in 2018 and 2022, respectively, distributed across schools in the United Arab Emirates, Spain, Hong Kong (China), Mexico, and Panama.

4 DESCRIPTIVE STATISTICS OF STUDENTS' LIFE SATISFACTION

In Figure 1, average levels of life satisfaction among students can be seen for the selected countries and separately for each country included in the study in the years 2018 and 2022. Overall, life satisfaction declined between the two waves, reflecting a generalized deterioration in students' subjective well-being. The largest decrease occurred in Panama (-0.94 points), followed by Mexico (-0.90) and the United Arab Emirates (-0.25). Spain also experienced a minor decline (-0.36). In contrast, Hong Kong (China) was the only country among the five to show a slight increase (+0.11).

In 2022, Mexico reported the highest average life satisfaction (7.23), while Hong Kong (China) reported the lowest (6.46). Notably, no country in this sample maintained an average satisfaction level above 7.5 in 2022, a threshold exceeded by Mexico and Panama in 2018. When considering the pooled sample, average life satisfaction fell from 7.84 in 2018 to 7.15 in 2022, suggesting a generalized deterioration in adolescent well-being following the pandemic period.

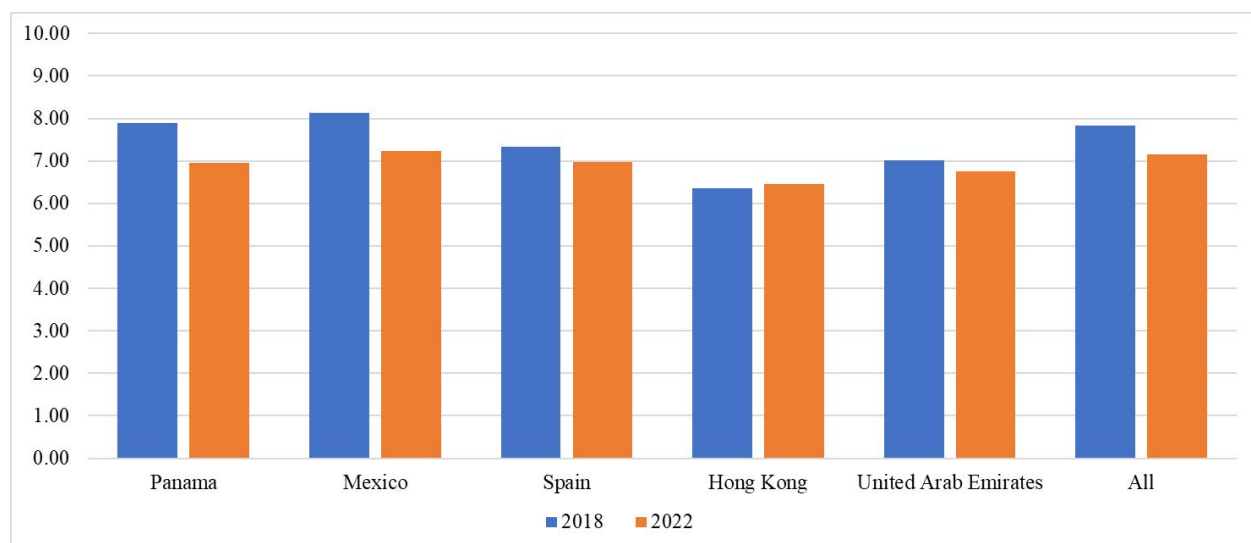


Figure 1 Average student' life satisfaction in the selected countries, 2018 and 2022
 Source: Own elaboration from PISA.

Gender differences are illustrated in Figure 2. In both years, boys consistently report higher life satisfaction than girls in all countries. Moreover, the gender gap widened in 2022, indicating a stronger deterioration in girls' well-being. For instance, in Mexico, the gap increased from 0.34 to 0.95 points, and in the United Arab Emirates, from 0.27 to 0.56 points. This indicates a pronounced and growing disparity in subjective well-being between male and female students.

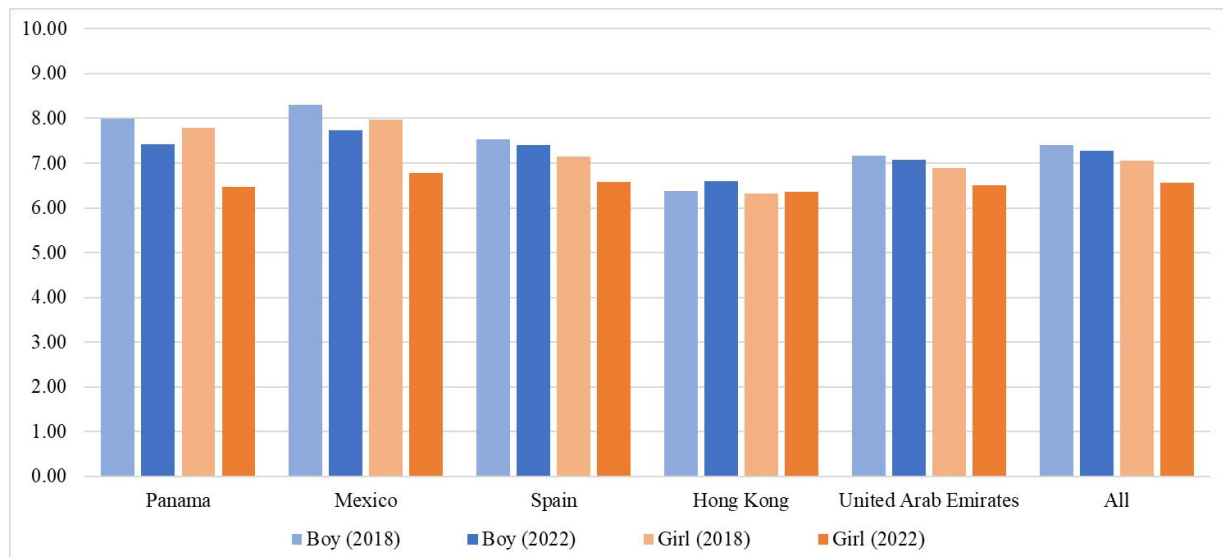


Figure 2 Average student' life satisfaction by gender in the selected countries, 2018 and 2022
 Source: Own elaboration from PISA.

In Table 2, descriptive statistics of the explanatory variables are presented, indicating that the number of girls and boys remains the same in both years. Repetition rates decrease slightly from 2018 to 2022. Family socioeconomic status improves on average, and parents' years of schooling increase substantially, reflecting changes in the sample composition and educational attainment across cohorts. However, students reported fewer close friends in 2022. Regarding school characteristics, most students attend public schools, and a considerable share of schools is located in medium or large cities. Average class size decreases between 2018 and 2022, although it remains relatively high in some countries. Experiences of bullying decline on average, but they remain a relevant concern. Notably, students' sense of belonging to school deteriorated between 2018 and 2022, indicating a weakening of school attachment. Concerning well-being and health indicators, body image perceptions worsen slightly, and the proportion of students reporting frequent anxiety increases markedly in 2022. Anxiety levels among students increased from 2018 (31%) to 2022 (44%).

Regarding the nationality of the students, Mexico stands out, representing 70% of the sample in 2018 and 72% in 2022. Panama has the lowest proportion of students in the samples for both 2018 and 2022, around 1% in both years, this is due to the higher responses obtained for the student satisfaction with life items. Therefore, this means that there were a more responses to questions regarding students' levels of life satisfaction for Mexico and Spain in 2018 and 2022.

Table 3 presents the average of the explanatory variables in 2018 and 2022 separated by each country included in the analysis. Across countries, substantial heterogeneity emerges. Hong Kong (China) shows relatively low family support indicators and a sense of belonging to school, while Spain consistently exhibits higher levels of school belonging.

In 2022, family support and support for self-directed learning improved in most countries, except in Hong Kong (China), where these indicators remained negative. Hong Kong (China) and the United Arab Emirates show higher levels of urbanization, smaller class sizes, and lower shares of public schools, whereas Mexico and Panama exhibit larger classes and higher public-school attendance. Anxiety levels increased in all countries, particularly in Panama, Mexico, and the United Arab Emirates, reinforcing concerns about adolescents' mental health.

Table 2 Descriptive Statistics of Independent Variables

Variable	2018				2022			
	Average	Standard Deviation	Minimum	Maximum	Average	Standard Deviation	Minimum	Maximum
Individual characteristics								
Gender	0.52	0.50	0.00	1.00	0.52	0.50	0.00	1.00
Age	15.84	0.29	15.25	16.33	15.83	0.29	15.25	16.42
Repetition	0.10	0.30	0.00	1.00	0.08	0.28	0.00	1.00
Family characteristics								
Family Socio-Economic Status	-0.83	1.23	-8.94	5.43	-0.60	1.01	-6.36	8.53
Immigration	1.09	0.39	1.00	3.00	1.09	0.37	1.00	3.00
Father's years of schooling	3.77	1.91	0.00	6.00	5.78	2.64	1.00	10.00
Mother's years of schooling	3.79	1.93	0.00	6.00	5.82	2.67	1.00	10.00
Emotional support from parents perceived by the student	0.11	1.00	-2.45	1.03	-	-	-	-
Family support	-	-	-	-	0.07	1.03	-3.06	1.96
Family support for self-directed learning	-	-	-	-	0.13	0.98	-2.39	2.44
Friends	9.10	9.13	0.00	50.00	6.49	6.69	0.00	50.00
School Characteristics								
Medium City	0.32	0.46	0.00	1.00	0.30	0.46	0.00	1.00
Large City	0.26	0.44	0.00	1.00	0.19	0.39	0.00	1.00
Megacity	-	-	-	-	0.06	0.23	0.00	1.00
Public	0.76	0.43	0.00	1.00	0.77	0.42	0.00	1.00
Class Size	39.27	11.45	13.00	53.00	35.74	11.19	13.00	53.00
Bullying	-0.06	0.98	-0.78	3.86	-0.42	0.94	-1.23	4.69
Sense of belonging to the school	0.13	1.10	-3.26	2.78	-0.04	1.10	-3.26	2.78
Feedback from teachers perceived by the student	-0.02	1.03	-1.64	2.02	-	-	-	-
Quality of student-teacher relationships	-	-	-	-	0.26	1.03	-6.49	3.42
Disciplinary climate in test language lessons	-0.06	0.95	-2.71	2.03	0.15	0.91	-2.49	1.85
Wellness and Health characteristics								
Body Image	0.09	1.04	-2.41	1.84	-0.15	1.05	-2.63	2.08
Feeling anxious	0.31	0.46	0.00	1.00	0.44	0.50	0.00	1.00
Regional Characteristics								
Panama	0.005	0.07	0.00	1.00	0.01	0.07	0.00	1.00
Mexico	0.70	0.46	0.00	1.00	0.72	0.45	0.00	1.00
Spain	0.23	0.42	0.00	1.00	0.22	0.42	0.00	1.00
Hong Kong (China)	0.03	0.18	0.00	1.00	0.02	0.14	0.00	1.00
United Arab Emirates	0.04	0.19	0.00	1.00	0.03	0.16	0.00	1.00

Source: Own elaboration from PISA.

Table 3 Average Statistics of Independent Variables separated by selected countries

Variable	Panama	Mexico	Spain 2018	Hong Kong (China)	United Arab Emirates
Individual characteristics					
Gender	0.52	0.52	0.52	0.56	0.60
Age	15.82	15.85	15.84	15.74	15.82
Repetition	0.16	0.06	0.21	0.13	0.06
Family characteristics					
Family Socio-Economic Status	-0.86	-1.20	0.10	-0.35	-0.09
Immigration	1.14	1.01	1.13	1.51	2.02
Father's years of schooling	3.94	3.62	4.12	3.52	5.29
Mother's years of schooling	4.12	3.52	4.36	3.38	5.04
Emotional support from parents perceived by the student	-0.07	0.14	0.09	-0.28	0.20
Friends	10.27	9.60	8.18	5.79	8.41
School Characteristics					
Medium City	0.29	0.34	0.25	0.34	0.28
Large City	0.15	0.29	0.10	0.46	0.40
Public	0.66	0.85	0.65	0.08	0.32
Class Size	38.28	43.35	29.80	27.83	31.11
Bullying	0.12	-0.02	-0.23	0.09	0.16
Sense of belonging to the school	-0.09	0.04	0.53	-0.35	0.02
Feedback from teachers perceived by the student	0.10	0.01	-0.19	0.14	0.43
Disciplinary climate in test language lessons	-0.23	-0.06	-0.19	0.32	0.38
Wellness and Health characteristics					
Body Image	0.34	0.10	0.08	-0.21	0.31
Feeling anxious	0.31	0.33	0.23	0.35	0.38
No. Observations	536	2,411	12,979	2,573	8,658
Variable 2022					
Individual characteristics					
Gender	0.50	0.52	0.52	0.55	0.55
Age	15.86	15.84	15.80	15.81	15.86
Repetition	0.11	0.06	0.15	0.11	0.06
Family characteristics					
Family Socio-Economic Status	-0.61	-0.86	0.13	-0.10	-0.19
Immigration	1.09	1.02	1.17	1.48	2.01
Father's years of schooling	6.51	5.54	6.47	5.33	8.00
Mother's years of schooling	6.82	5.35	7.00	5.06	7.53
Family support	0.17	0.05	0.16	-0.24	0.25
Family support for self-directed learning	0.37	0.15	0.08	-0.53	0.42
Friends	7.71	6.37	6.82	5.34	7.32
School Characteristics					
Medium City	0.22	0.31	0.26	0.29	0.29
Large City	0.06	0.20	0.11	0.46	0.40
Megacity	0.10	0.07	0.01	0.03	0.03
Public	0.62	0.84	0.65	0.10	0.31
Class Size	32.51	39.22	26.10	26.84	29.24
Bullying	-0.38	-0.43	-0.40	-0.48	-0.27
Sense of belonging to the school	-0.10	-0.13	0.31	-0.40	-0.11
Quality of student-teacher relationships	0.38	0.29	0.20	0.03	0.15
Disciplinary climate in test language lessons	0.13	0.20	-0.06	0.38	0.26
Wellness and Health characteristics					
Body Image	0.07	-0.17	-0.10	-0.30	0.07
Feeling anxious	0.48	0.47	0.33	0.40	0.48
No. Observations	417	2,558	12,046	1,893	8,631

Source: Own elaboration from PISA.

5 DETERMINANTS OF THE LEVEL OF STUDENTS' LIFE SATISFACTION

In this topic, the results of the Ordered Logit Model for student well-being in the selected countries are analyzed. Table 4 reports the estimated effects for the pooled sample in 2018 and 2022. Consistent with the descriptive evidence, across both years, being female is associated with lower life satisfaction, and this negative effect becomes stronger in 2022. Socio-economic status has a positive and statistically significant effect, indicating that students from more advantaged households tend to report higher life satisfaction. Parental education shows mixed effects, while indicators of emotional and family support exhibit strong and positive associations with students' well-being, underscoring the importance of the family environment. The number of close friends also has a consistently positive and significant impact on life satisfaction.

School characteristics show heterogeneous effects, but play a central role. Experiences of bullying significantly reduce students' life satisfaction in both years, with a stronger impact observed in 2022. Conversely, a higher sense of belonging to school emerges as one of the most influential positive determinants across both waves. Teacher-related variables also matter: feedback from teachers in 2018 and the quality of student–teacher relationships in 2022 are positively associated with life satisfaction.

Health and emotional well-being indicators show the largest effects. A positive body image substantially increases life satisfaction, whereas frequent feelings of anxiety strongly and negatively affect students' reported well-being in both periods.

Furthermore, the estimated results impacts indicate some heterogeneity between countries, although in general, the estimated effects have the same direction, as shown in Table 5, which presents the estimates for each country. Although the direction of most effects is similar, their magnitude and significance vary.

Gender has a consistently negative effect on life satisfaction in almost all countries, particularly in Mexico, Spain, and the United Arab Emirates, while it is weaker and often insignificant in Panama. Family socio-economic status is especially relevant in Mexico and Spain, while family support variables in 2022 are significant and positive across all countries. School environment variables remain important at the national level. Bullying has a significant negative impact on life satisfaction in all countries, with stronger effects observed in 2022, with large coefficients in Mexico and Spain 2022. The sense of belonging to school is consistently one of the strongest positive predictors, particularly in Hong Kong (China) and Panama. In 2022, the quality of student–teacher relationships is statistically significant in all countries, underscoring the importance of supportive interactions within schools.

Table 4 Estimated effects on student life satisfaction in selected countries

Variable	Coefficient	Standard Error	Coefficient	Standard Error
Individual Characteristics				
Gender	– 0.245***	0.059	– 0.453***	0.061
Age	– 0.044	0.109	– 0.081	0.097
Repetition	0.232**	0.106	– 0.041	0.095
Family Characteristics				
Family Socio-Economic Status	0.210***	0.033	0.147***	0.048
Immigration	– 0.096*	0.058	0.063	0.066
Father's years of schooling	– 0.044***	0.015	0.007	0.015
Mother's years of schooling	– 0.020	0.018	– 0.033***	0.011
Emotional support from parents perceived by the student	0.390***	0.030	–	
Family support	–		0.275***	0.038
Family support for self-directed learning	–		0.262***	0.040
Friends	0.019***	0.003	0.024***	0.005
School Characteristics				
Medium City	– 0.070	0.071	– 0.132*	0.069
Large City	– 0.239***	0.073	– 0.277***	0.086
Megacity	–		– 0.482***	0.102
Public	0.058	0.063	0.061	0.071
Class Size	0.008**	0.003	– 0.002	0.003
Bullying	– 0.158***	0.030	– 0.300***	0.032
Sense of belonging to the school	0.213***	0.028	0.227***	0.034
Feedback from teachers perceived by the student	0.093***	0.028	–	
Quality of student-teacher relationships	–		0.233***	0.031
Disciplinary climate in test language lessons	0.095***	0.031	– 0.066*	0.036
Wellness and Health characteristics				
Body Image	0.517***	0.041	0.570***	0.031
Feeling anxious	– 0.525***	0.053	– 0.798***	0.050
Regional Characteristics				
Mexico	0.222	0.151	0.595***	0.143
Spain	– 0.963***	0.156	– 0.289**	0.128
Hong Kong (China)	– 1.083***	0.164	– 0.008	0.155
United Arab Emirates	– 0.870***	0.176	– 0.084	0.143
Statistics				
No. Observations	27,157		25,545	
R ²	0.091		0.113	

Source: Own elaboration from PISA. Note: (*) Significant at 10%; (**) Significant at 5%; (***) Significant at 1%.

Table 5 Estimated effects on students' life satisfaction separated by selected countries

Variable	Panama		Mexico		Spain		Hong Kong (China)		United Arab Emirates	
	Coefficient	Standard Error	Coefficient	Standard Error	Coefficient	Standard Error	Coefficient	Standard Error	Coefficient	Standard Error
2018										
Individual Characteristics										
Gender	-0.069	0.237	-0.239***	0.084	-0.204***	0.047	-0.100	0.073	-0.395***	0.052
Age	-0.317	0.387	-0.071	0.150	0.070	0.077	-0.238	0.159	-0.173**	0.086
Repetition	0.048	0.326	0.411	0.255	0.113	0.074	-0.009	0.134	0.027	0.095
Family Characteristics										
Family Socio-Economic Status	0.093	0.103	0.241***	0.043	0.130***	0.033	0.070	0.052	0.101***	0.027
Immigration	-0.208	0.183	-0.311	0.536	-0.078*	0.043	-0.031	0.061	-0.077*	0.040
Father's years of schooling	-0.026	0.055	-0.069***	0.022	0.019	0.016	-0.045*	0.026	-0.021	0.026
Mother's years of schooling	-0.075	0.069	-0.019	0.025	-0.029**	0.014	0.053**	0.024	-0.052***	0.019
Emotional support from parents perceived by the student	0.350***	0.110	0.391***	0.043	0.394***	0.025	0.459***	0.054	0.338***	0.030
Friends	0.034***	0.012	0.021***	0.004	0.010**	0.004	0.016*	0.009	0.016***	0.003
School Characteristics										
Medium City	-0.503**	0.230	-0.038	0.110	-0.187***	0.054	-0.110	0.140	0.008	0.070
Large City	-0.490	0.322	-0.217**	0.103	-0.275***	0.079	-0.225*	0.129	-0.203***	0.070
Public	0.321	0.335	0.103	0.135	-0.068	0.061	-0.130	0.133	0.242***	0.078
Class Size	-0.009	0.007	0.009	0.006	0.005	0.003	0.013*	0.007	0.007**	0.003
Bullying	-0.201**	0.100	-0.159***	0.040	-0.145***	0.035	-0.087**	0.036	-0.178***	0.032
Sense of belonging to the school	0.388***	0.140	0.204***	0.042	0.257***	0.022	0.444***	0.083	0.263***	0.035
Feedback from teachers perceived by the student	0.158*	0.083	0.095**	0.041	0.087***	0.025	0.104*	0.054	0.099***	0.025
Disciplinary climate in test language lessons	0.188*	0.101	0.086*	0.049	0.088***	0.023	0.120**	0.054	0.129***	0.030
Wellness and Health characteristics										
Body Image	0.324***	0.115	0.517***	0.056	0.560***	0.031	0.474***	0.066	0.379***	0.031
Feeling anxious	-0.037	0.235	-0.490	0.071	-0.629***	0.068	-0.969***	0.089	-0.477***	0.050
Statistics										
No. Observations	536		2,411		12,979		2,573		8,658	
R ²	0.091		0.082		0.077		0.077		0.065	
2022										
Individual Characteristics										
Gender	-0.409*	0.231	-0.510***	0.084	-0.315***	0.045	-0.222***	0.079	-0.383***	0.050
Age	-0.682*	0.402	-0.093	0.131	-0.021	0.074	-0.090	0.160	-0.029	0.081
Repetition	0.251	0.463	0.015	0.159	-0.092	0.082	-0.101	0.170	0.128	0.103
Family Characteristics										
Family Socio-Economic Status	0.194	0.169	0.158***	0.059	0.176***	0.042	0.171***	0.063	0.106***	0.032
Immigration	-0.101	0.259	0.863***	0.264	-0.110*	0.063	-0.178**	0.070	-0.081**	0.038
Father's years of schooling	0.062	0.053	0.010	0.020	0.002	0.011	0.071**	0.029	0.009	0.016
Mother's years of schooling	-0.047	0.055	-0.045***	0.015	-0.002	0.010	0.026	0.023	-0.010	0.012
Family support	0.290**	0.123	0.289***	0.048	0.211***	0.031	0.302***	0.055	0.138***	0.027
Family support for self-directed learning	0.110	0.117	0.304***	0.055	0.122***	0.030	0.065	0.050	0.180***	0.027
Friends	0.028***	0.011	0.025***	0.007	0.022***	0.005	0.012	0.012	0.013***	0.004
School Characteristics										
Medium City	0.117	0.430	-0.195**	0.093	0.077	0.065	-0.314**	0.136	-0.065	0.082
Large City	0.096	0.534	-0.371***	0.112	0.043	0.091	-0.207	0.139	-0.095	0.066
Megacity	0.518	0.421	-0.513***	0.113	-0.350	0.226	-0.105	0.140	-0.370***	0.136
Public	0.319	0.386	0.057	0.129	0.014	0.055	-0.026	0.075	0.431***	0.067
Class Size	-0.020	0.019	-0.001	0.004	-0.002	0.003	-0.015**	0.007	0.003	0.003
Bullying	-0.128	0.125	-0.331***	0.042	-0.248***	0.034	-0.095**	0.042	-0.156***	0.025
Sense of belonging to the school	0.291***	0.093	0.237***	0.046	0.226***	0.030	0.491***	0.086	0.257***	0.030
Quality of student-teacher relationships	0.303***	0.118	0.224***	0.042	0.283***	0.031	0.227***	0.070	0.229***	0.027
Disciplinary climate in test language lessons	-0.015	0.129	-0.094*	0.050	-0.009	0.030	0.183***	0.054	0.074***	0.026
Wellness and Health characteristics										
Body Image	0.222*	0.128	0.554***	0.041	0.697***	0.029	0.489***	0.065	0.391***	0.029
Feeling anxious	-0.906***	0.211	-0.820***	0.066	-0.677***	0.062	-0.656***	0.090	-0.596***	0.051
Statistics										
No. Observations	417		2,558		12,046		1,893		8,631	
R ²	0.090		0.120		0.105		0.077		0.074	

Source: Own elaboration from PISA. Note: (*) Significant at 10%; (**) Significant at 5%; (***) Significant at 1%.

6 EXPLAINING GENDER DISPARITIES IN ADOLESCENTS' LIFE SATISFACTION: OAXACA-BLINDER DECOMPOSITION

Based on the results of the Ordered Logit model, heterogeneity between genders was observed in the five selected countries. To rigorously examine the persistent gender gap in life satisfaction, a core focus of this comparative study, we employ the Oaxaca-Blinder decomposition method. This method allows us to rigorously dissect the observed gender gap in life satisfaction within each country, separating the portion attributable to differences in observed characteristics (e.g., family support, school belonging) from the unexplained portion, which may reflect structural differences, unobserved factors, or differential returns to these characteristics for boys and girls. This analytical step provides a deeper, standardized comparative lens across the United Arab Emirates, Spain, Hong Kong (China), Mexico, and Panama, moving beyond average effects to understand the structure of gender inequality in subjective well-being within each national context.

To apply the Oaxaca-Blinder decomposition, we first estimate a Logit model and then decompose it. The Logit model belongs to the family of qualitative response models, where the explained variable is binary, being 1 for the specific condition and 0 otherwise. In this study, students with life satisfaction equal to or greater than 8 were considered 1; the others, 0. The dependent variables are the same as those in the Ordered Logit model, in Table 1. Greene (2012) describes the Logit model as follows:

$$\text{Prob}(Y = 1|x) = \frac{\exp(x'\beta)}{1 + \exp(x'\beta)} = \Lambda(x'\beta) \quad (4)$$

Where x is the vector of explanatory variables, β is the vector of parameters and Λ is the notation used to indicate the cumulative logistic distribution function.

The Oaxaca-Blinder decomposition allows us to decompose the difference between two groups into a part that is explained by differences in observed characteristics and a part that is explained by differences in the effects associated with these variables. According to Powers et al. (2011), the average difference in Y between groups A and B can be decomposed as:

$$\begin{aligned} \bar{Y}_A - \bar{Y}_B &= \bar{F}(X_A\beta_A) - \bar{F}(X_B\beta_B) \\ &= \underbrace{\{ \bar{F}(X_A\beta_A) - \bar{F}(X_B\beta_A) \}}_E + \underbrace{\{ \bar{F}(X_B\beta_A) - \bar{F}(X_B\beta_B) \}}_C \end{aligned} \quad (5)$$

Where Y denotes the vector of $N \times 1$ dependent variables, X is an $N \times K$ matrix of independent variables, and β is a vector of $K \times 1$ coefficients. $F(\cdot)$ is any once differentiable function that maps a linear combination of $X(X\beta)$ to Y .

For the Logit function, we can rewrite equation 5 as follows:

$$\begin{aligned} \bar{Y}_A - \bar{Y}_B &= \frac{e^{X\beta}}{1 + e^{X\beta}} (X_A\beta_A) - \frac{e^{X\beta}}{1 + e^{X\beta}} (X_B\beta_B) \\ &= \underbrace{\left\{ \frac{e^{X\beta}}{1 + e^{X\beta}} (X_A\beta_A) - \frac{e^{X\beta}}{1 + e^{X\beta}} (X_B\beta_A) \right\}}_E \\ &\quad + \underbrace{\left\{ \frac{e^{X\beta}}{1 + e^{X\beta}} (X_B\beta_A) - \frac{e^{X\beta}}{1 + e^{X\beta}} (X_B\beta_B) \right\}}_C \end{aligned} \quad (6)$$

The component labelled E refers to that part of the differential attributable to differences in endowments or characteristics, often called the explained component or trait effects. The component C refers to that part of the differential attributable to differences in coefficients or effects, often called the unexplained component or coefficient effects.

Using the Oaxaca-Blinder methodology, the Table 6 shows that gender differences increased between 2018 and 2022 in all countries. In most cases, only a relatively small share of the gap is explained by differences in observed characteristics, while the majority remains unexplained, reflecting differences in coefficients and unobserved factors.

Table 6 Oaxaca-Blinder decomposition of gender differences in life satisfaction in selected countries

Country	2018			2022		
	Explained	Not Explained	Total	Explained	Not Explained	Total
Panama	0.008 (261.54%)	- 0.005 (- 161.54%)	0.003 (100%)	0.059** (41.32%)	0.084* (58.68%)	0.144*** (100%)
Individual	0.007 (245.82%)	- 0.031 (- 1072.78%)	- 0.024 (- 826.96%)	0.008 (5.047%)	- 1.376 (- 956.37%)	- 1.368 (- 950.90%)
Family	0.006 (198.87%)	- 0.028 (- 967.25%)	- 0.022 (- 768.28%)	- 0.014 (- 9.75%)	- 0.392 (- 272.19%)	- 0.406 (- 281.94%)
School	- 0.005 (- 163.83%)	- 0.002 (- 74.42%)	- 0.007 (- 238.25%)	0.009 (5.92%)	0.271 (188.25%)	0.279 (194.17%)
Wellness and Health	- 0.0001 (- 19.43%)	- 0.0003 (- 8.89%)	- 0.0001 (- 28.32%)	0.057 (39.69%)	0.088 (61.02%)	0.145 (100.71%)
Mexico	0.029*** (37.35%)	0.048*** (62.65%)	0.077*** (100%)	0.061*** (33.46%)	0.122*** (66.54%)	0.184*** (100%)
Individual	0.00004 (0.06%)	- 0.541 (- 706.38%)	- 0.541 (- 706.32%)	- 0.001 (- 0.55%)	- 0.336 (- 182.74%)	- 0.337 (- 183.29%)
Family	0.010 (13.48%)	- 0.001 (- 1.64%)	0.009 (11.84%)	0.005 (2.87%)	0.186 (101.32%)	0.191 (104.19%)
School	- 0.003 (- 3.81%)	- 0.026 (- 33.74%)	- 0.029 (- 37.55%)	- 0.002 (- 1.01%)	- 0.040 (- 21.80%)	- 0.042 (- 22.81%)
Wellness and Health	0.021 (27.61%)	0.021 (27.45%)	0.042 (55.06%)	0.059*** (32.14%)	0.029 (23.12%)	0.088 (55.26%)
Spain	0.032*** (43.69%)	0.041*** (56.31%)	0.073*** (100%)	0.108*** (58.90%)	0.075*** (41.10%)	0.184*** (100%)
Individual	0.001 (0.75%)	1.453 (1994.58%)	1.454 (1995.33%)	- 0.001 (- 0.38%)	0.316 (172.37%)	0.316 (171.99%)
Family	- 0.012 (- 16.03%)	- 0.035 (- 47.74%)	- 0.046 (- 63.77%)	0.005 (2.79%)	- 0.086 (- 46.65%)	- 0.080 (- 43.86%)
School	0.001 (1.81%)	0.043 (59.48%)	0.045 (61.29%)	0.015 (8.25%)	- 0.032 (- 17.19%)	- 0.016 (- 8.94%)
Wellness and Health	0.042*** (57.17%)	0.010 (14.23%)	0.052 (71.40%)	0.089*** (48.22%)	0.030 (16.45%)	0.119 (64.67%)
Hong Kong (China)	0.016 (77.18%)	0.005 (22.82%)	0.021 (100%)	0.012 (15.75%)	0.064*** (84.25%)	0.076*** (100%)
Individual	0.002 (8.00%)	- 0.357 (- 1736.00%)	- 0.355 (- 1744.00%)	0.0002 (0.30%)	0.742 (972.12%)	0.742 (972.42%)
Family	- 0.025 (119.28%)	0.033 (156.28%)	0.008 (37.00%)	- 0.008 (- 10.54%)	0.088 (115.46%)	0.080 (104.92%)
School	0.006 (28.86%)	- 0.103 (- 485.15%)	- 0.097 (- 456.29%)	- 0.002 (- 3.06%)	- 0.189 (- 247.64%)	- 0.191 (- 250.70%)
Wellness and Health	0.034*** (159.59%)	- 0.012 (- 57.60%)	0.022 (101.99%)	0.022*** (29.06%)	0.028 (37.13%)	0.051 (66.19%)
United Arab Emirates	- 0.033** (- 47.93%)	0.101*** (147.93%)	0.068*** (100%)	0.022** (18.74%)	0.094*** (81.26%)	0.116*** (100%)
Individual	- 0.0003 (- 0.42%)	0.191 (280.69%)	0.191 (280.27%)	0.00001 (0.01%)	0.560 (482.09%)	0.560 (482.10%)
Family	0.002 (2.37%)	0.093 (136.64%)	0.095 (139.01%)	0.009 (8.12%)	- 0.059 (- 50.51%)	- 0.049 (- 42.39%)
School	- 0.042 (- 61.12%)	- 0.011 (- 15.98%)	- 0.053 (- 77.10%)	- 0.015 (- 12.94%)	0.026 (22.28%)	0.011 (9.34%)
Wellness and Health	0.008*** (11.23%)	0.004 (5.72%)	0.012 (16.95%)	0.027*** (23.55%)	0.031 (26.60%)	0.058 (50.15%)
All	0.031*** (39.71%)	0.047*** (60.29%)	0.078*** (100%)	0.071*** (39.91%)	0.108*** (60.09%)	0.179*** (100%)
Individual	0.0005 (0.59%)	0.221 (283.71%)	0.221 (284.30%)	- 0.001 (- 0.42%)	- 0.166 (- 92.96%)	- 0.167 (- 93.38%)
Family	0.003 (3.95%)	0.033 (42.15%)	0.036 (46.10%)	0.007 (3.93%)	- 0.002 (- 1.09%)	0.005 (2.84%)
School	- 0.003 (3.19%)	0.010 (42.44%)	0.007 (9.25%)	0.003 (1.42%)	- 0.028 (- 15.68%)	- 0.026 (- 14.26%)
Wellness and Health	0.026*** (32.97%)	0.015 (19.09%)	0.041 (52.06%)	0.063*** (35.16%)	0.038 (21.40%)	0.101 (56.56%)

Source: Own elaboration from PISA. Note: (*) Significant at 10%; (**) Significant at 5%; (***) Significant at 1%.

In 2018, explained components are mainly driven by wellness and health variables, particularly body image and anxiety, as well as by school-related factors such as bullying and sense of belonging. In 2022, the contribution of wellness and health variables became even more pronounced, indicating that rising anxiety and changes in body image perceptions play a key role in widening gender gaps in life satisfaction. Across countries, Tables 7 and 8 in the Appendix, school-related factors, particularly sense of belonging and bullying, account for a substantial share of the explained component. Family characteristics also contribute, especially in 2022, reflecting the growing importance of family support. In contrast, the unexplained component is largely driven by differences in coefficients related to individual and school characteristics, suggesting structural gender disparities in how students experience and internalize school and family environments. Overall, the analysis confirms the central importance of school climate, family support, and mental health in shaping students' subjective well-being and highlights persistent and growing gender inequalities that are not fully accounted for by observable characteristics.

7 DISCUSSION

The findings of this study reinforce the growing body of literature emphasizing that adolescents' subjective well-being is a multidimensional phenomenon shaped by individual characteristics, family context, school environment, and mental health conditions. Firstly, across the five countries analyzed, life satisfaction among students exhibits substantial variation, reflecting not only differences in socioeconomic and cultural contexts but also disparities in school environments and support systems. It is observed that the Asian countries included in the analysis have lower levels of satisfaction compared to other countries. This highlights a potential trade-off between academic rigor and holistic student development in certain cultural contexts. This result was also found in the work of Su and Lee (2023), where the authors highlight that school systems in Asian countries are more effective in producing students' academic performance, but relatively ineffective in supporting their well-being.

Consistent with a substantial body of evidence (Borchers & Cunha, 2023; Navarro et al., 2015; Varela et al., 2018; Tang, 2019), our results confirm the profoundly negative impact of bullying on life satisfaction. Furthermore, a strong sense of belonging to school emerges as a positive determinant, reinforcing the conclusions of Borchers and Cunha (2023), Guess and McCane-Bowling (2016), Huang (2020), and Kuhn et al. (2021) on the importance of connectedness and positive school relationships for adolescent well-being.

The positive role of family socio-economic status, parental support, and teacher feedback in enhancing life satisfaction resonates with the work of Borchers and Cunha (2023), Cho (2019) and Chung et al. (2022), Kuhn et al. (2021), Marquez and Long (2021), Marquez and Main (2021), and Rudolf (2020), emphasizing that adolescent well-being is anchored in supportive personal, familial, and school relationships. Interestingly, the negative association between school location in larger urban areas and well-being echoes findings that less dense environments may offer a less stressful lifestyle (Borchers & Cunha, 2023; Cho, 2019).

Gender differences represent one of the most robust and concerning findings of the study. Across countries and time periods, girls consistently report lower levels of life satisfaction than boys, a pattern well-documented in international studies (Marquez & Long, 2021;

Rudolf, 2020). The Oaxaca-Blinder decomposition adds nuance, showing that a large portion of this gap remains "unexplained" by standard variables, particularly mental health variables such as anxiety and body image concerns. This "unexplained" component suggests the influence of deeper, unmeasured factors such as gendered emotional socialization, internalized societal pressures, and potentially differential reporting biases, as discussed by Batz and Tay (2018), Esidio et al. (2023), and Orben et al. (2022). The persistence and, in some cases, widening of gender inequalities over time indicate that improvements in observable conditions may not be sufficient to eliminate disparities in well-being without addressing these underlying processes.

Thus, the results presented in this work demonstrate that the new coronavirus pandemic has presented new challenges for students, in addition to the already recognized low academic performance, which experts have identified as one of the main consequences of this prolonged period of interruption in face-to-face activities. The dramatic rise in reported anxiety from 2018 to 2022, alongside an overall decline in life satisfaction, underscores the profound impact of the pandemic on adolescent mental health. This period disrupted routines, limited social contact, and introduced new uncertainties, exacerbating existing vulnerabilities and creating new challenges for student well-being. Therefore, it is necessary to consider a new model of education for the future, aiming to mitigate the process of school dropout and the negative effects on school performance and student well-being.

8 CONCLUSION

This work aimed to verify the impacts of the main determinants of life satisfaction among 15 to 16-year-old students in the 5 (five) selected countries, using the Ordered Logit model and the 2015 and 2018 PISA databases carried out by the OECD, with particular attention to gender disparities in subjective well-being. By combining Ordered Logit estimations with Oaxaca-Blinder decomposition, the analysis provides a comprehensive view of both the factors associated with adolescents' well-being and the mechanisms underlying persistent gender gaps. The findings clearly demonstrate that adolescents' subjective well-being is influenced by a broad set of interrelated factors, spanning family background, school environment, and mental health. The study also extends the comparative literature by highlighting specific contextual patterns, such as the lower well-being in the Asian context examined and the significant role of school climate factors in explaining cross-country differences.

Among these dimensions, school climate stands out as particularly influential. Experiences of bullying and weak school belonging consistently undermine students' life satisfaction, while positive relationships with teachers and peers act as protective factors. Family support also plays an important role, suggesting that policies aimed at strengthening parental engagement and emotional support can have meaningful effects on adolescents' well-being. In addition, the growing importance of anxiety and body image concerns highlights the need to integrate mental health support more firmly into educational systems.

By applying the Oaxaca-Blinder decomposition, the research extends the literature by quantifying the gender gap in well-being, revealing that it is largely attributable to unexplained factors, suggesting deep-seated structural and social influences. The comparative analysis also highlights specific cultural and systemic challenges, particularly the lower well-being associated with high-performance academic systems in some Asian contexts.

The post-pandemic landscape, marked by elevated anxiety and diminished life satisfaction, necessitates a reimagined approach to education, one that intentionally integrates well-being promotion with academic learning. To improve student well-being, educational systems

should: (1) enhance and formalize parental engagement and support structures within schools; (2) implement robust, preventative anti-bullying programs; (3) actively foster students' sense of school belonging by ensuring their voices are heard and promoting positive peer and staff relationships; and (4) develop gender-sensitive support mechanisms that address the distinct emotional and academic pressures faced by boys and girls. Moving beyond a one-size-fits-all approach to incorporate these targeted, context-aware interventions is crucial for fostering equitable and supportive educational environments that promote both academic success and holistic well-being.

Overall, this study contributes to the international literature by providing comparative evidence on the determinants of adolescent life satisfaction and by highlighting the growing relevance of mental health and gender inequalities. Future research could further explore the mechanisms underlying the unexplained gender gap and investigate how specific school policies and cultural contexts may mitigate or exacerbate disparities in adolescent well-being.

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APPENDIX

See Tables 7 and 8.

Table 7 Oaxaca-Blinder decomposition of gender differences in life satisfaction in selected countries disaggregated by variable – 2018

Variable	Panama	Mexico	Spain Explained	Hong Kong (China)	United Arab Emirates
Individual Characteristics					
Age	– 0.001	0.00002	– 0.001**	– 0.002	– 0.0004
Repetition	0.008	0.00002	0.001	0.003	0.0001
Family Characteristics					
Family Socio-Economic Status	– 0.001	0.004***	– 0.003*	– 0.014	– 0.001
Immigration	– 0.002	–	– 0.0002**	0.000	– 0.005**
Father's years of schooling	– 0.00004	– 0.001	– 0.001	– 0.002	0.0003
Mother's years of schooling	0.001	0.000	0.0002	– 0.001	0.0002
Emotional support from parents perceived by the student	– 0.0004	– 0.006***	– 0.011***	– 0.013***	– 0.005***
Friends	0.008	0.013***	0.003*	0.003	0.012***
School Characteristics					
Medium City	0.004	0.000	– 0.0001*	– 0.003	0.0001
Large City	0.0004	0.0002	– 0.0001	0.003*	– 0.003
Public	0.0004	0.00002	– 0.00001	– 0.0002	– 0.004
Class Size	0.003	– 0.0004	– 0.001	0.001	– 0.004
Bullying	– 0.010	– 0.003**	– 0.002*	– 0.001	– 0.022***
Sense of belonging to the school	– 0.001	0.002**	0.004***	0.001***	– 0.004***
Feedback from teachers perceived by the student	0.001	0.0004	0.001	0.006***	0.001
Disciplinary climate in test language lessons	– 0.001	– 0.002*	– 0.001**	0.0004	– 0.006***
Wellness and Health characteristics					
Body Image	0.004	0.018***	0.034***	0.014***	– 0.003***
Feeling anxious	– 0.004	0.003**	0.008***	0.020***	0.011***
Variable Not Explained					
Individual Characteristics					
Age	– 0.033	– 0.534	1.450**	– 0.362	0.191
Repetition	0.002	– 0.007	0.003	0.005	0.001
Family Characteristics					
Family Socio-Economic Status	– 0.0002	0.014	– 0.003	0.001	0.000
Immigration	– 0.001	–	– 0.037	– 0.003	– 0.032
Father's years of schooling	– 0.009	– 0.001	– 0.0005	0.048	0.093
Mother's years of schooling	– 0.009	– 0.009	0.014	– 0.006	0.033
Emotional support from parents perceived by the student	0.0002	– 0.013	– 0.003	0.003	– 0.010***
Friends	– 0.009	0.008	– 0.004	– 0.010	0.009
School Characteristics					
Medium City	0.010	0.013	0.003	– 0.019	0.007
Large City	0.002	0.009	0.005	– 0.007	0.002
Public	– 0.001	0.035	0.031*	0.001	– 0.015
Class Size	– 0.014	– 0.082	0.010	– 0.071	0.004
Bullying	0.000	0.001	– 0.005	– 0.002	0.001
Sense of belonging to the school	– 0.0001	– 0.0003	– 0.004	0.006	– 0.001
Feedback from teachers perceived by the student	– 0.00004	– 0.0003	0.003	0.004	– 0.009*
Disciplinary climate in test language lessons	0.001	0.0001	0.001	– 0.015	– 0.0003
Wellness and Health characteristics					
Body Image	– 0.002	0.0001	– 0.0004	– 0.006	– 0.004
Feeling anxious	0.001	0.021	0.011	– 0.007	0.008
Constant	0.056	0.595	– 1.431**	0.444	– 0.177

Source: Own elaboration from PISA. Note: (*) Significant at 10%; (**) Significant at 5%; (***) Significant at 1%.

Table 8 Oaxaca-Blinder decomposition of gender differences in life satisfaction in selected countries disaggregated by variable – 2022

Variable	Panama	Mexico	Spain	Hong Kong (China)	United Arab Emirates
Explained					
Individual Characteristics					
Age	0.007	0.0001	– 0.00002	0.0001	– 0.0001
Repetition	0.001	– 0.001	– 0.001	0.0002	0.0001
Family Characteristics					
Family Socio-Economic Status	– 0.0004	0.001	0.0002*	– 0.007*	– 0.001**
Immigration	– 0.003	– 0.003**	0.0002	– 0.0001	– 0.002
Father's years of schooling	0.001	0.0004	– 0.0002	– 0.001	0.001
Mother's years of schooling	0.001	– 0.001	0.00004	– 0.001	– 0.004*
Family support	– 0.014**	– 0.005***	– 0.003***	– 0.003*	– 0.001**
Family support for self-directed learning	– 0.002	0.009***	0.001	– 0.001	0.004***
Friends	0.004	0.004	0.007***	0.005	0.013***
School Characteristics					
Medium City	– 0.0002	– 0.001	– 0.0001	0.002**	– 0.001
Large City	– 0.001	0.001	0.00002	0.002**	– 0.0001
Megacity	– 0.001	0.0001	0.0002	0.007*	– 0.002
Public	0.002	– 0.00004	0.0001	0.0001	– 0.008*
Class Size	0.003	0.0004	– 0.0002	– 0.0004	– 0.002*
Bullying	– 0.004	– 0.003***	0.002***	– 0.013	– 0.008***
Sense of belonging to the school	0.004	0.003***	0.015***	0.002***	0.011***
Quality of student-teacher relationships	0.007	– 0.001	– 0.003***	0.002	– 0.001***
Disciplinary climate in test language lessons	– 0.0003	– 0.001	0.001	– 0.004	– 0.004**
Wellness and Health characteristics					
Body Image	0.010	0.033***	0.066***	0.004***	0.002***
Feeling anxious	0.047***	0.026***	0.023***	0.018***	0.025***
Not Explained					
Individual Characteristics					
Age	– 1.380	– 0.335	0.318	0.736	0.563
Repetition	0.004	– 0.0005	– 0.001	0.006	– 0.003
Family Characteristics					
Family Socio-Economic Status	0.002	0.033	– 0.003	– 0.001	– 0.001
Immigration	– 0.131	0.142	– 0.004	0.032	0.035
Father's years of schooling	– 0.327	0.028	– 0.036	0.032	– 0.022
Mother's years of schooling	0.115	– 0.010	– 0.042	0.015	– 0.080
Family support	0.018	– 0.001	– 0.005*	– 0.001	– 0.006*
Family support for self-directed learning	– 0.040	0.000	– 0.001	0.031***	0.003
Friends	– 0.029	– 0.007	0.005	– 0.019	0.012
School Characteristics					
Medium City	0.016	– 0.024*	– 0.004	– 0.017	0.012
Large City	– 0.001	0.006	0.003	– 0.026	– 0.002
Megacity	– 0.010	0.005	– 0.001	– 0.007	– 0.002
Public	– 0.064	0.045	0.010	0.003	– 0.023
Class Size	0.313*	– 0.080	– 0.042	– 0.125	0.036
Bullying	0.013	0.002	0.001	– 0.007	0.002
Sense of belonging to the school	– 0.003	– 0.002	0.002	– 0.002	0.000
Quality of student-teacher relationships	0.006	– 0.003	0.0002	– 0.00001	– 0.001
Disciplinary climate in test language lessons	0.0001	0.010	0.0001	– 0.009	0.004
Wellness and Health characteristics					
Body Image	– 0.001	0.006	0.008*	– 0.001	0.000
Feeling anxious	0.089	0.037	0.023**	0.029	0.031**
Constant	1.493	0.269	– 0.154	– 0.605	– 0.464

Source: Own elaboration from PISA. Note: (*) Significant at 10%; (**) Significant at 5%; (***) Significant at 1%.

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