Does More Education Lead to More Happiness?

An Exploration of the Relationship between Educational Attainment and Different Measures of Happiness

Pedram Vafadari

Master of Philosophy in Higher Education
Department of Education
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Master's Thesis
30 Credits

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Abstract

This study explores the complex relationship between education and happiness, acknowledging the limitations inherent to establishing direct causal connections. Operationalizing education by formal Educational Attainment and happiness in two different meanings of (1) “Well-being” and (2) “long-term psychological Happiness”, the study delves into the intricate dynamics between education, the satisfaction of Deficiency and Growth needs, and self-reported levels of happiness. Utilizing data from the World Values Survey and additional contextual information, the research first highlights statistically significant correlations between Educational Attainment and various facets of Needs Satisfaction. Notably, it underlines the positive correlation between education and Deficiency Needs Satisfaction, particularly in individuals from lower socioeconomic backgrounds, and identifies a nuanced relationship between Educational Attainment and Esteem Needs Satisfaction. The study also points towards potential links between education and Cognitive Needs Satisfaction, particularly in specific religious or political contexts. However, the relationship between Educational Attainment and long-term psychological Happiness emerges as multifaceted, influenced by cultural contexts and the interplay between Well-being and Happiness. These findings suggest the significance of culture and context in understanding the relationship between education and different dimensions of human Well-being and Happiness, thereby paving the way for further explorations in this interdisciplinary domain.

Keywords: education, happiness, well-being, impact of education on happiness, deficiency needs, growth needs, educational attainment.

To the loving memory of my father,

Kamran Vafadari,

whose voice of reason echoes eternally within my mind.

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1. Introduction

My young friend, when I took you in my arms at your birth and, calling the Supreme Being to be witness of the commitment I dared to contract, dedicated my days to the happiness of yours, did I myself know what I was committing myself to? No, I only knew that in making you happy, I was sure to be.[1]

But of the tree of the knowledge of good and evil, thou shalt not eat of it: for in the day that thou eatest thereof thou shalt surely die.[2]

The importance of the role of knowledge in the current era is almost beyond dispute. The human race is now living in the age of globalized economies and their distinguishing character is being knowledge-based (Varghese, 2013, p.7). Education and in particular higher education is at the very core of this globalized knowledge economy (Altbach, 2013, 316). It could be said that to understand the important role of knowledge, and therefore education and higher education, people who lived through the early 2020s do not need any academic reference. The COVID-19 pandemic and the process of discovery, production, and distribution of vaccination for almost the whole population of the world is a clear indication of the importance of knowledge, and in turn the importance of education. Just looking around you when reading this text can show numerous products of knowledge-based economies that would not be available to you if it were not for the scientific discoveries of the past. More than 70 percent of the participants of the 7th wave of the World Value Survey (WVS), when asked about the role of science in the world, consider its role positive.[3] Knowledge and science have lots of benefits for society. So, it is understandable that society tries to produce, preserve, and disseminate knowledge. Therefore, it needs education and all the educational institutions to do so.

[1] From “Emil or On Education”, by Rousseau, translated by Alan Bloom, 1979, p. 442.
[2] King James Bible, Genesis, Chapter 2, Verse 17.
[3] Extracted from World Values Survey Wave 7 (2017-2022), Results in % by country weighted by w_weight, Study # WVS-2017, v4.0. Question number 163.

However, you do not need to be a scientist to benefit from science. A vaccine saves people regardless of their knowledge about its effect mechanism. Why should an individual want to be a scientist? Why should an individual want to be educated? What is in it for the individual? This is a straightforward question. Yet, it is a very fundamental one.

Why would anyone do anything? Some believe that the answer to this question will eventually reach one word: happiness. According to some thinkers like Barrow (2012) Mill (2022), or Noddings (2003), happiness, in its broadest meaning, might be regarded as the ultimate goal of almost all human actions. Therefore, for many, pursuing Happiness is regarded as one of the basic human rights of individuals in society, as for example mentioned in the United States Declaration of Independence (Declaration of Independence: A Transcription, 2021, pg. 2). It is also the cornerstone of the social agreement for thinkers like Rousseau (Salkever, 1978, p.28). There are even thinkers who believe that the very goal of education should be the happiness of individuals. For example, Rousseau in his book, Emil, emphasizes that the goal of education should indeed be happiness (Gilead, 2012, p. 270). So, it could be argued that the ultimate goal of an individual who wants to be educated is happiness.

But is that the case? Does more education lead to more happiness? In this study, the relationship between education and happiness will be examined.

1.1 Background

The relationship between Knowledge (and therefore education) and happiness can be traced back to Socrates, Plato, and Aristotle in the Western tradition. Aristotle for example, considers knowledge among external goods on which one's happiness is dependent (Barrow, 2012, p.17).

Education, and especially higher education in its current form could be considered built on the ideals of a German thinker in the late 1700s and early 1800s, Wilhelm von Humboldt. At the center of Humboldt's ideas about education is the concept of *Bildung* which could be understood as self-actualization through education and the pursuit of truth (Anderson, 2004, p.52). Among the German philosophers of his age, this understanding of self-actualization, through *Wissenschaft*, was the only true way of salvation of the individual (Anderson, 2004,

p.57 and also Watson, 2010, p.229), a concept that is considered the essence of happiness by some philosophers (Gibbs, 2014). So, in fact, the modern university in its roots arguably does not have the aim of achieving a stronger economy, but to help individuals reach ultimate happiness.

However, soon this “bridge between human and divine worlds”, as Fichte puts it (Anderson, 2004, p.57) proved to be a very productive way of producing science and technology in American universities (see Turner, 2001, also Powell, 2004), and later became the “center of the global knowledge economy” (Altbach, 2013, 316). The individual, their salvation, or happiness is not the main objective of the institution anymore. It could be even argued that the individual, who was regarded as the seeker of truth and salvation in the Humboldtian ideal, has transformed into a mere “pawn” in the game of economy and society (Karseth & Solbrekke, 2016).

But no matter whether they are “independent investigators of truth” or “pawns”, are they happy? Hartog and Oosterbeek (1998) were among the first who stated that it seems that more education does not lead to better health, wealth, or happiness. Since the publication of their work, some other researchers in the field have studied the same topic, yet it seems the scientific jury is still out on the relationship between education and individuals’ happiness.

1.2. The Research Question

With this in mind, the main research question guiding this study is articulated as follows.

What is the relationship between education and happiness?

As will be demonstrated in the Literature Review chapter, the state of the art of knowledge is inconclusive about the relationship between education and happiness. It is argued that this is on a large scale due to different conceptualizations of happiness as well as the complexity of the topic. So, in this study, extra attention is paid to the conceptualizations of happiness, both when discussing the literature and when building the theoretical framework.

Considering the importance of the conceptualization of happiness, this study tries to contribute to the discussions about the topic in two different ways. First, in this research, two different conceptualizations of happiness are being studied at the same time. One of them is a life that is considered good for the person leading it,

which is sometimes called Well-being in the literature. The other one is happiness in a long-term psychological sense which is a state of mind. For the sake of simplicity, the latter is called Happiness throughout this research. The parallel covering of these two different sides of happiness can increase the clarity of the discussions.

The second way in which this study tries to contribute to a better understanding of the relationship between education and individuals' happiness is by providing nuances of the topic by studying a large-scale dataset that covers many different countries all over the world, with the individual as the unit of analysis. This approach provides the possibility of comparison over different cultures as well as different socioeconomic contexts.

1.3. The Relevance

The inconsistencies in the literature regarding the relationship between Education and Happiness might be enough for the academic relevance of any study topic. There is still a gap in knowledge about the relationship between education and happiness.

However, in addition to that it could be argued that this study is socially relevant too. A better understanding of this topic might be beneficial to at least three groups. The first are individuals. They are spending a large portion of their most valuable resource, time, on education almost all over the world. In many cases, the resources spent on education are much more than just time. They deserve to know whether it will result in their happiness or not. The second group is educational organizations such as universities. In their competition for human resources, whether inside the sector (with other universities), or outside the sector (with other industries), they need to have a clear understanding of the value of their services to their clients to be able to absorb a better share of the market. And happiness is arguably valuable to many of such customers. The third group is the society as a whole, or its representatives such as politicians, policymakers, and even academic and public intellectuals. A deep understanding of the relationship between education and happiness has many social implications for each of these groups in regard to the future course of events and their role in it. It could be argued that happiness (in their own meaning) is what individuals are searching for, and the best way to allocate human resources to any task is to give them happiness in return. So, if society needs

knowledge and knowledge producers, it needs to give them what they want. And that probably is happiness. In sum, the relationship between education and happiness is a topic worthy of being explored.

1.4.The Structure of the Thesis

After this short introduction, in the second chapter, Literature Review, a number of conceptual and empirical studies about the complex and diverse concept of happiness and the relationship between education and happiness are examined.

In the third chapter, Theoretical Framework, two main conceptualizations of happiness in this study are introduced. After each conceptualization, its possible relation with education and higher education is examined. Under the discussion of the relationship of education with Well-being two main hypotheses with four specifications are presented. Under the discussion of the relationship between education and (psychological) Happiness, one main hypothesis with three specifications is developed.

The fourth chapter, Research Design and Methodology, starts with the ontological and epistemological underpinnings of the study. After that, the research design and strategy are discussed. Next, the data used in the study, all of the variables and measures, and the data analysis process are explained. Following are the study's limitations and quality discussions. Finally, ethical and political matters in regard to the study are presented.

The fifth chapter is the Results and Discussions. In this chapter, the results of the statistical analysis of each of the hypotheses mentioned in the Theoretical Framework chapter are presented and discussed one by one.

Eventually, in the final chapter, Conclusion, once more the findings of the study in regard to the research question are examined. After that, the theoretical and methodological approach of the study is examined again and a number of potential topics for future studies are suggested.

2. Literature Review

In the following passages, the studied literature around happiness on one side, and education and higher education on the other side, is discussed. In the beginning, the procedure under which the pieces of literature were chosen is elaborated. Next, the findings are examined due to their empirical or conceptual type. Then, different conceptualizations of happiness in the literature are explored. In doing so, first, the ontological as well as epistemological aspects of the concept are discussed. Later, the conceptualizations of the concept of happiness, in the empirical research reviewed in this study are examined. After that, the relationship between education and happiness is discussed.[4] This part consists of two sections. The first section explores, according to the literature, whether happiness could be seen as the ultimate goal of education and higher education. The second section is on the empirical findings about the impact of education, significantly higher education, on happiness. Finally, a summary of the literature review is presented.

2.1. Search, screening, and categorization

To find the most relevant literature using online search engine options, five different yet very similar combinations of phrases were searched on Google Scholar: *happiness and higher education*; *education happiness*; *happiness AND "higher education"*; *happiness AND university*; and finally, *happiness AND education*. Since the relevance of the search results drops after the few first hits, under each search, only the first twenty were examined. Though the search provided exactly one hundred results, due to the recurrence of some similar hits in different searches the total number of distinct pieces of literature was sixty-six.

In the first step of examining the results, the publishing journals of the articles were evaluated under the *Norwegian Register for Scientific Journals*.[5] Articles published in journals labeled as level zero, x, or not mentioned on the website were not examined further. According to the *Register*, there are doubts about the quality of

[4] In this study, the word "education" is used to refer to all sorts of education including "higher education", otherwise specific phrases such as "higher education" or "compulsory education" are used.
[5] https://kanalregister.hkdir.no/publiseringskanaler/Forside.

peer review in these journals and therefore doubts about the quality of articles as such. In the next step, the focus of the articles with journal levels of two and one, in addition to books and book chapters, was extracted. Based on the focus, the items were categorized into high and low relevance to the topic and questions of this study. The high-relevance items were studied in depth for their type, empirical or not, the research methods, the data, the unit of analysis, different conceptualizations of happiness, and the findings of the empirical studies regarding the relationship between (higher) education and happiness. In the following passages, the high-relevance items are discussed. (For a complete overview of all of the sources reviewed, and the screening procedure, consult Appendix A).

The relevant literature could be categorized into two distinct groups: conceptual texts and empirical studies. The conceptual texts examined consist of two books (Barrow 2012, and Noddings 2003), three book chapters (Dearden 2010, Gibbs 2014, Michalos 2017), and three journal articles (Gibbs 2015, Lee 2011, Roberts 2013). All these non-empirical writings, first, examine and define the concept of happiness, and later, try to explore its relevance and its implications for education, sometimes higher education, and schooling.

The empirical studies were, with few exceptions, journal articles. The two exceptions were one governmental report on the impact of education on happiness by Dockery (2010) and an unpublished, yet very interesting, paper by Stefano Castriota (2006) from the Department of Economics at *Universita' Tor Vergata* in Rome. All the empirical studies found, use quantitative methods on national datasets like Netherlands' Brabant Survey (Hartog & Oosterbeek 1998), Household Income, and Labour Dynamics in Australia (HILDA) Survey (Nikolaev & Rusakov 2016, and Nikolaev 2018), and the Chinese General Social Survey (CGSS) (Hu 2015), or regional or international datasets like East Asian Social Survey (EASS) (Chen 2012), European Social Survey (ESS) (Cuñado & de Gracia 2012, Jongbloed 2018), World Value Survey (WVS), and World Bank (Castriota 2006, Kim 2018). While in most cases the unit of analysis is the individual, Chen (2012) and Kim (2018) use different countries as the unit of analysis. In all these articles, the relationship between the education level, usually in terms of obtained degree or years spent on education, happiness as defined in the paper, and in some cases some other factors have been examined.

The extensive length of the literature review, particularly section 2.2, was due to the multifaceted and intricate nature of the concept of happiness. As demonstrated later in the review, the considerable divergence in the literature concerning the relationship between education and happiness stems from varying interpretations and definitions of happiness itself. Later, this exhaustive exploration of the concept of happiness plays a pivotal role in shaping the research framework. It serves to inform the choice of focusing on two distinct conceptualizations, 'Well Being' and 'Happiness', and contributes to the formulation of the hypotheses.

2.2. Concept of Happiness: Complexity and Diversity

According to Standford's Encyclopedia of Philosophy, the word happiness is used in two different senses in philosophical literature (Figure 1). One refers to **a state of mind**, a long-term psychological sense, which is usually related to one of the three major groups of theories: "life satisfaction, pleasure, or a positive emotional condition" (Haybron, 2020). The second one is **a life that is good for the person leading it**. In the latter sense, happiness is a value judgment that is related to well-being. Well-being in this sense is "what is non-instrumentally or ultimately good *for* a person" (Crisp, 2021). There are three main groups of theories regarding happiness in the well-being meaning; "hedonism, desire theories, and objective list theories" (Haybron, 2020, also see Crisp, 2021). While both hedonism and desire theories are in some sense subjective, objective list theories believe in the existence of some objective prudential goods that benefit people regardless of their attitude towards them (Haybron, 2020).[6] Guy Fletcher in his book, *The Philosophy of Well-Being, An Introduction*, adds two other categories to these three; the perfectionist theories of well-being, which could be regarded as a part of objective list theories, and happiness theories of well-being (Fletcher, 2016, p.77 & p.92). The two different usages of the word happiness and their subcategories are presented in Figure 1.

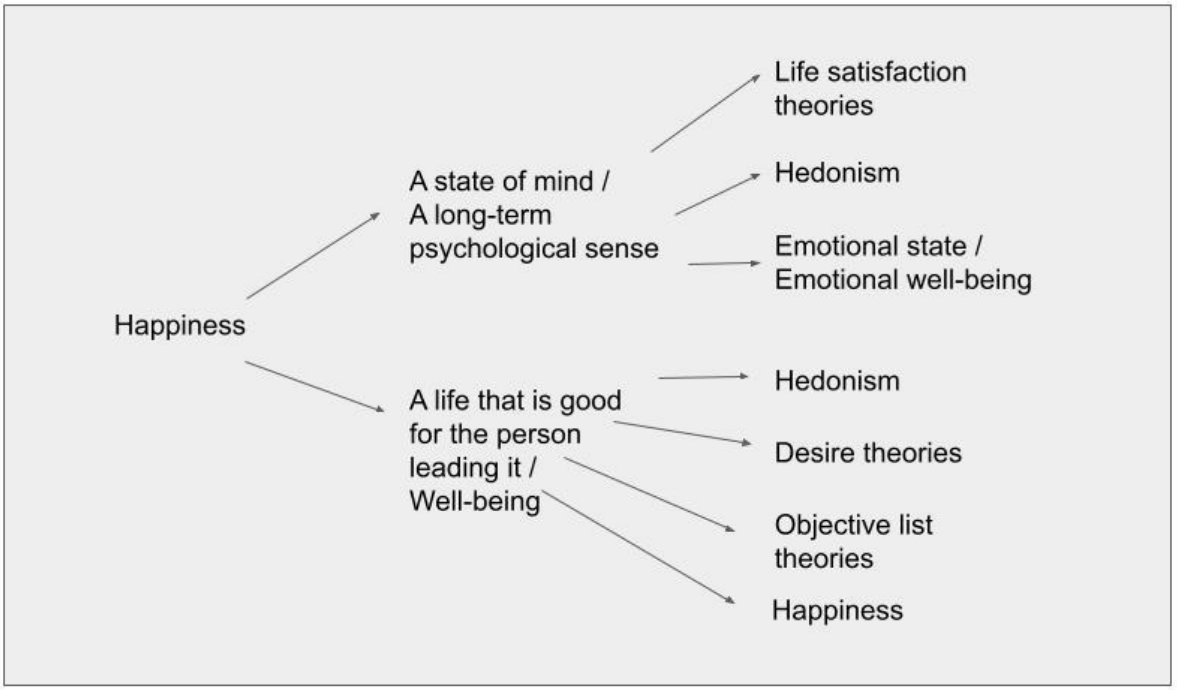
It is not always easy to distinguish the two different usages of the word happiness (long-term psychological sense, and well-being) (Haybron, 2020, sc.1-1). One of the reasons is that both happiness-as-well-being hedonists and long-term

[6] Here, subjective is used as something internal and therefore related to an individual's mind, and objective as something external to an individual's mind. The distinction of the two terms is later discussed in the chapter.

psychological-happiness hedonists identify happiness with the individual's balance of pleasure and pain, or pleasant over unpleasant experience (Haybron, 2020, sc.2-1). Even the term well-being is not necessarily only used for happiness-as-well-being. For example, the third category of theories of psychological happiness, which defines happiness as the general emotional condition of an agent, is often called "emotional well-being" (Haybron, 2020, sc.2-1). Also, there is *subjective well-being* which is one of the examples of a fourth group of views on happiness in the psychological sense which combines the others by identifying happiness with all three of pleasure, life satisfaction, and emotional well-being (Haybron, 2020, sc.2-1).

Figure 1.

Different Philosophical Conceptualizations of Happiness



Note. Based on Fletcher (2016).

It is also important to note that even when the distinction between happiness as a state of mind and happiness as life is clear to authors, the former might be considered a proxy of the latter (Haybron, 2020, sc.2-3). However Hayborn claims that though there is considerable support for the idea that happiness, mainly in the hedonistic approach, is the only important element in human well-being, most philosophers reject "the idea that happiness could suffice for well-being" (Haybron, 2020, sc.4-1). Fletcher also concludes that considering the hedonistic and life-satisfaction theories of happiness, "there is little to recommend a happiness theory of well-being over hedonism" (Fletcher, 2016, p.109).

As mentioned, the conceptualization of happiness is central to both conceptual and empirical studies on the relationship between happiness and education and higher education. While this might be dealt with relatively quickly in some of the empirical articles, the conceptual studies put significant consideration into the issue.

The differences in conceptualizations in the literature around happiness and education could be categorized into two parts; the ontological differences and the epistemological ones. Each of these two is explored in a distinct part in the following passages.

2.2.1. Ontological Differences

In this part, two main questions are going to be discussed. The first question is what is happiness? And the second one is what leads to it, or in other words, what are the practical necessities of happiness? But before going into these two topics, it is important to notice the difference between them.

There is a difference between, on the one hand, the logical necessities of a concept and, on the other hand, the practical necessities of it. Something is a logical necessity of a concept or condition when it is impossible to consider that concept or condition without that specific element. For example, having a child is a logical necessity of parenthood. However, parenthood has many practical necessities which may not be logically necessary for being a parent (for more on this distinction see Barrow, 2012, p.68).

The same difference exists in the concept of happiness. On the one hand, the answer to the question of what happiness is concerns the logical necessities of the concept of happiness. On the other hand, the answer to what leads to happiness tries to specify the practical necessities of the concept. Since the concept of happiness is a complex one, it is not always easy to separate logical and practical necessities. However, in this study, an attempt is made to distinguish between the two, for the sake of clarity.

2.2.1.1. What Is Happiness?

As mentioned before, the word ‘happiness’ is used in different contexts with many different meanings. While hedonists relate happiness to pleasure, many other

authors relate it to the satisfaction of wants and needs. For example, Barrow quotes Von Wright, *"Happiness on such a view is essentially contentedness - an equilibrium between needs and wants on the one hand and satisfaction on the other"* (Barrow, 2012, p.79), a view very much close to Michalos' Multiple Discrepancies Theory, which is related to "perceived discrepancies between what one has and wants" (Michalos, 2017, p.292), or Noddings' view that happiness *"is affected by the satisfaction of needs and wants"* (Noddings, 2003, p.72).

Among the authors in the education field, there are disagreements about two main issues. The *first* dispute is about considering happiness as something internal and therefore subjective, or as something external to the individual's mind and therefore objective. On the one hand, scholars like Michalos, give primacy to the objective reality of the condition of life or well-being of an individual. Michalos discusses that each person's quality of life, well-being, or happiness could be understood as a combination of two factors, their actual conditions and what they make of those conditions or the way they are perceived. The combination of two factors produces four different scenarios: real paradise, real hell, fool's paradise, and fool's hell (Michalos, 2017, p. 280). He states that this idea is based on a realistic foundation that assumes the existence of the real world and therefore considers some perceptions of this reality more reasonable, valid, and reliable than others.

On the other hand, scholars like Dearden (1968), Barrow (2012), and Gibbs (2015) emphasized happiness as something internal and subjective. Dearden's first point in defining happiness is that it *"is a state of mind"* and therefore a subjective reality (Dearden 1968, p.19). Barrow counts two logical necessities for the concept. The first one is that happiness is only possible for creatures with **consciousness**, which is the capacity to examine the situation **from an outside point of view** and to think of alternatives (Barrow, 2012, p.72). This implies that happiness is something in the mind of an individual. That is why Barrow considers indoctrination a possible, though not always necessarily successful, way of reaching happiness since indoctrination *"involves controlling thinking rather than bypassing it or obliterating it"* (2012, p.78). Gibbs parallels happiness with contentment which, to him, is the attunement of one's mood to their being. He defines moods, based on the ideas of Heidegger, as long-term states (of mind) with no, or no specific, object, in contrast with emotions which have specific objects (Gibbs, 2015, p.56). Therefore, for Gibbs

as well, happiness (or contentment) as a state of mind, is something internal and subjective.

This disagreement seems to stem from different words used in the field that though closely related, are slightly different. It seems that while Dearden, Noddings, and Barrow are talking about happiness in the long-term psychological sense based on Haybron's definition, Michalos is more concerned about happiness as a life or well-being. He, therefore, concludes that the quality of life of someone is something in the real world and therefore could be considered objective.

The *second* point is about the relationship between happiness and pleasure. Whether happiness is related to pleasure or not is under debate. Dearden (1968), Noddings (2003), and Barrow (2012) consider happiness related to pleasure. For Dearden *"happiness is a hedonic concept"* (Dearden 1968, p.20). He agrees with Mill on associating happiness with "pleasure and the absence of pain" (Mill 1863, ch.2 quoted by Dearden 1968, p.20). He argues that the fact that happiness is wished for, and based on Freud's ideas that the pleasure principle is the ruling principle of humans' wishes, it could be concluded that happiness is related to pleasure (Dearden 1968, p.22). Nel Noddings also sees pleasure and happiness, if not the same, as highly related (Noddings, 2003, p.20), while Barrow considers happiness related to pleasure. He accepts the idea of happiness being an aggregation of pleasure in its two meanings, *"a pleasurable sensation",* and *"a pleasurable state of consciousness brought about by doing something and undergoing some experience"* (Barrow, 2012, p.82). But, closer to Mill and away from Bentham, he believes that the second type is both necessary and sufficient (Barrow, 2012, p.83). In this sense, although by accepting the importance of pleasure, Barrow could be categorized as an advocate of hedonism, the importance he attributes to consciousness opens a room for moving towards the life satisfaction theory of happiness.

Contrary to these authors, Michalos is against considering happiness as related to pleasure. He strongly disagrees with the utilitarian/hedonic concept of happiness proposed by Kahneman (1999) which is the aggregation of one's recorded subjective experience of the moments during a longer period of time (Michalos, 2017, p.282). The concept proposed by Kahneman (1999) is very similar to the understanding of Barrow and Dearden of overall happiness. In his opposition to Kaneman's conceptualization of happiness, Michalos argues that this sort of aggregation eliminates the logical possibility of the existence of a fool's hell or

paradise, it gives supremacy to pleasure no matter how it has been produced, and it is biased against learning (Michalos, 2017, p.283).[7] So, Michalos could be categorized as a non-hedonic advocate of well-being, probably with an inclination towards objective list theory. Like Michalos, Gibbs also does not see happiness as necessarily related to pleasure but to the feeling of accomplishment in becoming what a person wills to be (Gibbs, 2015, p.58).

Two points could be brought up about pleasure in happiness discussions. One is that it seems that the word pleasure is used more broadly by authors like Dearden, Noddings, and Barrow, than by Gibbs. It could be argued that the *"feeling of accomplishment"* mentioned by Gibbs could be considered a *"pleasure of the mind"* or the second type of pleasure mentioned by Mill and later by Barrow. In the case of Michalos, also, it seems that he has a normative stance about happiness that urges him to consider it related to other concepts he deems positive, such as learning, and not related to concepts he deems negative, such as pleasure produced by unjustifiable means.

2.2.1.2. What leads to happiness?

While in the previous part, the logical necessities of the concept of happiness were explored, in this section the practical necessities of happiness, according to the authors examined here, will be discussed.

Though close in nature, the instant and long-term happiness of individuals are not the same. What is needed for an individual's instant happiness, using Michalos' two-factor model (2017, p.280), is not their real condition but what they make of their condition. In Barrow's words, it is enough for their (instant) happiness to have a favorable attitude towards whatever relationship they happen to have with their circumstances (2012, p.73). In this situation, reality, the actual conditions or circumstances, are unimportant in comparison to the perception, what one makes of reality, or the way they relate to it.

However, the happiness of the moment might be in contradiction to their long-term happiness, or to the happiness of others. Due to these two reasons, in most cases, various authors, in particular those discussing the relationship between happiness and education, tend to prioritize the sustainable happiness of societies

[7] In fact, in a sense, he is pointing to Nozick's Experience Machine objection to hedonism (for a detailed explanation see Fletcher 2016).

over the happiness of individuals, and more importantly the sustainable happiness of an individual to their instant one. As a result, instead of emphasizing the perception part of happiness, which is more related to the instant happiness of an individual, they focus on the objective reality which is general to all and more related to long-term happiness.

Almost all the authors reviewed here at some point or another referred to Aristotle (Barrow 2012, Dearden 1968, Gibbs 2014 & 2015, Michalos 2017, Noddings 2003). His ideas on happiness, or as he calls it *eudaimonia*, are closely connected to his other ideas about the nature of humankind, as rational and purposive beings, and his ethical ideas. As will be demonstrated, Aristotle's ideas are, in a way, at the center of all the following discussions about happiness. Therefore, his ideas about the subject will be briefly presented. The following lines are mainly extracted from a chapter on Aristotle's ideas on the subject, in Barrow's book *Happiness* (2012).

According to Barrow (2012), Aristotle starts with needs and wants, the satisfaction of which is almost equivalent to happiness. Then he categorizes needs into natural needs and acquired desires. He believes that *real or natural needs*, on which the existence of humans is dependent, stem from the nature of mankind and are therefore universal. For him, happiness is contingent on acquiring and having real goods which are the objects of real needs which include *biological goods*, *bodily goods*, *external goods*, and the *goods of the soul* including self-esteem, friendship, and knowledge. He believes that these goods could be attained by following *practical virtue* which in his view consists of choosing real good over apparent good, and moderation between extremes.

Yet, even practical virtue cannot guarantee one's happiness because their happiness is still dependent on *luck* or chance. For him, the only way to eliminate the chance factor is the contemplative life which means the life of the mind based on rationality.

2.2.1.2.1. Real Goods: Noddings and Michalos

Aristotle's views on real needs and goods are reflected in the work of Noddings and Michalos.

Noddings (2003) believes that happiness which can be found in different aspects of one's life is related to norms, and is affected by needs and wants, as well

as one's personality. Since the understanding of wants and personality can help an individual, at least to some degree, towards moderation and therefore contentment, in Noddings's view it can help in pursuing happiness. The moderation she is referring to could be understood as very similar to Aristotle's practical virtue. Most of all, Noddings sees happiness as dependent on relationships, or in other words, *"on loving connections with others – intimate relations with a few and cordial, cooperative relations with most of those we meet regularly"* (Noddings, 2003, p.72-73). These relationships are among the most significant external real goods, as outlined by Aristotle.

Noddings does not agree with Aristotle on the importance of rationality and the supremacy of contemplative life. In her view, although pleasures of the mind are important for the happiness of humans, they should not be evaluated as superior to all the others, because it puts pressure on people who are not good at these kinds of activities. She also claims that it is unethical to consider rationality or reasoning as the highest human characteristic since it raises questions about the moral worth of beings, whether human or not, without it (Noddings, 2003, p.12).

Michalos's (2017) ideas on happiness are also strongly influenced by Aristotle's eudaimonia, with an emphasis on external goods and practical virtue. He believes that the best way to reach happiness is to have a balanced combination of internal and external goods. By internal goods, he clarifies that he means *"an equally harmonious mixture of reason, appetite, and emotion"* (Michalos, 2017, p.289). But when examining the sample of the impacts of education on happiness, presented in his article, it becomes more clear that he is more focused on bodily, psychic, and external goods such as health, security, wealth, and knowledge (Michalos, 2017, p.289-290).

Thus, according to both Noddings and Michalos, acquiring real goods, whether it is good relationships or health and wealth, is what in general leads to happiness.

2.2.1.2.2. Rationality: Barrow

Like Michalos, Barrow's opinions about the ways of acquiring happiness are also highly influenced by Aristotle's ideas. He too starts with needs and wants and their satisfaction based on reality. To him, sustainable happiness depends on harmony on different levels, such as (a) between the different parts of the individual's mind,

including reason, will, and desire, (b) between the desires of an individual and their satisfied desires and achievements, and (c) between their satisfied desires and desires of other people in contact with them. From this, he concludes that *security*, *self-esteem*, and *realism*, are *"three essential conditions of happiness"* (Barrow, 2012, p.126).

To promote security, self-esteem, and realism the first step for Barrow is to seek to satisfy Aristotelian natural needs (2012, p.128). He further explains certain dispositions, such as determination, resignation, modesty, open-mindedness, empathy, and enthusiasm (Barrow, 2012, p.131-132), that can help one reach security, self-esteem, and realism and therefore happiness. He also claims some intellectual traits, such as "understanding, rationality, and an orderly mind" (Russel, 1975, quoted by Barrow, 2012, p.133), influence happiness due to influencing security, self-esteem, and realism, by contributing to the acquisition of real goods and more importantly by controlling the chance factor (Barrow, 2012, p.130). Like Aristotle, he values *rationality* the most. To him, rationality, supported by determination and resignation, is needed for realistic estimations of situations, predictions, and ordering of desires. He writes (Barrow, 2012, p.133):

> But the term rationality, if interpreted broadly, is by far the most important. This is rationality not simply in the sense of the ability to reason, but with the important addition of the *will* to reason and the ability to do it *well*. And rationality in this sense should be seen not as something opposed to emotion but as something that organises, orders, and controls emotions.

The rationality he is referring to could be regarded as the perfection of the rational aspect of human nature, and close to the concept of contemplative life proposed by Aristotle. At the same time, it could be seen as a complement to the practical virtue, helping to reduce the impact of chance. In any case, it could be seen as necessary if not sufficient for happiness.

2.2.1.2.3. Freedom and Agency: Gibbs

The impacts of Aristotle's ideas could also be seen in the ideas of Paul Gibbs (2014, and 2015). To Gibbs, profound happiness is (the result of) *"a fundamental and existential process of becoming what one wills one's being to be"*, and could be regarded as a mixture of Aristotelian eudaimonia and pleasure-seeking hedonism, yet different from both (Gibbs, 2014, p.183). He believes that profound happiness

could be realized throughout one's life as a consequence of an individual's agentic capabilities that are utilized to live a life that is in accordance with their being (Gibbs, 2014, p.183). Fundamental to Gibbs's proposed solution for the pursuit of happiness is that the individual should *know* what they want to be, and could be, regardless of the norms of the society they have been enculturated into, and then *will* it to be (Gibbs, 2014, p.184-185). In other words, to Gibbs, the most important component of happiness is freedom from one's culture in its widest meaning, or in one word, *agency*.

As can be seen, there is a lot of diversity in the ontological aspects of happiness. The main disputes are centered around the subjectivity or objectivity of happiness, its relation to pleasure, and the different ways in which it could be acquired. These differences have implications for the way happiness can be understood and studied.

2.2.2. Epistemological and Methodological Differences

The natural outcome of the ontological differences are the epistemological ones, concerning how happiness can be known and measured. At the center of this discussion about happiness lies the question of who is the best judge of one's happiness which itself relates to the question of happiness as something internal or external.

On one hand, authors like Michalos put emphasis on external aspects of happiness, which in these cases could be understood as similar to well-being or quality of life. Though they believe that each person's assessment of their own life should have some special status, they do not consider it as the ultimate definitive factor (Michalos, 2017, p.281). Discussing the issue, Michalos states that a fool's paradise should not be enough for researchers or policymakers when studying happiness. In doing so he essentially rejects the use of self-reported life satisfaction alone as the dependent variable by researchers (Michalos, 2017, p.281).

On the other hand, authors who see happiness as something internal consider each person's opinion on their happiness to be the only way to know and measure their happiness. Barrow argues that since *"being and feeling happy are logically inseparable"* (2012, p.87), the individual's judgment about it is the only possible valid indicator of it (Barrow, 2012, p.91). His ideas are in line with Dearden's

understanding who states that if someone is not self-deceived their judgment, regardless of their situation, is the only indicator of their happiness (Dearden, 1968, p.19).

It might be argued that the difference between the two groups' ideas about the best judge of one's happiness comes from the difference in their point of focus, as is the case of happiness being internal or external. Considering Barrow as a representative of the second group, while he considers happiness as something that could "*be settled by introspection on one's state of mind*" (2012, p.77), Michalos gives supremacy to the actual condition and not the way an individual perceives it. For Michalos, being in paradise is the most important thing, but to Barrow happiness and being in paradise is different. He explains that although in everyday language two sentences of "*at the time I thought I was in paradise, now I know that this is paradise*" and "*I thought I was happy, but this is real happiness*" might be used interchangeably, the two are not synonymous because the former is about the situation, which one can be mistaken about, but the latter is about the way they stand in relation to the situation. He argues that one's stand concerning a past situation might change but not falsify the past stand itself (Barrow, 2012, p.92).

The answer to the epistemological questions, following the ontological ones, has some implications for the methodological aspects of research on happiness. If, on the one hand, in a study, it is assumed that happiness equals well-being and quality of life, and therefore something external to the mind and objective, consequently it might be assumed that it could be measured externally based on some specific criteria by anyone about anyone. On the other hand, if it is assumed that happiness is dependent on the individual's perception of their situation and circumstances in the world, and therefore something inside one's mind and subjective, as a result, it might be assumed that it should be measured based on each individual's opinion of their happiness.

2.2.3. Conceptualization of Happiness in Empirical Studies

Most of the authors of the empirical studies seem to follow a line of thought that gives supremacy to an internal perspective of happiness and one's own evaluation. Therefore they conceptualize and operationalize happiness with terms like overall satisfaction with the quality of life (Hartog & Oosterbeek 1998), subjective well-being

(Jongbloed 2018, Kim 2018, Nikolaev & Rusakov 2016, and Nikolaev 2018), self-evaluation of happiness level (Chen 2012, Hu 2015), self-reported satisfaction level (Cuñado & de Gracia 2012), self-declared life-satisfaction (Castriota 2006), and perceived happiness (Ruiu & Ruiu 2019).

On the other hand, there are instances that researchers try to conceptualize and operationalize happiness in other ways, in addition to what one thinks of their happiness. For example, in addition to subjective well-being in terms of satisfaction with life (SWL), Jongbloed (2018) also defines flourishing as consisting of three elements: (a) psychological well-being, defined by competence, engagement, meaning, optimism, and self-esteem; (b) emotional well-being, including positive emotion, positive relationships, and SWL; and (c) mental well-being, measured by emotional stability, resilience, and vitality (p.739).

In a similar attempt, Nikolaev (2018) also defines what he calls Subjective Well-Being (SWB) in three distinct ways (a) life satisfaction, consisting of cognitive assessment involving an evaluative judgment of one's life as a whole on the meta-level, (b) eudaimonic, consisting of psychological well-being related to concepts of meaning, self-worth, and engagement in daily activities, and (c) hedonic, consisting of emotional well-being and positive and negative feelings in the past four weeks (pp.9-11).

Ontological and epistemological diversity and complexity of the concept of happiness impact any study about happiness, including those that focus on its relationship with other concepts, such as education and higher education.

2.3. The Relationship Between Happiness & (Higher) Education

The relationship between happiness and education, in general, and higher education, in particular, has been discussed in two distinct ways. On the one hand, discussions made mainly by philosophers of education concern the philosophical relationship between happiness and education. The main question for these authors is if happiness could be regarded as a goal, and maybe the only ultimate goal, of education, or not. To be able to answer this question, these authors were obliged to discuss a prior question that concerns happiness as the ultimate goal of life. On the other hand, some empirical researchers in the field have tried to answer the question of the relationship between the two by examining the impact of education on the

happiness of individuals or societies, while some mainly explore the co-occurrence of the two phenomena.

In the following sections, based on the reviewed literature, first, the conceptual and philosophical question of the suitability of happiness as the goal of life and education is explored. Then in the next part, a review of the empirical findings of the reviewed literature on the correlation between happiness and education, or the effect of education and higher education on an individual's happiness, is presented.

2.3.1. Happiness as the Goal of (Higher) Education

Regarding the conceptual and philosophical relationship between education and happiness, the literature could be divided into two distinct categories; the ones who regard an individual's happiness as the ultimate goal of their life and therefore the education they should receive, and the ones who do not believe that individual's happiness should be the goal of their education, either because happiness should not be the goal of one's life, or because education has a more important goal than individual's happiness, which is sustainable collective happiness.

As it will be demonstrated, it could be argued that the authors who have a tendency to define happiness as what it is based on its logical necessities (Barrow 2012, Dearden 1968, Roberts 2013), do not feel obliged to consider it as the goal of education. However, the ones who define happiness based on its practical necessities, and who have a more normative stance (Gibbs 2014 & 2015, Michalos 2017, Noddings 2003), think that it should be the goal of education.

Among the scholars who do not consider happiness as the only goal of life or education of an individual, Roberts (2013) believes that in modern societies, happiness is overrated and that due to this over-emphasis, education is increasingly concerned with happiness, even at the moment, and avoiding despair. Building on Dostoevsky's and Kierkegaard's ideas, he believes that suffering and despair are crucial for consciousness, and for increasing the capacity for reflective thought (Roberts, 2013, p.468-469). To him, one of the main goals of education is *"deepening understanding"* and *"extending and enhancing consciousness"*, given that by *"fostering the development of a reflective or critical consciousness, we also open up the possibility of greater suffering"* (Roberts, 2013, p.470). So, he believes

that instead of education aiming at increasing happiness, it should accept the possibility of suffering and despair as its end, and teach students to embrace them (Roberts, 2013, p.469-471).

Like Roberts, Dearden (1968) also thinks that an individual's happiness alone is inadequate to be the goal of their life. He has four criticisms of an individual's happiness being their ultimate goal in life. His *first* challenge, driving from morality, is that an individual's happiness is not necessarily compatible with the happiness of others. His *second* point is that parallel to happiness, dignity should also be an important issue for an individual, the dignity which is "founded on integrity, independence, and autonomy in the direction of one's affairs" (Dearden, 1968, p.24). The *third* point to him is the importance of knowledge and truth-seeking. He states that a deluded yet happy person should choose to discover the truth even if it leads to unhappiness (Dearden, 1968, p.24). His *fourth* and final point is the importance of friendship and beauty (Dearden, 1968, p.25). So, he concludes that since education can be considered *"understanding and appreciation of what is valuable or worth pursuing in life, and happiness is no more than one among several final ends worthy of pursuit"*, then it cannot be the only goal of education (Dearden, 1968, p.26).

Barrow believes that if happiness is correctly defined and widely considered, it should surely be the supreme goal of each person. He also believes that promoting collective happiness is an acceptable social ideal (Barrow, 2012, p.113-121). However, to him, first and foremost, education is not about happiness but about multifaceted understanding. He argues that even if happiness should be promoted in education, it should not be an individual's instant happiness, but their long-term happiness in life, and the general happiness of all (Barrow, 2013, p.123).

On the other hand, there are many philosophers of education and scholars in the field who consider happiness the ultimate goal of education. Lee (2011) clearly states that to him happiness *"is an ultimate goal of life and education"* (Lee, 2011, p.72). To him, higher education is important due to its capacity for promoting the happiness of an individual, as well as general happiness based on the utilitarianism doctrine (Lee, 2011, p.72).

Like Lee, Nodding also thinks that *"Happiness should be an aim of education, and a good education should contribute significantly to personal and collective happiness"* (Noddings, 2003, p.1). She strongly opposes what she calls the *"glorification of suffering"* and postponing happiness (Noddings, 2003, p.1), ideas

that might be considered very much in line with the ones proposed by Roberts (2013). She believes that since almost all people want to be happy, it is reasonable for happiness to be a goal of education (Noddings, 2003, p.74).

In the case of Michalos, while he does not explicitly claim that education should be aimed at happiness, he believes that if happiness, education, and influence are defined widely, then *"education has enormous influence on happiness"* (Michalos, 2017, p.278). However, it is implicitly pointed out in his text that he wants, and assumes that others also want, or should want, to achieve a good life for all people, and by a good life, he definitely means happiness as he defines it (Michalos, 2017, p.281). It could be concluded that to him happiness, defined in a specific way, is a legitimate goal of life and education.

The case is almost the same for Gibbs (2015) too. He defines (the way to) happiness in a very specific way which is contentment, resulting from the capability of the realization of one's potential due to agentic action (Gibbs, 2014 & 2015). He believes that this should be the goal of compulsory education (Gibbs, 2014, p.189) as well as higher education (Gibbs, 2015, p.54).

2.3.2. Empirical Claims on the Relationship

It could be argued that the empirical literature on the relationship between happiness and education (including higher education) could be considered insufficient and inconsistent. As will be demonstrated in this section, significant controversies are clearly visible in the findings. It is not possible to reach any final conclusion about the existence or nature of the effect (positive or negative) of education and higher education on happiness among individuals. While some believe that there is a positive correlation, others do not see such a relation, and a third group believes that there might be a negative relationship.

In the following sections, different empirical findings about the nature of the relationship between happiness and education, mainly higher education, are presented.

2.3.2.1. No or Negative Relationship

Though it was intuitively assumed that higher education should have a positive effect on individuals' happiness, Hartog and Oosterbeek published a paper in 1998 on the

data about a cohort of Dutch individuals born around 1940 and concluded that the highest levels of education are not related to the highest levels of wealth, health, or happiness (p.254). Surprisingly, it was the people with the general, not vocational, secondary education who were the happiest, healthiest, and wealthiest among all (Hartog & Oosterbeek, 1998, p.254).

This research uses a data set that was gathered in 1952, at around the age of 12 of the participants, and also in 1993, when the participants were around 53 years old (Hartog & Oosterbeek, 1998, p.247). This longitudinal cohort study eliminated the aging effects as well as some other intervening variables resulting in relatively more validity to the findings of the research. That said, the fact that all the participants were the same age and from the same time and place decreases the external validity and generalizability of the findings.

This paper was one of the first papers that questioned the positive impact of higher education on the individual's happiness and therefore opened the way for other studies on the topic.

In later research, Kim (2018) discusses the relationship between higher education, urbanization, and happiness on a dataset obtained from the World Bank (Kim, 2018, p. 24). The author concludes that urbanization has a positive effect on happiness whereas education and happiness have a negative correlation (Kim, 2018, p. 33). He attributes this negative correlation to an oversupply of university graduates and suggests that an *"appropriate tertiary enrollment ratio could be a good remedy for matching between job opportunities and college graduates"* (Kim, 2018, p. 34).

The findings of Kim are in accordance with another research. *The Complex Relationship Between Education and Happiness: The Case of Highly Educated Individuals in Italy* (2019), by Ruiu and Ruiu, is a quantitative research that examines the relationship between participants' expected income and their perceived happiness. The paper focuses on the outcomes of the income expectations of university graduates on their happiness (satisfaction) based on *"illusory superiority bias"* (Ruiu & Ruiu, 2019, p. 2633). The authors conclude that education positively affects income but this positive effect is not as big as graduates have expected. This unfulfilled expectation in turn results in frustration that eventually leads to negative effects on their perceived happiness (Ruiu & Ruiu, 2019, p. 2648). They assume that

"the negative consequences of not realizing income expectations pass mainly through a reduction in job satisfaction" (Ruiu & Ruiu, 2019, p. 2449).

Regarding this research, it is important to note that this research is conducted in Italy and it is important to be careful with the overgeneralization of the findings. As the authors themselves emphasize, *"possible positive effects of education on health and consequently on happiness"* (Ruiu & Ruiu, 2019, p. 2649), are not considered due to problems with the availability of data. In addition, the over-emphasis on job satisfaction might be one of the shortcomings of the paper in providing a complete view of the reasons for one's satisfaction or happiness.

2.3.2.2. Positive Relationship

In addition to the previous findings of no or negative relationship, there are authors who claim that education, and in some cases, higher education specifically, has positive effects on happiness. That said, there are many disagreements among these authors on different issues.

Does Education Affect Happiness? Evidence for Spain (2011), by Cuñado and Gracia, explores the direct and indirect effects of education (not only higher education) on happiness. The research is based on data from the European Social Survey (Cuñado & Gracia, 2011, p.187). The authors conclude that education has both direct and indirect positive effects on happiness. While the indirect effects are through income, status, and socioeconomic factors, controlling these, there is still a positive effect on happiness, which they attribute to the self-confidence or self-esteem caused by gaining knowledge. Their final conclusion is that the positive effect is the same for completing any level of education even if it is just primary education. According to them, after finishing primary school, education has no significant effect on happiness in itself (Cuñado & Gracia, 2011, p.192).

However, not all the proponents of the positive effects of education on happiness regard the difference between different levels of education as insignificant. In addition, regardless of the impact of the levels of education, different authors do not agree on the way education or higher education affects happiness. Chen (2011) in *How Education Enhances Happiness: Comparison of Mediating Factors in Four East Asian Countries*, examines the relationship between happiness and education. She differentiates between monetary and non-monetary effects. The author articulates non-monetary factors mainly through *"Social Capital and*

Cosmopolitan Experience" (Chen, 2011, p.121). She concludes that these non-monetary factors are an important factor in understanding the relationship between education and happiness. At the same time, monetary factors are, in the cases of Japan, Taiwan, and South Korea, trivial or even insignificant, while they seem quite important in the case of China, which Chen believes could be attributed to the lower income level in China in comparison with the three other countries. She argues that once crossing a certain level, the positive effect of more income is negated by psychological adaptation and social comparison (Chen, 2011, p.128). In this, Chen's conclusions come close to what Ruiu and Ruiu claim in a later study (2019).

While the distinction between monetary and non-monetary factors is valid and important, it is not clear why Chen limits the non-monetary factors to social capital and cosmopolitan experience. It is also important to note that this study is not focused on higher education.

In addition to the proposed explanation by Ruiu and Ruiu (2019), what Chen observes about the decreasing level of the effect of monetary factors on happiness in association with education, could also be explained by the findings of research by Castriota (2006) named *Education and Happiness: A further Explanation to the Easterlin Paradox*. In this research, Castriota concludes that the importance of the absolute income level on happiness decreases with an increase in education (Castriota, 2006, p.15). The Easterlin Paradox in the title refers to an article by an economist of the same name in 1974, which is also quoted by Chen (2011, p.118). Easterlin shows that despite an increase in real GDP per capita in advanced countries like the United States and the United Kingdom, self-reported happiness has been the same during the post-war time (Castriota, 2006, p.3). In other words, relative income is more important than absolute income when it comes to the relationship between income and happiness (Chen, 2011, p.118).

Castriota attributes this to the higher job satisfaction and more culturally interesting life of individuals with higher education resulting in them contributing less importance to consumption level. However, it could also be argued that up until a certain point, absolute income is important due to its role in satisfying basic needs, while after that certain point, relative income is more important since it could be regarded as just a measure of social status whereas, for people with higher education, the social status might be connected to other factors.

Considering the findings of Chen (2011) and Castriota (2006), it could be argued that the possible positive effect of higher education on happiness through monetary factors decreases as more and more wealth is accumulated at a global level and as national economies are becoming larger. This is in line with what Hu (2015) concludes that the impact of a college degree on subjective well-being in Urban China is declining from 2003 to 2010 (p.679). Hu also parallels this decline with the expansion of higher education by the Chinese government and concludes that the decline in the enhancing effect of higher education might be related to a decline in quality due to rapid expansion, or in other words, an increase in quantity (2015, p.679). So, it could be argued that, what Hu (2015) tries to explain as the decline in the effect of higher education on happiness from an internal perspective, or in other words, the decline in higher education quality, is the decline in the monetary effect mentioned by Castriota (2006) and Chen (2011).

More into the positive relationship spectrum of higher education and happiness are Nikolaev and Rusakov. In *Education and Happiness: An Alternative Hypothesis* (2016), Nikolaev and his colleague Rusakov, state that, though people with higher education have lower levels of happiness or subjective well-being during their early adulthood, and their level of happiness keeps lowering until their early forties, they overall live more happy lives in comparison with people without higher education and their actual level of happiness is higher from their early thirties onwards (Nikolaev & Rusakov, 2016, p.5). In this research, they work on the results of a survey of Australian people from 2001 to 2013. Their findings are in opposition to the findings of Hartog and Oosterbeek (1998), studying a Dutch cohort born in 1940. Also, in a later study working on the same data, Nikolaev (2018) concludes that higher education increases hedonic, eudaimonic, and satisfaction with most domains of life. However, people with higher education have less time and therefore less satisfaction with their amount of free time. Nikolaev claims that the positive effect of higher education on an individual's happiness is increasing, though at a decreasing rate (Nikolaev, 2018, p.18).

Another proponent of the positive effect of higher education on happiness is Janine Jongbloed. In her study she relies on ESS data from 27 European countries, with the total sample comprising over 50,000 individuals (Jongbloed, 2018), to investigate the relationship between happiness and higher education. As mentioned before, in this research, she uses different conceptualizations of well-being; *"a*

traditional hedonic approach; SWL; and a more complex eudaimonic approach capturing 'flourishing'" (Jongbloed, 2018, p.737). For education, she divides participants into four groups, people with education less than lower tier upper secondary, people who have completed upper secondary, people with advanced vocational training, and people with tertiary education (college or more). The author also considers control variables such as age, income, marital status, and physical health (Jongbloed, 2018, p.737). According to the results section, post-secondary education, both tertiary and vocational, has a significant positive impact on psychological, emotional, and mental well-being as three indicators of flourishing (Jongbloed, 2018, p.740). The author also reports that tertiary education significantly predicts satisfaction with life (Jongbloed, 2018, p.742). Jongbloed concludes that operationalizing and measuring well-being and happiness is a challenge for future research on the topic since, according to her findings, the measured and predicted results were very different for flourishing and SWL (Jongbloed, 2018, p.745).

As is clearly visible, there is no consensus about the nature of the relationship between (a) education and higher education, and (b) an individual's happiness. This might, at least partially, be related to different conceptualizations of happiness, life satisfaction, and well-being, and also operationalization of these concepts.

These challenges are addressed in a systematic literature review or meta-analysis which emphasizes the importance of conceptualization of happiness (Elwick & Cannizzaro, 2017). The study explores the literature on higher education and happiness as well as concepts such as satisfaction, despair, flourishing, and well-being.

Under the title *Profound Happiness*, the authors talk about the concept of eudaimonic happiness and well-being. According to them, there is a shortage of research focusing on eudaimonic happiness in higher education (Elwick & Cannizzaro, 2017, p.207). The authors argue that in most of the current debates around higher education, satisfaction is more emphasized than happiness, further arguing that the importance of satisfaction is due to higher education steering shifting toward market demands (Elwick & Cannizzaro, 2017, p.207-209). This includes domination of consumer satisfaction discourse, leading to situations in which what is referred to as happiness in university education simply means satisfaction with the services that the college or university provides.

At the same time, Elwick and Cannizzaro discuss the *"Vygotskian notion of needing to take students out of their comfort zone"* (2017, p.210), and conclude the importance of despair from this notion (2017, p.211). As a result, in their view, emphasis on satisfaction endangers profound happiness by avoiding required despair. They also bring about the question of the purpose of universities and point to the importance of the concept of well-being.

Finally, they conclude that the satisfaction discourse has dominated the current debate around happiness in higher education, making it limited, and endangering the long-term happiness, flourishing, and well-being of university students. They believe that eudaimonic happiness is *"heavily under-represented in both policy and academic discussion around higher education"* (Elwick & Cannizzaro, 2017, p.215). This observation is in line with what was presented earlier under the *Conceptualization of Happiness in Empirical Studies* section.

2.4. Summary

From reviewing the existing conceptual and empirical literature on happiness and its relationship with education, two points could be concluded.

The *first* conclusion of reviewing the literature on happiness and education is that happiness is an extremely complex and diversely defined concept. The differences around the concept of happiness are basically ontological and epistemological differences. The ontological differences are concerned with answering the question of what happiness is, and what leads to it. Regarding the quiddity of happiness, authors in the field disagree on the internality or the externality of happiness, as well as its relation to pleasure. Regarding the things that lead to happiness, different authors focus on the acquisition of real goods, rationality, and agency. The epistemological differences are mainly concerned with the question of who the best judge of one's happiness is and its implications on research in the field.

The *second* conclusion of the literature review is that there are a lot of disagreements about the relationship between happiness and education. These disagreements are around two main axes. The *first* one concerns the plausibility of happiness as the goal of education. It could be argued that authors who have a logical necessity approach towards the definition of the concept of happiness do not consider happiness necessarily as a goal for education or higher education.

However, the ones who define happiness based on the practical necessities they regard for happiness, or for reaching it, believe that it could, and should, be regarded as a goal of education at all levels. The *second* main disagreement is among the empirical studies. The empirical authors are divided into three groups; those who claim that there is no relationship between education and happiness, those who claim there is a negative relationship, and those who claim that there is a positive one. Even among those who have found a positive relationship between the two, there is no consensus about the causal mechanisms through which the two concepts are related. It could be argued, as it has been, that the differences in the findings of the empirical studies might be related to the differences in conceptualizations and operationalizations of the complex concept of happiness.

Therefore, there is obviously a need for further research with more comprehensive and well-developed conceptualizations and operationalizations of happiness in the field to better illuminate the nature of the relationship between happiness and education, and especially higher education.

3. Theoretical Framework

As mentioned before, this study tries to determine the relationship between education and happiness. So, the ultimate dependent variable in this research is happiness and the first step in building the theoretical framework is to define it. Then, based on the definition of happiness, it is important to provide a theoretical framework for how it could be related to or influenced by education and higher education.

In the following sections, happiness, in two different meanings used in the literature, and the possible relationship between education and each of these meanings, are discussed.

3.1 Happiness as Well-Being

As discussed in the literature review, happiness is sometimes used as an equivalent of well-being. In this sense, happiness or well-being is a life that is good for the person leading it. To avoid confusion, the word **Well-being** is used for this meaning in the following sections. This study accepts the premises of the hedonist theories of well-being, presented by scholars like Bentham, that pain and pleasure are the only important factors, and duration and intensity are the two aspects of them (Crisp, 2021). However, it is assumed that due to the common nature of human beings, it is possible to develop an objective list of needs that their satisfaction is essential for human well-being in the sense that it provides pleasure and eliminates pain most sustainably.[8] So, this study could be regarded as **hedonist** in essence yet very much like **objective list theorists** in approach. However, the study should not be regarded fully as an objective list theorist study, because it does not regard the items on the list non-instrumentally irrespective of the pain and pleasure they produce. This study considers these items instruments for maximizing pleasure and minimizing pain.

Therefore, to reach an objective list for humans' well-being, it is essential to define their **real needs**. Based on Aristotle's arguments, in this study, real needs, or

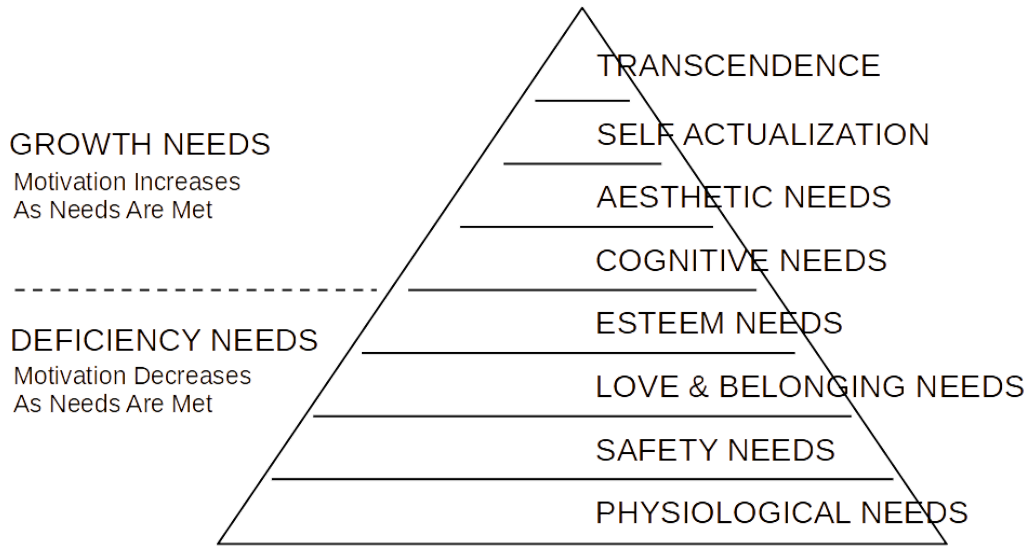
[8] Pain and pleasure are used in their broadest meaning, including pain and pleasure of the mind.

natural needs, are essential for human beings. So, it could be argued that Well-being is the satisfaction of real needs.

While there are many different conceptualizations and theories about real needs, understanding of real needs and therefore Well-being in this study is based on **Maslow's hierarchy of needs**. In several decades from the 1940s to the 1970s, he developed an eight-step pyramid of needs that are categorized under two distinct groups (Figure 2). The lower group is called **Deficiency Needs** and consists of Physiological Needs, Security, Love and Belonging, and Esteem and Prestige (Maslow, 1943, pp. 372-383). The upper group is called **Growth Needs** and includes Cognitive Needs, Aesthetic Needs, Self-actualization, and Transcendence (McLeod, 2023). In the case of Deficiency Needs, the motivation decreases when the needs are met, while in the case of Growth Needs, the motivation increases when these needs are met. In other words, contrary to growth needs, once Deficiency Needs are satisfied, further addition of what satisfies them does not lead to higher levels of well-being or happiness. It simply leads to indifference.[9] It is also important to note that while the hierarchy is important among the Deficiency Needs, it could be argued that, even in Maslow's vision, "there is no sequence amongst Growth Needs; they occur simultaneously and interact synergistically, and are simply part of the Growth Needs" (R. Diessner, personal communication, June 10, 2022).

Figure 2.

Maslow's Hierarchy of Needs



Note. Based on McLeod (2020). https://www.simplypsychology.org/maslow.html.

[9] The breathable air is an example of this situation, although everyone needs it, in normal situations, no one is more happy because they have more of it than they need.

Based on this categorization, the satisfaction of real needs, meaning Well-being (Wb) could be seen as the sum of the satisfaction of each of these categories of needs: Deficiency Needs Well-being (Wb_{DN}) and Growth Needs Well-being (Wb_{GN}).

$$Wb = Wb_{DN} + Wb_{GN}$$

Deficiency Needs Well-being is related to the pain of deficiency and its pleasure is the pleasure of relief of pain and therefore limited, while the pleasure or enjoyment of Growth Needs Well-being might be unlimited. At any point, regarding Deficiency needs, there is only the unsatisfied desire or no desire at all. In other words, the pain produced due to their lack is constant, but the pleasure due to their satisfaction is not. Contrary to Deficiency needs, the satisfaction of Growth needs is not just to reduce the pain, but to create genuine sustainable pleasure or enjoyment. It is also important to note that, as the structure of the pyramid indicates, the satisfaction of Deficiency Needs is a necessary precondition for the satisfaction of Growth Needs.

3.1.1. Education and Well-Being

It is important to explore the relationship between education and well-being. Flannery and Newstad (1998), among others, believe that throughout the history of the West, the idea of liberal arts has been concerned with rationality and agency. However, to preserve the freedom that is the prerequisite for exercising liberal arts, other forms of arts were needed which were called arts of necessity. The arts of necessity include the art of war for safeguarding security, and economics as the general art of acquiring necessary materials for the satisfaction of basic needs (Flannery & Newstad, 1998, p.10). So, it could be argued that education for the acquisition of real needs is as old as, if not older than, liberal education.

The importance of education for gaining all or some of what, following Aristotle, may be called real needs, is emphasized by different authors in the field. For example, in addition to the conceptual claims of Michalos (2017) and Noddings (2003) regarding the responsibility of education for producing well-being, Cuñado and Gracia (2011) count income and status as well as self-confidence and

self-esteem as possible outcomes of education, which all could be regarded as what Maslow categorizes as Deficiency Needs. Chen's (2011) observation about the difference between the impact of education on happiness through monetary factors (see previous section), is in line with the earlier discussion on limited capacity of Deficiency Needs in producing happiness.

Therefore, the first hypothesis of this study is about the role of education in the satisfaction of Deficiency Needs, and through that in increasing individuals' Well-being. The null and alternative for the first hypothesis are as follows:

> H0-1: An increase in Educational Attainment is not linked to an increase in Deficiency Needs satisfaction.
>
> H1-1: An increase in Educational Attainment is linked to an increase in Deficiency Needs satisfaction.

In this hypothesis, the two main variables are Educational Attainment and Deficiency Needs Satisfaction. For Deficiency Needs, based on Maslow's conceptualizations, different measures for Physiological Needs, Security, and Esteem and Prestige Needs have been developed based on different items of the survey.[10] Unfortunately, the questionnaire does not have items that could be regarded to measure the concept of Love and Belonging Needs. Therefore, this item is omitted from the Deficiency Needs and the analysis of the first hypothesis of this study. The Research Design and Methodology chapter explains the specific statistical approach to testing this hypothesis.

It could also be argued that the two first items of Deficiency Needs according to Maslow's hierarchy of needs, Physiological Needs and Security, are better met now due to economic growth and the elimination of absolute poverty in most countries. In general, food and shelter are more accessible to all than before (World Bank, n.d.). As a result, it could be assumed that the importance of higher levels of education for satisfying those needs drops, especially after compulsory education since the abundance eases the competition for acquiring them. Therefore, a specification of the first hypothesis could be articulated as follows:

> H0-1a: The strength of the statistical relationship between Educational Attainment and the satisfaction of Physiological and Security Needs does not decrease in higher levels of education.

[10] For a detailed explanation of different variables, consult the Research Design and Methodology chapter. Overview of WVS items used in this study is provided in Appendix B.

H1-1a: The strength of the statistical relationship between Educational Attainment and the satisfaction of Physiological and Security Needs decreases in higher levels of education.

In this hypothesis, the main variables are Educational Attainment, Physiological Needs Satisfaction, and Security. The statistical method for testing this hypothesis is discussed in the Research Design and Methodology chapter.

Social status and prestige are about rankings and one could argue that no amount of material abundance would lead to the erosion of this ranking system. So, the previous specification is not about all Deficiency Needs but only about Physiological Needs and Security.

It could also be expected that the impact of education especially on Physiological Needs Satisfaction is also related to the economic strength of the country that the individual lives in. In countries with an economy on the verge of collapse, where there is not enough food to go around, education probably is not among the strongest influential factors in the satisfaction of Physiological Needs. Also, in very strong economies, where there is plenty of food, again education would not be that important, because there *is* food for all. So, it could be argued that in very weak and very strong economies the correlation between education and Physiological Needs Satisfaction is low, albeit for two different reasons. While in countries in the middle of the wealth spectrum, the correlation is expected to be stronger. Since Physiological goods are neither scarce nor abundant in these countries, there is more room for education to play a role in the competition for their acquisition. Based on this argument, the second specification of the first hypothesis might be formulated as follows:

H0-1b: The relationship between Educational Attainment and the satisfaction of Physiological Needs is not most pronounced in countries with moderate levels of wealth.

H1-1b: The relationship between Educational Attainment and the satisfaction of Physiological Needs is most pronounced in countries with moderate levels of wealth.

In this hypothesis, the main variables are educational attainment, Physiological Needs Satisfaction, and the **economic situation** of the society in which the individual lives. In this study, **GDP per capita** is used as a proxy for the economic situation in a society. Although it cannot portray the differences within a country, it is

used for the sake of practicality. Some shortcomings of this approach are discussed further in detail in the Research Design and Methodology chapter.

Similar to the discussion about the importance of economic context for the satisfaction of Physiological Needs, the impact of education on Security Needs also can be moderated by the level of peace and conflict in the country that the individual lives in. In some countries, peace is so scarce that education cannot help satisfy an individual's Security Needs, and in some others, it is so abundant that education is arguably not important for its acquisition. As a result, the third specification of the first hypothesis is as follows:

> H0-1c: The relationship between Educational Attainment and the satisfaction of Security Needs is not most pronounced in countries with moderate levels of peacefulness.
>
> H1-1c: The relationship between Educational Attainment and the satisfaction of Security Needs is most pronounced in countries with moderate levels of peacefulness.

In this hypothesis, in addition to Educational Attainment, and Security Needs Satisfaction, the other main variable is the **level of peacefulness** in the country in which the individual lives. The **Global Peace Index (GPI)** can be used as a way of measurement of the level of peacefulness and presence of conflict. GPI, and the implications of its use, are discussed more in the Research Design and Methodology chapter.

The second hypothesis concerns the role of education on Growth Needs Satisfaction. The role of education and higher education in developing different aspects of what is called Growth Needs by Maslow is emphasized by different authors in the field. Dearden (1968) points to topics such as individual dignity, "founded on integrity, independence, and autonomy in the direction of one's affairs", "value of knowledge and the ideal of pursuing truth", as well as "aesthetic enjoyment" (Dearden, 1968, p.24-25). Emphasis on the importance of knowledge and independent search after truth is similar to Maslow's Cognitive Needs, whereas aesthetic enjoyment is related to his Aesthetic Needs category. Also, Dearden's emphasis on integrity, independence, and autonomy, as well as Gibbs' idea of the realization of one's potential due to agentic action (Gibbs, 2014 & 2015) could be understood as related to Maslow's Self-Actualization. Finally, the need for

Transcendence presented by Maslow might be considered as an answer or solution for the important step of moving from individual happiness to general or collective happiness, an idea that is a concern for Barrow (2012, p.117), and Dearden (1968, p.24), as well as almost all the utilitarians. Therefore it seems reasonable to assume that education has, or at least theoretically might have, a positive effect on Growth Needs satisfaction.

However, it is also important to note that there are at least two differences between the nature of the relationship between education and Deficiency Needs on the one hand, and the relationship between education and Growth Needs on the other hand. The first difference is that while the **satisfaction of Deficiency Needs**, depending on the socioeconomic situation that one lives in, is **a possible outcome** of education, the **satisfaction of Growth Needs** might be **a direct result** of education which when acquired is impossible to be taken back by any external force. In other words, the satisfaction of Growth Needs, like the development of cognitive abilities and appreciation for beauty, actualizing the potential in an individual, and finally helping them to go beyond their limited definition of self, might be considered the definition of education, while this is not true for Deficiency Needs. Education in any definition is not the satisfaction of Physiological, Security, Love and Belonging, or Esteem and Prestige Needs. The second difference is that while Deficiency Needs Satisfaction is logically more related to Educational Attainment, Growth Needs satisfaction is related to the process of education rather than the acquisition of a certain certificate at the end of an educational process. So, rightfully, it could be argued that **Educational Attainment is not a perfect proxy for the education process** when it comes to the question of the relationship between education and Growth Needs Satisfaction. Yet, acknowledging this point, and considering that it is impossible to measure the Educational Process of each individual based on the WVS data that is going to be used in this study, instead of exploring the relationship between Educational Process and Growth Needs satisfaction, the relationship of the Educational Attainment and Growth Needs Satisfaction will be addressed.[11]

[11] It could be argued that this in a sense might be considered a positive point because it prevents the problem of independent and dependent variables being one. It might be said that in the case of exploring the relationship between the education process and the growth resulting from it, independent and dependent variables might have been almost the same.

As a result, the second hypothesis of this study holds that higher levels of education are linked to better satisfaction of Growth needs, and the null and main hypotheses are formulated as follows:

H0-2: An increase in Educational Attainment is not linked to an increase in Growth Needs Satisfaction.

H1-2: An increase in Educational Attainment is linked to an increase in Growth Needs Satisfaction.

The two variables of this hypothesis are again Educational Attainment, measured as discussed earlier, and Growth Needs Satisfaction. As discussed before, based on Maslow's classification, Growth Needs are categorized into Cognitive Needs, Aesthetic Needs, Self-actualization, and Transcendence. Though there are items in the WVS survey that could be considered related to them, unfortunately, only the items related to **Cognitive Needs** can be linked to the concept presented by Maslow, without jeopardizing construct validity. However, since as mentioned before, the relationship between different Growth Needs is not distinct and hierarchic but connected and synergic, it could be argued that analysis of the relationship between Educational Attainment and Cognitive Needs, could, to some degree, give grounds to reflect on the relationship between Educational Attainment and all the Growth Needs. The statistical analysis used for testing this hypothesis is explained in the Research Design and Methodology chapter.

Growth Needs are a logical expansion of Self-actualization, a process highly related to the process of individualization mentioned by Rorty (1999) and in different terms by Gibbs (2015)., Rorty argues about the importance of higher education in the process of **individualization** after and over the process of **socialization** in elementary and secondary education (1999, p.118). In other words, socialization is a prerequisite of the individualization process. Therefore, regarding the second hypothesis, it could be argued that different levels of Educational Attainment have different impacts on Growth Needs Satisfaction. Based on these arguments, it could be argued that Higher Education might have more impact on all Growth Needs including Cognitive Needs satisfaction than compulsory education, because it is more strongly focused on individualization. Moreover, it can be expected that higher levels of higher education have higher impacts on Cognitive Needs Satisfaction since they are even more associated with the process of individualization. So, the first specification of the second hypothesis can be formulated as the following.

H0-2a: The strength of the statistical relationship between Educational Attainment and the satisfaction of Cognitive Needs does not increase in higher levels of education.

H1-2a: The strength of the statistical relationship between Educational Attainment and the satisfaction of Cognitive Needs increases in higher levels of education.

In this hypothesis, the main variables are Educational Attainment and Cognitive Needs. The statistical method for testing this hypothesis is discussed in the Research Design and Methodology chapter.

To summarize the Happiness as Well-Being section, it was mentioned that in some philosophical and scientific literature about happiness, it is meant as Well-being. Then it was discussed that though this study regards pleasure as the only prudential value, and therefore has a hedonist view of Well-being, it is argued that due to the common nature of human beings, it is logically plausible to consider a core of common needs, called Real Needs in contrast with Acquired Desires, that their satisfaction results in sustainable maximization of pleasure and minimization of pain. In other words, Well-being could be regarded as the satisfaction of Real Needs. Later, Maslow's hierarchy of needs, consisting of Deficiency Needs and Growth Needs, was presented as the conceptualization of Real Needs in this study. Finally, it was discussed that based on different conceptual and empirical studies, it could be argued that there might be a relationship between education and Deficiency Needs and Growth Needs satisfaction, and based on this the first two main hypotheses of this study, and their specifications, were formed.

So far, happiness as Well-being and the possible relationship between it and education have been explored. Yet, as discussed in the Literature Review Chapter, there is also another meaning for happiness. In the next section, this meaning, and how it may be related to education, will be discussed.

3.2. Happiness in the Psychological Sense

Aside from Well-being, happiness is also used in the literature in the long-term psychological sense, referring to a positive or pleasurable state of mind. In this section happiness in this sense and its possible relationship to education will be discussed. For the sake of simplicity and to avoid confusion, the word **Happiness** is

used in this study as happiness in the psychological sense (as opposed to Well-being discussed in the previous section). In this sense, based on Barrow's (2012) and Dearden's (1968) ideas presented earlier in the Literature Review Chapter, this study considers Happiness as **an individual's pleasurable state of mind in regard to the alignment of Perceived Reality with their Desired Reality,** meaning the ideal reality they have in mind. This definition indicates that the most appropriate way to measure the Happiness of each individual is to ask them, given they are the most reliable source for their perception of reality as well as their Desired Reality.

Contrary to Well-being which has a relatively clear connection to education, the connection between Happiness and education is much more complicated and indirect. Therefore, it is first required to explore and expand the concept of Happiness, to be able to distinguish the ways in which it could be related to education. The model here is an **a priori model** not presented as a means to measure happiness, which could be easily asked of each participant, but to lay the foundation for determining the possible relationship it has with education. Eventually, based on the implications of this model, some hypotheses will be formed and tested regarding the relationship between education and Happiness.

Considering the definition, Happiness (H) can be considered equal to the Perception of Reality (PR), compared to Desired Reality (DR).

$$H = \frac{PR}{DR}$$

This study presupposes the existence of Reality independent of personal or collective Perception of Reality.[12] It includes the individual and their social and natural environment, as well as all the interactions between all these. Therefore, the Perception of Reality is not the Reality itself, but a picture of Reality in the mind provided by the senses. It is the Perception as a mental function (in a mathematical meaning) of Reality.

However, since the senses are limited, the representation of the Reality that these senses provide is not complete. In other words, the Perception of Reality can

[12] This is also further discussed in the Ontology and Epistemology section of Research Design and Methodology chapter.

never be as comprehensive as Reality itself. The senses are imperfect and therefore prone to mistakes and in danger of deceiving the mind. Besides the limitations of the senses, the mind tries to make sense of what it perceives. This meaning-making process, at the social level and over the course of time, is deposited at and transferred to new members of the society by social structures, institutions, language, and culture in its widest meaning (Berger & Luckmann, 1966). So in a sense, each individual's Perception of Reality, in the beginning, is an **internalized Social Perception of Reality**.[13]

However, one can try to reduce the effects of the imperfections and deceptions of the senses, as well as the Perception of Reality inherited to them from their society, and develop a realistic view of Reality through the will to know them (deceptions of the senses and the inherited Social Perception of Reality), to question them, and adequately reason about them. In other words, it could be done through Rationality.[14] Following Barrow (2012), in this study, the word **Rationality** is used to refer to the ***ability* and *will* to question and adequately reason about everything**.[15]

So, considering Rationality as defined earlier for each person, if a coefficient of Rationality (Rt) is defined as between zero and one ($0 < Rt < 1$), then PR (Perception of Reality) could be defined as the following:

$$PR = Rt \times R + (1 - Rt) \times ISPR$$

[13] The discussions of this paragraph are well discussed in the works of philosophers such as Descartes (Meditations on First Philosophy. 1641, and Discourse on the Method. 1637), Kant (Critique of Pure Reason. 1781), Fichte (Foundations of the Science of Knowledge. 1794), and Schleiermacher (The Christian Faith. 1830), as well as psychologists such as Piaget (The Construction of Reality in the Child. 1954) and sociologists like Berger and Luckmann (The Social Construction of Reality: A Treatise in the Sociology of Knowledge. 1966).

[14] In addition to Rationality, the knowledge of how society forms each individual's mind, that is to say, social structures, institutions, language, and culture, is also essential in reducing its impact on one's perception. However, by including the will to reason in the definition of Rationality, as well as doing it well, it could be argued that the knowledge of social structures could be attained mainly by Rationality. Therefore Rationality, as defined here, is the most important factor in gaining Agency which is freedom from these structures.

[15] The discussions presented in this paragraph are very much related to the discussions of structure and agency and even the problem of "freedom and determination" (Baker, 2002, p. 86). However, due to the extreme complexity of the discussions around the topic, a complete version of the discussion needs its own separate study, and therefore will not be discussed here in detail.

where R is Reality and ISPR is Internalized Social Perception of Reality. This means that the Perception of Reality, depending on the level of Rationality in an individual, might be almost equal to Reality when the Rationality coefficient approaches one ($Rt \rightarrow 1 \Rightarrow PR \approx R$) or might be almost equal to the Social Perception of Reality in the case that the Rationality coefficient approaches zero ($Rt \rightarrow 0 \Rightarrow PR \approx ISPR$).

Here instead of using 'Individual Perception of Reality' in contrast to 'Social Perception of Reality' only the term Reality is used, while earlier it was stated that Perception of Reality can never be the same as Reality itself. This can be justified by arguing that, as mentioned before, this study takes the existence of Reality and the real world for granted, independent of the individual's mind. So, according to this fact, it is accepted that not everything an individual feels, experiences, and thinks is completely socially constructed. Social structures do not completely create individuals' perceptions out of nothing, instead, they distort, shape, form and at the same time deform the Perception of Reality which in their absence would have still been perceived, yet in other forms. So it could be argued that theoretically speaking, at a perfect level of Rationality ($Rt = 1$), Individual Perception of Reality would completely align with Reality itself.

Desired Reality is also the picture of the ideal Reality in mind. Since it is a mental picture, it is again based on past perceptions of Reality, and as a result, shaped by the social structures that one grows up in. It is important to note that as mental images, PR and DR share the same essence; they both are made of words or concepts and therefore are in a sense products of language. Following Aristotle's argument regarding natural or **Real Needs** presented in the Well-being section, in opposition to Real Needs, **Acquired Desires,** or needs that are learned individually or in society, are wanted since people are used to them or even in a sense, addicted to them, but are not crucial for the existence of humans, no matter how drastically wanted they are. Influenced by social norms and values, **one may define Desired Reality completely regardless of their Real Needs** and just in accordance with society's Desired Reality. Society, on the one hand, might be inclined to define Desired Reality as much more than Real Needs. In this case, by sacrificing individuals' Happiness, society persuades individuals to try harder to reach an unattainable goal to yield more collective benefits for society. On the other hand, society might be inclined to define Desired Reality much less than the Real Needs.

So, by sacrificing the real physical and mental Well-being of individuals, it maintains order, peace, and status quo by providing a sense of contentment and Happiness in them.

Again, as in the case of Perception of Reality, using Rationality, individuals can also form their own Desired Reality by focusing on their Real Needs and distancing from socially defined Desired Reality or in other words their Acquired Desires. So, in that case, the Desired Reality can be defined as follows.

$$DR = Rt \times RN + (1 - Rt) \times AD$$

Where RN is Real Needs and AD is Acquired Desires. Therefore the desired reality, depending on the level of rationality in an individual, might be almost equal to Real Needs when Rationality coefficient approaches one ($Rt \to 1 \Rightarrow DR \approx RN$), or might be almost equal to Acquired Desires, based on society's Desired Reality, in the case that the Rationality coefficient approaches zero ($Rt \to 0 \Rightarrow DR \approx AD$).

Putting the definitions of PR and DR in the happiness equation it will be as the following.

$$H = \frac{Rt \times R + (1 - Rt) \times ISPR}{Rt \times RN + (1 - Rt) \times AD}$$

To help gain a better understanding of the equation, it might be helpful to consider some extremes of it. Putting aside the hypothetical possibility of a fully rational society, wherein Acquired Desires are nothing but Real Needs, and Perception of Reality is as close as possible to Reality, and therefore, ISPR is defined the same as R, an individual has two extreme choices. The first is to continue without developing Rationality. In that case:

$A)\ Rt = 0 \Rightarrow$

$$H = \frac{Rt \times R + (1 - Rt) \times ISPR}{Rt \times RN + (1 - Rt) \times AD} = \frac{0 \times R + (1 - 0) \times ISPR}{0 \times RN + (1 - 0) \times AD} = \frac{ISPR}{AD}$$

In this situation, individual's Happiness is determined by the way in which society Perceives Reality (the way things *are*), its Desired Reality (the way things *should be*), and how these two relate together. In other words, their Happiness is in a sense predetermined by their society irrespective of Reality.[16] Thus, **without Rationality** $(Rt = 0)$**, individuals have no say in their own Perception of Reality or in their version of their society's Desired Reality and consequently, they have no control over their own Happiness.** Yet, there exists the possibility for an individual to experience sustainable happiness throughout their lifetime without developing Rationality and just by continuing to perceive Reality, and regard Desired Reality, the way their society does.[17]

The second option for the individual is to develop Rationality in themselves. Considering the case that an individual becomes fully rational:

$$B)\ Rt = 1 \ \Rightarrow$$

$$H = \frac{Rt \times R + (1 - Rt) \times ISPR}{Rt \times RN + (1 - Rt) \times AD} = \frac{1 \times R + (1 - 1) \times ISPR}{1 \times RN + (1 - 1) \times AD} = \frac{R}{RN}$$

In this case, the Happiness of the individual is not completely predetermined by their society. They have, though in a limited scope, free agency in finding and defining their Real Needs, as well as changing their Reality towards the satisfaction of their Real Needs.

To simplify the equation more, it is possible to standardize its components. In this equation, the interval of R is between zero and RN, and the interval of ISPR is between zero and AD. So, standardizing the equation will result in the following equation.

[16] This does not mean that all the individuals in a society experience the same level of happiness. Entering any society (as a newborn or an immigrant), each individual has a unique situation in their society and experiences social structures in a unique way which results in the formation of a unique mind and therefore unique perceptions of reality and internalizing a unique version of society's desired reality.

[17] However, it could be argued that at the social level, inaccurate social Perception of Reality is not sustainable at the social level. Societies need attention to objective Reality to survive, whether facing conflicts with other societies like wars or the natural world's crises like droughts and diseases. Survival is logically needed for sustainable or durable Happiness. So, at least at the long-term level, if looking for sustainable Happiness, societies should refrain from indoctrination in the sense that it distorts the individual's Perception of Reality. This argument exceeds the scope of this study and needs to be discussed elsewhere.

$$H = Rt \times (R/RN) + (1 - Rt) \times (ISPR/AD)$$

R/RN is the same as the satisfaction of Real Needs, or as discussed earlier in the Happiness as Well-Being section, Well-being. Also, ISPR/AD is the same as Acquired Desires Satisfaction (ADS). So, the equation could be rewritten as the following.

$$H = Rt \times (Wb) + (1 - Rt) \times (ADS)$$

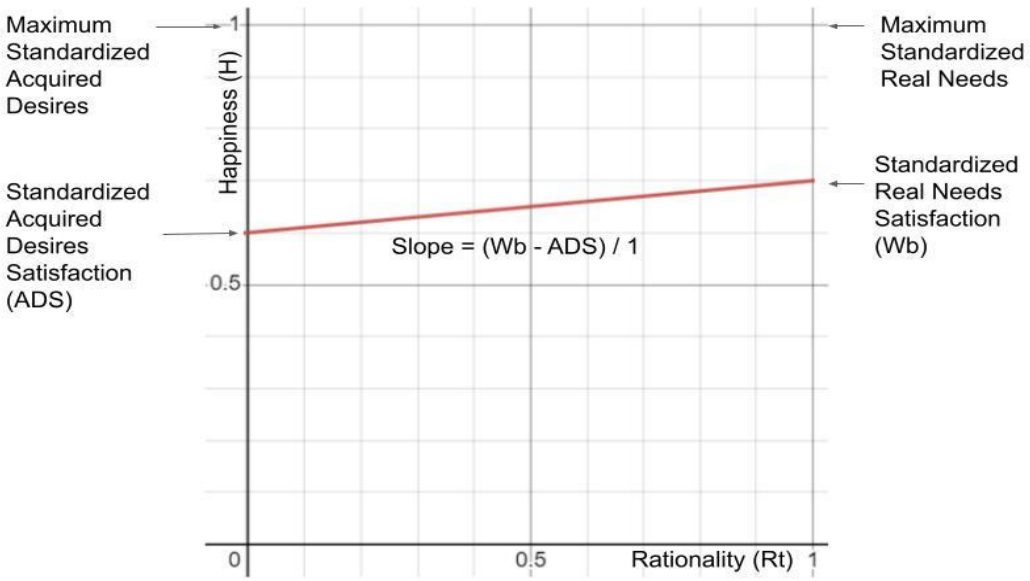
This can also be written as the following.

$$H = (Wb - ADS) \times Rt + ADS$$

As presented in Figure 3 (Desmos, n.d.), the difference between the level of Well-being and Acquired Desires satisfaction is the slope of the line that demonstrates the relationship between Rationality (Rt; x-axis) and Happiness (H; y-axis), and ADS is also the y-intercept. This modeling of happiness has implications for understanding and researching it. Based on this model, it could be argued that the most important determinants of happiness are Rationality, Well-being, and Acquired Desires Satisfaction.

Figure 3.

Schematic Graph Describing the Relationship between Rationality and Happiness



Note. The diagram is created using desmos.com. Please note that it represents just one potential variant of the slope.

There are two points, regarding this equation, and discussing them helps the later argument of the impact of education on Happiness. First, as it could be understood from the equation and graph, according to this model, **whether an increase in rationality results in an increase in Happiness level is dependent on the slope of the line** which is equal to the level of Well-being minus the level of Acquired Desires Satisfaction. In cases where the level of Well-being is higher than the level of Acquired Desires Satisfaction, the slope is positive, and therefore, an increase in Rationality increases Happiness. In cases where the level of Well-being is lower than the level of Acquired Desires Satisfaction, the slope is negative, and therefore, an increase in Rationality decreases Happiness. So, in cases where the differences between levels of Well-being and the level of Acquired Desires Satisfaction for each individual is not clear, it is not possible to determine the impact of (an increase in) Rationality on their Happiness. Therefore, **it is not plausible to look for a correlation between rationality and happiness among different people with different levels of Well-being and different levels of Acquired Desires Satisfaction**.

The second point is that **Well-being and Acquired Desires Satisfaction are not necessarily independent**. Therefore, an increase in the level of Well-being in some cases might affect Acquired Desires Satisfaction in a positive or negative way (and vice versa). For example, in a situation when satisfying Physiological Needs is against social values and regarded as taboo, satisfying them, though increases Well-being, decreases Acquired Desires Satisfaction. As a result, for an individual with a rationality level less than perfect, an increase in Well-being does not necessarily result in an increase in Happiness. So, in the model generated here, **it might not be correct to assume that with an increase in Well-being, Happiness increases**.

Regarding both of these points, it could be argued that maybe the most important implication of this modeling of happiness is that it is the **interaction** of **Rationality with Real Needs satisfaction and Acquired Desires Satisfaction** that has a relationship with Happiness. The Acquired Desires Satisfaction, without the interaction with Rationality, is also important for the level of Happiness. However, Real Needs satisfaction and Rationality independent of their interaction have no impact on Happiness.

So in conclusion, it could be argued that Happiness in an individual is determined by two main factors: (1) their Acquired Desires Satisfaction which is formed by their culture, and (2) their personal level of Rationality and Well-being, especially in the form of the interaction of the two. It is important to note that ADS in different cultures might include different things. As an example, formal Educational Attainments might be a part of ADS in a specific society due to the place of education in its culture. Also, ADS can include Rationality and Well-being in itself with different levels of importance, even with negative effects. This means that Deficiency Needs Satisfaction, or Growth Needs Satisfaction might have different importance (in regard to Happiness) in different cultures.

3.2.1. Education and Happiness

Based on the generated model, if there is a chance for education to have an impact on Happiness, it likely happens through **Rationality, Well-being, and/or Acquired Desires Satisfaction**, as the three components of the model. Reviewing the literature makes it clear that education and especially higher education, at least in the West, has traditionally been, and still is, preoccupied with Rationality. However, as also noted by Gibbs (2015, p.57), education, especially what is known as compulsory education, is embedded in schooling. As indicated earlier, schooling can be regarded as an agent of socialization, which is the internalization of social structures in the minds of students, from early childhood. This may in some cases be done through indoctrination. It could be argued that both indoctrination and education aim to impart certain beliefs to students. The difference is that in education it is done by reasoning, while in indoctrination it is done by authority. So, schooling can include both indoctrination which is based on authority, and education which is based on rationality (Barrow & Woods, 2006, p.70-82). So, it could be argued that if any sort of schooling is based on rationality and its promotion then it can be justifiably considered education, while when it is based on authority then it becomes more indoctrination and, in that way, antithetical to education.[18]

So considering this argument, and similar to what was discussed under the relationship between Growth Needs satisfaction and education, it could be argued that **Educational Attainment is a better proxy for schooling,** as it concerns the

[18] The extent to which schooling results in an increase in rationality in its participants could be considered a suitable determinant of their quality in regard to individuals.

outcome than for the process, which may have both education and indoctrination aspects. With the data available in this study, there is no possible way to evaluate the Educational Process. As a result, the relationship between Educational Attainment, not the Educational Process, and Rationality will be examined.

Therefore, the third hypothesis of this study might have been that higher levels of Educational Attainment increase the level of Rationality in individuals. However, in regard to the WVS data that is used in this study, and the strong conceptual relation between the two concepts of Rationality and Cognitive Needs, the available items for the operationalization of these concepts are almost the same. As a result, the measures for Rationality and Cognitive Needs become identical and therefore, the hypothetical third hypothesis would have been identical to the second one.[19]

As discussed earlier, although there are clear reasons to assume a relatively simple relationship between education and Well-being, the relationship between Well-being and Happiness, understood by the model presented here, is much more complicated. So it might not be correct to assume that an increase in Educational Attainment results in an increase in Happiness, by increasing Well-being or Rationality in general, for several reasons. First, it is the interaction of Rationality and Well-being that has an impact on Happiness rather than each of them individually. Second, the Acquired Desires Satisfaction, part of the a priori model discussed earlier, is also important.

Unfortunately, the data does not provide items for measuring Acquired Desires Satisfaction in each individual. However, it could be argued that **cultural contexts** are an important factor in Acquired Desires formation and later Satisfaction. **It could be assumed that despite the differences in individuals, in similar cultural contexts, the relationship between Educational Attainment, Well-being, and Happiness might be similar**. So, the third hypothesis might test this assumption.

At this point, the crucial point is the possibility of operationalization of cultural context based on the items in the WVS. Countries are considered a proxy for cultural context by many cultural and social scientists such as Hofstede (2011), R. D. Lewis

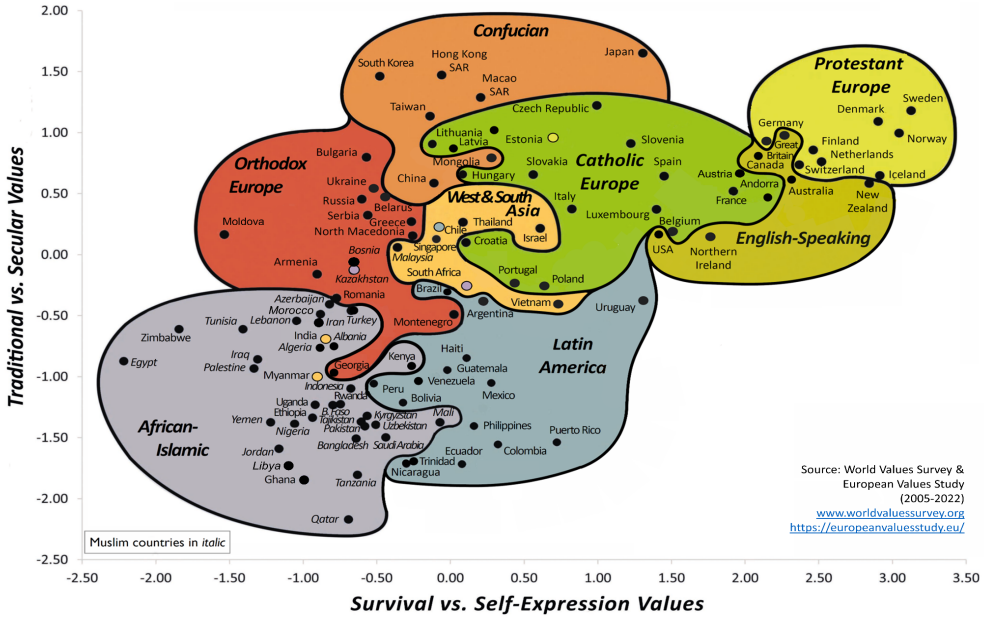
[19] So, although the a priori model has interesting indications about the possible relationship between the interaction of Rationality and Well-being, due to the lack of a proper measurement for Rationality (distinct from the measurement for Cognitive Needs satisfaction) in the WVS, the exploration of this should be left for further studies in the future.

(2010), and Trompenaars & Hampden-Turner (2011). Though cultural elements expand way beyond specific countries, they could be considered to represent a wide range of cultural differences in the context of society.[20] So, it could be assumed that by controlling them, the ADS factor might be eliminated to a relatively high degree, and therefore it might be possible to explore the relationship between Educational Attainment, Well-being, and Happiness.

However, there are two problems. The first problem is that the sample sizes for each country in the data are constructed in a way that in many cases the number of respondents with very low or very high levels of education is very low. This fact decreases the statistical significance of any analysis done for respondents with such levels of education. The second problem is that even if it was possible to analyze the data separately for each country in the survey, the workload would have been beyond the resources available to this study. Therefore, it is decided to form groups of countries with cultural similarities to solve both problems. For doing so, the **Inglehard-Welzel cultural map** (Figure 4) is used as a basis for the categorization in addition to **region** and **religion**. This is further discussed in the Research Design and Methodology chapter.

Figure 4.

The Inglehart-Welzel World Cultural Map 2023



Source: World Values Survey & European Values Study (2005-2022). https://www.worldvaluessurvey.org/WVSContents.jsp.

[20] It is important to note that here countries are just considered as a possible proxy for the whole cultural context that an individual lives in, regardless of their conformity with it.

To be able to test whether cultural context makes a difference in the impact of Educational Attainment, Deficiency Needs Satisfaction, and Growth Needs Satisfaction on Happiness, first, the relationship should be examined in general. Though it might be assumed that an increase in education results in an increase in Deficiency and Growth Needs Satisfaction (discussed under the first and second hypotheses), whether they increase or decrease Happiness is still dependent on the cultural context, and the same can be argued for the impact of Educational Attainment on Happiness. Therefore, given that the focus here is not to predict the direction of the relationship, but rather its existence, the third hypothesis could be written as follows.

H0-3: Educational Attainment, Deficiency Needs Satisfaction, and Growth Needs Satisfaction, are not related to an individual's Happiness level.

H1-3: Educational Attainment, Deficiency Needs Satisfaction, and Growth Needs Satisfaction, are related to an individual's Happiness level.

In this hypothesis, the main variables are Happiness, Educational Attainment, Deficiency Needs Satisfaction, and Growth Needs Satisfaction. The Research Design and Methodology chapter explains the specific statistical approach to testing this hypothesis as well as the measurements for each construct.

After exploring the relationship between these variables in general, the impact of them on Happiness in different cultural contexts should be examined to determine whether there is a difference in different cultural contexts. So the first specification of the third hypothesis could be written as follows.

H0-3a: The relationships between Educational Attainment, Deficiency Needs Satisfaction, Growth Needs Satisfaction, and an individual's Happiness level are not different in different cultural contexts.

H1-3a: The relationships between Educational Attainment, Deficiency Needs Satisfaction, Growth Needs Satisfaction, and an individual's Happiness level are different in different cultural contexts.

The variables and the statistical approach to this hypothesis are almost similar to the main third hypothesis. However, there is a need for an additional step that provides the possibility of comparison of the possible relationships. This will be discussed further in the Research Design and Methodology chapter.

Another interesting context for exploring the impact of different aspects of Well-being on Happiness might be the wealth and peacefulness of the country in

which the individual lives. Due to the hierarchical nature of the Deficiency and Growth Needs Satisfaction, which gives primacy to the former over the latter, it is plausible to predict that the positive impact of Cognitive Needs on Happiness starts after a certain level where the Deficiency Needs are satisfied to a certain level. Based on these assumptions, in regard to wealth, the second specification of the third hypothesis could be formulated as follows:

> H0-3b: The positive relationship between Cognitive Needs Satisfaction and Happiness is not higher in countries with higher levels of wealth.
>
> H1-3b: The positive relationship between Cognitive Needs Satisfaction and Happiness is higher in countries with higher levels of wealth.

Like in the case of the second specification of the first hypothesis, GDP per Capita (PPP) is used as a proxy for a country's wealth.

Based on the same argumentation used earlier about the second specification, the third specification of the third hypothesis could be stated as follows:

> H0-3c: The positive relationship between Cognitive Needs Satisfaction and Happiness is not higher in countries with higher levels of peacefulness.
>
> H1-3c: The positive relationship between Cognitive Needs Satisfaction and Happiness is higher in countries with higher levels of peacefulness.

GPI is used as a proxy for the countries' peacefulness. The variables and statistical approaches will be discussed in detail in the Research Design and Methodology chapter.

3.3. Summary

In this chapter, the concept of Happiness, in general, was examined to form a theoretical framework for the relationship between Educational Attainment, including higher education, and Happiness. The chapter is divided into two overarching sections, happiness as Well-Being, and Happiness in the Psychological Sense. For simplicity, the former is called Well-being, and the latter is called Happiness.

Regarding Well-being, it was conceptualized as related to the satisfaction of Real Needs in opposition to Acquired Desires. Following Maslow's hierarchy of

needs, Real Needs were categorized into Deficiency and Growth Needs. Two main hypotheses concerning the relationship between Educational Attainment on the one hand, and Deficiency Needs and Growth Needs on the other, were formed. For the first hypothesis, three specifications regarding the decreasing impact of higher levels of education on Physiological and Security Needs, the mediating impact of economic context on the relationship between education and Physiological Needs, and the mediating impact of the presence of conflict on Security Needs, were generated. For the second hypothesis, a specification in regard to the increasing impact of higher levels of education on Cognitive Needs was developed.

It was stated that the relationship between education and Happiness is much more complicated than the one regarding Well-being. So, first, an a priori model of Happiness was generated to distinguish its affecting elements, in order to later detect the possible relationships between education and Happiness. This came up to Rationality, Well-being, and Acquired Desires Satisfaction, as constituent elements of Happiness. It was stated that since the Acquired Desires Satisfaction is highly dependent on cultural contexts, such as country, and religion, it might be correct to look for the impact of Educational Attainment and Well-being on Happiness when the cultural context factors are controlled.

In the next chapter, the methodological aspects of the study and the statistical tools for testing the hypotheses generated here will be discussed.

4. Research Design and Methodology

The purpose of this chapter is to provide a detailed description and justification of the research design, methods, and procedures employed in the study. It mainly aims to increase replicability and research validity by maximizing transparency. It also tries to address political and ethical issues in the scope of this research.

In doing so, first, the ontological and epistemological underpinnings of the study are examined. Then the research design and strategy, quantitative cross-sectional on WVS available data, are defined and justified. Later the WVS data is introduced. Next, the different variables relevant for testing each hypothesis and their definitions, operationalizations, and measures are presented. After that, the data analysis procedures and tools are examined. Following that, the ethical and political issues related to this study are discussed, as well as the limitations of the study design, with the chapter ending with a summary of methodological considerations.

4.1. Ontology and Epistemology

In regard to the philosophy of science, this study can be categorized closely to **Critical Realism**, mainly developed by the ideas of Roy Bhaskar. This is because, Critical Realism is often seen as being close to positivism ontologically, and to interpretivism epistemologically (Furlong & Marsh, 2010, p.186, p.189). As Furlong and Marsh put it, a researcher's ontological and epistemological view is more like "a skin, not a sweater" (2010, p.184). Therefore, in this study, it is believed that ontological and epistemological are natural starting points for a discussion on research methods. In other words, ontological and epistemological stances are not taken to fit the methods, rather they are the point of departure and the choice of methods should be based on them.

Ontologically, this study assumes the **existence of the natural world**, and the **existence of social reality** as an intersubjective reality, in addition to or even regardless of an individual's comprehension of them. In simplified terms, this means

that the natural world would exist even when humankind is extinct,[21] which often is signified by labeling it objective reality. However, when it comes to social reality, with the extinction of humankind, the social reality would cease to exist, meaning it cannot be considered an objective reality. That said, it is not an entirely subjective reality either, since it exists independently of any individual mind. It exists even when all the existing individuals are dead, as long as humans exist. So, with regard to ontology, one can argue social reality exists as an **intersubjective reality** and is external to each individual.

While the underlying rules or essence of the existence of the former, the natural world, does not change, at least relative to human's understanding of time, the latter, the social world, in itself and therefore in all its rules and laws can and does change. While some superficial aspects of it might change rapidly, the fundamental aspects of society do not change very fast, and some might last for very long times. As said by Bhaskar, "There are **enduring structures** and **generative mechanisms** underlying and producing observable phenomena and events" (2011, p.2, emphasis added).[22]

Humans stand between nature and culture. They belong to both the natural world and the society, and they perceive and comprehend them through their **senses** and through **language and culture** in their widest meanings, implying a weakening in the distinction between natural and social reality. Each individual's comprehension or understanding of both natural and social reality is subjective. However, these understandings communicated through language become a form of intersubjective understanding that might be called knowledge in its widest meaning. **Knowledge** is the humans' collective understanding of the natural and social world, including themselves.

As discussed before, since the senses of humans are limited, the representation of reality they provide is **imperfect**. In other words, the perception of

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[21] It could be argued that it is not possible to say that since terms such as 'natural world' and also 'exist' are themselves as words are humans 'descriptions' and therefore in the hypothetical situation of humans extinction they will not exist either. Yet it can convey the meaning to some extent.

[22] When talking about change and stability, explanatory levels are important. Considering the example of the translational motion of the earth, at one level, the situation on earth such as seasons is changing, however, the underlying forces and physical laws are not.

In regard to social reality, it could be argued that only a change in forces and mechanisms caused by an external factor can be considered a real change. Therefore, deliberate real change can only be made by agents free from the forces and mechanisms of social reality. Freedom and agency that can only be gained through rationality and knowledge of the forces themselves. Bhaskar's discusses this point which might be regarded in relevance to the structure and agency discussions.

reality for humankind can never be as comprehensive as reality itself. The human senses are imperfect, making them prone to mistakes and susceptible to deceiving the mind. Apart from the limitations of the senses, the human mind endeavors to make sense of what it perceives. This process of assigning meaning, occurring at the social level and over time, is deposited and transmitted to new members of society through social structures, institutions, language, and culture in its broadest sense. As critical realists believe, there is a distinction between language and the natural and social world (Bryman, 2016, p.25). Consequently, neither each individual's perception of reality or understanding, nor knowledge or the intersubjective understanding of humankind, can ever be absolute.

However, this does not mean that all the assumptions about natural or social reality are equal in representing reality, or in their **explanatory capacities**. Since there is a reality outside each individual's mind, some perceptions of it or explanations about it might be more true or accurate than others in that they provide better explanations. At the individual level, as discussed before, considering the reality of the social (as well as natural) world, using rational methods for perceiving reality, and recognizing the inherited perceptions of reality and therefore accepting the possibility of bias can lead to more accurate perceptions and understandings (Bhaskar, 2014, pp.29-34, and pp.48-71). The collective understanding of humankind or knowledge can also move toward more accuracy when the individual's understanding improves, and also when there are institutions that can distinguish, accumulate, and disseminate high-quality understandings of reality, produced by individuals. One of these institutions is science.

As one of the two topics of interest in this study, well-being and happiness have both natural and social aspects to them. That said, higher education could be regarded as purely social, since it is not directly connected to physical aspects of human nature. Therefore, as discussed, the assumption is that they as topics of science are not purely subjective realities but intersubjective realities. Even in the case of higher education, the existence of the concept as a part of language is beyond the understanding of one single individual. Thus, while it is not an objective reality that exists outside human language, it is an intersubjective reality. Though intersubjective realities change over time, they are much more enduring than subjective personal realities. Therefore, they are worthy of transcending an individual's understanding and being the topic of science as a part of the knowledge

that in essence is social. The intersubjective reality can be analyzed through both qualitative and quantitative approaches. Realism, in general, and Critical Realism, in particular, approve the use of both these approaches (Furlong & Marsh, 2010, p.205).

4.1.1. Implications of Critical Realism View

Claims about reality, whether natural or social, should be based on some criteria to be worthy of being included as **scientific knowledge**. First of all, it should be possible for it to be communicated through **accurate languages** like verbal or mathematical languages. Inaccurate languages like artistic ones are disqualified for this purpose.[23] Also, it is not possible to accumulate and then disseminate generated knowledge about the rapidly changing, superficial aspects of reality due to its abundance. Scientific knowledge is valuable if it goes beyond the superficial aspects of reality and finds something about the deep relationships in reality, to reveal, in Bhaskar's words, **generative mechanisms** (Bhaskar, 2011, p.16). This also entails the importance of some level of **generalizability** for scientific findings (Danermark et al., 2019, pp.96-134). These points lead to the importance of the **role of theory** in scientific knowledge production. Theory mediates how the real world is understood and the causal powers are interpreted, and this in return has some implications for social actors' actions (Furlong & Marsh, 2010, p.190). The discussion about theory also leads to the discussion about different logics of inquiry or different forms of reasoning including inductive, deductive, and others.

Furthermore, produced knowledge about generative mechanisms can be called scientific knowledge if it is valid and reliable (Danermark et al., 2019, p.34). **Validity** and **reliability** conditions entail accurate observations or the perception of reality. Therefore, the data that is the basis for understanding reality, its **measurements**, and the **methods** with which it is acquired are important. The findings or the understanding that is gained about the data should be well-grounded in logic, a concern referred to in the literature as **internal validity**. Also related to the discussions of accurate language, it should be about what it claims is about. This is generally referred to as **construct validity**. The generalization of the findings from the observed aspects of reality to any point beyond that, also, should be done

[23] However, claims communicated through these languages might have a place in other forms of knowledge.

logically and accurately, a topic well discussed under the title of **external validity**. These issues, connected to research design and strategy, variables and measures, data, and data analysis, are discussed in the following sections in regard to this study.

By accepting the existence of the real world, yet at the same time accepting that it cannot be known completely and fully objectively, Critical Realism recognizes the inevitability of **limitations** in the research process. Some of these limitations come from the biases of the researcher generated by the unconscious impacts of their society. Potential limitations of the data, measurements, statistical tools, logical conclusions, as well as logical limitations in generalizing the findings, could also be other sources of limitations in the research process. Though inevitable, recognizing and admitting to these limitations can improve the validity and reliability of the findings.

The different types of validity and reliability as well as the limitations of this study will be discussed further in the coming sections.

4.2. Research Design and Strategy

Based on the ontology and epistemology discussed before, in accordance with the nature of the proposed research questions, and also based on the aims of this study - to expand the knowledge about the relationship between education and well-being and happiness - this research employs a cross-sectional design with a quantitative strategy. Though a longitudinal design might have been a better choice in order to investigate a causal relationship, due to the limitation of resources it was off the table from the beginning. However, using representative samples from different countries all over the world might provide a better possibility for looking into relationships between the various concepts in focus. Including data about participants in different countries provides the possibility of going beyond specific cultural contexts and investigating the possibility of something universal.[24]

Critical Realism goes beyond induction and deduction by using **retroduction** to provide causal explanations (Blaikie, 2004). As visible through the Theoretical Framework chapter, this study deals with three different main hypotheses. The first

[24] It could be argued that in a sense, in this study the primacy is given to generalisability (external validity) over proving causality (internal validity).

two use the deductive logic of inquiry. Therefore, the quantitative approach might be regarded as the most suitable approach for them. The third hypothesis, however, is based on a hypothetical model mainly about the possible relationship between education, different aspects of Well-being, Rationality, and Happiness. This hypothesis is based on retroduction as the logic of inquiry. Retroductive reasoning can benefit from both qualitative and quantitative methods. However, quantitative methods provide a better ground for establishing generalizable patterns and assessing the strength of relationships between variables. This, in addition to the availability of the WVS data, resulted in the choosing of a quantitative method for the third hypothesis as well. Almost all of the other researchers who have chosen this topic have also used quantitative strategy (Chen 2011, Cuñado & Gracia 2011, Jongbloed 2018, Kim 2018, and Ruiu & Ruiu 2019).

4.3. Data

Gathering needed data for exploring the proposed questions with all different intervening or influential factors needs more time and resources than the ones available for this research. As a result, the availability of an existing dataset that might be suitable for exploring the topic and the questions was investigated. The first thing that came to attention was the widespread use of available data among the researchers interested in the case. From the studies discussed during the literature review, Jongbloed (2018) and Cuñado and Gracia (2011) use different versions of the European Social Survey. East Asian Social Survey is used in Chen's (2011) research. Kim (2018) uses both the WVS and the World Bank dataset, and Ruiu and Ruiu (2019) use the data for a survey by the Bank of Italia. Therefore, the use of existing data seems to be an accepted practice amongst researchers interested in the topic of happiness and well-being.

However, the use of existing data limits the use and scope of a specific theoretical framework and may force some edits on the conceptual and theoretical framework. Therefore, in search of a data set, it was important to find a dataset that is in maximum accordance with the theoretical framework of this research to minimize the edits. After the search for a dataset that could fit the questions and objectives of this study, two publicly available datasets were identified; the European Social Survey (ESS) round 10, and the **World Value Survey (WVS)** wave 7.

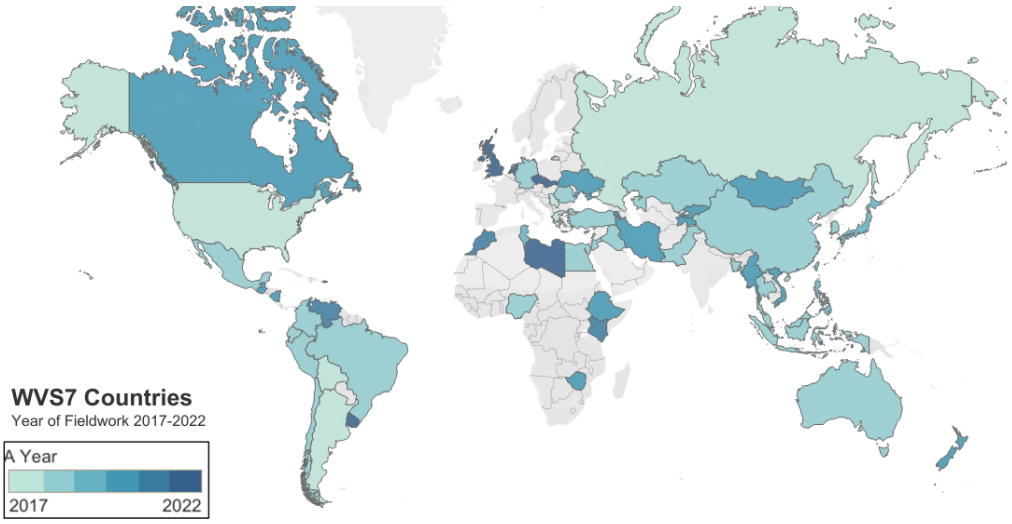
Eventually, the wider geographical inclusion of WVS made it the more appealing choice for this study, in particular given the interest to explore the importance of different socioeconomic contexts. In addition to WVS data, three additional data sets are also used in the research in regard to the specifications of the first hypothesis: IMF's (International Monetary Fund) **GDP per Capita (PPP)**, the **Global Peace Index** produced by the Institute for Economics and Peace (IEP), and **Inglehard and Welzel cultural map** data which is based on WVS data. Also, the **Democracy Index** published by the Economist Intelligence Unit **(EIU)** is used in developing measures for Cognitive Needs. These datasets are introduced below briefly.

4.3.1. World Value Survey

WVS is a worldwide social survey focusing on values since 1981. The 7th wave which was started in 2017, with one year delay due to Covid was officially closed on 31 December of 2021. However, in a few exceptional cases, the work was completed in 2022. It provides data about 64 countries/territories around the world which can be seen in Figure 5. The 7th wave explores the following topics: social values, attitudes, and stereotypes; happiness and well-being; social capital, trust, and organizational membership; economic values; corruption; migration; security; postmaterialist index; science and technology; religious values; ethical values and norms; political interest and political participation; and political culture and political regimes (WVS WAVE 7, n.d.).

Figure 5.

Countries Studied in WVS Wave 7



Note. The figure is made in *Tableau*, based on the WVS Wave 7.

The 7th wave data can be acquired through the WVS web page (WVS-Wave7, n.d.). The web page provides the 7th wave data in different formats including, the SPSS-compatible file format, ".sav". It also provides the master questionnaire that has been used for the 7th wave. The questionnaire has 290 questions including the demographic ones. The items of the survey that are used for forming different variables in this study are presented in the next section: Variables and Measurements.

The web page also provides some details about the sampling and fieldwork procedures. The sampling method is either full probability or a combination of probability and stratified sampling. The minimum sample size, in most countries with few exceptions, is 1200 participants. Based on the data, except for Northern Ireland with 447 participants, all the other samples are larger than 1000 participants. The largest samples are Canada with 4018, Indonesia with 3200, and (mainland) China with 3036 participants. The page ensures that samples are made in a way to represents "all people in the age 18 and older residing within private households in each country, regardless of their nationality, citizenship or language" (Fieldwork and Sampling, n.d.). The survey method with few exceptions is the face-to-face interview. In Australia, New Zealand, and Japan mail/post, and in Great Britain and Northern Ireland Video interviewing in addition to post and face-to-face methods have been used. The sampling design and the outcome are checked for internal consistency. Also, a rigorous data-cleaning procedure has been followed after the data collection phase (Fieldwork and Sampling, n.d.).

There are also strict regulations in regard to non-response. According to the web page (Fieldwork and Sampling, n.d.):

- In countries using a full probability design, no replacements are allowed. PIs (Principal Investigators) should plan on as many callbacks as the funding will allow.
- In countries using some form of quota sampling, every effort should be made to interview the first contact.
- In any case, and as indicated below, a full report on non-responses is required.

Based on all these considerations, it might be concluded that WVS demonstrates high levels of both reliability and representativeness.

4.3.2. Contextual Data

In addition to WVS, this study uses the International Monetary Fund's (IMF) Gross Domestic Product (GDP) per capita adjusted based on Purchasing Power Parity (PPP) for the specifications of the first hypothesis. The data for the period from 1980 up until now can be acquired through the IMF's web page (IMF- GDP per Capita PPP, n.d.). This is a comparative measure of wealth produced in different countries adjusted to purchasing power in those countries.

The International Monetary Fund (IMF) established in 1944, is comprised of 190 member countries. IMF publishes GDP per capita for all its member countries, based on various sources, through its annual report The World Economic Outlook (WEO), a publication by the IMF (IMF, n.d.).

The Global Peace Index (GPI) is another dataset used for the specifications of the first hypothesis. GPI is produced by an independent think tank called the Institute for Economics and Peace or IEP for short (IEP, n.d.). The GPI measures the relative peacefulness of countries and regions around the world based on the level of Societal Safety and Security, the extent of Ongoing Domestic and International Conflict, and the degree of Militarisation (GPI Indicators, n.d.). The lower the score the more peaceful the country (GPI, n.d.). The data can be acquired through IEP's web page Vision of Humanity (Public Data Release, n.d.).

The Democracy Index is a widely referenced tool for researchers, and policymakers published by the Economist Intelligence Unit (EIU), which is a division of The Economist Group (EIU, n.d.). The index assesses the democratic practices and governance in 167 independent countries and two territories based on Electoral process and pluralism, Civil liberties, Functioning of government, Political participation, and Political Culture. Based on their scores countries are categorized into four regime types: 0.00 to 4.00 Authoritarian regimes, 4.01 to 6.00 Hybrid regimes, 6.01 to 8 Flawed democracies, and 8.01 to 10 Full democracies (Index, 2022, p.3).

Inglehard and Welzel first published the map in their book *Modernization, Cultural Change, and Democracy, The Human Development Sequence* (2005, p.63). The study uses the WVS data. The map places different countries based on their score on two axes; traditional vs. secular-rational values, and survival vs. self-expression values (Inglehart & Welzel, 2005, p.61). Then, based on Samuel P.

Huntington's (1966) book, the countries on the map are separated according to their "cultural zones" (Inglehart & Welzel, 2005, p.65). The map is regularly updated after each new wave of WVS. This study uses the data for the 2023 edition of the map.

With regard to the contextual data discussed here, it can be concluded that, despite certain limitations (which will be addressed below), all of them could be regarded as high-quality data suitable for similar research purposes.

4.4. Variables and Measures

In this section, the independent Variables (IV), dependent variable (DV), as well as control variables (CV), are defined and operationalized. Issues regarding construct validity will be discussed later under Research Quality and Limitations.

4.4.1. Independent Variable (IV)

Educational attainment is the main IV in this study. Educational attainment can be defined as the highest level of formal education that a respondent has completed. In other words, the highest educational degree they have attained. Question number 275 of the survey asks about the highest educational attainment of the respondents.[25] The respondent can answer the question in accordance with the International Standard Classification of Education (ISCED) 2011.[26] There is a hierarchical nature to its items, therefore, the measurement level of this variable is ordinal. This question is the only question in the survey that deals with the level of education of the respondents and is clearly related to their educational attainment. As a result, it is selected as an indicator of the main IV of this study.

[25] All the corresponding questions as well as detailed explanations of the formation of each coefficient can be found in Appendix B.
[26] ISCED 2011 has nine education levels:
ISCED 0: Early childhood education ('less than primary' for educational attainment)
ISCED 1: Primary education
ISCED 2: Lower secondary education
ISCED 3: Upper secondary education
ISCED 4: Post-secondary non-tertiary education
ISCED 5: Short-cycle tertiary education
ISCED 6: Bachelor's or equivalent level
ISCED 7: Master's or equivalent level
ISCED 8: Doctoral or equivalent level.

4.4.2. Dependent Variable (DV) and Control Variable (CV)

Each hypothesis of this study deals with a specific DV of its own. In the following sections, the DV of each hypothesis is introduced, defined, and operationalized. Also, the rationale for the selection of the questions in WVS is explained.

4.4.2.1. 1st Hypothesis

The first main hypothesis predicts that “an increase in Educational Attainment is linked to an increase in Deficiency Needs satisfaction” In this hypothesis, DV is Deficiency Needs satisfaction. This concept and its different aspects are explained before. As mentioned in the Theoretical Framework Chapter, though Deficiency Needs consist of four sub-categories, due to a lack of relevant-enough data for the Love and belonging Needs, in this study just Physiological, Security, and Esteem and Prestige are included.

The Coefficient for the Physiological Needs is calculated based on questions number 47, 51, 53, 54, and 55 of the WVS survey. These questions cover topics such as health, availability of food, medicine, cash income, and shelter. All these could be considered as different components of Physiological Needs. The Coefficient for the Security Needs is calculated based on questions number 131 to 141, and 144 to 148 of the survey. These items are among questions 131 to 151 which constitute the security section of the survey. A few items, 149 to 151, have been omitted because they were more related to security as a social value. Also, items 142 and 143 were omitted since they were related to losing their job and not being able to provide education for their children which are related to another form of security than the one which is the concern of this study. The coefficient for Esteem and prestige Needs is based on question 287. This question asks respondents about their perception of their own socioeconomic class. Though this question does not ask about the self-esteem and self-confidence of the respondent, it is the only question related to this issue. Each of these coefficients can be between zero and one. Since the Coefficients of Physiological Needs and Security are made of different questions the final result can be considered as an interval variable, while the coefficient for Esteem and Prestige Needs is an ordinal one. The Coefficient for Deficiency Needs is made of the sum of the Physiological, Security, and Esteem & Prestige Needs, divided by three. Since this variable is composed of different variables which one of

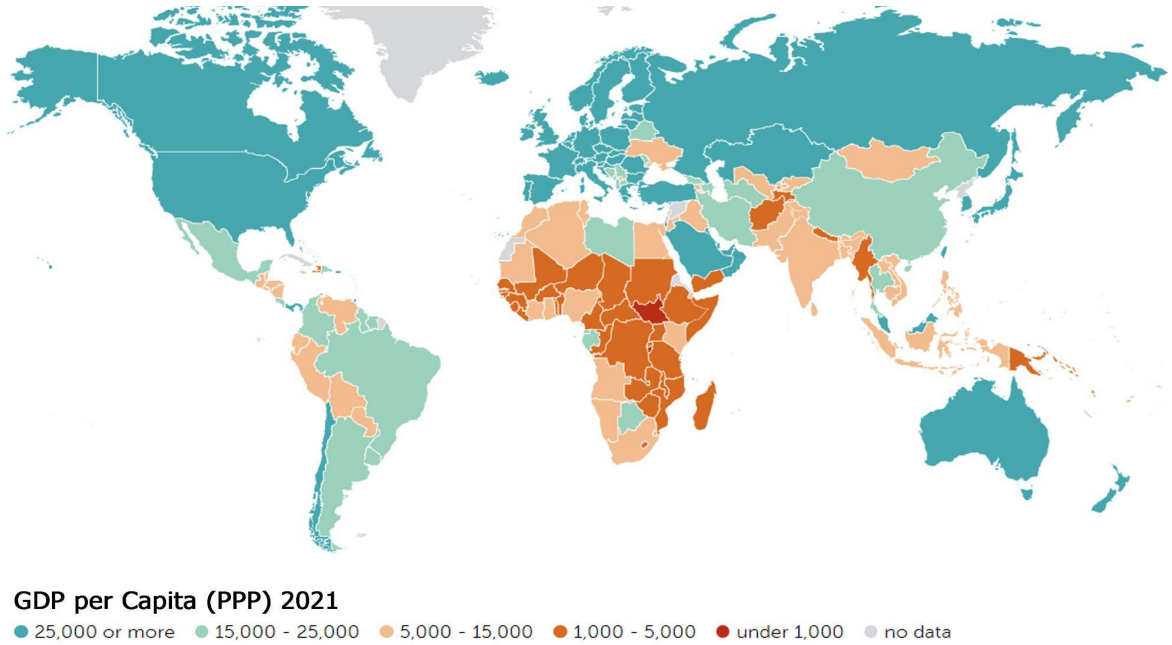
them is ordinal, this coefficient is also an ordinal one. For all these coefficients zero represents the least satisfied and one the most satisfied.

The variables of the first specification of the first hypothesis are the same as the main hypothesis.

The second specification of the first hypothesis predicts that “The relationship between Educational Attainment and the satisfaction of Physiological Needs is most pronounced in countries with moderate levels of wealth”. In this specification, countries’ wealth is a control variable (CV). GDP per Capita is a very well-accepted measure of a country’s wealth. However in order to be able to compare the impact of wealth in regard to Physiological Needs satisfaction GDP per capita Purchasing Power Parity (PPP) is used. To test this specification, respondents are categorized based on the **IMF’s GDP per Capita PPP** of their countries in the same year that the survey was conducted in their countries. Then the data is categorized into five groups based on IMF classification according to GDP per Capita PPP: lower than 1,000 dollars Group 1, from 1,000 to 5,000 Group 2, from 5,000 to 15,000 Group 3, from 15,000 to 25,000 Group 4, and higher 25,000 dollars Group 5. The measurement level of this variable is ordinal. Figure 6 shows the GDP per Capita (PPP) in 2021.

Figure 6.

GDP per Capita (PPP) 2021

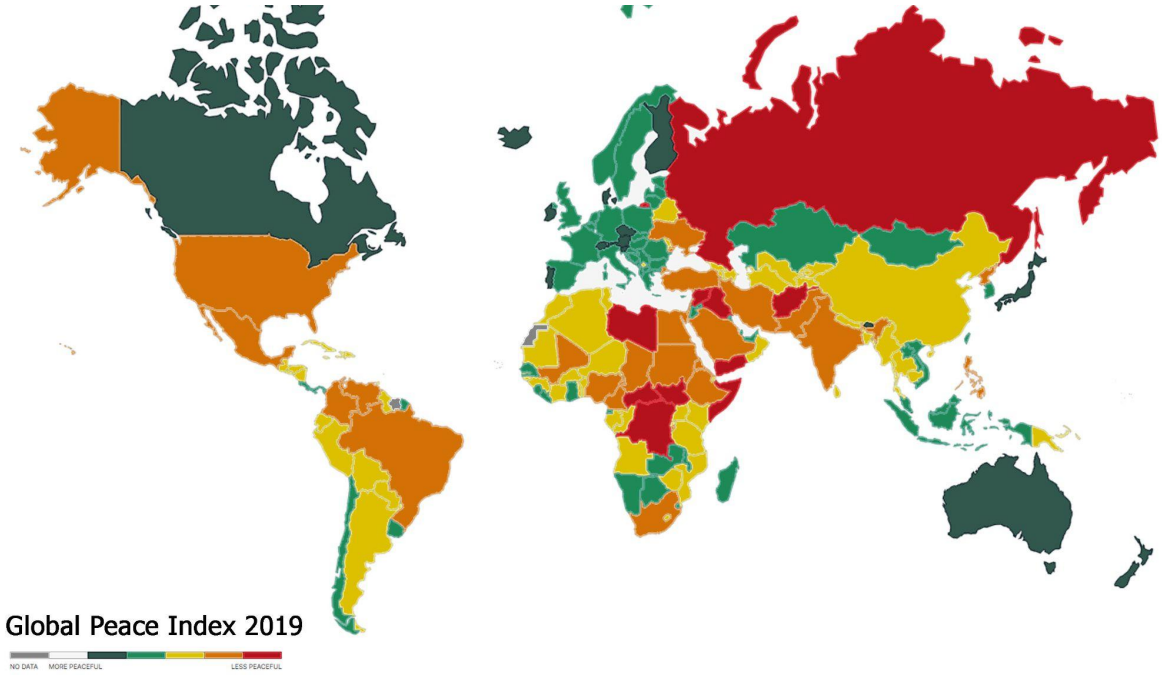


Note. Source: IMF - GDP per Capita, Current Prices. IMF, DATAMAPPER, 2021. https://www.imf.org/external/datamapper/PPPPC@WEO/OEMDC/ADVEC/WEOWORLD?year=2022

The third specification of the first hypothesis predicts that “The relationship between educational attainment and the satisfaction of Security Needs is most pronounced in countries with moderate levels of peacefulness”. In this specification, the level of peacefulness is the CV. The level of peacefulness in a country, in this study, is defined in regard to ongoing domestic and international conflicts, societal safety and security, and the level of militarization. **GPI score** is used as a means for the operationalization of this concept. Respondents are categorized based on their GPI score in the year that they have been questioned for the WVS survey. Following GPI classifications, countries with scores between 1 and 1.499 are categorized as Group 1, 1.5 to 1.999 as Group 2, 2 to 2.299 as Group 3, 2.3 to 2.899 as Group 4, and higher than 2.9 as Group 5. The measurement level of this variable is also ordinal. IEP does not provide GPI for Andorra, Hong Kong, Maldives, Macao, Northern Ireland, and Puerto Rico. Therefore these countries/regions are omitted from the analysis of this specification. Figure 7 demonstrates the GPI grouping for the year 2019.

Figure 7.

Global Peace Index 2019



Note. Based on Vision of Humanity. https://www.visionofhumanity.org/maps/#/ .

4.4.2.2. 2nd Hypothesis

The second main hypothesis predicts that “An increase in Educational Attainment is linked to an increase in Growth Needs Satisfaction”. In this hypothesis, DV is Growth Needs satisfaction which was discussed before.

As mentioned in the Theoretical Framework Chapter, the items in the WVS survey do not cover Aesthetic Needs, Self-Actualization, or Transcendence. However, some items can be regarded as relevant to the satisfaction of Cognitive Needs which could be understood as the development of some cognitive or mental traits. These items are categorized into two overarching themes: **sensitivity to contradiction**, and **attention to reality**. For the contradiction part, respondents’ answers to questions number 237 and 238, and also to questions number 235 and 250 are compared. These two sets of questions are in opposition to one another in the sense that the respondents cannot agree with both at the same time without contradicting themselves. In this study, giving value to science as a means of knowing reality is considered a sign of valuing reality itself. As a result, for the reality aspect of Cognitive Needs, questions 160 and 169 are considered as measurements for this concept. In addition, respondents’ answer to question number 251, which is about the democracy in their countries, is compared to the **Democracy Index** (DI) of their countries in the respective year. The closer their answers are to the DI of their countries the higher they are considered in their attention to reality. This coefficient can also be considered an ordinal one.

The variables of the first specification of the second hypothesis are the same as the main hypothesis.

4.4.2.3. 3rd Hypothesis

The third main hypothesis predicts that “Educational Attainment, Deficiency Needs Satisfaction, and Growth Needs Satisfaction, are related to an individual’s Happiness level”. Here, DV is “individual’s Happiness Level”, i.e. what each individual considers as their own happiness level. Therefore it can be determined by asking participants directly. Since the conceptualization of happiness in this study could be categorized in the “life satisfaction” branch of philosophical theories on happiness, question number 49 is the most relevant one. It asks participants how satisfied they are, all things considered, with their life as a whole, with answers ranging from completely

satisfied to completely not satisfied. Question 46 of the survey also asks participants about how happy they are in general on a 4-level answer. Though both questions relate to the concept of happiness presented in this study, the former seems more suitable for measuring it. Therefore question 49 is used as a measure of happiness related to the concept of satisfaction with one's life. This variable is an ordinal one.

In this hypothesis, Educational Attainment, Deficiency Needs Satisfaction, and Growth Needs Satisfaction, are the IVs. For all these concepts, the same operationalizations mentioned in the previous sections are used.

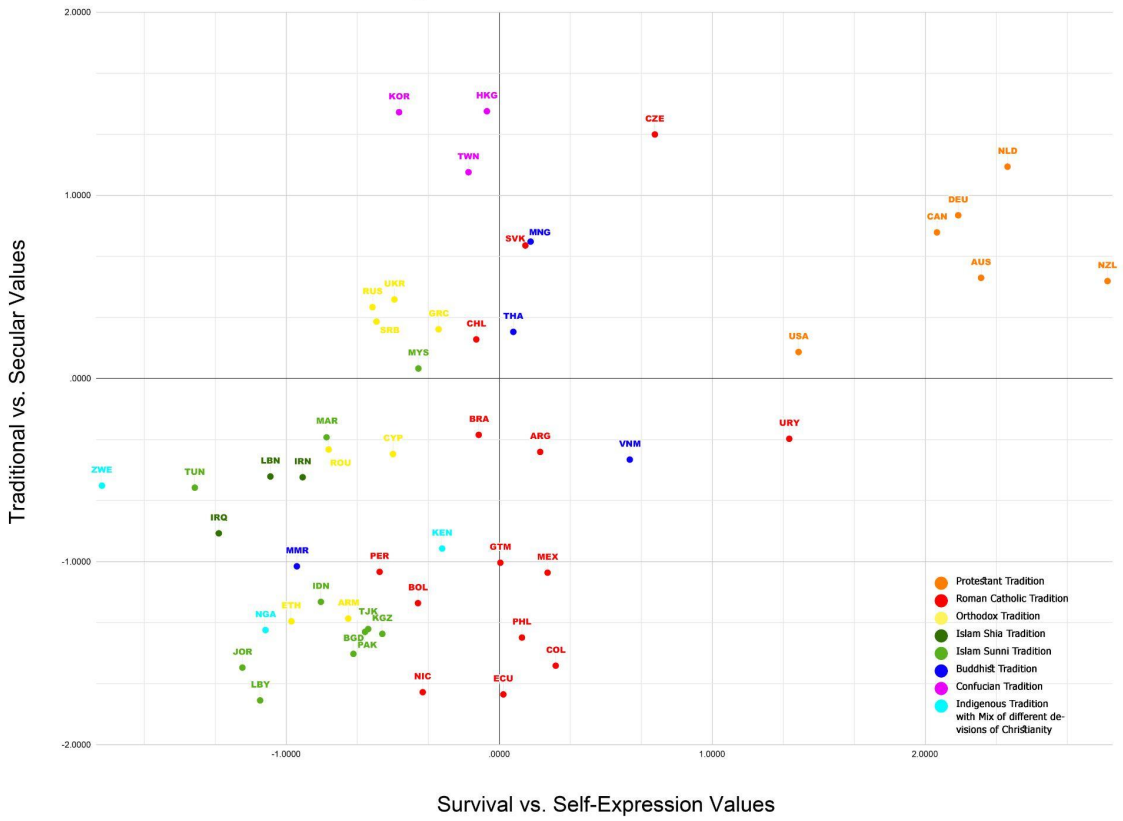
The first specification of the third hypothesis uses the same variables, with cultural context as a control variable. As mentioned in the Theoretical Framework Chapter, this is operationalized through groupings based on the Inglehart-Welzel cultural map. However, in order to increase the accuracy of the groupings, two more factors are considered: the region (in regard to a difference between North America and Oceania as well as Africa and Islamic countries of Asia), and religion (in regard to Shia/Sunni division in Islam). Incorporating these two factors provides a more nuanced approach to understanding the intricacies of cultural context differences.

The respondents' data in some of the countries in the survey lacks some items which in turn results in them not having some of the measures presented before. The Security Needs measure is unavailable in China, Egypt, Great Britain, Japan, Kazakhstan, North Ireland, and Singapore. The Esteem and Prestige Needs measure is unavailable in Great Britain and North Ireland. Also, the Rationality/Growth Needs measure is unavailable in Andorra, Egypt, Macao, Maldives, North Ireland, Puerto Rico, Turkey, and Venezuela. As a result, these countries are omitted from the analysis of the third hypothesis. Based on traditional and survival values quantifications, according to the final version of the Inglehart-Welzel cultural map (WVS Cultural Map. n.d.), the remaining countries are presented in Figure 8.[27]

[27] The data can be found in Appendix C.

Figure 8.

Inglehart- Welzel / Religious Traditions. All the Countries with Available Data for The Third Hypothesis



Note. Based on the final version of the Inglehart-Welzel cultural map (WVS Cultural Map. n.d.), with the addition of Religious Traditions.

From this list of countries, the following are grouped based on their place on the Inglehart-Welzel cultural map, and their regional and religious similarities:

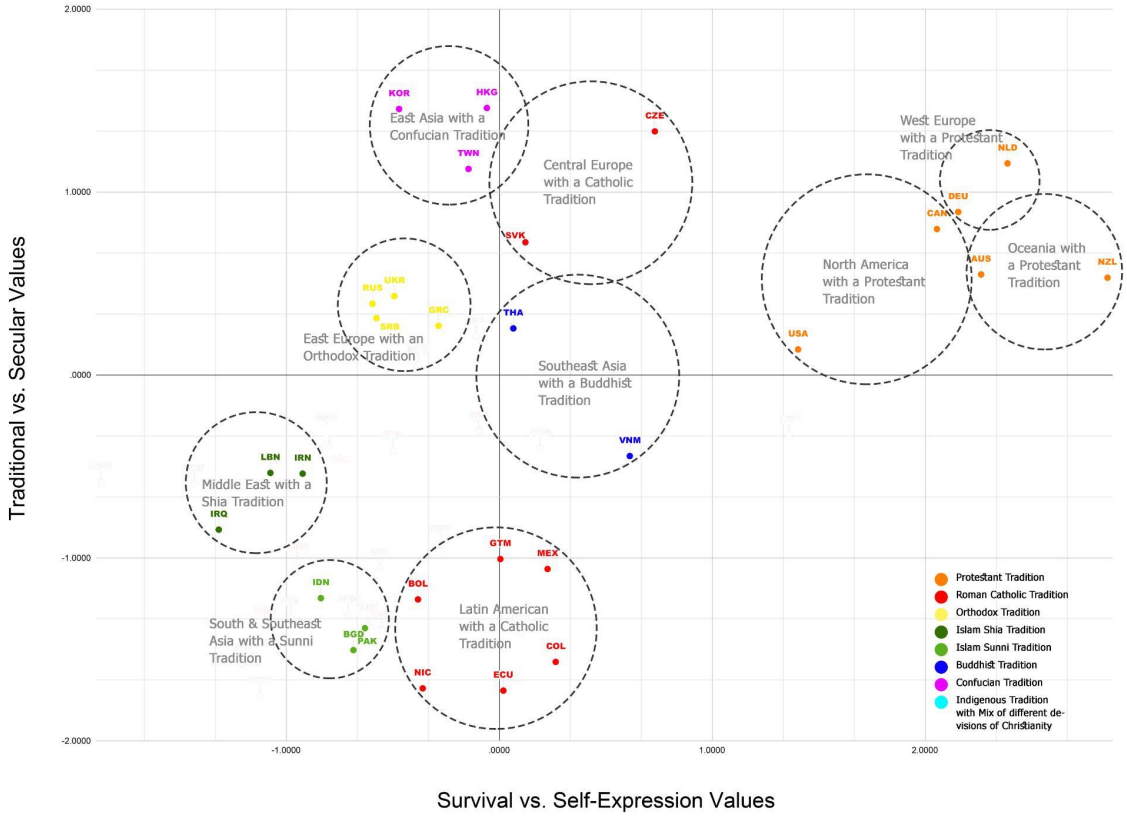
- Central Europe with a Catholic tradition: Czechia and Slovakia
- East Asia with a Confucian tradition: Hong Kong, South Korea, Taiwan
- East Europe with an Orthodox tradition: Greece, Russia, Serbia, and Ukraine
- Latin America with a Catholic tradition: Bolivia, Colombia, Ecuador, Guatemala, Mexico, Nicaragua,
- Middle East with Shia tradition: Iran, Iraq, Lebanon
- North America with a Protestant tradition: Canada, and The United States
- Oceania with a Protestant tradition: Australia and New Zealand

- South and Southeast Asia with a Sunni tradition: Bangladesh, Indonesia, and Pakistan
- Southeast Asia with a Buddhist tradition: Thailand, and Vietnam
- West Europe with a Protestant tradition: Germany and Netherlands

These groupings are demonstrated in Figure 9. The rest of the countries are omitted from the study of the third hypothesis.

Figure 9.

Inglehart- Welzel / Religious Traditions. Groupings of The Countries Based on Region



Note. Based on Figure 8, with attention to regions of the countries.

The main variables of the second and third specifications of the third hypothesis are the same as the main third hypothesis. The control variables of these two specifications are the level of wealth and the level of peacefulness of a country. These concepts are operationalized in the same way they were operationalized for the second and third specifications of the first hypothesis.

In order to provide a better understanding of the relationships, for the third hypothesis, in addition to Deficiency Needs Satisfaction and Cognitive Needs Satisfaction, the within-country standardized version of these two variables (Z-scores) are also calculated and included in the analyses. To calculate the within-country Z-score for each of these variables, each individual's score is

subtracted from the country's average and then it is divided by the standard deviation of the country. However, due to space limitations, these variables are just included in the tables and charts in the Appendices.

4.5. Data Analysis

All the study's data management and analyses are carried out in IBM's Statistical Package for the Social Sciences (SPSS) software. The used software is version 29.0.0.0 (241). SPSS has been widely used for the purpose of analyzing quantitative data in social sciences, since the 1960s (Bryman, 2016, p.353).

4.5.1. Descriptive Statistics

Before everything else, the number of valid and missing values of the whole relevant data, measures of central tendency (mean, median, and mode), as well as measures of dispersion (range, variance, and standard deviation) of all the interval variables, and frequencies of ordinal variables, are examined. Suitable data visualizations, tables, and charts are provided to facilitate the comprehension of the data. However, due to space limitations, instead of the main text these (as well as SPSS raw outputs of the analyses and additional analyses) are presented in Appendix D.

4.5.2. Inferential Statistics

4.5.2.1. 1st Hypothesis

To test this hypothesis, first, the strength and direction of the correlation between the IV and each of the DVs are examined through Spearman's Rho which is a non-parametric measure of correlation that can be used for ordinal and ordinal, or ordinal and interval variables, even when the relationship is not strictly linear (Bryman, 2016, p.343).

The first specialization of the first hypothesis predicts that "the strength of the statistical relationship between Educational Attainment and the satisfaction of Physiological and Security Needs decreases in higher levels of education". To be able to test this prediction, in addition to Spearman's Rho, the One-way ANOVA test, as well as Tukey's post-hoc test are also carried out for each set of variables to be able to evaluate the possible differences between the impact of different levels of

educational attainment on the satisfaction of Deficiency Needs and its components. In cases where the One-way ANOVA test demonstrates significant differences among means of multiple groups, Tukey's post hoc test identifies the group means which are significantly different from each other (Agresti & Finlay, 2014, p.378).[28] Some sources consider Tukey's HSD sensitive to unequal sample sizes. Tukey-Kramer is a modification of the test that deals with this problem. In SPSS, while the Homogenus Subset Table does not account for this problem, the Multiple Comparisons Table "implements the Tukey-Kramer modification" (Does SPSS Offer Tukey-Kramer Post-hoc Tests?, n.d.).

The analysis process for the second and third specifications of the first hypothesis starts similar to the main hypothesis within categorizations based on the control variables. Then, the correlation coefficients should be compared and the significance of their difference should be determined. However, SPSS does not do this automatically. So, in order to be able to compare the correlation coefficients, Fisher's adjustment (rho or r-to-z transformation) is conducted.

Fisher's adjustment uses $z = 0.5 * \ln((1 + r) / (1 - r))$ to standardize the correlation coefficient (Rosenthal, 1991, p.21). After that, using the standard error (SE) of the difference between the two z-scores ($\text{sqrt}(1 / (n1 - 3) + 1 / (n2 - 3))$), and the z-score for the difference between the two correlation coefficients ($(z1 - z2) / SE$), the significance of the difference between the two coefficients is determined. The accepted two-tailed alpha for the difference is set as 0.05.

4.5.2.2. 2nd Hypothesis

The inferential statistical methods of the second hypothesis and its specification are similar to the ones for the first hypothesis.

4.5.2.3. 3rd Hypothesis

For the third hypothesis and its specifications, Spearman's Rho as a non-parametric measure of correlation is used. In addition, in order to be able to compare the

[28] Tukey's post hoc test calculates the minimum significant difference (also known as the "Honestly Significant Difference" or HSD) between each pair of group means. If the difference between the two group means is greater than the HSD value, then it is possible to conclude that those two groups have significantly different means. Tukey's post hoc test is more conservative than some other post hoc tests, meaning it controls the family-wise error rate (the probability of making at least one Type I error across all pairwise comparisons). It is a widely used and reliable method for conducting post-hoc comparisons following an ANOVA.

correlation coefficients in the specifications of the third hypothesis, Fisher's adjustment (the same procedure that is used for the analysis of the second and third specifications of the first hypothesis) is applied.

The main interest of the second and third hypotheses is the change of the impact of Cognitive Needs Satisfaction (in different levels of a country's wealth and peacefulness) on Happiness. However, in order to gain a better understanding, the correlation between Educational Attainment and Deficiency Needs Satisfaction, and Happiness are also examined.

4.6. Research Quality and Limitations

In this section, some of the topics related to research quality and its limitations are discussed.

4.6.1. Positionality Discussions

This study is a quantitative research carried out on existing data. This fact decreases the importance of the positionality discussions since the scope of possible intervention of the researcher is more limited in comparison to qualitative research where the researcher is directly involved in the production of the data together with the respondents (for more on the importance of positionality see Denzin & Lincoln, 2017). However, Critical Realism acknowledges the subjectivity of researchers and therefore the importance of reflexivity. As a result, even in this research, discussing the researcher's positionality increases transparency and, therefore, the quality of the research.

The researcher of this study is an upper-middle-class Middle Eastern man, in his late thirties. Ideologically, he can be considered influenced by a specific interpretation of the Baha'i Faith, which can be considered close to Ibrahimic religions and especially Islamic gnosis ('Irfan عرفان) as well as Hellenistic traditions. As a result, the superiority of reason and rationality is a dominant part of his worldview. This might have had an influence on the centrality of rationality and reason in the formation of the study's a priori model in defining the relationship between happiness and well-being.

4.6.2. Potential Limitations of the Data

All the data sets used in this research, like any other data set, have limitations. Regarding WVS data, it might be argued that sample sizes as large as 1000 to 4000 participants are incapable of capturing all the minorities and marginalized populations in different countries. Also, since the data is gathered through a survey, it could be argued that it has a low ecological validity (Bryman, 2016, p.48). This in turn might have led to Social Desirability bias meaning that participants might have answered the questions in a way they might have considered more appropriate rather than their true opinions (Bryman, 2016, p.227). In addition, there might be some issues with Response Validity, ranging from inaccurate understanding of the questions to fatigue resulting from the length and complexity of the survey.

In this study, other sources of data are also used in addition to WVS data. IMF's GDP per Capita (PPP) is a very well-known and used data set. While in general PPP GDP per Capita is a very well-accepted measure, it is important to note that it is not suitable for capturing within-country differences in regional development or income distribution.

IEP's GPI is another data set used in this study. In comparison to GDP, the concept of peace is much harder to measure since it is more subjective and definition-dependent. This fact might be considered an inherent limitation of such measures. Like GDP per Capita, GPI is also a blanket measure and therefore unable to demonstrate within-country differences. In addition, the measure is dependent on data about different sorts of conflicts, the quality and availability of which are different in different countries.

Similar to GPI, the EIU's Democracy Index is also relatively subjective and definition-dependent. In measuring democracy in different countries it is very hard to account for cultural differences which might result in differences between formal law and what is done in practice.

The Inglehart-Welzel cultural map also has limitations. It could be argued that since it is based on WVS data, it inherits the limitations of WVS. In addition, it could be argued that by oversimplifying complex cultural dynamics, the Inglehart-Welzel cultural map might undermine the diversity within each country.

4.6.3. Measurement Limitations: Construct Validity and Reliability

As discussed by Kleven (2008), construct validity is about the validity of inferences from “the indicators to the construct” (p.224). A task, that though apparently impossible, is at the same time inevitable for doing empirical research. Therefore, construct validity concerns the quality of alignment of indicators and constructs (Kleven, 2008, p.224). The two possible threats to construct validity are **systemic measurement errors** and **random measurement errors**. Random measurement errors are related to the concept of **reliability**. Reliability consists of stability over time, internal reliability, and inter-rater reliability (Bryman, 2016, p.157). Systematic measurement error includes **construct underrepresentation,** where there are aspects of the construct that the measure is not representing, and **construct irrelevance,** where the measure is representing something which is irrelevant to the construct. In this section, construct underrepresentation and irrelevance for each of the measurements of the constructs discussed under “Variables and Measures" will be discussed.

4.6.3.1. Educational Attainment

Educational Attainment, understood as the highest level of formal education one has had, is not a highly abstract construct. As a result, it could be argued that question number 275 and the use of well-established ISCED classification provide high levels of construct validity. However, even in this measurement, some nuances of the construct might be lost in operationalization. The fact that the ISCED does not capture different years or even semesters of the formal educational process might be considered an instance of construct underrepresentation. Also, the measurement does not engage with the issue of quality at all, though it might be a part of the educational attainment construct. A degree attained from the most prestigious universities with the highest grade is considered equal to the same level degree obtained from a higher education institute lowest in any sort of ranking with the lowest grades.

Regarding the reliability of the measurement, it could be argued that since the construct has a relatively high level of objectivity, respondents’ answer to it is irrespective of time, their mood, or the one asking them. Yet, since this study works with available data, there is no possibility of applying the test-retest method, not for

this measure nor for any other one in this study. In addition, since only one question is used for this measure, it is not possible to test internal reliability.

4.6.3.2. Physiological Needs

Physiological Needs is a multi-layered concept that can be related to different needs of the human body. The combination of different questions related to health, availability of food, medicine, cash income, and shelter has been done to reduce construct underrepresentation. However, there are still needs related to the human body that are not addressed by any question. In regard to clean air and water, as well as sexual activity the measure is underrepresented. The inclusion of items related to income, on the other hand, might result in an increase in construct irrelevance. However, it is included since it can be a representative of satisfaction of other Physiological Needs, especially ones not mentioned explicitly, such as clothing.

Again, as in the case of educational attainment, the high level of objectivity increases the stability and inter-rater aspects of the reliability of the measurement. In regard to internal reliability, Cronbach's Alpha for all the questions of this measure (47, 51, 53, 54, and 55) is 0.601. Though this may seem low, the reason may be in the diverse nature of the concept of Deficiency Needs. It is an umbrella term for different needs and their satisfaction is not necessarily related to each other. Omitting question 47 which is about the respondent's health, Cronbach's Alpha for the remaining four questions is 0.783, which is much higher. However, since health is an important aspect of Physiological Needs, it is decided to include question 47 in the measurement.

4.6.3.3. Security Needs

As discussed in the Variables and Measures section, a few items from the security section of the survey have been omitted in order to avoid construct irrelevance. The abundance of questions eliminates the possibility of construct underrepresentation.

Moving up in Maslow's hierarchy of needs the level of subjectivity increases. Higher levels of subjectivity to some degree decrease the stability over time. Respondents may feel different about their security at different times which in turn results in different answers. However, the accuracy of the questions in the section secures a high level of stability. The items are directly answered by the respondent so the question of inter-rater reliability is resolved. Cronbach's Alpha for all the

questions of this measure (131 to 141, and 144 to 148) is 0.772. By omitting question 131 which asks about the feeling of security in each respondent, Cronbach's Alpha raises to 0.813. Keeping question 131 in the items decreases the possibility of construct underrepresentation.

4.6.3.4. Esteem & Prestige

This measure is solely based on one question regarding the perception of respondents about their own socioeconomic class. The concept of esteem and prestige is much more than just the perception of an individual about their socioeconomic class. Yet, due to the lack of any other relevant enough questions, the measure for this construct faces construct underrepresentation. Aspects such as self-esteem which is mentioned by Maslow, as well as esteem in close circles such as family and extended family, colleagues, friends, religious communities, etc., are not represented in the measurement.

Since the measure is made of only one question, it is not possible to test its internal reliability. However, since people tend to have a relatively stable perception of their socioeconomic class, the stability, and inter-rater reliability of the measurement can be considered relatively high.

4.6.3.5. Deficiency Needs

As discussed before, the concept of Deficiency Needs in addition to Physiological Needs, Security, and Esteem and Prestige, also includes Love and Belonging which due to the lack of relevant items in the questionnaire is not explored in this study. As a result, the construct of Deficiency Needs in this study is clearly underrepresented.

In regard to reliability, as a variable composed of three other variables, its stability and inter-rated reliability are dependent on the three composing components. Since the components are distinct from each other conceptually, there should not be a high level of internal reliability among them (Cronbach's Alpha: 0.450).

4.6.3.6. Cognitive Needs

The concept of Cognitive Needs is, in this study, divided into sensitivity to contradiction and attention to reality. As explained before, for the contradiction part, respondents' answers to two sets of questions, each consisting of two questions, are

compared with each other for signs of contradiction. The measure only covers the political aspects of each respondent's beliefs or ideas. However, people may have contradictions among other aspects of their belief systems, ideologies, or conceptual frameworks, such as their religious beliefs, or moral systems. In this sense, the construct is underrepresented by the measure.

Since the possibility of the existence of a contradiction is more likely in the first set of questions over the second one, the former has a larger share (twice) than the latter. The existence of contradictions in someone's ideas does not necessarily mean that they are contradicting themselves at each and every stance. Thus, there is no need for these two stances to have a high correlation with each other. Cronbach's Alpha for the two items of contradiction is 0.337. All four questions, and therefore the measure, are relatively stable over time and the answer to them is irrespective of the one interviewing the respondents.

As discussed more extensively in Appendix B, Science is considered one natural outcome of giving importance to Reality in contrast to Internalized Social Perception of Reality. As a result, the importance that each respondent gives to science is used to operationalize the importance given to Reality. The measure covers the stances of the participants on the scientific view of Reality in opposition to perceptions of reality formed by religious or sociopolitical beliefs. Though there might be some other sources of social perception of reality, religious and sociopolitical beliefs are amongst the most dominant ones. As a result, it could be argued that since the measure gauges the importance that participants give to science in opposition to these two, the probability of construct underrepresentation and construct irrelevance is low. The stability and inter-rater reliability of the measure are high because the questions seem to be related to the core of participants' belief system and therefore not likely to change over time or interviewer.

Regarding the internal reliability of the whole measure of Cognitive Needs, the two aspects have almost the same share in forming the measure, with a slightly higher share for the attention to reality in comparison to the lack of contradiction.

4.6.3.7. Happiness

As discussed in the Theoretical Framework Chapter, happiness in this study is understood as "an individual's pleasurable state of mind in regard to the alignment of perceived reality with their desired reality." Question 49 which asks participants

about their satisfaction with their life is used to measure this construct. This measure is limited to the satisfaction with one's life while the concept clearly is about reality as a whole and not just one's life. As a result, it could be argued that there exist levels of construct underrepresentation.

The stability of the measure over time may also be questioned. Though the question is in regard to one's life as a whole, the immediate mood of the participants may play a role in their answer. The question may also be vulnerable in the case of inter-rater reliability, at least to some extent. The answer to a question that might be considered connected to the self-image of the participant, might raise the possibility of different answers to different interviewers. Since it is a one-question measure, the internal reliability of it is inapplicable.

4.6.3.8. Cultural Context

As discussed before, a combination of the Inglehart-Welzel cultural map, regional placements of the countries in which the respondents reside, and the religious majority of those countries have been used to determine the cultural context of the respondents. Despite being highly influential (Beugelsdijk & Welzel, 2018, p.1471) Inglehart-Welzel cultural model, like any other model, has some limitations. One of its limitations might be its Western-centredness. For example, while the model distinguishes different branches of Christianity, it is silent about the Shia / Sunni division in Islam. This specific problem is addressed in this study by distinguishing the two main Islamic traditions. Nevertheless, focusing on the national level, the measure is clearly an underrepresentation of the concept of cultural context. A better measure would have been able to capture the differences due to differences in the economic, legal, and political situation in each country, the subcultural nuances such as religious, lingual, ethnic, or gender minorities, as well as cultural differences related to different geography within each country, and economic class and the education of the family in which the respondent has been brought up. It should also be mentioned that while the Shia/Sunni distinction improves the measure to some extent, it is still silent about different branches of Buddhism or different schools of Confucianism.

The measure is very stable over time. The social and cultural similarities of the countries grouped in this measure are something that is related to their histories and therefore unlikely to change easily even in the relatively long term.

4.6.4. Statistical and Internal Validity

Statistical validity, or whether a covariation is trivial or worthy of interpretation (Kleven, 2008, p.224) is an important question. To be sure about the statistical significance, the accepted P-value is smaller than 0.05 in this study. To quantify the magnitude of the relationships between dependent and independent variables, eta-squared is calculated as an effect size measure for the ANOVA test and r-squared for the regression. It could be said that it is common to believe that values **between 0.01 and 0.059** are considered **small, between 0.06 and 0.139** are considered **medium,** and **larger than 0.140** as **large** for eta-squared (Cohen, 1988, pp.285-287). For Spearman's rho, the correlations with absolute values between zero and 0.1 are, in the scope of this study, considered very weak, between 0.1 and 0.2 weak, between 0.2 and 0.3 moderate, between 0.3 and 0.6 strong, and higher than 0,6 very strong (Agoklu, 2018, p.92). It is important to note that the interpretation of the magnitude of the correlation between two variables or the effect size is dependent on the field and complexity of the relationships and concepts. All the dependent variables in this study, Deficiency Needs, Cognitive Needs, and Happiness, are very complicated concepts that could be influenced by many different factors. As a result, it could be argued that looking for a high correlation coefficient or effect size between any of them and one factor is not realistic. That is the case, especially with Happiness, which is an extremely complicated and complex concept.

In ANOVA, the normality of the distribution of the responses in each category, the equality of the standard deviations for each group, and the independence of random samples are the three main assumptions for the F-test. However, in practice, the first two assumptions are not satisfied completely (Agresti and Finlay, 2014, p.370). In this study too, the first two criteria are not completely met.

In the case of Spearman's rho, the most important assumption is that there is a monotonic relationship between the paired observations of each respondent (Laerd Statistics, n.d.). The monotonicity of the relationships is examined through scatter plots for each pair of variables.

According to Agresty and Finlay, the most important assumptions of statistical inference based on regression are random sampling and a linear relationship between the predictor variable and the mean of dependent variables (2014, p.276). While the first criterion is met, the second is checked. Also, it is important to note that

in order to be able to use the regression method, all the different ordinal variables of the third hypothesis including the measure of Happiness (satisfaction with life), are treated as scale variables. This is largely considered acceptable among social scientists about ordinal variables with a large number of orders or categories (Bryman, 2016, p.335).

Internal validity concerns causal relations (Kleven, 2008, p.227; Bryman, 2016, p.41). Since the study is ultimately interested in causal relationships between the independent variables and the dependent ones, it is important to note that any claims about a causal relationship between two or more variables cannot be proven merely due to an association between two sets of variables, even when the temporal order condition is met. Nonetheless, the theory is strengthened when, in addition to temporal order, controlling for other variables the association remains (Agresti and Finlay, 2014, p.528). However, it is hard to be sure about the temporal order in a cross-sectional study. In addition, it is not possible to be sure at any point that the associations between variables are not caused by a third unknown variable (spurious correlation). As a result, any claim in support of a causal relation should be considered as mere temporary support for the theory and not a piece of absolute evidence for it.

4.6.5. External Validity

External validity is concerned with the generalizability of the findings of the study to the larger population (Kleven, 2008, p.229, as well as Bryman, 2016, p.42). The relatively large sample sizes in WVS provide reasonable grounds for generalizability from the sample to the population in the studied countries. However, the cross-sectional nature of the study limits the possibility of generalization over time. Since only one specific point in time is studied it is important to note that education and educational systems studied in this study as the ultimate independent variable are subject to change over time, and as a result, the impact of educational attainment acquired under current educational systems cannot be completely generalized to educational systems in the future. In addition, it is important to note that many important aspects of educational systems, such as quality, are not accounted for in this study. Moreover, in regard to higher education, important

aspects such as disciplinary differences are absent. All these missing factors reduce the generalizability of the findings.

4.7. Ethical and Political Considerations

According to the WVS website, “all deposited data is made anonymous on the PI [Principal Investigators] side and the archive deposited files have no means to trace the respondents” (Fieldwork and Sampling, n.d.). Therefore lots of ethical concerns about the data-gathering process such as harm to participants, lack of informed consent, invasion of privacy, and deception (Bryman, 2016, p.125) are resolved. Since the study is undertaken on available data, an NSD approval was not needed and therefore not acquired.

Yet, there are still ethical and political issues regarding the quality of analysis and publication of the findings. Protecting the integrity of the data is one of the obligations of this study regarding the data. Also, it is an ethical obligation for this study to truthfully contribute to the advancement of knowledge by doing rigorous analysis and presenting and publishing the real findings. In this study, an attempt is made to approach this goal, as much as possible, by following established academic methods in the field, and by maximizing honesty and transparency in the research process.

It is very unlikely for this research to reach any findings that might endanger the marginalized groups of any community. So, the choice between commitment to truth or protection of minorities would not be an issue.

As a topic with potential implications for policy making, the findings of this study may be regarded as taking sides with the specific political system. It is important to emphasize that, as discussed under Positionality (see above), the researcher is not ideologically and politically neutral. However, this research is not sponsored in any way by any political or ideological group, and the researcher endeavors to maintain neutrality throughout the research process.

4.8. Summary

In this chapter, different issues in regard to research design and methodological choices of the study were discussed. First, in regard to the ontological and epistemological underpinnings, it was discussed that this study could be considered

close to Critical Realism. Then it was discussed that this study uses a cross-sectional quantitative method.

In the later sections, the different datasets used in this study were presented and discussed. These included WVS, IMF's GDP per Capita (PPP), Global Peace Index, Democracy Index, and the Inglehart-Welzel cultural Map and data. In the following part, different concepts of each hypothesis and their operationalizations were discussed. In the Data Analysis section, descriptive statistics and inferential statistics of each of the hypotheses of the study, including non-parametric correlation analysis of Spearman's rho and One-way ANOVA, were discussed. Also, in the same part, IBM's Statistical Package for the Social Sciences (SPSS), and the version used in this study, were introduced.

Then, the research quality issues and the limitations of the study were discussed. These included positionality discussions, potential limitations of the data, measurement limitations, and validity issues. Finally, the ethical and political considerations of the study were discussed.

In the following chapter results of the analyses and the discussions about it are presented.

5. Results and Discussion

In this chapter, the results of the inferential statistics regarding each hypothesis are presented and based on this it is determined if the null hypothesis of each item can be rejected or not. After presenting the main analysis for each hypothesis, the supplementary analysis about that subject is also demonstrated. Finally, there is a brief summary of all results. Due to space limitations, the descriptive statistics of the key variables are presented in Appendix D.

5.1. First Main Hypothesis

The first main hypothesis predicts that “an increase in Educational Attainment is linked to an increase in Deficiency Needs satisfaction.” The testing of the hypothesis is done for both the Deficiency Needs Satisfaction as a whole, as well as its three components: Physiological Needs Satisfaction, Security Needs Satisfaction, and Esteem and Prestige Needs Satisfaction. The results of the correlation test between these items and the Highest Educational Attainment are presented in Table 1.

Table 1.

Correlation between Educational Attainment and Deficiency Needs and Its Three Components

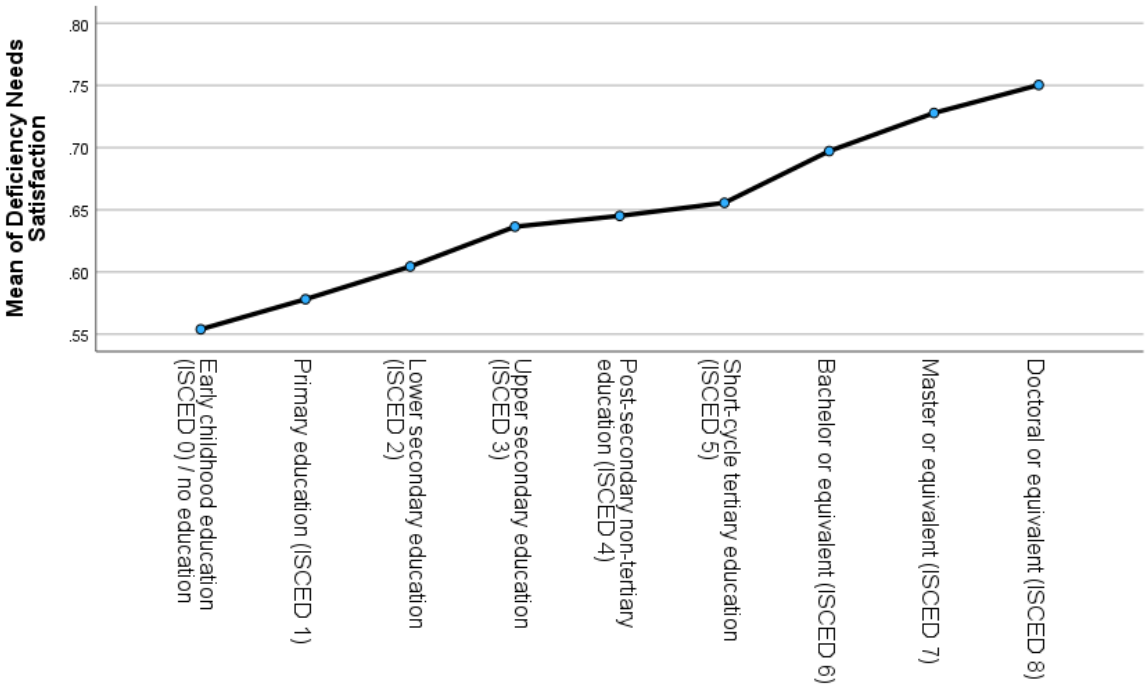
Correlations	**Highest Educational Attainment**		
	N	Spearman's Rho	Sig.
Deficiency Needs Satisfaction	**68,515**	**0.341**	**<.001**
Physiological Needs Satisfaction	91,947	0.227	<.001
Security Needs Satisfaction	70,127	0.123	<.001
Esteem and Prestige Needs Satisfaction	88,309	0.331	<.001

As can be seen, there is a statistically significant and positive correlation between the Highest Educational Attainment and Deficiency Needs Satisfaction and all its three components. Therefore, the null hypothesis of the first main hypothesis about Deficiency Needs Satisfaction is rejected**.** This means that **the claim of the hypothesis that an increase in Educational Attainment is linked to an increase in Deficiency Needs Satisfaction, is supported**. The high significance level here means that the probability of having a sample in which this relationship exists without the existence of this relationship in the whole population (Type I error) is less than 0.1 percent.

However, the fact that the correlations are significant and positive does not allow an analysis of how specific increases in Educational Attainment are linked with Deficiency Needs Satisfaction. For these reasons, a One-way ANOVA test is done, as it improves the understanding of the magnitude and the distribution of the impact of the Highest Educational Attainment on Deficiency Needs Satisfaction.[29] The test reveals a significant difference in Deficiency Needs Satisfaction among participants with different Educational attainment $F(8, 68506) = 1142.395$, $p<0.001$.[30] The eta-squared value for Deficiency Needs Satisfaction is 0.118 (95% Confidence Interval: 0.113 to 0.122) which, as mentioned in the Research Design and Methodology chapter, can be considered **medium**. Based on the Tukey-Kramer posthoc test, all the mean differences are significant with P-values less than 0.001. Figure 10 displays the Means Plot of Deficiency Needs Satisfaction for each ISCED group. The mean of Deficiency Needs Satisfaction grouped by different ISCED classifications is presented in Table 2, and the mean differences are visualized in Figure 11.

Figure 10.

Means of Deficiency Needs Satisfaction for Each ISCED Group



Note. The plot is a direct output of SPSS. All the mean differences are statistically significant (P-value < .001).

[29] The tables are presented in Appendix D.

[30] APA style is used for reporting the results of the One-way ANOVA. The guidelines can be found at https://www.scribbr.com/apa-style/numbers-and-statistics/.

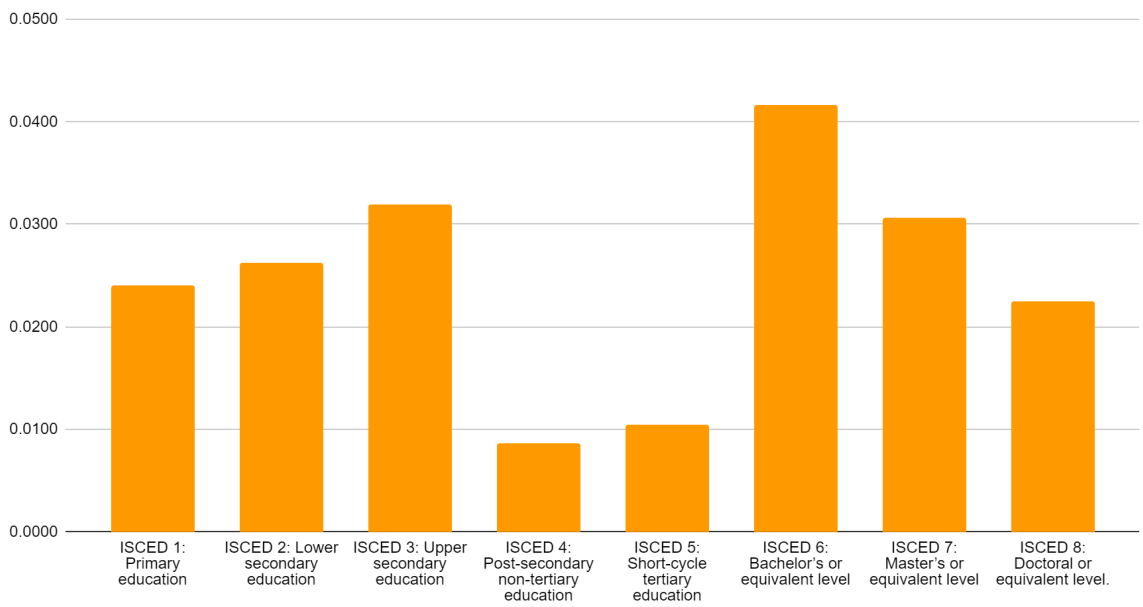
Table 2.

One-way ANOVA Results for Deficiency Needs Satisfaction for Each ISCED Level

One-way ANOVA				
Deficiency Needs Satisfaction	**N**	**Mean**	**Mean Difference with the Previous Level**	**Mean Difference Sig.**
ISCED 0: Early childhood education	3,105	0.554		
ISCED 1: Primary education	8,386	0.5781	0.0241	<.001
ISCED 2: Lower secondary education	9,780	0.6044	0.0263	<.001
ISCED 3: Upper secondary education	18,018	0.6364	0.0320	<.001
ISCED 4: Post-secondary non-tertiary education	6,841	0.6451	0.0087	<.001
ISCED 5: Short-cycle tertiary education	5,377	0.6556	0.0105	<.001
ISCED 6: Bachelor's or equivalent level	11,825	0.6972	0.0416	<.001
ISCED 7: Master's or equivalent level	4,310	0.7278	0.0306	<.001
ISCED 8: Doctoral or equivalent level.	873	0.7503	0.0225	<.001

Figure 11.

Mean Difference of Deficiency Needs Satisfaction for Each ISCED Level



Note. The chart is made using Google Sheets, based on the SPSS results.

Taken together, such analysis indicates that getting a Bachelor's is related to the highest change in the mean of Deficiency Needs Satisfaction, compared to those that have a short-cycle tertiary education qualification. It is followed by completing Upper Secondary education (compared to those that have lower secondary

education), and then obtaining a Master's degree (compared to those having a Bachelor's degree). Achieving Short-cycle tertiary education (compared to Post-secondary non-tertiary education), or Post-secondary non-tertiary education (compared to Upper secondary education) is related to the least change in the mean of Deficiency Needs Satisfaction. However, It is important to note that the normal trajectory for individuals in many countries is ISCED 3 and then ISCED 6. In this case, the mean of Deficiency Needs Satisfaction of individuals with a Bachelor's should be compared to those with an Upper secondary education. Calculated that way, the change in the mean of Deficiency Needs Satisfaction of individuals with a Bachelor's increases from 0.0416 to 0.0608.

However, to be precise, the data here is **not enough to claim a causal direction** from Educational Attainment to Deficiency Needs Satisfaction, primarily because such a correlation might be spurious. There might be several reasons that there is a correlation between two variables in a sample; the high correlation might be due to mere chance, one of them might have been caused by the other, or both of them might have been caused by a third factor. Statistical significance almost eliminates the possibility of mere chance. To claim that Educational Attainment causes Deficiency Needs Satisfaction and its components, one must eliminate the possibility of the causal direction being reversed or both of them being caused by a third factor.

For claiming that one has caused the other, a theoretical explanation and temporal order are important. There might be theoretical explanations to support both causal directions; about how higher Educational Attainment can be a cause of or caused by higher levels of Deficiency Needs Satisfaction. Also, the **temporal order** is not clear. Although Deficiency Needs Satisfaction can be a result of higher Educational Attainment and therefore happening after Educational attainment, it is also plausible that higher Deficiency Needs Satisfaction might result in higher Educational Attainment and therefore precede it in time. This means that to be able to attribute all the correlations to a causal impact of Educational Attainment on Deficiency Needs Satisfaction, it is needed to be sure that before having any education, all the respondents had had the same amount of Physiological, Security, Esteem and Prestige, and Deficiency Needs Satisfaction as a whole.

With regards to other variables that may be of relevance, one could consider an individual's intellectual abilities or their initial socio-economic background, either

the immediate one (such as the families in which they were born and raised) or the broader one (the communities or countries they were born and raised in). All of these can be actually the cause for both the higher Educational Attainment and the higher Deficiency Needs Satisfaction.

Therefore, in order to have a better understanding of the nature of the relationship some additional analyses are needed. To have a longitudinal approach that could ensure a specific temporal order is beyond the possibilities of this study and should be done in later ones. However, in cross-sectional research such as this, to be able to conclude in support of a causal direction, the individual characteristics as well as the situations, whether their families, communities, or countries, in which individuals are born and raised should be controlled. The data available for this study does not provide any information on individual characteristics such as IQ, or any other aspect that could be plausibly linked to intellectual abilities. With regards to the possible impact of the broader socio-economic context in which the respondent lives, this is to some extent addressed through the second and third specifications of the first main hypothesis (see below). The potential relevance of the more immediate socio-economic situation is discussed in the following section.

5.1.1. The Potential Importance of the Immediate Socioeconomic Background

A complete evaluation of the socioeconomic situation of the families in which the respondent was born and raised is hard to attain. However, WVS includes items about the highest Educational Attainment of the parents of the respondents which are categorized into lower, middle, and higher.[31] Given that Parental Education is considered an indicator of the socioeconomic situation of the upbringing of an individual (Erola et al., 2016, p.33), it seems that a fruitful approach to a better understanding of the impact of Educational Attainment on Deficiency Needs Satisfaction and its components can be to **control for parents' education** when analyzing the correlation between the individual's Educational Attainment and Deficiency Needs Satisfaction, as presented in Table 3.

[31] The questions can be found in Appendix B.

Table 3.

Correlation between Educational Attainment and Deficiency Needs Satisfaction Controlling Parents' Educational Attainment Level

Correlations	Respondent's Mother			Respondent's Father		
Highest Educational Attainment and Deficiency Needs Satisfaction	**N**	**Spearman's Rho**	**Sig.**	**N**	**Spearman's Rho**	**Sig.**
Lower	39,724	0.293	<.001	36,888	0.285	<.001
Middle	15,133	0.248	<.001	15,578	0.241	<.001
Higher	7,687	0.222	<.001	9,115	0.222	<.001
Highest Educational Attainment and Physiological Needs Satisfaction	**N**	**Spearman's Rho**	**Sig.**	**N**	**Spearman's Rho**	**Sig.**
Lower	51,956	0.205	<.001	48,642	0.204	<.001
Middle	18,921	0.135	<.001	19,336	0.129	<.001
Higher	9,847	0.118	<.001	11,519	0.117	<.001
Highest Educational Attainment and Security Needs Satisfaction	**N**	**Spearman's Rho**	**Sig.**	**N**	**Spearman's Rho**	**Sig.**
Lower	40,607	0.096	<.001	37,696	0.085	<.001
Middle	15,462	0.129	<.001	15,911	0.132	<.001
Higher	7,890	0.111	<.001	9,357	0.092	<.001
Highest Educational Attainment and Esteem and Prestige Needs Satisfaction	**N**	**Spearman's Rho**	**Sig.**	**N**	**Spearman's Rho**	**Sig.**
Lower	51,639	0.272	<.001	48,421	0.266	<.001
Middle	18,752	0.245	<.001	19,140	0.225	<.001
Higher	9,693	0.219	<.001	11,335	0.228	<.001

These results show that, when controlling for the Parental education of either mother or father, the correlation between the Education Attainment of Respondent and the Deficiency Needs Satisfaction (either as a whole or its individual components) **remains statistically significant and positive**. However, the correlation coefficients for **Deficiency** Needs, **Physiological** Needs, and **Esteem and Prestige** Needs Satisfaction **decrease,** compared to the general correlation presented under the first main hypothesis (see above). In most of these cases, the correlation is strongest when the respondent's parents have **lower** levels of Educational Attainment. This decrease in the correlation might be due to the effect of

the socioeconomic status of the families in which individuals are born which at the same time might result in respondent's higher levels of Educational Attainment. The only exception is the relationship between the Highest Educational Attainment and **Security** Needs Satisfaction. In this case, the correlation **increases** in comparison to the general situation. In this case, the correlation is strongest when the respondent's parents have **middle** levels of educational attainment.

To explore the relationship between the Educational Attainments of the individual and the situation in which they were born and raised, the **relation between one's Educational Attainment and the Educational Attainments of their parents is explored**. As can be expected these correlations are significant, positive, and high (the detailed results are presented in Appendix D).

So, if the respondent's parents have higher education, probably the respondents might have higher levels of Educational Attainment, while the impact of Educational Attainment on their Deficiency Needs Satisfaction is lower. While this is also true about Physiological Needs, and Esteem and Prestige Needs, it is not the case about Security Needs. The possible impact of context on the correlation between Educational Attainment and Security Needs Satisfaction is also discussed under the first and third specifications of the first hypothesis.

5.1.2. A Closer Look at Esteem and Prestige

Among the three components of Deficiency Needs Satisfaction studied in this study, Esteem and Prestige Needs Satisfaction has the highest correlation with respondents' Educational Attainment. This could be interpreted in a way that suggests that the statistically significant and positive correlation between Deficiency Needs Satisfaction and Educational Attainment is to a large extent due to the strength of the relationship between Esteem and Prestige Needs Satisfaction and Educational Attainment. Earlier it was discussed that even controlling for parents' education there is still a significant and positive correlation between Educational Attainment and Esteem and Prestige Needs Satisfaction, especially among individuals with parents with lower levels of education (see above). As mentioned before, the temporal order issue cannot be completely resolved in the scope of this study. However, these two facts could be considered indicators of the importance of Educational Attainment in societies regardless of its impact on other aspects of

Deficiency Needs Satisfaction. In other words, putting the temporal order issue aside for the moment, and assuming that there is a certain causal direction, it could be said that education plays a role in the placement of individuals in social classes. In this case, it may be relevant to explore how specific increases in educational attainment are linked to Esteem and Prestige Needs Satisfaction.

The One-way ANOVA test provides a better understanding of the distribution of the impact of the Highest Educational Attainment on Esteem and Prestige Needs Satisfaction. It reveals a significant difference in Esteem and Prestige Needs Satisfaction among participants with different Educational attainment $F(8, 88300) = 1402.69$, $p<0.001$. The mean of Esteem and Prestige Needs Satisfaction grouped by different ISCED classifications is presented in Table 4. Based on the Tukey-Kramer posthoc test, all the mean differences are significant with P-values less than 0.001. The eta-squared value for Esteem and Prestige is 0.113 (95% Confidence Interval: 0.109 to 0.116) which is considered **medium**.

Table 4.

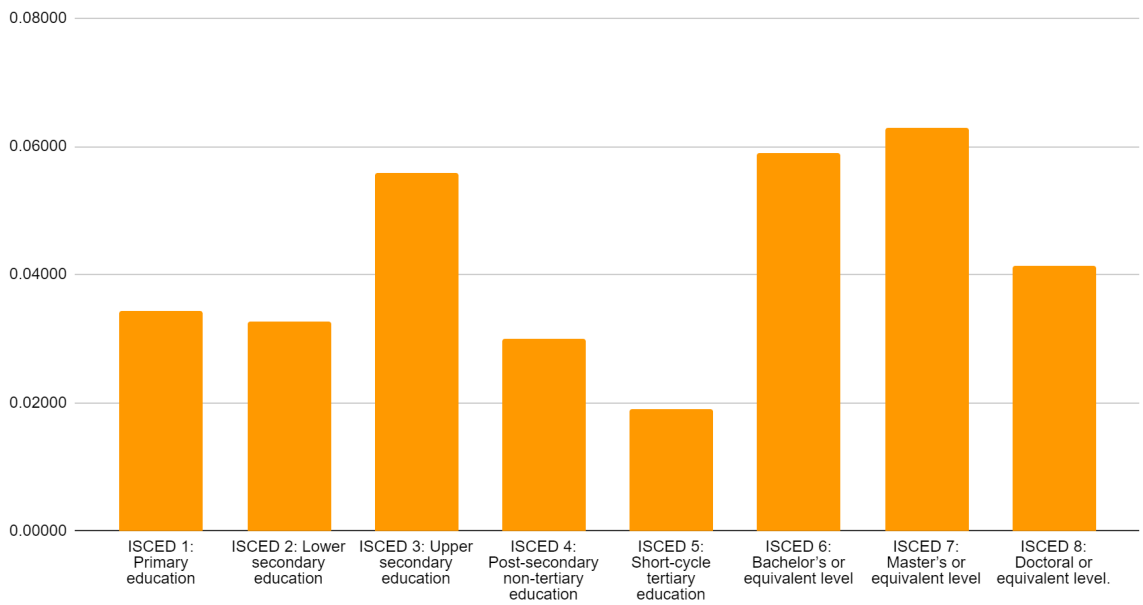
One-way ANOVA Results for Esteem and Prestige Needs Satisfaction for Each ISCED Level

One-way ANOVA				
Esteem and Prestige Needs Satisfaction	**N**	**Mean**	**Mean Difference with the Previous Level**	**Mean Difference Sig.**
ISCED 0: Early childhood education	4,567	0.3001	-	-
ISCED 1: Primary education	10,879	0.3345	0.03440	<.001
ISCED 2: Lower secondary education	12,879	0.3672	0.03270	<.001
ISCED 3: Upper secondary education	22,970	0.4232	0.05594	<.001
ISCED 4: Post-secondary non-tertiary education	8,090	0.4532	0.03006	<.001
ISCED 5: Short-cycle tertiary education	7,301	0.4723	0.01902	<.001
ISCED 6: Bachelor's or equivalent level	15,134	0.5312	0.05892	<.001
ISCED 7: Master's or equivalent level	5,498	0.5941	0.06289	<.001
ISCED 8: Doctoral or equivalent level.	991	0.6355	0.04139	<.001

The mean differences are visualized in Figure 12. As can be seen, getting a Master's is related to the most increase in the mean of Esteem and Prestige Needs Satisfaction (compared to those who have a Bachelor's degree). It is followed by obtaining a Bachelor's degree (compared to those that have a short cycle degree), Upper Secondary education (compared to those that have Lower secondary), and Doctoral level (compared to those that have a Master's).

Figure 12.

Mean Difference of Esteem and Prestige Needs Satisfaction for Each ISCED Level



Note. The chart is made using Google Sheets, based on the SPSS results.

However, as discussed before, it could be argued that one does not necessarily go through all the ISCED stages. In many cases, students do not go through stages 4 and 5, and complete a Bachelor's program right after their Upper Secondary education. In that case, the mean difference caused by getting a Bachelor's degree increases from 0.05892 to 0.18010. This might mean that the completion of a Bachelor's is the most effective in increasing Esteem and Prestige Needs Satisfaction.

No matter how the impacts are calculated, it could be said that higher education (Bachelor's and Master's) is associated with the most increase in the mean of Esteem and Prestige Needs Satisfaction. However, as discussed before, it is important to note that in claiming a causal direction other factors should also be considered.

5.1.3. First Specification of the First Hypothesis

As presented in the Theoretical Framework chapter, the first specification of the first hypothesis predicts that the "strength of the statistical relationship between Educational Attainment and the satisfaction of Physiological and Security Needs decreases at higher levels of education".

The One-way ANOVA test reveals a significant difference in Physiological Needs Satisfaction among participants with different Educational attainments $F(8, 91938) = 696.626$, $p<0.001$. The mean of Physiological Needs Satisfaction grouped by different ISCED classifications is presented in Table 5. Based on the Tukey-Kramer posthoc test, all the mean differences, except for ISCED 4 and ISCED 8, are significant with P-values less than 0.001. The eta-squared value for Esteem and Prestige is 0.057 (95% Confidence Interval: 0.054 to 0.060) which is considered **small** to medium. The mean differences are visualized in Figure 13. Note that based on Tukey's HSD the Doctoral level mean is significantly different from the Master's level mean of Physiological Needs Satisfaction. However, when tested according to Kramer's modification of the test that accounts for the sample numbers, due to the low number of participants with Doctoral level education, its mean difference with Master's level is not statistically significant.

Table 5.

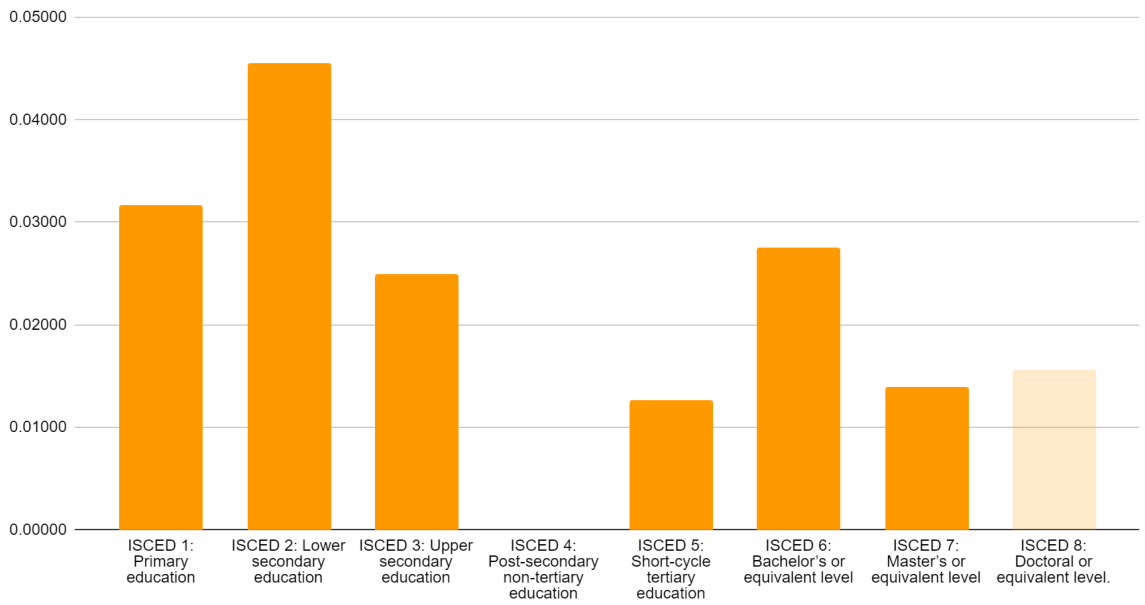
One-way ANOVA Results for Physiological Needs Satisfaction for Each ISCED Level

One-way ANOVA				
Physiological Needs Satisfaction	**N**	**Mean**	**Mean Difference with the Previous Level**	**Mean Difference Sig.**
ISCED 0: Early childhood education	4610	0.6724	-	-
ISCED 1: Primary education	10,962	0.7041	0.0317	<.001
ISCED 2: Lower secondary education	13,886	0.7496	0.0455	<.001
ISCED 3: Upper secondary education	23,595	0.7745	0.0249	<.001
ISCED 4: Post-secondary non-tertiary education	8,218	0.7745	0.0000	1.000
ISCED 5: Short-cycle tertiary education	7,673	0.7871	0.0126	<.001
ISCED 6: Bachelor's or equivalent level	15,948	0.8147	0.0276	<.001
ISCED 7: Master's or equivalent level	5,972	0.8287	0.0140	<.001
ISCED 8: Doctoral or equivalent level.	1083	0.8443	0.0156	0.117

Note. The mean differences with the previous level for ISCED 4 and ISCED 8 are not statistically significant.

Figure 13.

Mean Difference of Physiological Needs Satisfaction for Each ISCED Level



Note. The chart is made using Google Sheets, based on the SPSS results. The mean differences with the previous level for ISCED 4 and ISCED 8 are not statistically significant.

As visible in the chart, the most improvement occurs by attaining the Lower-secondary Level (.0455 increase in the mean), compared to having only Primary education. After attaining the Lower-secondary Level, the next most effective educational attainment, in turn, are finishing primary school, turning a short-cycled tertiary into a bachelor, from a lower-secondary to an upper-secondary, getting a Master's, and a short-cycle tertiary education certificate.

However, again as discussed before, if getting a Bachelor's could be considered the natural next level after Upper-secondary education, it gains the second highest rank in mean differences (.0402).

So, in regard to the first specification of the first hypothesis, it could be said that, while the mean difference associated with a Bachelor's is almost as large as completing Lower-secondary or Primary education, and definitely as large as finishing Upper-secondary, the mean difference associated with a Master's is almost half of finishing those levels. Also, there is not enough evidence to claim that gaining a doctorate has a significant difference with a Master's. Therefore it could be concluded that **the results are according to the prediction of the specification in regard to Physiological Needs Satisfaction**.

Regarding Security Needs Satisfaction, the ANOVA shows a statistically significant difference among participants with different Educational attainment $F(8, 70118) = 129.154$, $p<0.001$. The mean of Physiological Needs Satisfaction grouped by different ISCED classifications is presented in Table 6. Based on the Tukey-Kramer posthoc test, ISCED 0 and 1 are categorized in a single subset, ISCED 2 to 5 in another one, ISCED 6 in a distinct one, and ISCED 7 and 8 together in another one. This means that the differences in their means are not significantly different from each other. The eta-squared value for Esteem and Prestige is 0.015 (95% Confidence Interval: 0.013 to 0.016) which is **small**. The mean differences are visualized in Figure 14. The non-significant differences are shown in a lighter color.

Table 6.

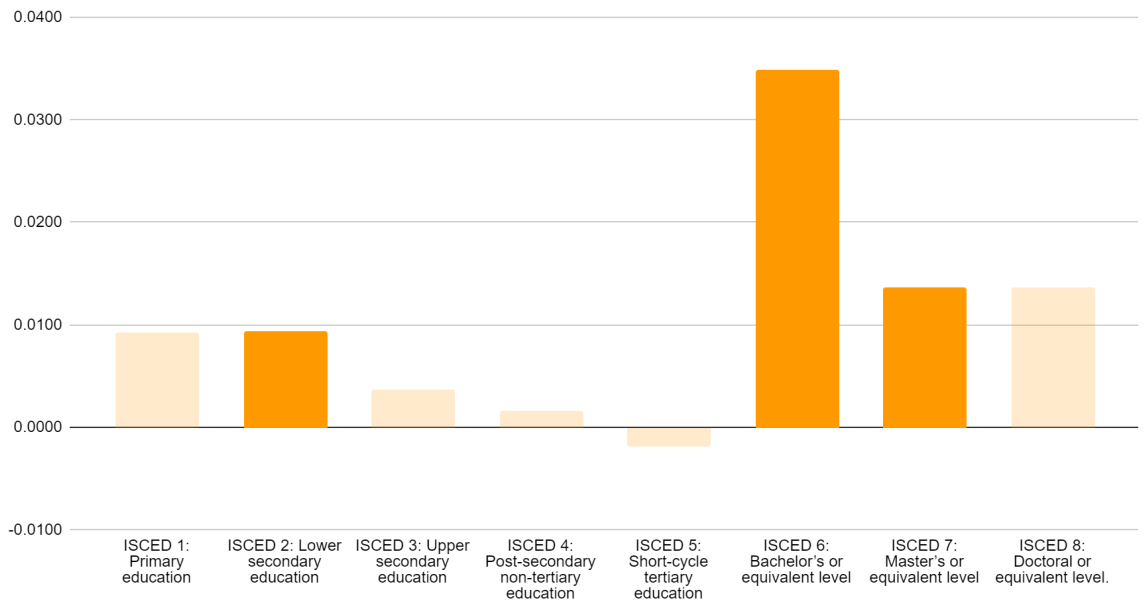
One-way ANOVA Results for Security Needs Satisfaction for Each ISCED Level

One-way ANOVA				
Security Needs Satisfaction	**N**	**Mean**	**Mean Difference with the Previous Level**	**Mean Difference Sig.**
ISCED 0: Early childhood education	3,240	0.6856		
ISCED 1: Primary education	8,557	0.6949	0.0093	0.144
ISCED 2: Lower secondary education	10,003	0.7043	0.0094	0.004
ISCED 3: Upper secondary education	18,398	0.708	0.0037	0.692
ISCED 4: Post-secondary non-tertiary education	7,026	0.7096	0.0016	0.999
ISCED 5: Short-cycle tertiary education	5,532	0.7077	-0.0019	0.999
ISCED 6: Bachelor's or equivalent level	12,061	0.7426	0.0349	<.001
ISCED 7: Master's or equivalent level	4,447	0.7563	0.0137	<.001
ISCED 8: Doctoral or equivalent level.	899	0.77	0.0137	0.366

Note. The mean differences with the previous level for ISCED 1, 3, 4, 5, and ISCED 8 are not statistically significant.

Figure 14.

Mean Difference of Security Needs Satisfaction for Each ISCED Level



Note. The chart is made using Google Sheets, based on the SPSS results. The mean differences with the previous level for ISCED 1, 3, 4, 5, and ISCED 8 are not statistically significant.

Regarding Security Needs Satisfaction, getting a Bachelor's has the highest impact (.0349). After getting a Bachelor's, gaining a Master's (.0137) has the second rank, followed by Lower-secondary (.0094).

As a result, it could be concluded that higher education in general is associated with a larger increase in the mean of Security Needs Satisfaction than lower levels of education. However, the mean difference decreases when getting a Master's degree to less than 40 percent. This is **contrary to the prediction** of the first specification of the first hypothesis in regard to **Security** Needs Satisfaction.

As a result, the findings fail to reject the null hypothesis of the first specification of the first hypothesis. In other words, **the results are not able to support the claim that the strength of the statistical relationship between Educational Attainment and the satisfaction of Physiological and Security Needs decreases at higher levels of education**.

This specification of the first hypothesis was based on the fact that extreme poverty has decreased and therefore there is an abundance of goods related to basic needs including security. However, the findings show that although this might be the case for Physiological Needs, it does not seem to be the case for Security. It

seems that the attainment of lower levels of education can be sufficient for providing basic goods like food and shelter at a universal level.

Regarding security, it might be said that on a global scale, it is not abundant enough that having low levels of education could be sufficient for its acquisition everywhere. However, the results here do not necessarily indicate that higher levels of Educational Attainment on the individual level are linked to higher levels of Security Needs Satisfaction everywhere regardless of the context. The results might be due to a correlation between the massification of higher education in countries with higher levels of security, without any real causal relation between higher levels of Educational Attainment of the individuals and the security of the country. In other words, both the massification of higher education and a high level of (perception of) security can be caused by a third factor such as the socio-economic development of the country. Controlling contextual factors might help a better understanding of the impact of Educational Attainment on Security Needs Satisfaction on the individual level. This is further discussed under the third specification of the first hypothesis.

5.1.4. Second Specification of the First Hypothesis

The second specification of the first hypothesis predicts that the "relationship between Educational Attainment and the satisfaction of Physiological Needs is most pronounced in countries with moderate levels of wealth". In 2023, the IMF only categorized the Republic of South Sudan as a country with less than 1000$ in GDP per Capita (PPP). Very few countries between 2017 and 2022 are categorized in this group. None of them are included in the 7th wave of WVS. Therefore, in this study, there are no participants in Group GDP per Capita (PPP) 1. The Spearman's Rho for the correlation between Physiological Needs Satisfaction and Educational Attainment for Groups 2, 3, 4, and 5 are presented in Table 7. In all the groups Educational Attainment has a statistically significant correlation with Physiological Needs Satisfaction with P-values less than 0.001. The correlation between the Highest Educational Attainment and Physiological Needs Satisfaction is most pronounced in respondents in Group 3, which are countries with a GDP per Capita of 5,000 $ to 15,000 $ per year (Figure 15).

Table 7.

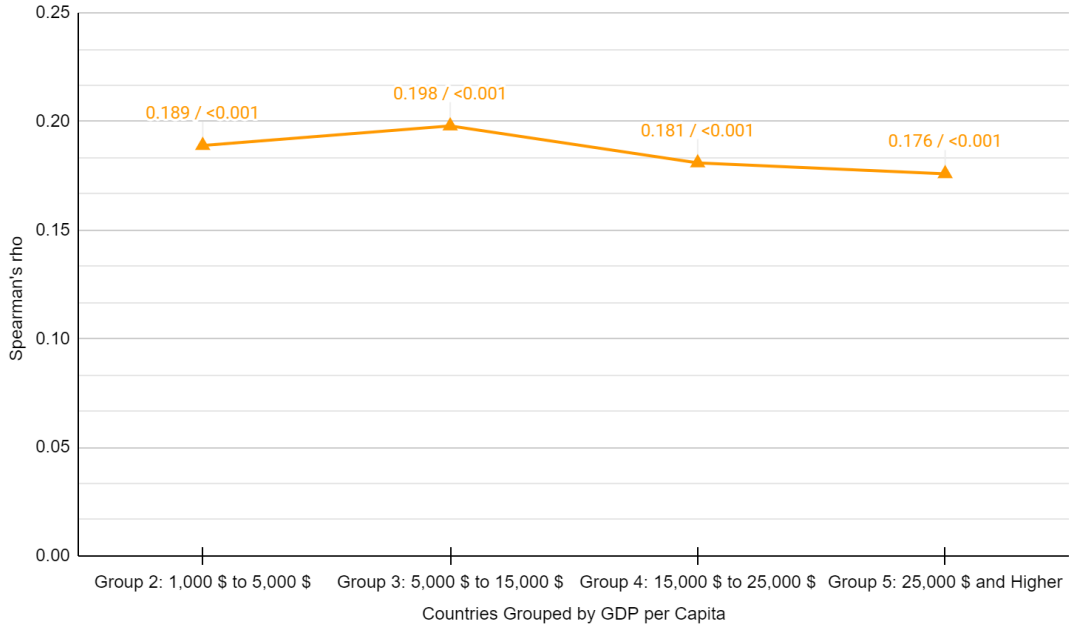
Correlation between Educational Attainment and Physiological Needs Satisfaction in Different Countries Grouped by GDP per Capita PPP

Correlations			
Highest Educational Attainment and Physiological Needs Satisfaction	**N**	**Spearman's Rho**	**Sig.**
Group 2 (1,000 $ to 5,000 $)	4,797	0.189	<.001
Group 3 (5,000 $ to 15,000 $)	30,803	0.198	<.001
Group 4 (15,000 $ to 25,000 $)	16,177	0.181	<.001
Group 5 (higher than 25,000 $)	40,170	0.176	<.001

Note. There is no country with a GDP per Capita PPP of less than 1,000 $ (Group 1) in WVS Wave 7 Data.

Figure 15.

Correlation Between Educational Attainment and Physiological Needs Satisfaction in Different Countries Grouped by GDP per Capita PPP



Note. The chart is made using Google Sheets, based on the SPSS results.

To be able to compare the correlation coefficients, it is important to first make sure that their difference is statistically significant. In order to determine the significance of the differences between the coefficient correlations, Fisher's adjustment and the rest of the procedure explained in the Research Design and Methodology chapter are carried out. The results are presented in Table 8.

Table 8.

The Z-Score of The Differences of Standardized Correlation Coefficients Between EA and PNS (Grouped by GDP per Capita PPP)

	The Z Score of the Differences	Sig.
Group 2 and Group 3	-0.6022	0.546
Group 2 and Group 4	0.5037	0.614
Group 2 and Group 5	0.8800	0.378
Group 3 and Group 4	1.8159	0.069
Group 3 and Group 5	3.0101	0.002
Group 4 and Group 5	0.5545	0.578

Note. The significant differences are demonstrated in light grey.

This means that only the difference between the coefficient correlations for Group 3 with Group 5, is statistically significant. So, the null hypothesis of the second specification of the first hypothesis cannot be rejected. This means that **the results do not support the idea that in countries with moderate levels of wealth, the relationship between educational attainment and the satisfaction of Physiological Needs is stronger**. However, it could be said that the relationship between educational attainment and the satisfaction of Physiological Needs in countries with a GDP per Capita (PPP) of more than 25,000 $ is lower than the same relationship in countries with a GDP per Capita (PPP) of 5,000 to 15,000 $.

As predicted in the Theoretical Framework chapter this might be due to wider room for Educational Attainment in the middle ground situation in comparison to richer countries where basic needs are so abundant that decreases the impact of Educational Attainment on their acquisition.

Another interesting finding is the difference between correlation coefficients in countries grouped according to their wealth production and the general correlation coefficient presented under the main first hypothesis. While in general, the correlation coefficient between Educational Attainment and Physiological Needs Satisfaction is 0.227, when countries are grouped based on their wealth, at the highest the correlation coefficient is 0.198. This decrease in the correlation might be due to the effect of higher levels of the massification of higher education in advanced economies. In other words, the difference indicates that a part of the relationship found under the main hypothesis is probably due to the correlation between Educational Attainment and Physiological Needs Satisfaction at the country level

without any meaningful relation to the real impact of Educational Attainment at the individual level.

The findings of this section were in regard to the broader socioeconomic context. Doing the same analysis controlling for wealth in the more immediate socioeconomic contexts, such as family, might also provide valuable insights.

5.1.5. Third Specification of the First Hypothesis

The third specification of the first hypothesis predicts that the "relationship between Educational Attainment and the satisfaction of Security Needs is most pronounced in countries with moderate levels of peacefulness". The Spearman's Rho for the correlation between Security Needs Satisfaction and Educational Attainment for 5 groups of countries based on their GPI are presented in Table 9. In groups 1, 2, 3, and 5, Educational Attainment has a statistically significant correlation with Security Needs Satisfaction with P-values less than 0.001.

The correlation between the Highest Educational Attainment and Security Needs Satisfaction is most pronounced in Group 1, which includes countries with a GPI from 1 to 1.499, and least in Group 4, which includes countries with a GPI from 2.3 to 2.899 (Figure 16).

Table 9.

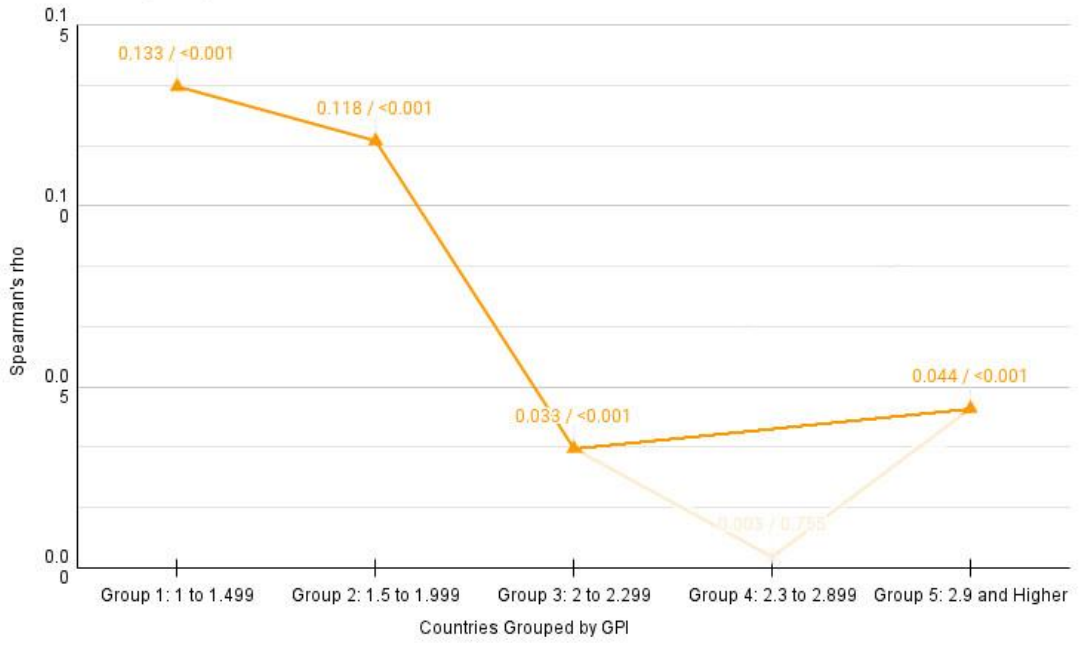
Correlation between Educational Attainment and Physiological Needs Satisfaction in Different Countries Grouped by GPI

Correlations			
Highest Educational Attainment and Security Needs Satisfaction	**N**	**Spearman's Rho**	**Sig.**
Group 1 (1<GPI<1.499)	8,235	0.133	<.001
Group 2 (1.5<GPI<1.999)	20,212	0.118	<.001
Group 3 (1.999<GPI<2.299)	16,042	0.033	<.001
Group 4 (2.3<GPI<2.899)	13,726	0.003	0.755
Group 5 (2.9<GPI)	6,866	0.044	<.001

Note. The significant correlations are demonstrated in light grey.

Figure 16.

Correlation Between Educational Attainment and Physiological Needs Satisfaction in Different Countries Grouped by GPI



Note. The chart is made using Google Sheets, based on the SPSS results. The correlation between Educational Attainment and Physiological Needs Satisfaction is not significant in Group 4.

In order to compare the correlation coefficients, the statistical significance of their differences should be checked. The results of Fisher's adjustment to compare the correlation coefficients are presented in Table 10. Since the correlation is not significant in Group 4 it is omitted from the Table.

Table 10.

The Z-Score of The Differences of Standardized Correlation Coefficients Between EA and PNS (Grouped by GDP per Capita PPP)

	The Z Score of the Differences	Sig.
Group 1 and Group 2	1.1655	0.243
Group 1 and Group 3	7.4331	<.001
Group 1 and Group 5	5.4915	<.001
Group 2 and Group 3	8.0889	<.001
Group 2 and Group 5	5.3341	<.001
Group 3 and Group 5	-0.7637	0.445

Note. The significant differences are demonstrated in light grey.

This means that the correlation coefficients could be divided into two: Groups 1 and 2, and Groups 3 and 5. The correlation coefficients in Groups 1 and 2 are statistically significantly higher than the correlation coefficients in Groups 3 and 5.

This is completely contrary to the prediction of the third specification of the first hypothesis that in countries with moderate levels of peacefulness, the relationship between educational attainment and the satisfaction of Security Needs is stronger than in others. Therefore the analysis fails to reject the null hypothesis. Thus, **the findings do not support the claim that the relationship between educational attainment and the satisfaction of Security Needs is most pronounced in countries with moderate levels of peacefulness**. In fact, in this particular case, the low chance of Type I error in each group's correlation coefficient (Table 9) results in a very low probability of Type II error of the whole hypothesis. In other words, since the probability of the correlation coefficients in groups 1, 2, 3, and 5, to be produced by chance is very low (P-value < .001), and since the same is true about the results of the comparisons of Z-scores, the probability of a "false negative" is very low.

This means that **the relationship between Educational Attainment and Security Needs Satisfaction is strongest in peaceful countries** (with GPI lower than 2). In countries with moderate or low levels of peacefulness, the relationship between Educational Attainment and Security Needs Satisfaction is trivial. This, approximately (since the data is only about the year 2023), means that only in dark green and green countries in Figure 7 (in the Research Design and Methodology chapter), Educational Attainment has a statistically significant and relatively strong correlation with Security Needs Satisfaction. It could be concluded that Security is not as abundant as was assumed in the Theoretical Framework chapter. As a result, in countries at the top of the peacefulness ranking, there is competition for its acquisition in which education might play a role. However, it is so scarce in other countries that education cannot play a significant role in its acquisition.

5.2. Second Main Hypothesis

The second main hypothesis predicts that "an increase in Educational Attainment is linked to an increase in Growth Needs Satisfaction". The Spearman's Rho for the correlation between Cognitive Needs Satisfaction and Educational Attainment is presented in Table 11. There is a statistically significant and positive correlation between the Highest Educational Attainment and Cognitive Needs Satisfaction. Therefore, the null hypothesis of the second main hypothesis about Cognitive Needs

Satisfaction is rejected. Since as mentioned before, Cognitive Needs might be considered very much related to the whole concept of Growth Needs Satisfaction, it could be concluded that **the claim of the hypothesis that an increase in Educational Attainment is linked to an increase in Cognitive Needs Satisfaction, is supported.**

Table 11.

Correlation between Educational Attainment and Cognitive Needs Satisfaction

Correlations			
Highest Educational Attainment	**N**	Spearman's Rho	Sig.
Cognitive Needs Satisfaction	**71,079**	**0.262**	**<.001**

The temporal order issue and the possibility of spurious relationships are relevant in this case too. The causal direction is not clear. Theoretically, higher Educational Attainment might result in higher levels of Cognitive Needs Satisfaction, which is very close to the concept of rationality. However, the causal direction might also be reversed. It might be that higher levels of Cognitive Needs Satisfaction and higher levels of Rationality are causing higher Educational Attainment. Like in the case of Deficiency Needs, to make sure about a causal direction research with longitudinal design is needed.

5.2.1. The Potential Importance of the Immediate Socioeconomic Background

In the absence of a longitudinal approach that could ensure a specific temporal order, to be able to explore the possibility of claiming a causal relationship, similar to the first hypothesis, the correlation is examined by controlling for several factors. The first is the participants' parents' education, with a similar rationale as for the first main hypothesis, i.e. the parents' education might have an impact on the cultivation of cognitive abilities in individuals and therefore their Cognitive Needs Satisfaction. The correlation coefficients are demonstrated in Table 12.

Table 12.

Correlation between Educational Attainment and Cognitive Needs Satisfaction Controlling Parents' Educational Attainment Level

Correlations	**Respondent's Mother**			**Respondent's Father**		
Highest Educational Attainment and Cognitive Needs Satisfaction	**N**	**Spearman's Rho**	**Sig.**	**N**	**Spearman's Rho**	**Sig.**
Lower	39,917	0.206	<.001	37,301	0.206	<.001
Middle	15,517	0.195	<.001	15,748	0.192	<.001
Higher	7,717	0.160	<.001	9,248	0.176	<.001

A statistically significant and positive correlation between the Highest Educational Attainment and Cognitive Needs Satisfaction remains when controlling for parents' Educational Attainments. The correlation coefficient is at the highest when the respondent's parents have lower levels of educational attainment. However, in general, the strength of the correlation decreases by controlling for parents' Educational Attainment. This decrease in the correlation might be due to the impact of parents' education on the development of individuals' cognitive abilities which at the same time results in respondent's higher levels of Educational Attainment.

So, if the respondent's parents have higher education, probably the respondents might have higher levels of Educational Attainment and also higher levels of Cognitive Needs Satisfaction. So it could be said that at least a part of the correlation between an individual's Educational Attainment and Cognitive Needs Satisfaction that was mentioned earlier is spurious. Therefore, it seems that the impact of Educational Attainment on individuals' Cognitive Needs Satisfaction in general might be lower than what is shown by the results of the correlation analysis. However, the Educational Attainment of the parents is not the only factor that might play a role in the relationship between respondents' Educational Attainment and their Cognitive Needs Satisfaction.

In addition to parents' education, other factors such as ideological or cultural factors like religious and political affiliations might also play a role in the relationship between Educational Attainment and change in Cognitive Needs Satisfaction. Cognitive Needs Satisfaction can be very much related to the ideology and worldview of a person which in turn might be related to their religious denominations

or political leanings. In addition to the philosophical impact, it could be argued that these factors in the form of religious or political communities might be a part of the mid-range sociocultural context of an individual which can impact their cognition and Cognitive Needs Satisfaction. WVS provides data about both the religious denominations as well as the political affiliations of the respondents.

To have a better understanding of the nature of this relationship, the correlation between Educational Attainment and Cognitive Needs Satisfaction while **controlling for religious affiliations** is conducted. The correlation coefficients are demonstrated in Table 13.

Table 13.

Correlation between Educational Attainment and Cognitive Needs Satisfaction Controlling for Religious Affiliations

Correlations			
Highest Educational Attainment and Cognitive Needs Satisfaction	**N**	**Spearman's Rho**	**Sig.**
Do not belong to a denomination	18,969	0.294	<.001
Catholic	13,600	0.236	<.001
Protestant	6,467	0.279	<.001
Orthodox	5,536	0.108	<.001
Jew	233	0.430	<.001
Muslim	17,039	0.017	<.001
Hindu	514	0.329	<.001
Buddhist	4,764	0.298	<.001
Other Christian	1,833	0.293	<.001
Others	1,508	0.254	<.001

There is a statistically significant and positive correlation between the Highest Educational Attainment and Cognitive Needs Satisfaction in all the religious groups. The correlation among Jews, Hindus, Buddhists, people who do not consider themselves to belong to any religious denomination, Christians other than the three major branches, and Protestants is stronger than the general correlation discovered under the second main hypothesis. It is important to note that the data about Jews and Hindus in this table are not from participants living in countries where any of these religions have the majority of the population. Therefore these respondents are minorities in the societies explored in the survey. The differences in the magnitudes

of the correlations imply that in specific cultures the impact of Educational Attainment may be stronger.

It is important to note several points here. First, this is about the correlation between Educational Attainment and Cognitive Needs Satisfaction, and not Cognitive Needs Satisfaction per se. Second, this does not imply any causal relationship between one's religious belief and the magnitude of the correlation between Educational Attainment and Cognitive Needs Satisfaction.

WVS also provides data about the political tendencies of the respondents.[32] The correlation coefficients of Educational Attainment and Cognitive Needs Satisfaction **controlling political tendencies** are presented in Table 14.

Table 14.

Correlation between Educational Attainment and Cognitive Needs Satisfaction Controlling for Political Tendencies

Correlations			
Highest Educational Attainment and Cognitive Needs Satisfaction	**N**	**Spearman's Rho**	**Sig.**
Left	9,677	0.394	<.001
Middle	32,263	0.235	<.001
Right	12,328	0.215	<.001

There is a statistically significant and positive correlation between the Highest Educational Attainment and Cognitive Needs Satisfaction in all three groups. The correlation is strongest among people who have left-leaning tendencies. The correlation in this group is considerably stronger than the general correlation discussed before.

Again, like in the case of religious denominations, it is important to note that this is not about Cognitive Needs Satisfaction in itself, but about the correlation between Educational Attainment and Cognitive Needs Satisfaction. Again, in this case, the temporal order is very important. A possible explanation might be that the left-leaning tendency itself can in fact be caused by, and not the cause of, Cognitive Needs Satisfaction due to Educational Attainments. This, in turn, might be due to a relative prevalence of left-leaning ideas in universities at least in some regions (see Van de Werfhorst, 2020). That said, such considerations remain mere speculations,

[32] The main 10-stage left-right scale is recorded into three categories; left 1 to 3, middle 4 to 7, and right 8 to 10. See Appendix B.

as to find valid and reliable explanations for this phenomenon further studies are needed.

5.2.2. First Specification of the Second Hypothesis

The first specification of the second hypothesis predicts that the “strength of the statistical relationship between Educational Attainment and the satisfaction of Cognitive Needs increases in higher levels of education”.

The One-way ANOVA test reveals a significant difference in Cognitive Needs Satisfaction among participants with different Educational attainments $F(8, 71070) = 611.067$, $p<0.001$. The mean of Cognitive Needs Satisfaction grouped by different ISCED classifications is presented in Table 15. Based on the Tukey-Kramer posthoc test, all the mean differences, except for the ISCED 5 with its previous level, are significant with P-values less than 0.001. The eta-squared value for Cognitive Needs Satisfaction is 0.064 (95% Confidence Interval: 0.061 to 0.068) which is considered **medium to small**. The mean differences are visualized in Figure 17. The non-significant differences are shown in a lighter color.

As can be seen in the chart, the most improvement occurs by attaining the Doctoral degree (.0366 increase in the mean), compared to a Master’s. After attaining the Doctoral degree, the next most effective educational attainment is a Bachelor’s degree, followed by Lower Secondary and Primary education. However, considering getting a Bachelor's degree at a single level after upper-secondary education (from ISCED 3 to ISCED 6), it gains the highest rank (.0562).

Table 15.

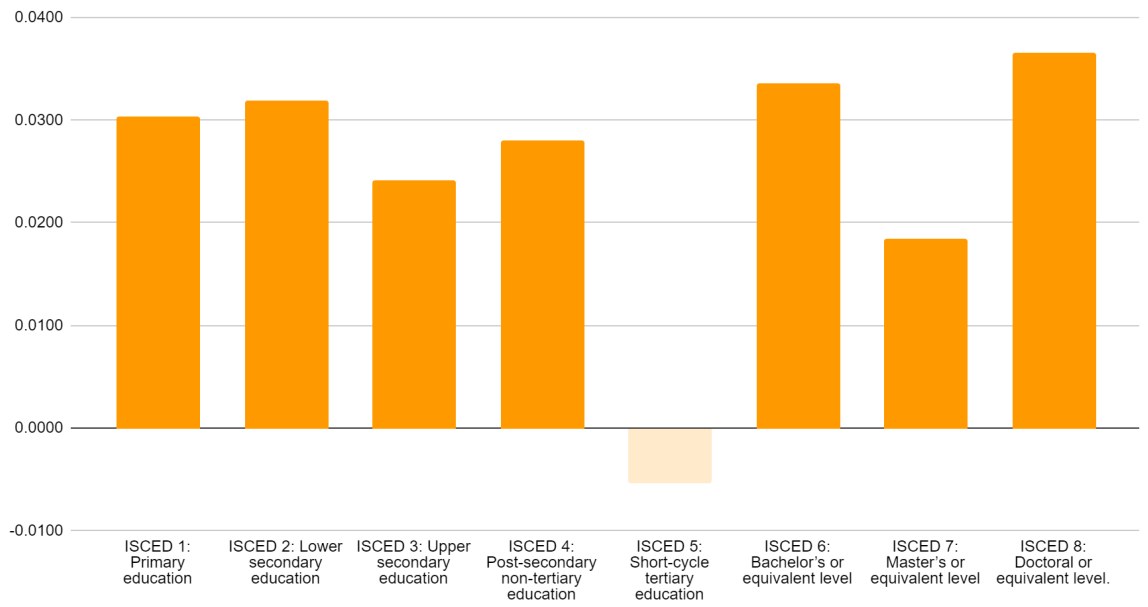
One-way ANOVA Results for Cognitive Needs Satisfaction for Each ISCED Level

One-way ANOVA Cognitive Needs Satisfaction	N	Mean	Mean Difference with the Previous Level	Mean Difference Sig.
ISCED 0: Early childhood education	3,172	0.6169		
ISCED 1: Primary education	8,039	0.6472	0.0303	<.001
ISCED 2: Lower secondary education	10,559	0.6791	0.0319	<.001
ISCED 3: Upper secondary education	18,412	0.7032	0.0241	<.001
ISCED 4: Post-secondary non-tertiary education	5,695	0.7312	0.0280	<.001
ISCED 5: Short-cycle tertiary education	6,866	0.7258	-0.0054	0.702
ISCED 6: Bachelor’s or equivalent level	12,621	0.7594	0.0336	<.001
ISCED 7: Master’s or equivalent level	4,882	0.7779	0.0185	<.001
ISCED 8: Doctoral or equivalent level.	833	0.8145	0.0366	<.001

Note. The mean differences with the previous level for ISCED 5 is not statistically significant.

Figure 17.

Mean Difference of Cognitive Needs Satisfaction for Each ISCED Level



Note. The chart is made using Google Sheets, based on the SPSS results. The mean differences with the previous level for ISCED 5 are not statistically significant.

These results are in line with the prediction of the first specification of the second hypothesis. In other words, **the results support the idea that the strength of the statistical relationship between Educational Attainment and the satisfaction of Cognitive Needs is higher in higher levels of education**. However, except for Short-cycle tertiary education that shows no statistically significant effect, primary and both lower- and upper-secondary education have impacts on Cognitive Needs Satisfaction similar in magnitude to the impact of a bachelor's or a doctorate. For example, the impact of finishing lower-secondary education is almost 95 percent of turning a short-cycled tertiary into a bachelor's and 88 percent of gaining a doctoral degree. However, considering getting a Bachelor a single level after upper-secondary education, it gains the highest rank, even above getting a Doctoral degree (.0562).

This specification of the second hypothesis was formed based on the assumption that cognitive growth and therefore Cognitive Needs Satisfaction are more related to the process of Individualization which in turn is more related to higher education. Finding results in support of the specification of the hypothesis might be considered as support for these assumptions. However, as mentioned in

the Theoretical chapter, the process of socialization which might be regarded as related to compulsory education, is a necessary prerequisite of the process of individualization. The fact that compulsory education levels might have impacts on Cognitive Needs Satisfaction, close to the higher education in magnitude, might be considered in line with the importance of the socialization process in Cognitive Needs Satisfaction.

5.3. Third Main Hypothesis

The third main hypothesis predicts that "Educational Attainment, Deficiency Needs Satisfaction, and Growth Needs Satisfaction, are related to an individual's Happiness level". The Spearman's rho as the correlation coefficients between Happiness (DV), and Educational Attainment, Deficiency Needs Satisfaction, and Cognitive Needs Satisfaction (IVs), are calculated. The results of the correlation test between these items are presented in Table 16.

Table 16.

Correlation between Educational Attainment, Deficiency Needs Satisfaction, Cognitive Needs Satisfaction, and Happiness

Nonparametric Correlations	Spearman's rho	Highest Educational Attainment	Deficiency Needs Satisfaction	Cognitive Needs Satisfaction
Happiness	ρ	.037**	.220**	-.069**
	Sig.	<.001	<.001	<.001
	N	92940	68748	71493

As can be seen, all the correlations are statistically significant. In all cases, P-values are less than 0.001 which means that the probability of Type I error is very low. According to the findings, Happiness has a **moderate positive** correlation with Deficiency Needs Satisfaction and a **very weak positive** correlation with Educational Attainment. It has also a **very weak negative** correlation with Cognitive Needs Satisfaction. Therefore it could be concluded that the null hypothesis of the third main hypothesis is rejected. In other words, **the results support the claim that Educational Attainment, Deficiency Needs Satisfaction, and Growth Needs Satisfaction, are related to an individual's Happiness level**. However, it is important to note that the correlations Between Happiness and Educational Attainment, and also Happiness and Cognitive Needs Satisfaction are very weak.

In this case, too, the existence of a correlation does not prove causality. Happiness level might have been the same before the Educational Attainment, Deficiency Needs, or Cognitive Needs Satisfaction (Temporal Order Problem). Also, there might be other factors that may have caused both Happiness and other variables (Spurious Relation Problem). Further analyses controlling other possible factors might help improve the understanding of the mechanism of the relationship and the causal direction, if any.

However, it could be discussed that in the case of Temporal Order, there is a difference in this case with the discussions in the first two hypotheses. Happiness as the IV of the third hypothesis in this study is understood as an individual's judgment of their whole life at any particular moment. In this sense, Happiness, or satisfaction with life as a whole, at any particular moment is the most recent conscious thought of each individual. Therefore, although an individual's happiness at the moment can possibly impact their life from now on, it can not be the reason for anything in the past. In this sense, contrary to the first two hypotheses, the reverse causal direction is not plausible. So, it could be argued that in the presence of a theory that explains the relationships and the mechanisms, and also in the presence of statistically significant relationships, it is easier to defend causal claims in regard to Happiness. The most important point that still exists is the probability of spurious relationships. Theoretically, this can never be eliminated. However, by controlling for possible factors that might have been the cause for both variables at the same time, and eliminating them, the plausibility of the theory increases.

5.3.1. First Specification of the Third Hypothesis

As presented in the Theoretical Framework chapter, the first specification of the third hypothesis predicts that the "relationship between Educational Attainment, Deficiency Needs Satisfaction, Growth Needs Satisfaction, and an individual's Happiness level are different in different cultural contexts".

The correlation coefficients between Happiness (DV), and Educational Attainment, Deficiency Needs Satisfaction, and Cognitive Needs Satisfaction (IVs), are calculated for the ten different cultural contexts based on the Inglehart-Welzel cultural map, the region of the countries, and their religious tradition. The results of the correlation test between these items are presented in Table 17.

The relationship between Educational Attainment as an IV, and Deficiency Needs Satisfaction, and Cognitive Needs Satisfaction as DVs have been studied under the first and second hypotheses of this study. However, to have a better understanding of this relationship between Educational Attainment and Deficiency and Cognitive Needs Satisfaction, the correlation between them in each cultural context is also included in the Table.

Non-significant correlations have been indicated with darker grey shading. The light grey is the correlation coefficient between the Highest Educational Attainment and Needs Satisfaction.

Table 17.

Correlation between Educational Attainment, Deficiency Needs Satisfaction, Cognitive Needs Satisfaction, and Happiness in Different Cultural Contexts

Nonparametric Correlations			Highest Educational Attainment	Deficiency Needs Satisfaction	Cognitive Needs Satisfaction
Central Europe Catholic	Happiness	ρ	0.232	0.433	0.147
		Sig.	<.001	<.001	<.001
		N	2399	2029	2022
	HEA	ρ		0.448	0.158
		Sig.		<.001	<.001
		N		2028	2021
East Asia Confucian	Happiness	ρ	-0.007	0.303	-0.093
		Sig.	0.634	<.001	<.001
		N	4539	4413	4370
	HEA	ρ		0.288	0.071
		Sig.		<.001	<.001
		N		4412	4368
East Europe Orthodox	Happiness	ρ	0.140	0.350	0.041
		Sig.	<.001	<.001	0.013
		N	5253	3656	3604
	HEA	ρ		0.251	0.020
		Sig.		<.001	0.228
		N		3649	3594
Latin America Catholic	Happiness	ρ	-0.003	0.170	-0.142
		Sig.	0.801	<.001	<.001
		N	8859	8015	8287
	HEA	ρ		0.255	0.133
		Sig.		<.001	<.001
		N		7942	8211
Middle East Shia	Happiness	ρ	0.164	0.539	-0.058
		Sig.	<.001	<.001	<.001

		N	3890	3563	3340
	HEA	ρ		0.313	0.114
		Sig.		<.001	<.001
		N		3559	3334
North America Protestant	Happiness	ρ	0.095	0.386	0.050
		Sig.	<.001	<.001	<.001
		N	6552	6448	5993
	HEA	ρ		0.320	0.214
		Sig.		<.001	<.001
		N		6418	5970
Oceania Protestant	Happiness	ρ	0.027	0.370	0.061
		Sig.	0.163	<.001	0.003
		N	2726	2098	2437
	HEA	ρ		0.346	0.193
		Sig.		<.001	<.001
		N		2059	2391
South/Southeast Asia Sunni	Happiness	ρ	0.030	0.161	-0.122
		Sig.	0.018	<.001	<.001
		N	6375	5316	5621
	HEA	ρ		0.272	0.076
		Sig.		<.001	<.001
		N		5323	5628
Southeast Asia Buddhist	Happiness	ρ	0.129	0.256	-0.317
		Sig.	<.001	<.001	<.001
		N	2672	2526	2339
	HEA	ρ		0.157	-0.153
		Sig.		<.001	<.001
		N		2511	2330
West Europe Protestant	Happiness	ρ	0.056	0.323	0.092
		Sig.	<.001	<.001	<.001
		N	3460	2475	2793
	HEA	ρ		0.436	0.277
		Sig.		<.001	<.001
		N		2466	2766

Note. The non-significant correlations are demonstrated in darker grey shading.

There is a statistically significant **moderate positive** correlation between Happiness and the Highest Educational Attainment in the Central Europe Catholic Group. The relationship between the two variables is statistically significant, **positive** yet **weak** in Middle East Shia, East Europe Orthodox, and Southeast Asia Buddhist Groups, and **very weak** in North America Protestant Group, West Europe Protestant, and South/Southeast Asia Sunni Groups. There is no statistically

significant correlation in Latin America Catholic, East Asia Confucian, and Oceania Protestant Groups. In many cases, the differences between these correlation coefficients are statistically significant.[33] Therefore, the null hypothesis in regard to the correlation between Happiness and Educational Attainment is rejected. This means that **the results support the claim that the relationship between Educational Attainment and an individual's Happiness level is different in different cultural contexts**.

In regard to Deficiency Needs Satisfaction, There is a statistically significant positive correlation with Happiness in all groups. The correlation could be considered strong in Middle East Shia, Central Europe Catholic, North America Protestant, Oceania Protestant, East Europe Orthodox, West Europe Protestant, and East Asia Confucian. It is moderate in Southeast Asia Buddhist, and weak in Latin America Catholic and South/Southeast Asia Sunni. In many cases, these differences are statistically significant. Therefore, the null hypothesis in regard to the correlation between Happiness and Deficiency Needs Satisfaction is rejected. This means that **the results support the claim that the relationship between Deficiency Needs Satisfaction and an individual's Happiness level is different in different cultural contexts**.

Regarding Cognitive Needs Satisfaction, also there is a statistically significant correlation with Happiness in all groups. However, the correlations are not positive in all cultural contexts. On the one hand, there is a strong negative correlation in the Southeast Asia Buddhist Group, a weak negative correlation in Latin America Catholic and South/Southeast Asia Sunni, and a very weak negative correlation in East Asia Confucian and Middle East Shia Groups. On the other hand, there is a weak positive correlation in Central Europe Catholic and a very weak positive correlation in West Europe Protestant, East Europe Orthodox, Oceania Protestant, and North America Protestant groups. In many cases, these differences are statistically significant. Therefore, the null hypothesis in regard to the correlation between Happiness and Cognitive Needs Satisfaction, and therefore Growth Needs Satisfaction as a whole is rejected. This means that **the results support the claim that the relationship between Growth Needs Satisfaction and an individual's Happiness level is different in different cultural contexts**.

[33] The Fisher's adjustment for the correlation coefficients is presented in Appendix X.

It is important to note that for the same reasons discussed earlier, these findings are not enough for a causal claim. In order to strengthen the causal claims, the correlations should be conducted controlling for other possible influencing factors. However, if a causal direction could be assumed, based on the a priori model, Educational Attainment cannot impact happiness directly (besides its possible impact through Well-being) unless it is included in Acquired Desires Satisfaction (see 3.2. Happiness in the Physiological Sense). This means that the differences in its correlation with Happiness might be due to the differences in the importance of formal Educational Attainments in different cultures.

With the same assumptions, in regard to Deficiency Needs Satisfaction, it seems that although it is related to Happiness in every culture, its importance, i.e. the magnitude of the possible impact it has on Happiness, is again different due to differences in the cultures.

However, the most interesting findings are in regard to Cognitive Needs Satisfaction. In the theoretical discussions, it was discussed that Cognitive Needs in particular, and Growth Needs in general, are parts of Real Needs the satisfaction of which is a part of each individual's Well-being. In the a priori model in happiness part of the discussion, it was discussed that an increase in Well-being, i.e. Needs Satisfaction of any sort, should theoretically increase an individual's Happiness unless it is against Acquired Desires Satisfaction. In other words, considering the causal theory and the a priori model, it might be concluded that in many cases there is a serious conflict between the satisfaction of Cognitive Needs and Acquired Desires Satisfaction. In mathematical terms, in many cultures, Acquired Desires Satisfaction should include Cognitive Needs Satisfaction with a negative coefficient sometimes larger than one. In this case, the decrease in Acquired Desires Satisfaction due to satisfaction of Cognitive Needs nullifies the positive effect caused by an increase in Well-being.

It is important to note that these conclusions are based on many assumptions that are not proven, or in some cases may never be. In addition to causal claims that could be regarded impossible to prove especially in social sciences, the discussions about well-being (which were used as a foundation for the theoretical discussions of this study) also have a philosophical element that sometimes excludes it from the

realm of science.[34] However, in line with the ontology and epistemology of critical realism, this study tries to develop a model that could explain perceived reality in the best possible way, without claiming the model to be ever identical to reality.

The possible impact of Cognitive Needs Satisfaction on Happiness is further explored in the second and third specifications of the third hypothesis.

Although the main interest of this specification is the changes in Happiness, and its relationship with Educational Attainment, Deficiency, and Cognitive Needs Satisfaction in each cultural context, attention to the correlations between Educational Attainment and Deficiency and Cognitive Needs Satisfaction can also be interesting.

In regard to Deficiency Needs, it has a statistically significant correlation with Educational Attainment in all groups. The correlation is positive and strong in Central Europe Catholic, West Europe Protestant, Oceania Protestant, North America Protestant, and Middle East Shia groups, positive and moderate in East Asia Confucian, South/Southeast Asia Sunni, Latin America Catholic, and East Europe Orthodox groups, and positive and weak in Southeast Asia Buddhist group.

In regard to Cognitive Needs, the correlation is statistically significant in all groups except for East Europe Orthodox. The correlation is positive and moderate in West Europe Protestant and North America Protestant groups, positive and weak in Oceania Protestant, Central Europe Catholic, Latin America Catholic, and Middle East Shia, and positive and very weak in South/Southeast Asia Sunni, and East Asia Confucian. Surprisingly, there is a negative weak correlation between Educational Attainment and Cognitive Needs Satisfaction in Southeast Asia Buddhist group. This issue can be discussed in relation to the quality of education and the distinction between the education process and indoctrination in the schooling process. However, in order to be able to explore the issue further analysis is needed which should be left for future studies.

5.3.2. Second Specification of the Third Hypothesis

The second specification of the third hypothesis predicts that the “positive relationship between Cognitive Needs Satisfaction and Happiness is higher in countries with higher levels of wealth.”

[34] As an example, whether one defines Well-being based on Hedonism, Desire Theories, or Objective List Theories, is something beyond the reach of (empirical) science.

Spearman's Rho for the correlation between Happiness and Cognitive Needs Satisfaction for 4 groups of countries based on their GDP per Capita (PPP) are presented in Table 18.[35]

Table 18.

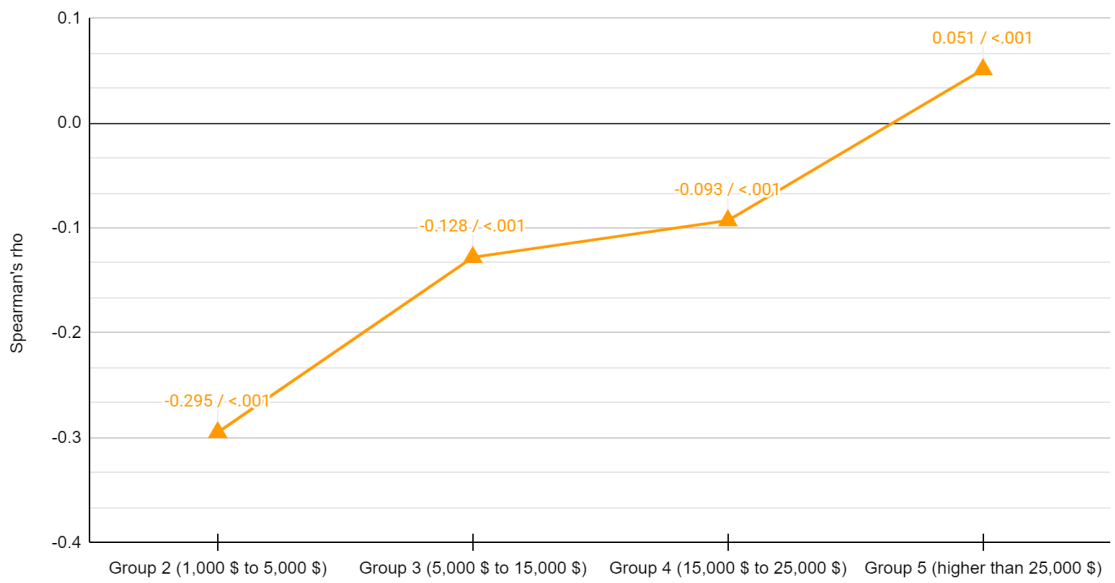
Correlation between Happiness and Cognitive Needs Satisfaction in Different Countries Grouped by GDP per Capita PPP

Correlations			
Happiness and Cognitive Needs	**N**	**Spearman's Rho**	**Sig.**
Group 2 (1,000 $ to 5,000 $)	4658	-0.295	<.001
Group 3 (5,000 $ to 15,000 $)	24860	-0.128	<.001
Group 4 (15,000 $ to 25,000 $)	13584	-0.093	<.001
Group 5 (higher than 25,000 $)	28391	0.051	<.001

In all the groups Cognitive Needs Satisfaction has a statistically significant correlation with Happiness with P-values less than 0.001. Cognitive Needs Satisfaction and Happiness have a moderate negative correlation in Group 2, a weak negative correlation in Group 3, a very weak negative correlation in Group 4, and a very weak positive correlation in Group 5 (Figure 18).

Figure 18.

Correlation Between Happiness and Cognitive Needs Satisfaction in Different Countries Grouped by GDP per Capita PPP



Note. The chart is made using Google Sheets, based on the SPSS results.

[35] In order to have a better understanding, the correlations between all the variables included in the main hypothesis, are analyzed for the second and third specifications as well. The results can be found in Appendix D.

In order to compare the correlation coefficients, the statistical significance of their differences should be checked. The results of Fisher's adjustment to compare the correlation coefficients are presented in Table 19.

Table 19.

The Z-Score of The Differences of Standardized Correlation Coefficients Between H and CNS (Grouped by GDP per Capita PPP)

	The Z Score of the Differences	Sig.
Group 2 and Group 3	-10.9814	<.001
Group 2 and Group 4	-12.4129	<.001
Group 2 and Group 5	-22.4613	<.001
Group 3 and Group 4	-3.3212	<.001
Group 3 and Group 5	-20.6941	<.001
Group 4 and Group 5	-13.8330	<.001

As can be seen, all the correlation coefficient differences are statistically significant. So, the null hypothesis of the second specification of the third hypothesis is rejected. This means that the results support the claim that **in countries with higher levels of wealth, the positive relationship between Cognitive Needs Satisfaction and Happiness is larger**.

Considering the possibility of a causal relationship, as predicted in the Theoretical Framework chapter, this result might be due to the hierarchical nature of Maslow's pyramid of needs. According to this interpretation, it could be said that since in richer countries, the majority of people are capable of satisfying their Deficiency Needs (especially Physiological Needs which can be considered very close to wealth), paying attention to Growth Needs Satisfaction, including Cognitive Needs Satisfaction is more accepted by the majority of the people. Therefore, it can be accepted by culture and included as part of Socially Acquired Desires. As a result, its satisfaction can result in higher levels of Acquired Desires Satisfaction and therefore higher levels of Happiness or satisfaction with life. This theory needs more research to be truly studied.

5.3.3. Third Specification of the Third Hypothesis

The third specification of the third hypothesis predicts that the "positive relationship between Cognitive Needs Satisfaction and Happiness is higher in countries with higher levels of peacefulness."

The Spearman's Rho for the correlation between Happiness and Cognitive Needs Satisfaction for 5 groups of countries based on their GPI are presented in Table 20.

Table 20.

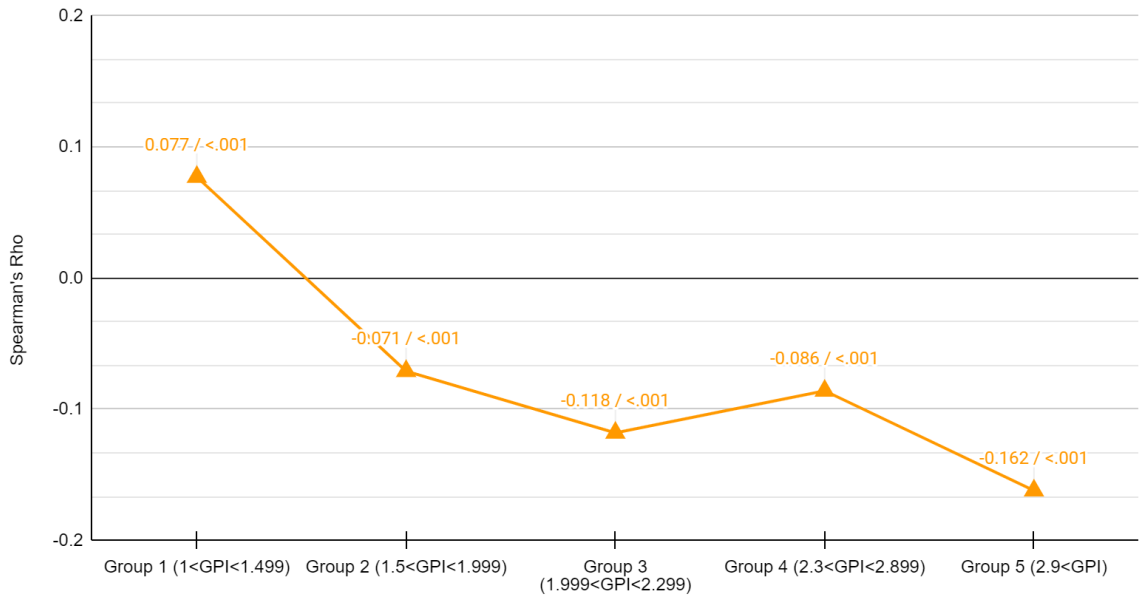
Correlation between Happiness and Cognitive Needs Satisfaction in Different Countries Grouped by GPI

Correlations			
Happiness and Cognitive Needs Satisfaction	**N**	**Spearman's Rho**	**Sig.**
Group 1 (1<GPI<1.499)	10,392	0.077	<.001
Group 2 (1.5<GPI<1.999)	22,614	-0.071	<.001
Group 3 (1.999<GPI<2.299)	18,861	-0.118	<.001
Group 4 (2.3<GPI<2.899)	12,355	-0.086	<.001
Group 5 (2.9<GPI)	5,312	-0.162	<.001

In all the groups Cognitive Needs Satisfaction has a statistically significant correlation with Happiness with P-values less than 0.001. Cognitive Needs Satisfaction and Happiness have a very weak positive correlation in Group 1, a very weak negative correlation in Group 2, a weak negative correlation in Group 3, a very weak negative correlation in Group 4, and a weak negative correlation in Group 5 (Figure 19).

Figure 19.

Correlation Between Happiness and Cognitive Needs Satisfaction in Different Countries Grouped by GPI



Note. The chart is made using Google Sheets, based on the SPSS results.

In order to compare the correlation coefficients, the statistical significance of their differences should be checked. The results of Fisher's adjustment to compare the correlation coefficients are presented in Table 21.

Table 21.

The Z-Score of The Differences of Standardized Correlation Coefficients Between H and CNS (Grouped by GDP per Capita PPP)

	The Z Score of the Differences	Sig.
Group 1 and Group 2	12.5113	<.001
Group 1 and Group 3	16.0195	<.001
Group 1 and Group 4	12.2735	<.001
Group 1 and Group 5	14.2645	<.001
Group 2 and Group 3	4.8101	<.001
Group 2 and Group 4	1.3491	0.177
Group 2 and Group 5	6.0549	<.001
Group 3 and Group 4	-2.7941	0.005
Group 3 and Group 5	2.8898	0.004
Group 4 and Group 5	4.7069	<.001

Note. The significant differences are demonstrated in light grey.

As can be seen, all the correlation coefficient differences, except between Group 2 and Group 4, are statistically significant. This means that the null hypothesis of the second specification of the third hypothesis is rejected. This means that the results support the claim that **in countries with higher levels of peacefulness, the positive relationship between Cognitive Needs Satisfaction and Happiness is larger**. It should be noted that although the countries with the highest levels of peacefulness (lowest GPI) are the ones in which the positive relationship between Happiness and Cognitive Needs Satisfaction is highest, and the countries with the lowest level of peacefulness (highest GPI) are the ones in which the negative relationship is highest, the change is not linear. Although the correlation coefficients in groups 2, 3, and 4 are close, the correlation in group 3 is statistically significantly lower than the other two.

Maybe something more interesting than the positive correlation in rich and peaceful countries between Happiness and Cognitive Needs is the (much stronger) negative correlation in countries with the lowest levels of wealth and peacefulness. Is it possible to speculate that when the situation on the ground, including the availability of the satisfaction of Physiological Needs and Security, is harsh, stronger

cognitive abilities actually are linked to more pain? In other words, is it better to see the ugly truth or not? Another possible explanation might be that the problem is not in understanding itself, but in the distance it causes with other people in the society, in specific situations. These questions require further studies to be answered with an acceptable level of certainty. However, it could be said that assuming the causal relationship for the sake of argument, the results in the last two specifications could be explained by the difference between Acquired Desire Satisfaction and Well-being. As discussed in the Happiness a priori model in the Theoretical Framework chapter, whether an increase in Rationality results in an increase in Happiness is dependent on the difference between Acquired Desire Satisfaction and Well-being (see Figure 3 in the Theoretical Framework chapter). It could be argued that due to the high conceptual connectedness of the two concepts of Rationality and Cognitive Needs Satisfaction, the possible impact of Cognitive Needs Satisfaction is similar to the possible impact of Rationality on Happiness in different situations.

5.4. Summary

In this chapter the results of the analyses of different hypotheses were presented and discussed.

Regarding the first main hypothesis, the results showed a statistically significant, moderate positive correlation between Educational Attainment and Deficiency Needs Satisfaction, therefore the null hypothesis was rejected. The findings supported that an increase in Educational Attainment is related to an increase in Deficiency Needs satisfaction. The same was true about all three composing components of Deficiency Needs as well. Regarding the first specification of the first hypothesis, the results were able to support the claim that the relationship between Educational Attainment and the satisfaction of Physiological Needs drops at higher levels of education. However, this was not the case about Security Needs Satisfaction. In regard to the second specification of the first hypothesis, the results were not able to support the idea that in countries with moderate levels of wealth, the relationship between Educational Attainment and the satisfaction of Physiological Needs is stronger. Also, in regard to the third specification, the results were not able to support the claim that the positive relationship between Cognitive Needs Satisfaction and Happiness is higher in countries with higher levels of peacefulness.

In regard to the second main hypothesis, the claim of the hypothesis that an increase in educational attainment is related to an increase in Cognitive Needs Satisfaction was supported by the results. Also, regarding the only specification of the second hypothesis, the results supported the idea that the strength of the statistical relationship between Educational Attainment and the satisfaction of Cognitive Needs increases at higher levels of education.

The third main hypothesis, stating that Educational Attainment, Deficiency Needs Satisfaction, and Growth Needs Satisfaction, are related to an individual's Happiness level, was also supported by the results. However, the correlations Between Happiness and Educational Attainment, and Happiness and Cognitive Needs Satisfaction were very weak. The first specification of the third hypothesis, stating the importance of cultural contexts on the relationship between Educational Attainment, Deficiency Needs Satisfaction, Growth Needs Satisfaction, and an individual's Happiness level, was supported for all three variables. The second and third specifications were also supported by the results. The positive relationship between Cognitive Needs Satisfaction and Happiness is larger both in wealthier and more peaceful countries.

6. Conclusion

In the final chapter of the thesis, the research question is examined in light of the findings presented in the previous chapter. This is also the basis for a reflection on the theoretical and methodological approach and a discussion of possible avenues for further research.

6.1. Answering Research Questions

The main concern of this study was **the relationship between education and happiness**.

Although the formulation of the question clearly refrains from showing interest in finding a causal relationship with a clear causal direction, the study is ultimately interested in a causal direction from education to happiness. However, as it was extensively discussed in the previous chapter, It was not possible for this study to be completely certain about claims of causal relationships. There were two reasons for this. First, there was no way, in the scope of this study, to be sure about the temporal order condition. Second, it was impossible, again for this study, to control for all the factors that might have relations with both of the variables discussed in each hypothesis to make sure that the discovered relationships are not spurious. So, at the most, when (1) there is a statistically significant correlation between two variables, and (2) the statistically significant correlation remains when controlling for other variables that might be considered related, the study might claim only that there is some evidence in support of a theory that predicts a causal relationship.

This research question could have been answered in regard to different meanings of Happiness as well as different meanings of Education. Although this study acknowledged the vast possible ways in which education can be understood, due to limitations at the disposal of this research, education was operationalized by formal educational attainments.

In regard to Happiness, it was discussed that it can be understood in two different meanings: (1) well-being and (2) the long-term psychological sense of happiness. For the sake of convenience, throughout the study, the first was referred to as Well-being and the second as Happiness.

Happiness as Well-being in this study was understood as satisfaction of Deficiency Needs and Growth Needs, based on Maslow's hierarchy of needs. This conceptualization (especially the Deficiency part) is more aligned with the definition of happiness discussed by Michalos (2017) and Noddings (2003) while defining happiness in terms of Well-being related to Growth Needs Satisfaction is in line with the ideas of Gibbs (2015). Two main hypotheses and several specifications were put forward concerning the relationship between educational attainment and satisfaction of these two different types of needs, and these were tested using data from WVS, combined with additional information linked to the economic situation and peacefulness in the countries where the respondents reside.

The study showed that there is a statistically significant and positive correlation between educational attainment and Deficiency Needs Satisfaction.

This finding is aligned with the findings of researchers like Cuñado & Gracia (2011) emphasizing the positive impact of education on happiness through income and status. Although many other factors such as the socioeconomic situation on different scales play a role, it could be said that there is evidence in support of the idea that finishing different levels of school can help people better satisfy their basic Physiological Needs such as food and shelter, especially if they are born in families with lower socioeconomic status. The study also showed that Higher educational attainment may play a role in increasing security in individuals in very specific situations. The positive correlation between Educational Attainment and Security Needs Satisfaction was strongest among individuals who have parents with middle education, and only in peaceful countries. The study also found evidence in support of the idea that Educational Attainment, especially higher education, might play its strongest role in Deficiency Needs Satisfaction through Esteem and Prestige Needs Satisfaction. There was a statistically significant and relatively strong positive correlation between individuals' Esteem and Prestige Needs Satisfaction, particularly if they were born into families with low socioeconomic status.

Related to Growth Needs Satisfaction, the study found evidence in support of the claim that education could, in specific situations, even have relatively large impacts on cognitive needs satisfaction which is a part of growth needs. Due to the interconnected nature of growth needs, it could be predicted that there might probably be a significant positive correlation between education and other aspects of growth needs satisfaction such as aesthetic needs, self-actualization, or

transcendence. Clearly, this needs to be tested in future studies. The possible mechanism of the impact of educational attainment on cognitive needs satisfaction, if any, is not clear at all, however, the results showed that in specific religious or political contexts, the relationship might be stronger.

The findings about the positive relationship between Educational Attainment and Growth Needs Satisfaction could be considered as an approval for the possibility of ideas presented by scholars like Barrow (2012), Dearden (1968), Gibbs (2014 & 2015), and Roberts (2013), who all in different ways indicate that the goal of education should be Growth Needs Satisfaction. None of the empirical studies reviewed in this study was interested in measuring the relationship between education and what was categorized here as Growth Needs Satisfaction.

Happiness in the long-term psychological sense and its relationship with education and educational attainments, is much more complicated. In this study, Happiness was conceptualized as an individual's pleasurable state of mind in regard to the alignment of perceived reality with their desired reality. This conceptualization is more aligned with the ideas of scholars like Dearden (1968), and Barrow (2012). Based on this conceptualization an a priori model was formed in order to clarify the possible influential factors on it and eventually find how education could be related to it. It was concluded that education might impact Happiness directly (as a part of Acquired Desires Satisfaction) or through impacting Well-being.

The results showed that Educational Attainment had a statistically significant positive, yet very weak correlation with Happiness in general. However, this correlation was much stronger in specific cultural contexts. This phenomenon, based on the a priori model, was interpreted as a possible sign of the importance of Educational Attainment in itself in these cultural contexts. The cultural differences might explain the differences in the findings of scholars like Jongbloed (2018) who focuses only on Europe, and Kim (2018) who looks at the global level.

However, as was discussed before, Educational Attainment may theoretically have an impact on well-being and well-being might have an impact on Happiness. Therefore, the possible impact of Deficiency and Growth Needs Satisfaction on Happiness was also of interest to this study. As could have been predicted, Deficiency Needs Satisfaction had a statistically significant and positive correlation with Happiness in general, as well as in different cultural contexts. However, the differences in the magnitude of the correlation in different contexts were also very

interesting (from 0.539 in the Middle East Shia group to 0.161 in the South/Southeast Asia Sunni group). These cultural differences, in regard to the relationship between Happiness and Deficiency Needs might to some degree explain the Easterlin Paradox discussed by Castriota (2006). These differences definitely have the potential to be the subject of many interesting studies in the future.

The relationship between Growth Needs Satisfaction and Happiness was discussed in the second and third specifications of the third hypothesis as well as the first one. The second and the third specifications support the idea that Cognitive Needs Satisfaction, and maybe Growth Needs in general, might have a higher positive relationship with Happiness in countries with higher levels of wealth and peace. However, if assuming a causal relationship, the first specification clearly indicates that peacefulness and peace are not the only important determinants of the impact of Cognitive Needs Satisfaction on Happiness but also cultural contexts might play a role. The much stronger correlation coefficient in the Central Europe Catholic (in comparison to the results in the two other specifications as well as other groups in the first one) testifies for that. As mentioned before, the role of culture in the possible impact of Cognitive Needs Satisfaction, and Growth Needs in general, on Happiness might be an interesting topic for further studies in the future.

The findings of the study in regard to the negative relationship (-.061) between Cognitive Needs Satisfaction and Happiness in general were in line with Roberts's (2013) prediction that the development of cognitive abilities, and in particular if this leads to critical or reflective consciousness, might lead to more suffering. However, the medium to high positive results about the same relationship in specific cultural contexts such as West Europe Protestant (.277), showed that it should not necessarily be the case.

6.2. Reflections on the Theoretical and Methodological Approach and Suggestions for Further Research

To do this research, many choices have been made. However, the ontological and epistemological views discussed in the Research Design and Methodology chapter were not among them. As beautifully put by Furlong and Marsh (2010), these stances are more like one’s skin that is a part of their, being rather than a sweater that can be put on and off. According to critical realism, although there is a reality, it

is impossible to comprehend it completely. Therefore, humankind's knowledge can never be perfect, i.e. to mirror reality completely.

If humankind’s knowledge cannot be perfect, this is even more so the case for a study with limited time and resources. Limitations imply choices and choices are trade-offs. In a trade-off, one gains and loses at the same time. So, in any choice made in this study, something has been lost to gain something else.

The first choice is the topic itself. Choosing the very broad and overarching concept of happiness had many implications for the study. Working on such concepts, on the one hand, might provide fundamental insights with a wide range of conceptual and practical implications. However, on the other hand, moves the focus from more concrete issues with very clear implications on everyday practices in the field.

Choosing the broad concept of Happiness as the pivotal theme of the study had implications. The scope of the literature around happiness spans all over the history of thought and many different disciplines of knowledge. Also, the amount of literature on the subject is extensive. So, decisions had to be made about the literature and the concepts. In regard to literature, the focus was mainly on the intersection of happiness and education, or in some cases higher education. This of course meant that the literature on many other related topics was discarded.

About the conceptualization of happiness, based on the philosophical literature around the concept, also, decisions were made. First, it was decided to keep both definitions of happiness in the study, which meant a wider scope for the research. Regarding the Well-being definition of the concept, while the study agreed with the foundations of the hedonist branch, in approach, it was similar in form to the objective list theories. For sure, choosing other conceptualizations would have changed the course of the study completely.

Further research with different conceptualizations of Well-being might improve the theoretical understanding of the concept. It can also result in completely different findings about the relationship between education and happiness as Well-being.

Conceptualizing Well-being based on an objective list (which theoretically can sustainably maximize pleasure and minimize pain), provided the possibility of connecting the concept of well-being to Maslow's hierarchy of needs theory, which in turn was able to provide clear yet comprehensive concepts that can be operationalized for empirical research.

In regard to the long-term psychological meaning of the term, or what was referred to as Happiness in the study, this study could be considered close to the satisfaction with life theories. In this case, also, conceptualizations close to other theories may result in completely different findings. A task that could be done by others interested in the field.

The a priori model presented in the Theoretical Framework chapter was completely based on understanding long-term psychological happiness as overall satisfaction with life. This conceptualization made room for including concepts such as Well-being and Rationality in the discussion of Happiness, which in turn, made it possible to connect it to the concept of education. Also, the concept of Acquired Desire Satisfaction made room for the conceptual connection of education itself to Happiness. Although it was not possible to have a complete evaluation of the a priori model, it might be considered a minor theoretical contribution of this study to the field.[36]

The concept of happiness is a very complicated and complex concept. On the one hand, there are many different complexities in defining it. On the other hand, there are many different social and individual factors that can both affect or be affected by it. This complexity shows itself in the analysis with the numerous possible influential factors that should be controlled, the temporal order, and eventually the issue of causal direction. The same issue could be regarded as the main reason for the complexity of the a priori model. It is due to all these complexities that even when there is a statistically significant correlation between the variables, it is not possible to be sure about a causal relationship. However, the complexity of the issue, whether in the well-being part or the happiness part was accepted. Acknowledging that this study is not able to completely discover the complex underlying mechanisms, whether due to the lack of data or because of the design and methods used in the study, it was tried to render the complexity both in the theoretical discussions as well as the empirical part. In other words, when facing complexity, accuracy was given priority.

In regard to the design and method, the research employed a cross-sectional design with a quantitative strategy. Due to ethical issues, any experimental research on this topic is off the table from the beginning. However, a longitudinal study (such

[36] A concise extended version of the a priori model can be found in Appendix E.

as a cohort study) might have been a better choice for making causal claims since it gives the possibility of controlling the temporal order. Yet it was way beyond the scope of time and resources at the disposal of this study.

Between qualitative and quantitative methods, the latter was chosen. The reason for this choice was the interest of the research in providing a broad overview of the research topic and allowing for the identification of correlations and trends in the general population. Now and in light of the findings of this study, different qualitative studies might provide a much deeper understanding of each of the specific situations discovered in this study. It is just a personal preference of the researcher of this study to first have an overall understanding of the whole phenomenon, and then later have a deeper understanding of each part. However, the order also might have been reversed; starting with specifics and then reaching to generals.

Qualitative studies might be very helpful in finding, exploring, and understanding exceptional cases. A question that was brought up in the analysis process of this study was in regard to individuals, if any, who can resist the pressure of culture and Socially Acquired Desires, and be happy regardless of them (for example with focusing on Growth Needs Satisfaction). The identification and in-depth study of these individuals might provide valuable insights, especially for policymakers.

Between gathering the data firsthand for this specific study and using already available data, the latter was chosen due to the limitations in time and resources. Among publicly available datasets that might have been used, the World Value Survey was selected. WVS gave the study the possibility to explore the issue on a global scale by providing reliable and representative samples in different countries all over the world.

However, this choice limited some of the measures that were of interest to the study, both with regard to Deficiency Needs and Growth Needs. Concerning the former, there was no data in WVS in regard to the Love and Belonging stage of Maslow's hierarchy of needs. Also, the items related to the Esteem and Prestige aspects were very limited. The problem was much more severe in the case of Growth Needs. Due to a lack of suitable items for measuring Aesthetic Needs, Self-actualization, or Transcendence, Growth Needs were just represented by Cognitive Needs. Also, there were not sufficiently related items on the survey that

could encompass the concept of Rationality with all its different nuances. The problem led to further problems due to the fact of having the same measure for both concepts of Rationality and Cognitive Needs.

In addition to this, there were also some challenges in operationalizing education. The only item related to education in the data was the level of Educational Attainment. As discussed extensively in the Theoretical Framework chapter, Educational Attainment is incapable of rendering many nuances in the concept of education, such as the quality of respondents' education, their specializations in upper secondary or their disciplines in higher education, the gaps between their studies, and many other factors which, if available, could have been used to fine-tune the measurement of the concept of education in the study.

Any further study that can overcome the limitations of the study mentioned before in regard to the data and different measures in the study might be informative and result in valuable findings. For example, enhancing the items related to concepts such as Rationality and Esteem and Prestige Needs, and adding items related to Love and Belonging (magnitude and depth of intimate relationships), Aesthetic Needs, Self-actualization, and Transcendence can improve the useability of WVS in studies on happiness and Well-being. Furthermore, including more detailed information about the educational process of the respondents can increase the functionality of the dataset for educational studies.

6.3. Final Words

Science has an unquestionable importance in today's world. The global science economy, issues like COVID-19, and the pressing issue of climate change are just examples of the importance of science in today's world. Education, particularly higher education, has a very crucial place in the production of science, and therefore in today's world. It could be argued that human society, now more than ever, needs science and therefore scientists to solve natural and social problems.

With this as the backdrop, it could be argued that the only role of education is not the individual's happiness. However, in order to make sure that the wheel of science production will be in motion, society needs to keep education and higher education appealing to individuals. Happiness is the ultimate currency in which society should buy individuals' time and effort, or in other words, their lives.

Arguably education, and probably mainly in its early stages, is playing its role in increasing an individual's happiness through improving Deficiency Needs Satisfaction. However, as discussed before, the capacity of Deficiency Needs Satisfaction to cause happiness is limited.

Therefore, there are two ways in front of societies to increase happiness in individuals. The first is through focusing on (Non-Real Needs) Acquired Desires and their satisfactions. This might help in the short term. However, in the long term, it cannot be sustainable.

The other alternative is to promote Growth Needs Satisfaction and to strengthen its ultimate impact on happiness. In this way, the society and the individual will probably be able to reach a win-win situation in which there is sustainable growth for society and sustainable happiness for individuals.

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Appendix A

Table of all the reviewed literature searched under five different titles in Google Scholar, including their journal level (J.L), Focus, Relevance (R), Method, Data, and Unit of Analysis. Abbreviations: B=Book, BC=Book Chapter, NM=Not Mentioned, UP=Unpublished Paper, NJ=Not a Journal, OS=Online Submission, H=High, L=Low.

#	Name searched under	J.L	Focus	R	Method	Data	Unit Of Analysis
	happiness and higher education						
1	Elwick, A., & Cannizzaro, S. (2017). Happiness in higher education. Higher Education Quarterly, 71(2), 204-219.	1	Relationship between Happiness and Higher Education	H	Meta-Analysis		
2	Hartog, J., & Oosterbeek, H. (1998). Health, wealth and happiness: why pursue a higher education?. Economics of education review, 17(3), 245-256.	2	Relationship between Education and Heath, Wealth, and Happiness	H	Empirical, quantitative, ordered probit model	Brabant Survey	Individual
3	Nikolaev, B. (2018). Does higher education increase hedonic and eudaimonic happiness?. Journal of happiness Studies, 19(2), 483-504.	1	Relationship between Happiness and Higher Education	H	Empirical, quantitative, random-effects (RE) linear estimator with robust standard errors clustered at the individual level	Household Income and Labour Dynamics in Australia (HILDA) Survey	Individual
4	Kim, D. (2018). Cross-national pattern of happiness: do higher education and less urbanization degrade happiness?. Applied Research in Quality of Life, 13(1), 21-35.	1	Relationship between Happiness, Higher Education, and Urbanization.	H	Empirical, quantitative, multiple linear regression	World Bank & WVS	Country
5	Arora, R. G. (2020). Happiness among higher education academicians: a demographic analysis. Rajagiri Management Journal.	NM					
6	Jongbloed, J. (2018). Higher education for happiness? Investigating the impact of education on the hedonic and eudaimonic well-being of Europeans. European Educational Research Journal, 17(5), 733-754.	2	Relationship between Happiness and Higher Education	H	Empirical, quantitative, ordinary least squares (OLS) regressions	ESS	Individual
7	Lee, J. K. (2011). Higher education and happiness in the age of information. Higher Education Review, 43(3).	1	Relationship between Happiness and Higher Education in the age of information	H	Not Empirical.		
8	Moussa, N. M., & Ali, W. F. (2022). Exploring the relationship between students' academic success and happiness levels in the higher education settings during the lockdown period of COVID-19. Psychological Reports, 125(2), 986-1010.	1	Relationship between students' academic success and their happiness levels	L			

9	Tan, H., Luo, J., & Zhang, M. (2020). Higher education, happiness, and residents' health. Frontiers in Psychology, 11, 1669.	1	Effect of Higher Education on the Health of the Chinees population mediated by Happiness	L			
10	Binnawas, M. S. H., Khalifa, G. S., & Bhaumick, A. (2019). The influence of higher education service quality on Behavioural intention: The mediating role of student happiness. Restaurant Business, 118(10), 444-458.	NM					
11	Nikolaev, B., & Rusakov, P. (2016). Education and happiness: an alternative hypothesis. Applied Economics Letters, 23(12), 827-830.	1	Role of Age in the Relationship between Higher Education and Happiness	H	It seems to be a part of number 3	HILDA	Individual
12	Giannetti, B. F., Velazquez, L., Perkins, K. M., Trillas-Ortiz, M., Anaya-Eredias, C., Agostinho, F., ... & Munguia, N. (2021). Individual-level characteristics of environmental sustainability among students in a higher education institution: The role of happiness and academic performance. International Journal of Sustainability in Higher Education.	1	Relationship between Happiness, Academic Achievement and Sustainability Behaviors	L			
13	Escobar-Tello, M., & Bhamra, T. (2013). Happiness as a harmonising path for bringing higher education towards sustainability. Environment, development and sustainability, 15(1), 177-197.	1	Sustainable Lifestyles within the Student Population	L			
14	Huang, P. H. (2018). Adventures in higher education, happiness, and mindfulness. British Journal of American Legal Studies, 7(2), 425-484.	NM					
15	Gibbs, P. (2017). Why universities should seek happiness and contentment. Bloomsbury Publishing. Gibbs, P. (2014). Happiness and education: recognising a fundamental attunement. Philosophical Perspectives on Compulsory Education, 183-191.	B	I was not able to gain access to the book, instead, I checked an article by the author named ***Happiness and Education: Recognising a Fundamental Attunement***. in a book named *Philosophical Perspectives on Compulsory Education*, to become familiar with the author's ideas on the subject.	H	Not empirical.		
16	Alavi, K., Isa, K., & Palpanadan, S. T. (2020). Application of Rasch Model on Resilience in Higher Education: An Examination of Validity and Reliability of Malaysian Academician Happiness Index (MAHI). International Journal of Higher Education, 9(4), 261-271.	1	Verify the validity and reliability of the instrument on the Malaysian Academician Happiness Index	L			

			(MAHI) on resilience				
17	Hu, A. (2015). The changing happiness-enhancing effect of a college degree under higher education expansion: Evidence from China. Journal of Happiness Studies, 16(3), 669-685.	1	The change in the Relationship between Higher Education and Happiness among the Chinees Population	H	Empirical, quantitative, apply nonparametric regression models to examine the changing individual-level effect of education on happiness	Chinese General Social Survey (CGSS)	Individual
18	Lee, J. K. (2017). Happiness and Ethical Values in Higher Education. Online Submission.	OS					
19	Hartog, J., & Oosterbeek, H. (1998). Health, wealth and happiness: why pursue a higher education?. Economics of education review, 17(3), 245-256.	2	Relationship between Education and Heath, Wealth, and Happiness	H	Empirical, quantitative, ordered probit model	Brabant Survey	Individual
20	Cuñado, J., & de Gracia, F. P. (2012). Does education affect happiness? Evidence for Spain. Social indicators research, 108(1), 185-196.	1	Relationship between Education and Happiness	H	Empirical, quantitative, estimating ordinal logit models	ESS	Individual
	education happiness						
1	Michalos, A. C. (2017). Education, happiness and wellbeing. In Connecting the quality of life theory to health, well-being and education (pp. 277-299). Springer, Cham.	BC	Exploring the possible ways to question the relationship between Education and Happiness.	H	Not empirical.		
2	Noddings, N. (2003). Happiness and education. Cambridge University Press.	B	The effect of education on happiness; the importance of happiness as a goal; and implications of these factors on curriculum and education as a whole	H	Not empirical.		
3	Cuñado, J., & de Gracia, F. P. (2012). Does education affect happiness? Evidence for Spain. Social indicators research, 108(1), 185-196.	1	Relationship between Education and Happiness	H	Empirical, quantitative, estimating ordinal logit models	ESS	Individual
4	Tan, H., Luo, J., & Zhang, M. (2020). Higher education, happiness, and residents' health. Frontiers in Psychology, 11, 1669.	1	Effect of Higher Education on the Health of the Chinees population mediated by Happiness	L			
5	Nikolaev, B., & Rusakov, P. (2016). Education and happiness: an alternative hypothesis. Applied Economics Letters, 23(12), 827-830.	1	Role of Age in the Relationship between Higher Education and Happiness	H	It seems to be a part of number 3	HILDA	Individual

6	Hartog, J., & Oosterbeek, H. (1998). Health, wealth and happiness: why pursue a higher education?. Economics of education review, 17(3), 245-256.	2	Relationship between Education and Heath, Wealth, and Happiness	H	Empirical, quantitative, ordered probit model	Brabant Survey	Individual
7	Chen, W. C. (2012). How education enhances happiness: Comparison of mediating factors in four East Asian countries. Social indicators research, 106(1), 117-131.	1	The effect of Education on Happiness	H	Empirical, quantitative, OLS regression analysis, data: EASS	East Asian Social Survey (EASS)	Country
8	Chan, G., Miller, P. W., & Tcha, M. (2005). Happiness in university education. International review of economics education, 4(1), 20-45.	1	Quantify the determinants of happiness in university students	H	Empirical, quantitative, ordered probit model	A Survey Conducted with Students at the University of Western Australia in 2003.	Individual
9	Elwick, A., & Cannizzaro, S. (2017). Happiness in higher education. Higher Education Quarterly, 71(2), 204-219.	1	Relationship between Happiness and Higher Education	H	Meta-Analysis		
10	Huang, P. H. (2018). Adventures in higher education, happiness, and mindfulness. British Journal of American Legal Studies, 7(2), 425-484.	NM					
11	Castriota, S. (2006). Education and happiness: A further explanation to the Easterlin Paradox. Unpublished paper.	UP	The lessening mediating impact of Education on the role of income on happiness	H	Empirical, quantitative, ordered Logit regressions with robust standard errors	WVS & World Bank	Individual
12	O'Brien, C. (2010). Sustainability, happiness and education. Journal of Sustainability Education, 1(1), 1-18.	NM					
13	Roberts, P. (2013). Happiness, despair and education. Studies in Philosophy and Education, 32(5), 463-475.	2	The relationship between education happiness and despair based on Kierkegaard and Dostoevsky's ideas.	H	Not empirical		
14	Dockery, A. M. (2010). Education and happiness in the school-to-work transition. National Centre for Vocational Education Research.	NJ	The impact of Education on Happiness	H	Seems to be a governmental document rather than a peer-reviewed journal	The Longitudinal Surveys of Australian Youth (LSAY)	Individual
15	Nikolaev, B. (2018). Does higher education increase hedonic and eudaimonic happiness?. Journal of happiness Studies, 19(2), 483-504.	1	Relationship between Happiness and Higher Education	H	Empirical, quantitative, random-effects (RE) linear estimator with robust standard errors clustered at the individual level	Household Income and Labour Dynamics in Australia (HILDA) Survey	Individual
16	Jongbloed, J. (2018). Higher education for happiness? Investigating the impact of education on the hedonic and eudaimonic well-being of Europeans. European Educational Research Journal, 17(5), 733-754.	2	Relationship between Happiness and Higher Education	H	Empirical, quantitative, ordinary least squares (OLS) regressions	ESS	Individual

17	Ruiu, G., & Ruiu, M. L. (2019). The complex relationship between education and happiness: The case of highly educated individuals in Italy. Journal of Happiness Studies, 20(8), 2631-2653.	1	The impact of Higher Education on Happiness	H	Empirical, quantitative, logistic regression	The Biennial Survey conducted by the Bank of Italy on the Italian households' incomes and wealth	Individual
18	Watson, G. (1930). Happiness among adult students of education. Journal of Educational Psychology, 21(2), 79.	2	Happiness among a sample of students	L			
19	Bailey, R. (2009). Well-being, happiness and education. *British Journal of Sociology of Education*, 30(6), 795-802	2	The Review essay on ***Happiness***, by R. Layard Criticizing the Happiness industry.	L			
20	Dearden, R. F. (2010). Happiness and education. In *Education and the development of reason* (pp. 71-83). Routledge. Probably the same as: Dearden R. F. (1968). Happiness and education. Journal of Philosophy of Education, 2(1), 17-29.	BC	The aim of education cannot simply be happiness	H	Not empirical.		
	happiness AND "higher education"						
1	Elwick, A., & Cannizzaro, S. (2017). Happiness in higher education. Higher Education Quarterly, 71(2), 204-219.	1	Relationship between Happiness and Higher Education	H	Meta-Analysis		
2	Hartog, J., & Oosterbeek, H. (1998). Health, wealth and happiness: why pursue a higher education?. Economics of education review, 17(3), 245-256.	2	Relationship between Education and Heath, Wealth, and Happiness	H	Empirical, quantitative, ordered probit model	Brabant Survey	Individual
3	Kim, D. (2018). Cross-national pattern of happiness: do higher education and less urbanization degrade happiness?. Applied Research in Quality of Life, 13(1), 21-35.	1	Relationship between Happiness, Higher Education, and Urbanization.	H	Empirical, quantitative, multiple linear regression	World Bank & WVS	Country
4	Nikolaev, B. (2018). Does higher education increase hedonic and eudaimonic happiness?. Journal of happiness Studies, 19(2), 483-504.	1	Relationship between Happiness and Higher Education	H	Empirical, quantitative, random-effects (RE) linear estimator with robust standard errors clustered at the individual level	Household Income and Labour Dynamics in Australia (HILDA) Survey	Individual
5	Arora, R. G. (2020). Happiness among higher education academicians: a demographic analysis. Rajagiri Management Journal.	NM					
6	Jongbloed, J. (2018). Higher education for happiness? Investigating the impact of education on the hedonic and eudaimonic well-being of Europeans. European Educational Research Journal, 17(5), 733-754.	2	Relationship between Happiness and Higher Education	H	Empirical, quantitative, ordinary least squares (OLS) regressions	ESS	Individual

7	Moussa, N. M., & Ali, W. F. (2022). Exploring the relationship between students' academic success and happiness levels in the higher education settings during the lockdown period of COVID-19. Psychological Reports, 125(2), 986-1010.	1	Relationship between students' academic success and their happiness levels	L			
8	Binnawas, M. S. H., Khalifa, G. S., & Bhaumick, A. (2019). The influence of higher education service quality on Behavioural intention: The mediating role of student happiness. Restaurant Business, 118(10), 444-458.	NM					
9	Nikolaev, B., & Rusakov, P. (2016). Education and happiness: an alternative hypothesis. Applied Economics Letters, 23(12), 827-830.	1	Role of Age in the Relationship between Higher Education and Happiness	H	It seems to be a part of number 3	HILDA	Individual
10	Silva Munar, J. L., De Juana-Espinosa, S., Martínez-Buelvas, L., Vecchiola Abarca, Y., & Orellana Tirado, J. (2020). Organizational happiness dimensions as a contribution to sustainable development goals: A prospective study in higher education institutions in Chile, Colombia and Spain. Sustainability, 12(24), 10502.	1	organizational happiness in the context of higher education institutions	L			
11	Alteneiji, S., Alsharari, N. M., AbouSamra, R. M., & Houjeir, R. (2023). Happiness and positivity in the higher education context: an empirical study. International Journal of Educational Management, (ahead-of-print).	2	Relationship between students' happiness, stress, and emotional closeness	L			
12	Lee, J. K. (2011). Higher education and happiness in the age of information. Higher Education Review, 43(3).	1	Relationship between Happiness and Higher Education in the age of information	H	Not Empirical. Might be useful for university categorizations.		
13	Escobar-Tello, M., & Bhamra, T. (2013). Happiness as a harmonising path for bringing higher education towards sustainability. Environment, development and sustainability, 15(1), 177-197.	1	Sustainable Lifestyles within the Student Population	L			
14	Huang, P. H. (2018). Adventures in higher education, happiness, and mindfulness. British Journal of American Legal Studies, 7(2), 425-484.	NM					
15	Giannetti, B. F., Velazquez, L., Perkins, K. M., Trillas-Ortiz, M., Anaya-Eredias, C., Agostinho, F., ... & Munguia, N. (2021). Individual-level characteristics of environmental sustainability among students in a higher education institution: The role of happiness and academic performance. International Journal of Sustainability in Higher Education.	1	Relationship between Happiness, Academic Achievement, and Sustainability Behaviors	L			

16	Hu, A. (2015). The changing happiness-enhancing effect of a college degree under higher education expansion: Evidence from China. Journal of Happiness Studies, 16(3), 669-685.	1	The change in the Relationship between Higher Education and Happiness among the Chinees Population	H	Empirical, quantitative, apply nonparametric regression models to examine the changing individual-level effect of education on happiness	Chinese General Social Survey (CGSS)	Individual
17	Tan, H., Luo, J., & Zhang, M. (2020). Higher education, happiness, and residents' health. Frontiers in Psychology, 11, 1669.	1	Effect of Higher Education on the Health of the Chinees population mediated by Happiness	L			
18	Alavi, K., Isa, K., & Palpanadan, S. T. (2020). Application of Rasch Model on Resilience in Higher Education: An Examination of Validity and Reliability of Malaysian Academician Happiness Index (MAHI). International Journal of Higher Education, 9(4), 261-271.	1	Verify the validity and reliability of the instrument on the Malaysian Academician Happiness Index (MAHI) on resilience	L			
19	Lee, J. K. (2017). Happiness and Ethical Values in Higher Education. Online Submission.	OS					
20	Schuelka, M. J., Braznell, M., Leavesley, M., Dorji, S., Dorji, K., Nidup, K., & Latsho, P. (2021). Happiness, wellbeing, and mental health in Bhutanese higher education: Exploring student and staff experiences and perceptions within a framework of Gross National Happiness. Journal of International and Comparative Education (JICE), 33-50.	NM					
	happiness AND university						
1	Chan, G., Miller, P. W., & Tcha, M. (2005). Happiness in university education. International review of economics education, 4(1), 20-45.	1	Quantify the determinants of happiness in university students	H	Empirical, quantitative, ordered probit model	A Survey Conducted with Students at the University of Western Australia in 2003.	Individual
2	Lee, S., Chung, B., & Kim, S. (2015). Influence on subjective happiness of university students. Journal of Korean Public Health Nursing, 29(1), 115-126.	NM					
3	San Martín, J., Perles, F., & Canto, J. M. (2010). Life satisfaction and perception of happiness among university students. The Spanish journal of psychology, 13(2), 617-628.	1	Evaluation of three orientations towards happiness: pleasure, meaning, and engagement, as well as their relation to life satisfaction and the perception of happiness	L			

4	Abecia, D., Samong, M., Abella, L., Baldomero, F., Tamayo, A., & Gabronino, R. (2014). Measuring happiness of university students. Available at SSRN 2433950.	0					
5	Leonard, T. C. (2008). Richard H. Thaler, Cass R. Sunstein, Nudge: Improving decisions about health, wealth, and happiness: Yale University Press, New Haven, CT, 2008, 293 pp, $26.00. Published Online in *Springer Science+Business Media, LLC 2008*	NM					
6	Batik, M. V., Bingöl, T. Y., Kodaz, A. F., & Hosoglu, R. (2017). Forgiveness and Subjective Happiness of University Students. International Journal of Higher Education, 6(6), 149-162.	0					
7	Ziapour, A., Khatony, A., Jafari, F., & Kianipour, N. (2018). Correlation of Personality Traits with Happiness among University Students. Journal of Clinical & Diagnostic Research, 12(4).	NM					
8	van Zyl, Y., & Dhurup, M. (2018). Self-efficacy and its relationship with satisfaction with life and happiness among university students. Journal of Psychology in Africa, 28(5), 389-393.	1	The relationship between self-efficacy and satisfaction with life and happiness among university students in South Africa	L			
9	Choi, J. (2016). Sustainable behavior: Study engagement and happiness among university students in South Korea. Sustainability, 8(7), 599.	1	the relationships among sustainable behavior, study engagement, and happiness	L			
10	Bhatia, A., & Mohsin, D. F. (2020). Measuring happiness of university teachers during challenging times. International Journal of Advanced Science and Technology, 29(10s), 7805-7817.	0					
11	Al-Naggar, R. A., Al-Jashamy, K. A., Low, W. Y., Isa, Z. M., Alsaror, M. I., & Al-Naggar, A. G. A. (2010). Perceptions and opinion of happiness among university students in a Malaysian university. ASEAN Journal of Psychiatry, 11(2), 198-205.	NM					
12	Alipour, A., Hashemi, T., Babapour, J., & Tousi, F. (2010). Relationship between coping strategies and happiness among university students. Journal of Modern Psychological Researches, 5(18), 71-86.	NM					
13	Schnettler, B., Orellana, L., Lobos, G., Miranda, H., Sepúlveda, J., Etchebarne, S., ... & Grunert, K. G. (2015). Relationship between the domains of the Multidimensional Students' Life Satisfaction Scale, satisfaction with food-related life and happiness in university students. Nutricion hospitalaria, 31(6), 2752-2763.	0					

14	Meyzari Ali, R., & Dasht Bozorgi, Z. (2016). The relationship of altruistic behavior, empathetic sense, and social responsibility with happiness among university students. Practice in Clinical Psychology, 4(1), 51-56.	NM					
15	Foo, Z., & Prihadi, K. D. (2021). Happiness of University Students in New Normal Malaysia: The Role of Mattering, Optimism, and Social Support. International Journal of Evaluation and Research in Education, 10(2), 448-454.	NM					
16	Bhatia, A., & Mohsin, F. (2020). Determinants of college teachers' happiness-a comprehensive review. Journal of critical reviews, 7(9), 9-17.	NM					
17	Muñoz, J. M., Romo, J. F. M., Nuñez, A., & Saucedo, L. K. C. (2022). Happiness in University Students in Uaz, México. Revista Iberoamericana de Psicología, 15(1), 103-112.	NM					
18	Kozma, A., & Stones, M. J. (1980). The measurement of happiness: Development of the Memorial University of Newfoundland Scale of Happiness (MUNSH). Journal of gerontology, 35(6), 906-912.	2	Construction of a happiness scale for the elderly	L			
19	Ramos, M. F. D., Perez, M., & Andrade, E. R. C. (2022). Orientations to Happiness and University Students' Engagement during the COVID-19 Era: Evidence from Six American Countries. International Journal of Educational Psychology: IJEP, 11(1), 50-67.	NM					
20	Rehman, R., Zafar, A., Mohib, A., & Baig, M. (2018). A gender-based comparison in health behaviors and state of happiness among university students. Cureus, 10(3).	x					
	happiness AND education						
1	Noddings, N. (2003). Happiness and education. Cambridge University Press.	B	The effect of Education on Happiness, the importance of Happiness as a goal, and implications of these factors on curriculum and education as a whole	H	Not empirical.		
2	O'Brien, C. (2010). Sustainability, happiness and education. Journal of Sustainability Education, 1(1), 1-18.	NM					
3	Bailey, R. (2009). Well-being, happiness and education. *British Journal of Sociology of Education*, 30(6), 795-802	2	The Review essay on ***Happiness***, by R. Layard Criticizing the Happiness industry.	L			

4	Gibbs, P. (2015). Happiness and education: Troubling students for their own contentment. Time & Society, 24(1), 54-70.	2	Whether should higher education focus on the happiness of students or their contentment derived from realizing their potential.	H	Not empirical.		
5	Dearden, R. F. (2010). Happiness and education. In Education and the development of reason (pp. 71-83). Routledge.	BC	The aim of education cannot simply be happiness	H	Not empirical.		
6	Steel, S. (2014). The pursuit of wisdom and happiness in education: Historical sources and contemplative practices. State University of New York Press.	B	Wisdom seeking in schools	L			
7	Alexander, H. (2013). Caring and agency: Noddings on happiness in education. Educational Philosophy and Theory, 45(5), 488-493.	1	Hanan Alexander, philosopher of education at the university of Hifa argues that the caring presented by Noddings requires " a situated human agent who can choose freely to enter into relation".	L			
8	Demirbatir, R. E. (2015). Relationships between psychological well-being, happiness, and educational satisfaction in a group of university music students. Educational Research and Reviews, 10(15), 2198-2206.	0					
9	Cheung, H. Y., & Chan, A. W. (2011). The relationship of competitiveness motive on people's happiness through education. International Journal of Intercultural Relations, 35(2), 179-185.	1	The relationship between competitiveness motive and happiness	L			
10	Chan, G., Miller, P. W., & Tcha, M. (2005). Happiness in university education. International review of economics education, 4(1), 20-45.	1	Quantify the determinants of happiness in university students	H	Empirical, quantitative, ordered probit model	A Survey Conducted with Students at the University of Western Australia in 2003.	Individual
11	Ozen, F. (2018). The Impact of the Perception of Organizational Virtue on the Perception of Organizational Happiness in Educational Organizations. Educational Policy Analysis and Strategic Research, 13(4), 124-140.	NM					
12	Gibbons, Y. M. (2005). Happiness and education.Contemporary Sociology 34(2), 196-198.	1	A Review on Nodding's Book with the same name.	L			

13	Michalos, A. C. (2017). Education, happiness and wellbeing. In Connecting the quality of life theory to health, well-being and education (pp. 277-299). Springer, Cham.	BC	Exploring the possible ways to question the relationship between Education and Happiness.	H	Not empirical.		
14	Cuñado, J., & de Gracia, F. P. (2012). Does education affect happiness? Evidence for Spain. Social indicators research, 108(1), 185-196.	1	Relationship between Education and Happiness	H	Empirical, quantitative, estimating ordinal logit models	ESS	Individual
15	Datu, J. A. D., Valdez, J. P., Cabrera, I. K., & Salanga, M. G. (2017). Subjective happiness optimizes educational outcomes: Evidence from Filipino high school students. The Spanish Journal of Psychology, 20, E60.	1	The effect of subjective happiness on educational outcomes	L			
16	Roberts, P. (2013). Happiness, despair and education. Studies in Philosophy and Education, 32(5), 463-475.	2	The relationship between education happiness and despair based on Kierkegaard and Dostoevsky's ideas.	H	Not empirical		
17	Guilherme, A., & de Freitas, A. L. S. (2017). 'Happiness education': A pedagogical-political commitment. Policy Futures in Education, 15(1), 6-19.	1	Exploring Happiness Education using the ideas of Freire and Snyders	L			
18	Barrow, R. (2012). Happiness. Routledge.	B	Robin Barrow is a philosopher of education and the book is on happiness and its implications for education.	H	Not empirical		
19	Hustak, C. (2013). Love, sex, and happiness in education: The Russells, Beacon Hill School, and teaching "sex-love" in England, 1927-1943. Journal of the History of Sexuality, 22(3), 446-473.	1	History of sex education	L			
20	Ideland, M. (2017). The end of the world and a promise of happiness: Environmental education within the cultural politics of emotions. In *A Political Sociology of Educational Knowledge* (pp. 163-176). Routledge.	BC	Environmental education in schools	L			

Appendix B

The following discusses the different variables of the study and presents the different questions of WVS (recoded version) as well as other datasets used in operationalizing them.[37]

Education level

Q275- What is the highest educational level that you have attained?
ISCED 0 ISCED 1 / ISCED 2 / ISCED 3 / ISCED 4 / ISCED 5 / ISCED 6 / ISCED 7 / ISCED 8 / DK / NA.

Happiness

Although Q46 also seems related, Q49 is more aligned with the conceptualization of Happiness discussed in the Theoretical Framework chapter.

Q46- Taking all things together, would you say you are:
Very happy / Quite happy / Not very happy / Not at all happy / Don´t know / No answer.

Q49- All things considered, how satisfied are you with your life as a whole these days?
10- Completely satisfied / 9 / 8 / 7 / 6 / 5 / 4 / 3 / 2 / 1- Completely dissatisfied / Don´t know / No answer

Deficiency Needs

Deficiency Needs is the sum of PN, SN, and EPN, divided by 3.

Physiological Needs

A coefficient for Physiological Needs could be defined as the following.

[37] The "WVS-7 Master Questionnaire 2017-2020 English.pdf" and "WVS Explanatory note on scales recoding.pdf" can be found on the WVS webpage, under Data and Documentation / Data Download / Wave 7 (2017-2022). (https://www.worldvaluessurvey.org/WVSDocumentationWV7.jsp)

$$CPN = 1 - \frac{10-2(q47)+q51+q53+q54+q55-4}{20}$$

It is between zero and one.

Due to the importance of health, its weight has been increased. The other adjustments are in line with making the questions in the same direction and also making the coefficient between 0 and 1.

Q47- All in all, how would you describe your state of health these days? Would you say it is...

5=Very good / 4=Good / 3=Fair / 2=Poor / 1=Very poor

Q51- In the last 12 months, how often have you or your family: Gone without enough food to eat?

Often=4 / Sometimes=3 / Rarely=2 / Never=1

Q53- In the last 12 months, how often have you or your family: Gone without needed medicine or treatment that you needed?

Often=4 / Sometimes=3 / Rarely=2 / Never=1

Q54- In the last 12 months, how often have you or your family: Gone without a cash income?

Often=4 / Sometimes=3 / Rarely=2 / Never=1

Q55- In the last 12 months, how often have you or your family: Gone without a safe shelter over your head

Often=4 / Sometimes=3 / Rarely=2 / Never=1

Security

A coefficient for security needs could be defined as the following.

$$CSN = \frac{\Sigma(q131\ to\ 141,\ and\ q144\ to\ 148)}{96}$$

It is between zero and one.
Answers to each of the questions will be quantified as follows.

Q131- Could you tell me how secure you feel these days in your neighborhood?
Very secure: 0 / Quite secure: 2 / Not very secure: 4 / Not at all secure: 8.

How frequently do the following things occur in your neighborhood? Very frequently: 4 / Quite frequently: 2 / Not frequently: 1 / Not at all frequently: 0.
Q132- Robberies:
Q133- Alcohol consumption in the street:
Q134- Police or military interfere with people:
Q135- Racist behavior:
Q136- Drug sale in streets:
Q137- Street violence and fights:
Q138- Sexual harassment:

Which of the following things have you done for reasons of security? (MULTIPLE RESPONSES): Yes: 2 / No: 0.
Q139- Didn't carry much money:
Q140- Preferred not to go out at night:
Q141- Carried a knife, gun, or other weapons:

Have you been the victim of a crime during the past year?
And what about your immediate family – has someone in your family been the victim of a crime during the last year?
Q144- Respondent. Yes: 20 / No: 0.
Q145- Family. Yes: 10 / No: 0.

To what degree are you worried about the following situations? Very much: 8 / A good deal: 4 / Not much: 2 / Not at all: 0.

Q146- A war involving my country:
Q147- A terrorist attack:
Q148- A civil war

Love and Belonging

Although questions number 1, 2, 94, 95, 96, 103, and 273 could be somehow regarded as related to this topic, unfortunately, they are not either close or directly related enough to provide a valid construct for this variable.

Esteem and Prestige

Although questions number 94 to 105 and 288 could be somehow regarded as related to this topic, unfortunately, they are not either close or directly related enough to provide a valid construct for this variable. So the measure is solely based on question number 287.

A coefficient for Esteem and Prestige is between zero and one.
Answers to question 287 will be quantified as the following.

Q287- People sometimes describe themselves as belonging to the working class, the middle class, or the upper or lower class. Would you describe yourself as belonging to one of them?
Upper class: 1 / Upper middle class: 0.75 / Lower middle class: 0.50 / Working class: 0.25 / Lower class: 0.00.

Growth Needs

In growth needs, recognizing the need is almost the same as satisfying it. As a result, in defining related questions for each need, in addition to questions that indicate a high level of satisfaction (or not satisfaction) of that need, indications of paying attention or importance to these could also be considered almost as the satisfaction of those needs.

Cognitive Needs

Consistency and attention to reality could be considered important aspects of cognitive abilities and signs of satisfaction of cognitive needs.

Contradictions between answers (lack of internal consistency). The following questions could be regarded as related to this topic (Between -12 and 0):

> Q237 What do you think about having the army rule as a way of governing this country, and Q238- What do you think about having a democratic political system as a way of governing this country (-8,0). Since the variable tries to measure contradictions, it is impartial to the view of each respondent. However, regarding the two questions if a respondent's answers to both of these questions are positive at the same time since they are naturally in opposition to each other it could be a sign of contradiction. As a result, if a respondent replies to both questions as "Very Good" it will be considered as (-8), to one "Very Good" and to another "Good" it will be considered as (-6), and to both "Good" it will be considered (-4). Regarding the validity of these measures for this construct, it could be argued that someone may think that two opposing solutions, in this case, army rule and a democratic political system, could both be suitable for a particular situation, here, the respondent's country. However, regardless of the practical issues, the philosophical difference between the two solutions is so major that someone answering positively to both of them could be considered a relatively good sign of internal consistency.
>
> Q235 What do you think about having a strong leader who does not have to bother with parliament and elections, and Q250- How important is it for you to live in a country that is governed democratically (-4,0). Again if a respondent's answers to both of these questions are positive at the same time since they are naturally in opposition to each other it could be a sign of contradiction. Theoretically, it could be imagined that someone considers it very important for herself to live in a country that is governed democratically, but she considers it positive for the country that she is living in at the moment to have a dictator, or vice versa. Though this probability is small enough to be able to compromise and include it as a part of the construct, its existence makes it reasonable to associate a lesser weight to this in comparison to the

previous one. Therefore, if a respondent replies to both questions as “Very Good” it will be considered as (-4), to one “Very Good” and to another “Good” it will be considered as (-3), and to both “Good” it will be considered (-2).

Being indifferent to reality. Science is considered a natural outcome of giving importance to reality in this study (not questioning the perception). The following questions could be regarded as related to this topic (Between -14,0):

Q160- We depend too much on science and not enough on faith (Between -2.25, and 0). If a respondent answers “Completely Agree” it will be considered as (-2.25), the next as (-2), and it decreases til it reaches (0) for “Completely Disagree”.

Q169- Whenever science and religion conflict, religion is always right (-1,0). If a respondent answers “Strongly Agree” it will be considered as (-5), “Agree” as (-3), “Don’t know” or “No answer” as (-1), and the rest as (0). This question is given more weight in comparison to the previous one because it could be regarded as a good sign of religious indoctrination which makes individuals indifferent or even opposed to reality.

Q251- How democratically is this country being governed today?, and The Democracy Index of the country (Between -10, and 0). The negative amount of the absolute value of the difference between each respondent’s answer to question number 251, which is between one (1) for not at all democratic and ten (10) for completely democratic, and the Democracy Index for her country, which is technically between zero (0), for the least, and ten (10) for the highest. This item, completing the previous item, could be regarded as a good sign of political indoctrination, both positive and negative, which makes individuals indifferent to or opposed to reality.

According to this way of weighting each question, for each individual, the contradiction part might have a score between minus twelve (-12), and zero (0), and the indifference to the reality part might have a score between minus seventeen point twenty five (-17.25), and zero (0). The reason for the latter to have a heavier weight in this construct is that while the contradiction part mainly covers political issues, the reality part deals with both politics and religion.

Measured in this way, the most rational person would score zero and the least rational one would score approximately -29.25. Therefore the Coefficient of Rationality (CR) could be defined as

$$CR = \frac{29.25 + \Sigma Q}{29.25}$$

In this equation, sigma Q refers to all the questions mentioned above.

Aesthetic Needs

Although questions number 96, 152, and 153 could be somehow regarded as related to this topic, unfortunately, they are not either close or directly related enough to provide a valid construct for this variable.

Self-actualization

Self-actualization could be understood as gaining free agency as well as developing personal potential and capacities. For the agency part, as mentioned before, it could be argued that being free from positive or negative prejudices caused by social institutions could be interpreted as a sign of increasing the capacity for agency. Therefore questions 19 to 23, 25, 26, 30, 33, 182, 185, 186, and 188 could be considered related to negative prejudices, and questions 27, 42, 170, and 254 could be regarded as related to positive prejudices. However, they are not either close or directly related enough to provide a valid construct for this variable.

Unfortunately, there are no questions regarding the actualization of the potential of the individual either.

Transcendence

Although questions number 99, 101, 103, and 104 could be somehow regarded as related to this topic, unfortunately, they are not either close or directly related enough to provide a valid construct for this variable.

Rationality

Rationality in this study, following Barrow (2012), is understood as the ability and will to reason well. Therefore, the clear sign of Rationality, in this meaning, in an individual is examining her own beliefs, values, and norms, and developing a

comprehensive conceptual framework based on Reality, without contradictions, and free from negative or positive prejudices that might come from social institutions.

However, as discussed before there are not enough related items to positive or negative prejudices in the survey. Therefore, the available coefficient of Rationality in this study will be equal to the one for Cognitive Needs Satisfaction.

Parent's Education

Q277-278 (R). What is the highest educational level that your mother and your father have attained?
1=Lower / 2=Middle / 3=Higher.

Religious Denomination

Q289. Do you belong to a religion or religious denomination? If yes, which one? (Code answer due to list below. Code 0, if the respondent answers " no denomination")
No: do not belong to a denomination 0
Yes: Roman Catholic 1 / Protestant 2 / Orthodox (Russian/Greek/etc.) 3 / Jew 4 / Muslim 5 / Hindu 6 / Buddhist 7 / Other (write in):_____ 8

Political Affiliation

Q240. In political matters, people talk of "the left" and "the right." How would you place your views on this scale,
generally speaking? (Code one number):
Left (1, 2, 3) / Middle (4, 5, 6, 7) / Right (8, 9, 10)

Appendix C

The traditional and survival values quantifications of the final version of the Inglehart-Welzel cultural map for the countries included in the study, minus Andorra, China, Egypt, Great Britain, Japan, Kazakhstan, Macao, Maldives, North Ireland, Puerto Rico, Singapore, Turkey, and Venezuela.

Country (year)	Tradition	Survival	Country (year)	Tradition	Survival
Argentina (2017)	-.4009	.1913	Morocco (2021)	-.3176	-.8135
Armenia (2021)	-1.3110	-.7100	Mexico (2018)	-1.0603	.2260
Australia (2018)	.5493	2.2627	Myanmar (2020)	-1.0254	-.9508
Bangladesh (2018)	-1.5034	-.6875	Mongolia (2020)	.7472	.1470
Bolivia (2017)	-1.2266	-.3828	Malaysia (2018)	.0546	-.3823
Brazil (2018)	-.3078	-.0973	Nigeria (2018)	-1.3736	-1.1028
Canada (2020)	.7975	2.0555	Nicaragua (2020)	-1.7126	-.3604
Chile (2018)	.2133	-.1089	Netherlands (2022)	1.1562	2.3876
Colombia (2018)	-1.5681	.2642	New Zealand (2020)	.5317	2.8566
Cyprus (2019)	-.4121	-.4995	Pakistan (2018)	-1.3833	-.6330
Czechia (2022)	1.3322	.7298	Peru (2018)	-1.0557	-.5629
Germany (2018)	.8909	2.1561	Philippines (2019)	-1.4145	.1057
Ecuador (2018)	-1.7248	.0182	Romania (2018)	-.3876	-.8017
Ethiopia (2020)	-1.3259	-.9801	Russia (2017)	.3895	-.5950
Greece (2017)	.2686	-.2853	Serbia (2018)	.3106	-.5770
Guatemala (2020)	-1.0060	.0042	Slovakia (2022)	.7261	.1217
Hong Kong SAR (2018)	1.4589	-.0582	Thailand (2018)	.2545	.0658
Indonesia (2018)	-1.2194	-.8403	Tajikistan (2020)	-1.3680	-0.6182
Iran (2020)	-.5392	-.9236	Tunisia (2019)	-.5962	-1.4324
Iraq (2018)	-.8453	-1.3175	Taiwan ROC (2019)	1.1261	-.1447
Jordan (2018)	-1.5785	-1.2090	Ukraine (2020)	.4312	-.4930
Kenya (2021)	-.9285	-.2731	Uruguay (2022)	-.3293	1.3611
Kyrgyzstan (2020)	-1.3943	-.5518	United States (2017)	.1444	1.4034
South Korea (2018)	1.4536	-.4708	Vietnam (2020)	-.4429	.6128

Lebanon (2018)	-.5352	-1.0751	Zimbabwe (2020)	-.5850	-1.8709
Libya (2022)	-1.7575	-1.1256			

Appendix D

First Hypothesis

Table 22 demonstrates descriptive statistics of Educational Attainment and Figure 20 displays its frequency histogram.

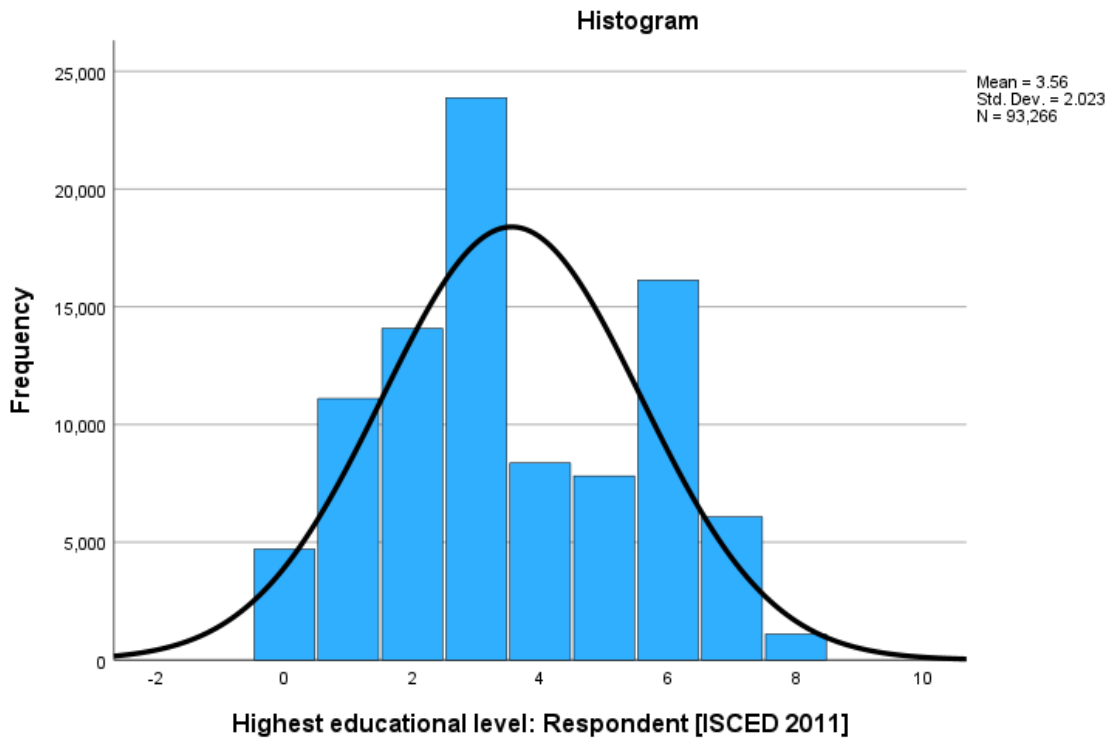

Figure 20.

Statistics

Highest educational level: Resp

N	Valid	93266
	Missing	1012
Mean		3.56
Median		3.00
Mode		3
Std. Deviation		2.023
Variance		4.092
Range		8
Minimum		0
Maximum		8

Table 22.

The dependent variable of the first hypothesis is **Deficiency Needs Satisfaction,** which is composed of Physiological Needs Satisfaction, Security Needs Satisfaction, and Esteem and Prestige Needs Satisfaction. Table 23 demonstrates descriptive statistics of **Physiological Needs Satisfaction** and Figure 21 displays its frequency histogram.

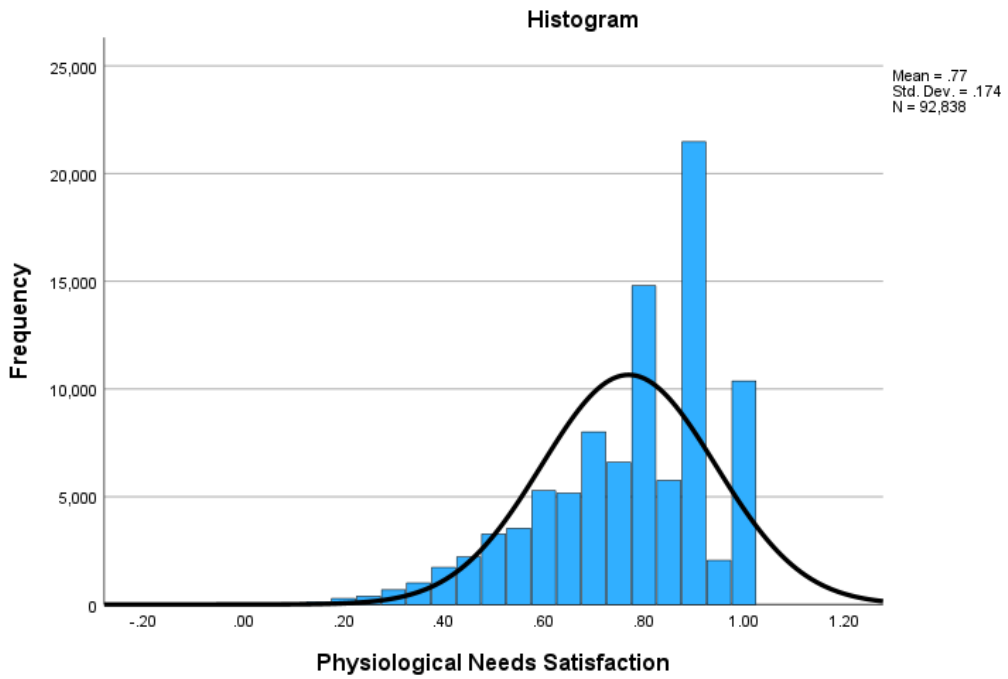

Figure 21.

Statistics

Physiological Needs Satisfactio

N	Valid	92838
	Missing	1440
Mean		.7696
Median		.8000
Mode		.90
Std. Deviation		.17378
Variance		.030
Range		1.00
Minimum		.00
Maximum		1.00

Table 23.

Table 24 demonstrates descriptive statistics of **Security Needs Satisfaction** and Figure 22 displays its frequency histogram.

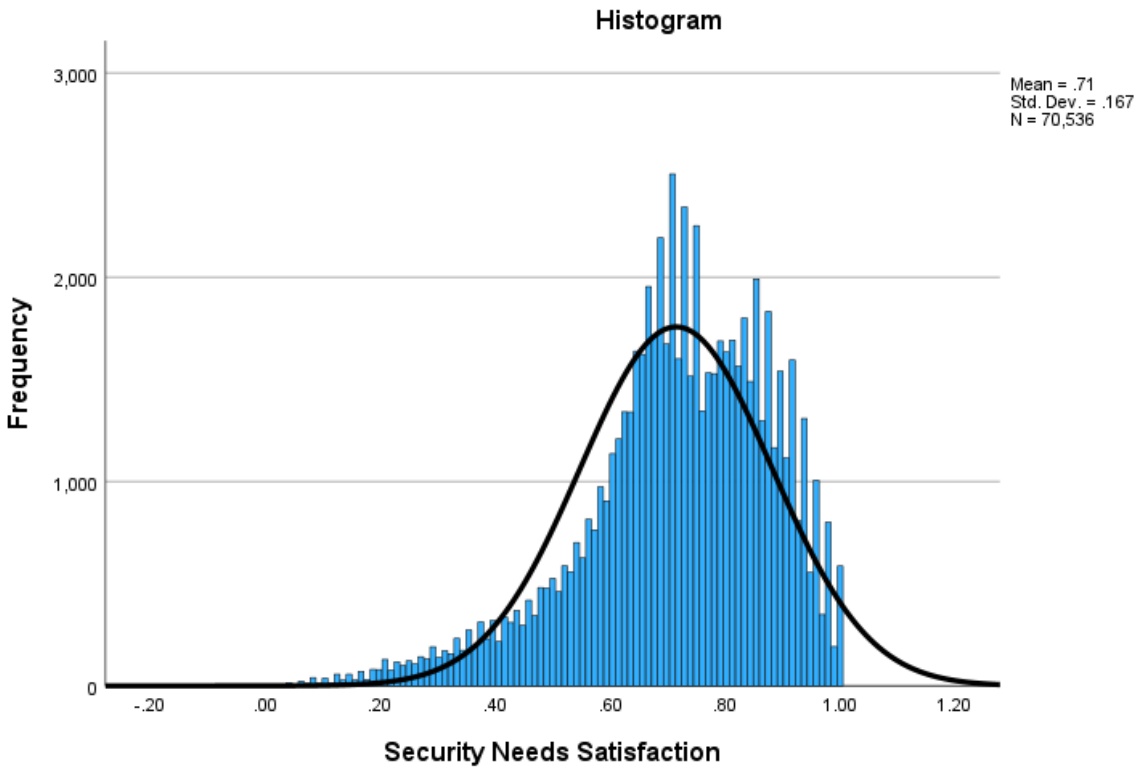

Figure 22.

Statistics

Security Needs Satisfaction

N	Valid	70536
	Missing	23742
Mean		.7147
Median		.7292
Mode		.71
Std. Deviation		.16681
Variance		.028
Range		1.00
Minimum		.00
Maximum		1.00

Table 24.

Table 25 demonstrates descriptive statistics of **Esteem and Prestige Needs Satisfaction** and Figure 23 displays its frequency histogram.

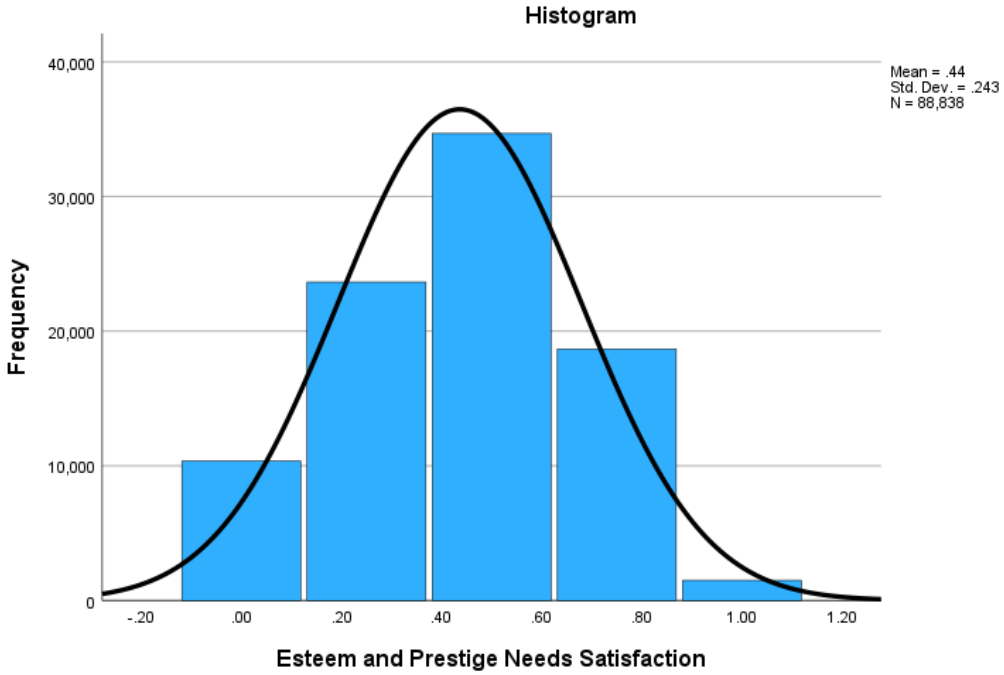

Figure 23.

Statistics

Esteem and Prestige Needs Sa

N	Valid	88838
	Missing	5440
Mean		.4362
Median		.5000
Mode		.50
Std. Deviation		.24293
Variance		.059
Range		1.00
Minimum		.00
Maximum		1.00

Table 25.

The Coefficient for Deficiency Needs is composed of the three previously mentioned coefficients. Table 26 demonstrates descriptive statistics of **Deficiency Needs Satisfaction** and Figure 24 displays its frequency histogram.

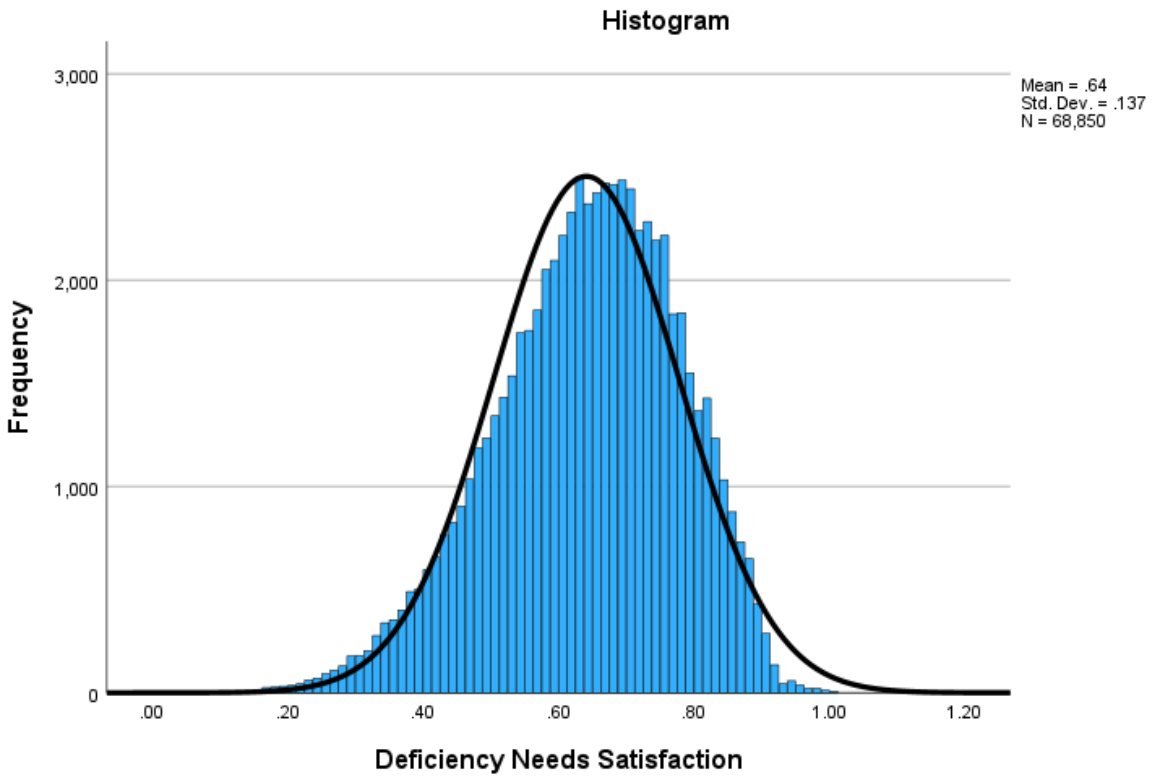

Figure 24

Statistics

Deficiency Needs Satisfaction

N	Valid	68850
	Missing	25428
Mean		.6410
Median		.6521
Mode		.78
Std. Deviation		.13714
Variance		.019
Range		.97
Minimum		.03
Maximum		1.00

Table 26.

Figure 25 displays the frequency of Deficiency Needs Satisfaction stacked by the Highest Educational Attainment of the respondents. As can be seen in the graph, the pick of the normal curve for higher educational attainments is moving to the right.

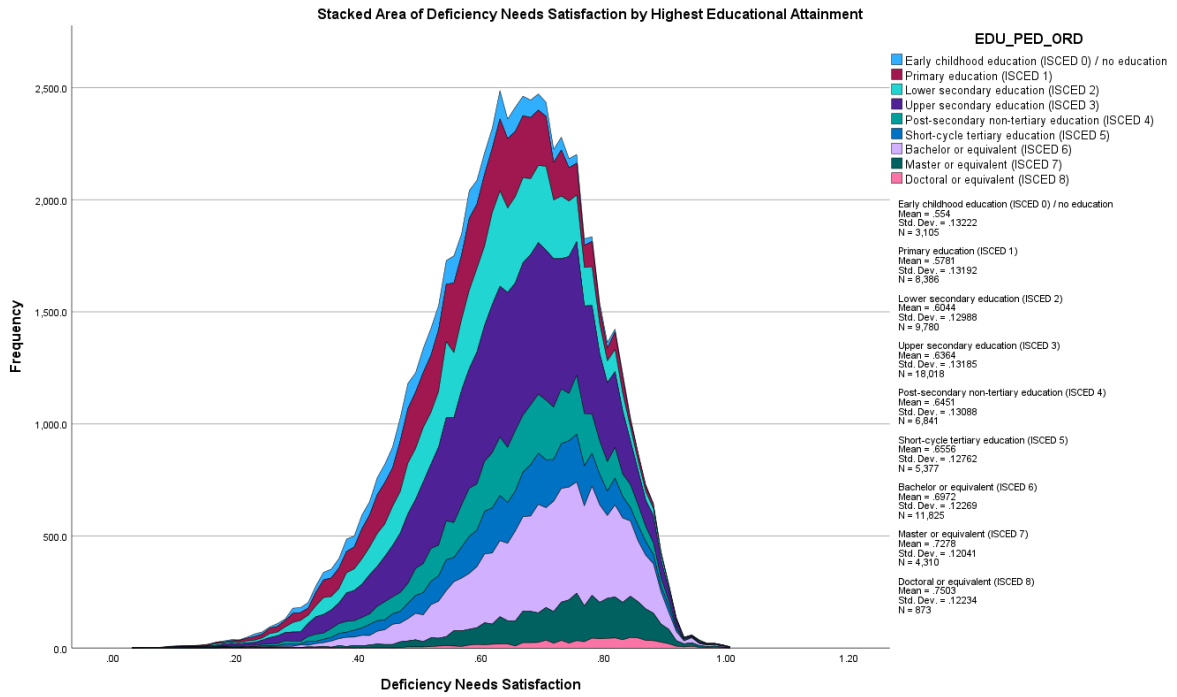

Figure 25.

Tables 27, 28, 29, and 30 present the results of Spearman's rho correlation analysis between Educational Attainment and Deficiency Needs Satisfaction and its three components; Physiological Needs Satisfaction, Security Needs Satisfaction, and Esteem and Prestige Needs Satisfaction.

Correlations

			Highest Educational Attainment	Deficiency Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.341**
		Sig. (2-tailed)	.	<.001
		N	93266	68515
	Deficiency Needs Satisfaction	Correlation Coefficient	.341**	1.000
		Sig. (2-tailed)	<.001	.
		N	68515	68850

**. Correlation is significant at the 0.01 level (2-tailed).

Table 27.

Correlations

			Physiological Needs Satisfaction	Highest Educational Attainment
Spearman's rho	Physiological Needs Satisfaction	Correlation Coefficient	1.000	.227**
		Sig. (2-tailed)	.	<.001
		N	92838	91947
	Highest Educational Attainment	Correlation Coefficient	.227**	1.000
		Sig. (2-tailed)	<.001	.
		N	91947	93266

**. Correlation is significant at the 0.01 level (2-tailed).

Table 28.

Correlations

			Highest Educational Attainment	Security Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.123**
		Sig. (2-tailed)	.	<.001
		N	93266	70127
	Security Needs Satisfaction	Correlation Coefficient	.123**	1.000
		Sig. (2-tailed)	<.001	.
		N	70127	70536

**. Correlation is significant at the 0.01 level (2-tailed).

Table 29.

Correlations

			Highest Educational Attainment	Esteem and Prestige Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.331**
		Sig. (2-tailed)	.	<.001
		N	93266	88309
	Esteem and Prestige Needs Satisfaction	Correlation Coefficient	.331**	1.000
		Sig. (2-tailed)	<.001	.
		N	88309	88838

**. Correlation is significant at the 0.01 level (2-tailed).

Table 30.

Tables 31 and 32 demonstrate the results of Oneway ANOVA for Deficiency Needs Satisfaction.

ANOVA

Deficiency Needs Satisfaction

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	151.632	8	18.954	1142.395	<.001
Within Groups	1136.611	68506	.017		
Total	1288.243	68514			

Table 31.

ANOVA Effect Sizes[a]

		Point Estimate	95% Confidence Interval Lower	95% Confidence Interval Upper
Deficiency Needs Satisfaction	Eta-squared	.118	.113	.122
	Epsilon-squared	.118	.113	.122
	Omega-squared Fixed-effect	.118	.113	.122
	Omega-squared Random-effect	.016	.016	.017

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

Table 32.

Correlation between Educational Attainment and Deficiency Needs and Its Components Controlling for Parents' Education

The following 6 tables (Tables 33 to 38) demonstrate the correlation between Educational Attainment and Deficiency Needs Satisfaction and its three components, controlling for parents' education.

Correlations[a]

			Highest Educational Attainment	Esteem and Prestige Needs Satisfaction	Physiological Needs Satisfaction	Security Needs Satisfaction	Deficiency Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.272**	.205**	.096**	.293**
		Sig. (2-tailed)	.	<.001	<.001	<.001	<.001
		N	52626	51639	51956	40607	39724
	Esteem and Prestige Needs Satisfaction	Correlation Coefficient	.272**	1.000	.227**	.098**	.742**
		Sig. (2-tailed)	<.001	.	<.001	<.001	<.001
		N	51639	51717	51098	40119	39778
	Physiological Needs Satisfaction	Correlation Coefficient	.205**	.227**	1.000	.280**	.683**
		Sig. (2-tailed)	<.001	<.001	.	<.001	<.001
		N	51956	51098	52032	40311	39778
	Security Needs Satisfaction	Correlation Coefficient	.096**	.098**	.280**	1.000	.566**
		Sig. (2-tailed)	<.001	<.001	<.001	.	<.001
		N	40607	40119	40311	40666	39778
	Deficiency Needs Satisfaction	Correlation Coefficient	.293**	.742**	.683**	.566**	1.000
		Sig. (2-tailed)	<.001	<.001	<.001	<.001	.
		N	39724	39778	39778	39778	39778

**. Correlation is significant at the 0.01 level (2-tailed).

a. Highest educational level: Respondent's Mother (recoded into 3 groups) = Lower

Table 33.

Correlations[a]

			Highest Educational Attainment	Esteem and Prestige Needs Satisfaction	Physiological Needs Satisfaction	Security Needs Satisfaction	Deficiency Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.245**	.135**	.129**	.248**
		Sig. (2-tailed)	.	<.001	<.001	<.001	<.001
		N	19174	18752	18921	15462	15133
	Esteem and Prestige Needs Satisfaction	Correlation Coefficient	.245**	1.000	.225**	.163**	.747**
		Sig. (2-tailed)	<.001	.	<.001	<.001	<.001
		N	18752	18785	18567	15262	15154
	Physiological Needs Satisfaction	Correlation Coefficient	.135**	.225**	1.000	.318**	.661**
		Sig. (2-tailed)	<.001	<.001	.	<.001	<.001
		N	18921	18567	18955	15361	15154
	Security Needs Satisfaction	Correlation Coefficient	.129**	.163**	.318**	1.000	.636**
		Sig. (2-tailed)	<.001	<.001	<.001	.	<.001
		N	15462	15262	15361	15484	15154
	Deficiency Needs Satisfaction	Correlation Coefficient	.248**	.747**	.661**	.636**	1.000
		Sig. (2-tailed)	<.001	<.001	<.001	<.001	.
		N	15133	15154	15154	15154	15154

**. Correlation is significant at the 0.01 level (2-tailed).

a. Highest educational level: Respondent's Mother (recoded into 3 groups) = Middle

Table 34.

Correlations[a]

			Highest Educational Attainment	Esteem and Prestige Needs Satisfaction	Physiological Needs Satisfaction	Security Needs Satisfaction	Deficiency Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.219**	.118**	.111**	.222**
		Sig. (2-tailed)	.	<.001	<.001	<.001	<.001
		N	10014	9693	9847	7890	7687
	Esteem and Prestige Needs Satisfaction	Correlation Coefficient	.219**	1.000	.224**	.136**	.731**
		Sig. (2-tailed)	<.001	.	<.001	<.001	<.001
		N	9693	9729	9590	7763	7699
	Physiological Needs Satisfaction	Correlation Coefficient	.118**	.224**	1.000	.327**	.677**
		Sig. (2-tailed)	<.001	<.001	.	<.001	<.001
		N	9847	9590	9885	7832	7699
	Security Needs Satisfaction	Correlation Coefficient	.111**	.136**	.327**	1.000	.630**
		Sig. (2-tailed)	<.001	<.001	<.001	.	<.001
		N	7890	7763	7832	7902	7699
	Deficiency Needs Satisfaction	Correlation Coefficient	.222**	.731**	.677**	.630**	1.000
		Sig. (2-tailed)	<.001	<.001	<.001	<.001	.
		N	7687	7699	7699	7699	7699

**. Correlation is significant at the 0.01 level (2-tailed).

a. Highest educational level: Respondent's Mother (recoded into 3 groups) = Higher

Table 35.

Correlations[a]

			Highest Educational Attainment	Esteem and Prestige Needs Satisfaction	Physiological Needs Satisfaction	Security Needs Satisfaction	Deficiency Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.266**	.204**	.085**	.285**
		Sig. (2-tailed)	.	<.001	<.001	<.001	<.001
		N	49290	48421	48642	37696	36888
	Esteem and Prestige Needs Satisfaction	Correlation Coefficient	.266**	1.000	.226**	.088**	.740**
		Sig. (2-tailed)	<.001	.	<.001	<.001	<.001
		N	48421	48487	47889	37273	36935
	Physiological Needs Satisfaction	Correlation Coefficient	.204**	.226**	1.000	.273**	.683**
		Sig. (2-tailed)	<.001	<.001	.	<.001	<.001
		N	48642	47889	48708	37399	36935
	Security Needs Satisfaction	Correlation Coefficient	.085**	.088**	.273**	1.000	.558**
		Sig. (2-tailed)	<.001	<.001	<.001	.	<.001
		N	37696	37273	37399	37747	36935
	Deficiency Needs Satisfaction	Correlation Coefficient	.285**	.740**	.683**	.558**	1.000
		Sig. (2-tailed)	<.001	<.001	<.001	<.001	.
		N	36888	36935	36935	36935	36935

**. Correlation is significant at the 0.01 level (2-tailed).

a. Highest educational level: Respondent's Father (recoded into 3 groups) = Lower

Table 36.

Correlations[a]

			Highest Educational Attainment	Esteem and Prestige Needs Satisfaction	Physiological Needs Satisfaction	Security Needs Satisfaction	Deficiency Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.225**	.129**	.132**	.241**
		Sig. (2-tailed)	.	<.001	<.001	<.001	<.001
		N	19584	19140	19336	15911	15578
	Esteem and Prestige Needs Satisfaction	Correlation Coefficient	.225**	1.000	.209**	.154**	.738**
		Sig. (2-tailed)	<.001	.	<.001	<.001	<.001
		N	19140	19175	18960	15704	15596
	Physiological Needs Satisfaction	Correlation Coefficient	.129**	.209**	1.000	.321**	.661**
		Sig. (2-tailed)	<.001	<.001	.	<.001	<.001
		N	19336	18960	19371	15807	15596
	Security Needs Satisfaction	Correlation Coefficient	.132**	.154**	.321**	1.000	.634**
		Sig. (2-tailed)	<.001	<.001	<.001	.	<.001
		N	15911	15704	15807	15930	15596
	Deficiency Needs Satisfaction	Correlation Coefficient	.241**	.738**	.661**	.634**	1.000
		Sig. (2-tailed)	<.001	<.001	<.001	<.001	.
		N	15578	15596	15596	15596	15596

**. Correlation is significant at the 0.01 level (2-tailed).

a. Highest educational level: Respondent's Father (recoded into 3 groups) = Middle

Table 37.

Correlations[a]

			Highest Educational Attainment	Esteem and Prestige Needs Satisfaction	Physiological Needs Satisfaction	Security Needs Satisfaction	Deficiency Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.228**	.117**	.092**	.222**
		Sig. (2-tailed)	.	<.001	<.001	<.001	<.001
		N	11689	11335	11519	9357	9115
	Esteem and Prestige Needs Satisfaction	Correlation Coefficient	.228**	1.000	.225**	.143**	.732**
		Sig. (2-tailed)	<.001	.	<.001	<.001	<.001
		N	11335	11369	11227	9195	9132
	Physiological Needs Satisfaction	Correlation Coefficient	.117**	.225**	1.000	.324**	.668**
		Sig. (2-tailed)	<.001	<.001	.	<.001	<.001
		N	11519	11227	11555	9302	9132
	Security Needs Satisfaction	Correlation Coefficient	.092**	.143**	.324**	1.000	.640**
		Sig. (2-tailed)	<.001	<.001	<.001	.	<.001
		N	9357	9195	9302	9374	9132
	Deficiency Needs Satisfaction	Correlation Coefficient	.222**	.732**	.668**	.640**	1.000
		Sig. (2-tailed)	<.001	<.001	<.001	<.001	.
		N	9115	9132	9132	9132	9132

**. Correlation is significant at the 0.01 level (2-tailed).

a. Highest educational level: Respondent's Father (recoded into 3 groups) = Higher

Table 38.

Correlation between an Individual's Educational Attainment and their Parents'.

The results of a nonparametric correlation **between one's Educational Attainment and the Educational Attainments of their parents** are presented in Table 39. As can be seen, the respondent's highest Educational Attainment has a statistically **significant, high, positive correlation** with their parents' Educational Attainments. Conducting a One-way ANOVA shows a significant difference in respondents' Educational Attainment with mothers with different Educational attainments F(2, 81811) = 11038, p<0.001, and fathers with different Educational attainments F(2, 80560) = 11821, p<0.001. The eta-squared values are 0.213 (95% Confidence Interval: 0.208 to 0.217) for mothers and 0.227 (95% Confidence Interval: 0.222 to 0.232) for fathers, which both are considered **large**.

Correlations	**Respondent's Highest Educational Attainment**		
	N	**Spearman's Rho**	**Sig.**
Mother's Highest Educational Attainment	81,814	0.466	<.001
Father's Highest Educational Attainment	80,563	0.481	<.001

Table 39.

ANOVA for Educational Attainment and Esteem and Prestige Needs Satisfaction

Tables 40 and 41 demonstrate the results of Oneway ANOVA for Esteem and Prestige Needs Satisfaction.

ANOVA

Esteem and Prestige Needs Satisfaction

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	586.885	8	73.361	1402.169	<.001
Within Groups	4619.802	88300	.052		
Total	5206.687	88308			

Table 40.

Esteem and Prestige Needs Satisfaction

Tukey HSD[a,b]

Highest Educational Attainment	N	Subset for alpha = 0.05								
		1	2	3	4	5	6	7	8	9
Early childhood education (ISCED 0) / no education	4567	.3001								
Primary education (ISCED 1)	10879		.3345							
Lower secondary education (ISCED 2)	12879			.3672						
Upper secondary education (ISCED 3)	22970				.4232					
Post-secondary non-tertiary education (ISCED 4)	8090					.4532				
Short-cycle tertiary education (ISCED 5)	7301						.4723			
Bachelor or equivalent (ISCED 6)	15134							.5312		
Master or equivalent (ISCED 7)	5498								.5941	
Doctoral or equivalent (ISCED 8)	991									.6355
Sig.		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 4616.136.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Table 41.

First Specification of the First Hypothesis

Tables 42 and 43 demonstrate the results of Oneway ANOVA for Physiological Needs Satisfaction.

ANOVA

Physiological Needs Satisfaction

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	158.633	8	19.829	696.626	<.001
Within Groups	2616.971	91938	.028		
Total	2775.604	91946			

Table 42.

Physiological Needs Satisfaction

Tukey HSD[a,b]

Highest Educational Attainment	N	Subset for alpha = 0.05							
		1	2	3	4	5	6	7	8
Early childhood education (ISCED 0) / no education	4610	.6724							
Primary education (ISCED 1)	10962		.7041						
Lower secondary education (ISCED 2)	13886			.7496					
Post-secondary non-tertiary education (ISCED 4)	8218				.7745				
Upper secondary education (ISCED 3)	23595				.7745				
Short-cycle tertiary education (ISCED 5)	7673					.7871			
Bachelor or equivalent (ISCED 6)	15948						.8147		
Master or equivalent (ISCED 7)	5972							.8287	
Doctoral or equivalent (ISCED 8)	1083								.8443
Sig.		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 4923.239.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Table 43.

Tables 44 and 45 demonstrate the results of Oneway ANOVA for Security Needs Satisfaction.

ANOVA

Security Needs Satisfaction

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	28.285	8	3.536	129.154	<.001
Within Groups	1919.537	70118	.027		
Total	1947.823	70126			

Table 44.

Security Needs Satisfaction

Tukey HSD[a,b]

Highest Educational Attainment	N	Subset for alpha = 0.05					
		1	2	3	4	5	6
Early childhood education (ISCED 0) / no education	3204	.6856					
Primary education (ISCED 1)	8557	.6949	.6949				
Lower secondary education (ISCED 2)	10003		.7043	.7043			
Short-cycle tertiary education (ISCED 5)	5532			.7077			
Upper secondary education (ISCED 3)	18398			.7080			
Post-secondary non-tertiary education (ISCED 4)	7026			.7096			
Bachelor or equivalent (ISCED 6)	12061				.7426		
Master or equivalent (ISCED 7)	4447					.7563	
Doctoral or equivalent (ISCED 8)	899						.7700
Sig.		.247	.237	.894	1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3868.436.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Table 45.

Second Specification of the First Hypothesis

Tables 46, 47, 48, and 49 demonstrate the results of the correlation between Physiological Needs Satisfaction and Educational Attainment grouped by GDP per Capita (PPP).

Correlations[a]

			Highest Educational Attainment	Physiological Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.189**
		Sig. (2-tailed)	.	<.001
		N	4824	4797
	Physiological Needs Satisfaction	Correlation Coefficient	.189**	1.000
		Sig. (2-tailed)	<.001	.
		N	4797	4818

**. Correlation is significant at the 0.01 level (2-tailed).

a. Countries grouped by GDP per Capita (PPP) = From 1,000 to 5,000 $ per year

Table 46.

Correlations[a]

			Highest Educational Attainment	Physiological Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.198**
		Sig. (2-tailed)	.	<.001
		N	31253	30803
	Physiological Needs Satisfaction	Correlation Coefficient	.198**	1.000
		Sig. (2-tailed)	<.001	.
		N	30803	30938

**. Correlation is significant at the 0.01 level (2-tailed).

a. Countries grouped by GDP per Capita (PPP) = From 5,000 to 15,000 $ per year

Table 47.

Correlations[a]

			Highest Educational Attainment	Physiological Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.181**
		Sig. (2-tailed)	.	<.001
		N	16363	16177
	Physiological Needs Satisfaction	Correlation Coefficient	.181**	1.000
		Sig. (2-tailed)	<.001	.
		N	16177	16312

**. Correlation is significant at the 0.01 level (2-tailed).

a. Countries grouped by GDP per Capita (PPP) = From 15,000 to 25,000 $ per year

Table 48.

Correlations[a]

			Highest Educational Attainment	Physiological Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.176**
		Sig. (2-tailed)	.	<.001
		N	40826	40170
	Physiological Needs Satisfaction	Correlation Coefficient	.176**	1.000
		Sig. (2-tailed)	<.001	.
		N	40170	40770

**. Correlation is significant at the 0.01 level (2-tailed).

a. Countries grouped by GDP per Capita (PPP) = 25,000 $ per year and higher

Table 49.

For Fisher's r to z procedure, the z score of each correlation coefficient, the SE of each pair of Zs, the Z score of the difference, and the significance tables are presented (Tables 50 - 53).

Z2	0.1912999213
Z3	0.2006500854
Z4	0.1830163662
Z5	0.1778517993

Table 50.

SE (Zi, Zj)	Z3	Z4	Z5
Z2	0.01552615884	0.01644450366	0.01528038399
Z3		0.009710569347	0.007573875588
Z4			0.009312555156

Table 51.

Z Diff	Z3	Z4	Z5
Z2	-0.6022200476	0.5037278892	0.8800905803
Z3		1.815930519	3.010121551
Z4			0.5545810802

Table 52.

Sig. two-tailed	Z3	Z4	Z5
Z2	0.5470276727	0.6144526073	0.3788102416
Z3		0.06938103109	0.002611431594
Z4			0.5791812331

Table 53.

Third Specification of the First Hypothesis

Tables 54, 55, 56, 57, and 58 demonstrate the results of the correlation between Security Needs Satisfaction and Educational Attainment grouped by GPI.

Correlations[a]

			Highest Educational Attainment	Security Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.133**
		Sig. (2-tailed)	.	<.001
		N	12510	8235
	Security Needs Satisfaction	Correlation Coefficient	.133**	1.000
		Sig. (2-tailed)	<.001	.
		N	8235	8325

**. Correlation is significant at the 0.01 level (2-tailed).

a. Countries grouped by GPI = Group 1 (1 to 1.499)

Table 54.

Correlations[a]

			Highest Educational Attainment	Security Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.118**
		Sig. (2-tailed)	.	<.001
		N	26971	20212
	Security Needs Satisfaction	Correlation Coefficient	.118**	1.000
		Sig. (2-tailed)	<.001	.
		N	20212	20310

**. Correlation is significant at the 0.01 level (2-tailed).

a. Countries grouped by GPI = Group 2 (1.5 to 1.999)

Table 55.

Correlations[a]

			Highest Educational Attainment	Security Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.033**
		Sig. (2-tailed)	.	<.001
		N	21678	16042
	Security Needs Satisfaction	Correlation Coefficient	.033**	1.000
		Sig. (2-tailed)	<.001	.
		N	16042	16172

**. Correlation is significant at the 0.01 level (2-tailed).

a. Countries grouped by GPI = Group 3 (2 to 2.299)

Table 56.

Correlations[a]

			Highest Educational Attainment	Security Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.003
		Sig. (2-tailed)	.	.755
		N	16793	13726
	Security Needs Satisfaction	Correlation Coefficient	.003	1.000
		Sig. (2-tailed)	.755	.
		N	13726	13780

a. Countries grouped by GPI = Group 4 (2.3 to 2.899)

Table 57.

Correlations[a]

			Highest Educational Attainment	Security Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.044**
		Sig. (2-tailed)	.	<.001
		N	8651	6866
	Security Needs Satisfaction	Correlation Coefficient	.044**	1.000
		Sig. (2-tailed)	<.001	.
		N	6866	6879

**. Correlation is significant at the 0.01 level (2-tailed).

a. Countries grouped by GPI = Group 5 (2.9 and Higher)

Table 58.

For Fisher's r to z procedure, the z score of each correlation coefficient, the SE of each pair of Zs, the Z score of the differences, and the significance tables are presented (Tables 59 to 62).

Z1	0.1337926421
Z2	0.1185522989
Z3	0.03301198683
Z4	0.003000009
Z5	0.0440284277

Table 59.

SE (Zi, Zj)	Z2	Z3	Z4	Z5
Z1	0.01307516982	0.01355821482	0.01394085815	0.01634582626
Z2		0.01057501444	0.01106134112	0.01397110509

Z3			0.01162834426	0.01442417763
Z4				0.0147844255

Table 60.

Z Diff	Z2	Z3	Z4	Z5
Z1	1.165594289	7.433180302	9.381964276	5.49156788
Z2		8.088907351	10.44649909	5.334142911
Z3			2.580933033	-0.7637482804
Z4				-2.775110788

Table 61.

Sig. two-tailed	Z2	Z3	Z4	Z5
Z1	0.2437785181	0	0	0.0000000398381
Z2		0	0	0.0000000959968
Z3			0.009853369334	0.4450172632
Z4				0.005518290612

Table 62.

Second Hypothesis:

The dependent variable of the second hypothesis is Cognitive Needs Satisfaction. Table 63 demonstrates descriptive statistics of **Cognitive Needs Satisfaction** and Figure 26 displays its frequency histogram.

Statistics

RTNLTY_STD

N	Valid	71604
	Missing	22674
Mean		.7105
Median		.7309
Mode		.96
Std. Deviation		.17306
Variance		.030
Range		.94
Minimum		.06
Maximum		1.00

Table 63.

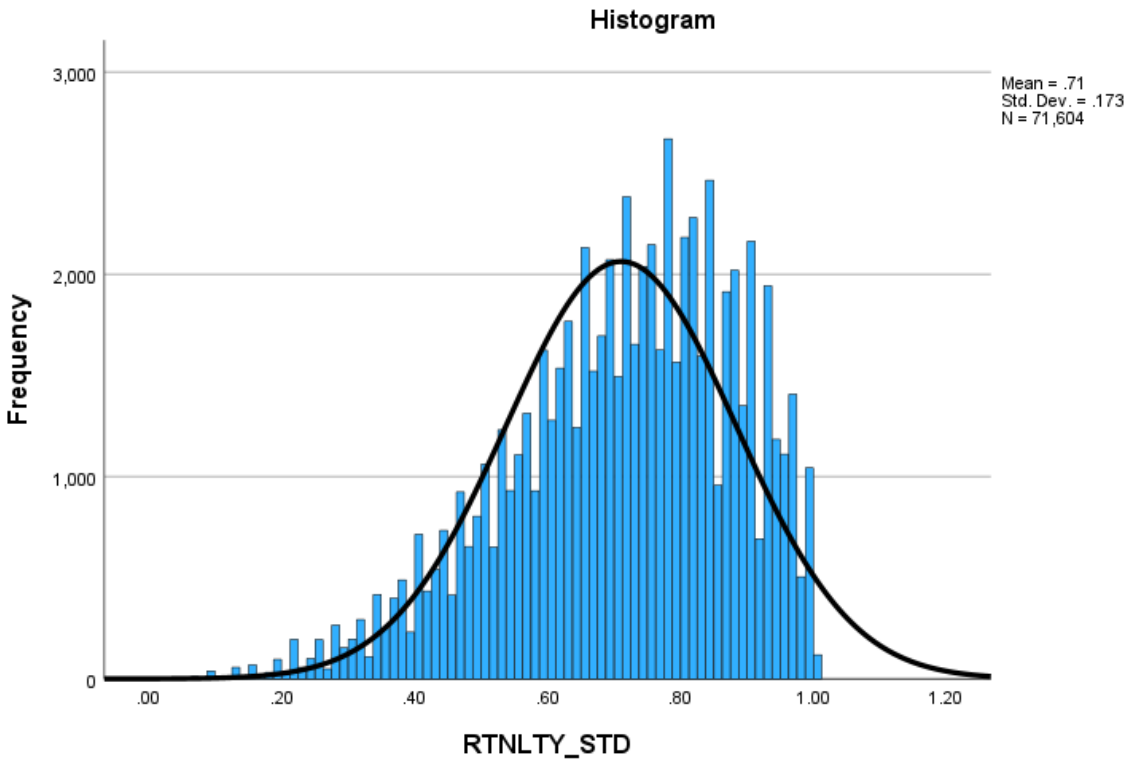

Figure 26.

Table 64 presents the results of Spearman's rho correlation analysis between Educational Attainment and Cognitive Needs Satisfaction.

Correlations

			Highest Educational Attainment	Rationality / Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.262**
		Sig. (2-tailed)	.	<.001
		N	93266	71079
	Rationality / Cognitive Needs Satisfaction	Correlation Coefficient	.262**	1.000
		Sig. (2-tailed)	<.001	.
		N	71079	71604

**. Correlation is significant at the 0.01 level (2-tailed).

Table 64.

Figure 27 displays the frequency of Cognitive Needs Satisfaction stacked by the Highest Educational Attainment of the respondents. In this case, the pick of the normal curve for higher educational attainments is moving to the right.

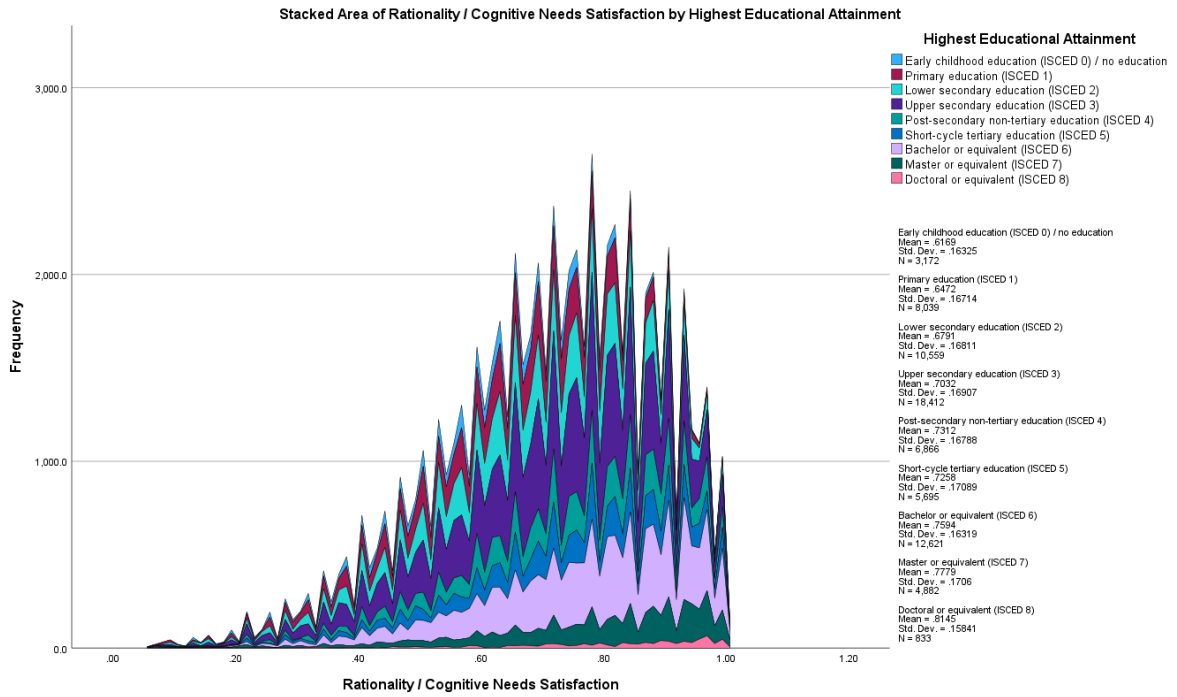

Figure 27

The potential importance of the immediate socio-economic background

The following 6 tables (Tables 65 to 70) demonstrate the correlation between Educational Attainment and Cognitive Needs Satisfaction controlling parents' education.

Correlations[a]

			Highest Educational Attainment	Rationality / Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.206**
		Sig. (2-tailed)	.	<.001
		N	52626	39917
	Rationality / Cognitive Needs Satisfaction	Correlation Coefficient	.206**	1.000
		Sig. (2-tailed)	<.001	.
		N	39917	39970

**. Correlation is significant at the 0.01 level (2-tailed).

a. Highest educational level: Respondent's Mother (recoded into 3 groups) = Lower

Table 65.

Correlations[a]

			Highest Educational Attainment	Rationality / Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.206**
		Sig. (2-tailed)	.	<.001
		N	52626	39917
	Rationality / Cognitive Needs Satisfaction	Correlation Coefficient	.206**	1.000
		Sig. (2-tailed)	<.001	.
		N	39917	39970

**. Correlation is significant at the 0.01 level (2-tailed).

a. Highest educational level: Respondent's Mother (recoded into 3 groups) = Lower

Table 66.

Correlations[a]

			Highest Educational Attainment	Rationality / Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.160**
		Sig. (2-tailed)	.	<.001
		N	10014	7717
	Rationality / Cognitive Needs Satisfaction	Correlation Coefficient	.160**	1.000
		Sig. (2-tailed)	<.001	.
		N	7717	7746

**. Correlation is significant at the 0.01 level (2-tailed).

a. Highest educational level: Respondent's Mother (recoded into 3 groups) = Higher

Table 67.

Correlations[a]

			Highest Educational Attainment	Rationality / Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.206**
		Sig. (2-tailed)	.	<.001
		N	49290	37301
	Rationality / Cognitive Needs Satisfaction	Correlation Coefficient	.206**	1.000
		Sig. (2-tailed)	<.001	.
		N	37301	37344

**. Correlation is significant at the 0.01 level (2-tailed).

a. Highest educational level: Respondent's Father (recoded into 3 groups) = Lower

Table 68.

Correlations[a]

			Highest Educational Attainment	Rationality / Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.192**
		Sig. (2-tailed)	.	<.001
		N	19584	15748
	Rationality / Cognitive Needs Satisfaction	Correlation Coefficient	.192**	1.000
		Sig. (2-tailed)	<.001	.
		N	15748	15777

**. Correlation is significant at the 0.01 level (2-tailed).

a. Highest educational level: Respondent's Father (recoded into 3 groups) = Middle

Table 69.

Correlations[a]

			Highest Educational Attainment	Rationality / Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.176**
		Sig. (2-tailed)	.	<.001
		N	11689	9248
	Rationality / Cognitive Needs Satisfaction	Correlation Coefficient	.176**	1.000
		Sig. (2-tailed)	<.001	.
		N	9248	9275

**. Correlation is significant at the 0.01 level (2-tailed).

a. Highest educational level: Respondent's Father (recoded into 3 groups) = Higher

Table 70.

The following 10 tables (Tables 71 to 80) demonstrate the correlation between Educational Attainment and Cognitive Needs Satisfaction controlling religious denominations.

Correlations[a]

			Highest Educational Attainment	Rationality / Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.294**
		Sig. (2-tailed)	.	<.001
		N	23184	18969
	Rationality / Cognitive Needs Satisfaction	Correlation Coefficient	.294**	1.000
		Sig. (2-tailed)	<.001	.
		N	18969	19137

**. Correlation is significant at the 0.01 level (2-tailed).

a. Religious denominations - major groups = Do not belong to a denomination

Table 71.

Correlations[a]

			Highest Educational Attainment	Rationality / Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.236**
		Sig. (2-tailed)	.	<.001
		N	17861	13600
	Rationality / Cognitive Needs Satisfaction	Correlation Coefficient	.236**	1.000
		Sig. (2-tailed)	<.001	.
		N	13600	13675

**. Correlation is significant at the 0.01 level (2-tailed).

a. Religious denominations - major groups = Catholic (Roman/Greek/etc)

Table 72

Correlations[a]

			Highest Educational Attainment	Rationality / Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.279**
		Sig. (2-tailed)	.	<.001
		N	7796	6467
	Rationality / Cognitive Needs Satisfaction	Correlation Coefficient	.279**	1.000
		Sig. (2-tailed)	<.001	.
		N	6467	6523

**. Correlation is significant at the 0.01 level (2-tailed).

a. Religious denominations - major groups = Protestant

Table 73.

Correlations[a]

			Highest Educational Attainment	Rationality / Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.108**
		Sig. (2-tailed)	.	<.001
		N	7708	5536
	Rationality / Cognitive Needs Satisfaction	Correlation Coefficient	.108**	1.000
		Sig. (2-tailed)	<.001	.
		N	5536	5587

**. Correlation is significant at the 0.01 level (2-tailed).

a. Religious denominations - major groups = Orthodox (Russian/Greek/etc.)

Table 74.

Correlations[a]

			Highest Educational Attainment	Rationality / Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.430**
		Sig. (2-tailed)	.	<.001
		N	246	233
	Rationality / Cognitive Needs Satisfaction	Correlation Coefficient	.430**	1.000
		Sig. (2-tailed)	<.001	.
		N	233	239

**. Correlation is significant at the 0.01 level (2-tailed).

a. Religious denominations - major groups = Jew

Table 75.

Correlations[a]

			Highest Educational Attainment	Rationality / Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.017*
		Sig. (2-tailed)	.	.023
		N	24957	17039
	Rationality / Cognitive Needs Satisfaction	Correlation Coefficient	.017*	1.000
		Sig. (2-tailed)	.023	.
		N	17039	17094

*. Correlation is significant at the 0.05 level (2-tailed).

a. Religious denominations - major groups = Muslim

Table 76.

Correlations[a]

			Highest Educational Attainment	Rationality / Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.329**
		Sig. (2-tailed)	.	<.001
		N	605	514
	Rationality / Cognitive Needs Satisfaction	Correlation Coefficient	.329**	1.000
		Sig. (2-tailed)	<.001	.
		N	514	516

**. Correlation is significant at the 0.01 level (2-tailed).

a. Religious denominations - major groups = Hindu

Table 77.

Correlations[a]

			Highest Educational Attainment	Rationality / Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.298**
		Sig. (2-tailed)	.	<.001
		N	5533	4764
	Rationality / Cognitive Needs Satisfaction	Correlation Coefficient	.298**	1.000
		Sig. (2-tailed)	<.001	.
		N	4764	4784

**. Correlation is significant at the 0.01 level (2-tailed).

a. Religious denominations - major groups = Buddhist

Table 78.

Correlations[a]

			Highest Educational Attainment	Rationality / Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.293**
		Sig. (2-tailed)	.	<.001
		N	2477	1833
	Rationality / Cognitive Needs Satisfaction	Correlation Coefficient	.293**	1.000
		Sig. (2-tailed)	<.001	.
		N	1833	1870

**. Correlation is significant at the 0.01 level (2-tailed).

a. Religious denominations - major groups = Other Christian (Jehova withness...)

Table 79.

Correlations[a]

			Highest Educational Attainment	Rationality / Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.254**
		Sig. (2-tailed)	.	<.001
		N	1803	1508
	Rationality / Cognitive Needs Satisfaction	Correlation Coefficient	.254**	1.000
		Sig. (2-tailed)	<.001	.
		N	1508	1511

**. Correlation is significant at the 0.01 level (2-tailed).

a. Religious denominations - major groups = Other

Table 80.

The following 3 tables (Tables 81 to 83) demonstrate the correlation between Educational Attainment and Cognitive Needs Satisfaction controlling political affiliation.

Correlations[a]

			Highest Educational Attainment	Rationality / Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.394**
		Sig. (2-tailed)	.	<.001
		N	12099	9677
	Rationality / Cognitive Needs Satisfaction	Correlation Coefficient	.394**	1.000
		Sig. (2-tailed)	<.001	.
		N	9677	9735

**. Correlation is significant at the 0.01 level (2-tailed).

a. LEFT_RIGHT = LEFT

Table 81.

Correlations[a]

			Highest Educational Attainment	Rationality / Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.235**
		Sig. (2-tailed)	.	<.001
		N	39749	31263
	Rationality / Cognitive Needs Satisfaction	Correlation Coefficient	.235**	1.000
		Sig. (2-tailed)	<.001	.
		N	31263	31548

**. Correlation is significant at the 0.01 level (2-tailed).

a. LEFT_RIGHT = MIDDLE

Table 82.

Correlations[a]

			Highest Educational Attainment	Rationality / Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	1.000	.215**
		Sig. (2-tailed)	.	<.001
		N	15767	12328
	Rationality / Cognitive Needs Satisfaction	Correlation Coefficient	.215**	1.000
		Sig. (2-tailed)	<.001	.
		N	12328	12406

**. Correlation is significant at the 0.01 level (2-tailed).

a. LEFT_RIGHT = RIGHT

Table 83.

First Specification of the Second Hypothesis

Tables 84 to 86 demonstrate the results of Oneway ANOVA for Cognitive Needs Satisfaction. Figure 28 demonstrates the Means Plot of Cognitive Needs Satisfaction for each ISCED group.

ANOVA

Rationality / Cognitive Needs Satisfaction

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	137.050	8	17.131	611.067	<.001
Within Groups	1992.448	71070	.028		
Total	2129.498	71078			

Table 84.

ANOVA Effect Sizes[a]

		Point Estimate	95% Confidence Interval Lower	Upper
Rationality / Cognitive Needs Satisfaction	Eta-squared	.064	.061	.068
	Epsilon-squared	.064	.061	.068
	Omega-squared Fixed-effect	.064	.061	.068
	Omega-squared Random-effect	.009	.008	.009

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

Table 85.

Rationality / Cognitive Needs Satisfaction

Tukey HSD[a,b]

Highest Educational Attainment	N	Subset for alpha = 0.05 1	2	3	4	5	6	7	8
Early childhood education (ISCED 0) / no education	3172	.6169							
Primary education (ISCED 1)	8039		.6472						
Lower secondary education (ISCED 2)	10559			.6791					
Upper secondary education (ISCED 3)	18412				.7032				
Short-cycle tertiary education (ISCED 5)	5695					.7258			
Post-secondary non-tertiary education (ISCED 4)	6866					.7312			
Bachelor or equivalent (ISCED 6)	12621						.7594		
Master or equivalent (ISCED 7)	4882							.7779	
Doctoral or equivalent (ISCED 8)	833								.8145
Sig.		1.000	1.000	1.000	1.000	.907	1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3758.683.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Table 86.

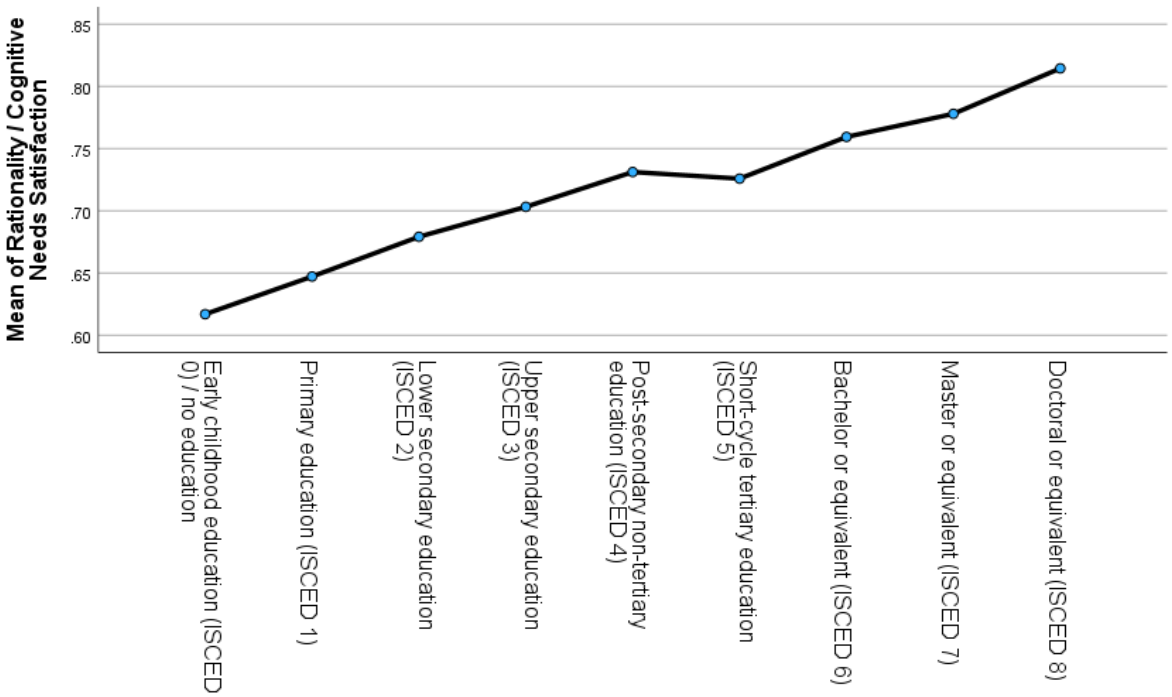

Figure 28

Third Main Hypothesis

The dependent variable of the second hypothesis is **Happiness**. Table 87 demonstrates descriptive statistics of Happiness and Figure 29 displays its frequency histogram.

Statistics

Satisfaction with Life

N	Valid	93868
	Missing	410
Mean		7.06
Median		7.00
Mode		8
Std. Deviation		2.231
Variance		4.979
Range		9
Minimum		1
Maximum		10

Table 87.

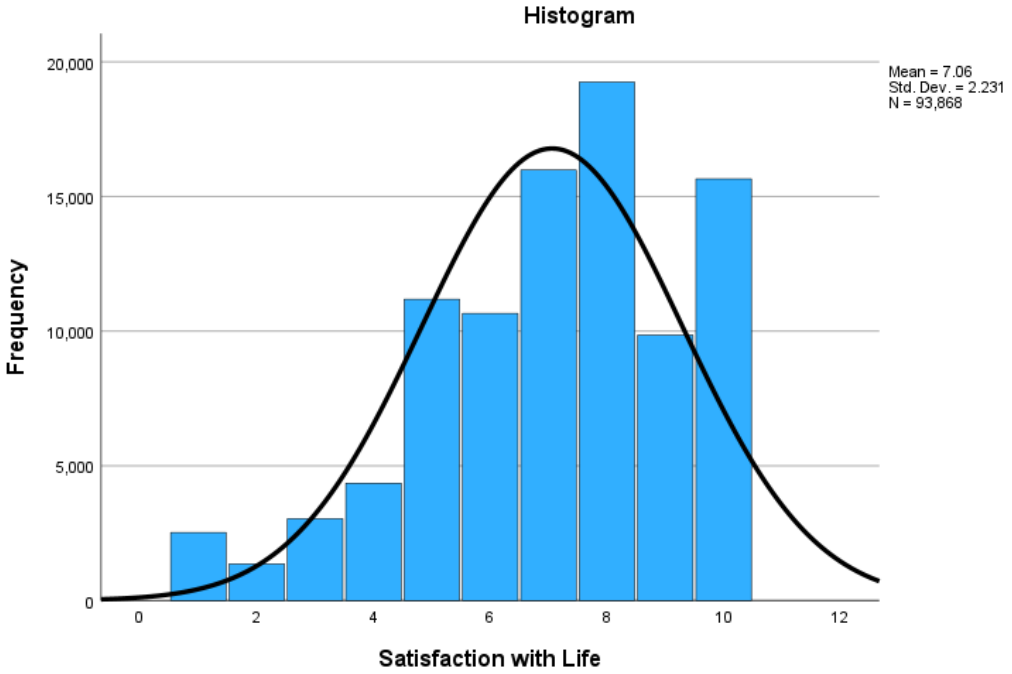

Figure 29.

Table 88 presents the results of Spearman's rho correlation analysis between Happiness, Educational Attainment, Deficiency Needs, and Cognitive Needs Satisfaction.

Correlations

			Satisfaction with Life	Highest Educational Attainment	Deficiency Needs Satisfaction	Rationality
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	.037**			
		Sig. (2-tailed)	<.001			
		N	92940			
	Deficiency Needs Satisfaction	Correlation Coefficient	.220**	.341**		
		Sig. (2-tailed)	<.001	<.001		
		N	68748	68515		
	Rationality	Correlation Coefficient	-.069**	.262**	.236**	
		Sig. (2-tailed)	<.001	<.001	<.001	
		N	71493	71079	56858	
	Individual's Rationality Minus Average Rationality of The Country	Correlation Coefficient	-.061**	.106**	.105**	.782**
		Sig. (2-tailed)	<.001	<.001	<.001	<.001
		N	71493	71079	56858	71604

**. Correlation is significant at the 0.01 level (2-tailed).

Table 88.

First Specification of the Third Hypothesis

Nest 10 Tables (89 to 98) present the results of Spearman's rho correlation analysis between Happiness, Educational Attainment, Deficiency Needs, and Cognitive Needs Satisfaction, controlling cultural contexts.

Correlations[a]

			Satisfaction with Life	Highest Educational Attainment	Deficiency Needs Satisfaction	Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	.232**			
		Sig. (2-tailed)	<.001			
		N	2399			
	Deficiency Needs Satisfaction	Correlation Coefficient	.433**	.448**		
		Sig. (2-tailed)	<.001	<.001		
		N	2029	2028		
	Cognitive Needs Satisfaction	Correlation Coefficient	.147**	.158**	.303**	
		Sig. (2-tailed)	<.001	<.001	<.001	
		N	2022	2021	1807	
	Individual's Rationality Minus Average Rationality of The Country	Correlation Coefficient	.128**	.174**	.277**	.971**
		Sig. (2-tailed)	<.001	<.001	<.001	<.001
		N	2022	2021	1807	2022

**. Correlation is significant at the 0.01 level (2-tailed).

a. Inglehart-Welzel / Region and Religion = Central Europe Catholic

Table 89.

Correlations[a]

			Satisfaction with Life	Highest Educational Attainment	Deficiency Needs Satisfaction	Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	-.007			
		Sig. (2-tailed)	.634			
		N	4539			
	Deficiency Needs Satisfaction	Correlation Coefficient	.303**	.288**		
		Sig. (2-tailed)	<.001	<.001		
		N	4413	4412		
	Cognitive Needs Satisfaction	Correlation Coefficient	-.093**	.071**	.075**	
		Sig. (2-tailed)	<.001	<.001	<.001	
		N	4370	4368	4289	
	Individual's Rationality Minus Average Rationality of The Country	Correlation Coefficient	-.072**	.081**	.079**	.982**
		Sig. (2-tailed)	<.001	<.001	<.001	<.001
		N	4370	4368	4289	4371

**. Correlation is significant at the 0.01 level (2-tailed).

a. Inglehart-Welzel / Region and Religion = East Asia Confucian

Table 90.

Correlations[a]

			Satisfaction with Life	Highest Educational Attainment	Deficiency Needs Satisfaction	Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	.140**			
		Sig. (2-tailed)	<.001			
		N	5253			
	Deficiency Needs Satisfaction	Correlation Coefficient	.350**	.251**		
		Sig. (2-tailed)	<.001	<.001		
		N	3656	3649		
	Cognitive Needs Satisfaction	Correlation Coefficient	.041*	.020	.097**	
		Sig. (2-tailed)	.013	.228	<.001	
		N	3604	3594	2845	
	Individual's Rationality Minus Average Rationality of The Country	Correlation Coefficient	.047**	.105**	.060**	.972**
		Sig. (2-tailed)	.005	<.001	.001	<.001
		N	3604	3594	2845	3614

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

a. Inglehart-Welzel / Region and Religion = East Europe Orthodox

Table 91.

Correlations[a]

			Satisfaction with Life	Highest Educational Attainment	Deficiency Needs Satisfaction	Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	-.003			
		Sig. (2-tailed)	.801			
		N	8859			
	Deficiency Needs Satisfaction	Correlation Coefficient	.170**	.255**		
		Sig. (2-tailed)	<.001	<.001		
		N	8015	7942		
	Cognitive Needs Satisfaction	Correlation Coefficient	-.142**	.133**	.057**	
		Sig. (2-tailed)	<.001	<.001	<.001	
		N	8287	8211	7617	
	Individual's Rationality Minus Average Rationality of The Country	Correlation Coefficient	-.129**	.117**	.037**	.994**
		Sig. (2-tailed)	<.001	<.001	.001	<.001
		N	8287	8211	7617	8289

**. Correlation is significant at the 0.01 level (2-tailed).

a. Inglehart-Welzel / Region and Religion = Latin America Catholic

Table 92.

Correlations[a]

			Satisfaction with Life	Highest Educational Attainment	Deficiency Needs Satisfaction	Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	.164**			
		Sig. (2-tailed)	<.001			
		N	3890			
	Deficiency Needs Satisfaction	Correlation Coefficient	.539**	.313**		
		Sig. (2-tailed)	<.001	<.001		
		N	3563	3559		
	Cognitive Needs Satisfaction	Correlation Coefficient	-.058**	.114**	.032	
		Sig. (2-tailed)	<.001	<.001	.076	
		N	3340	3334	3113	
	Individual's Rationality Minus Average Rationality of The Country	Correlation Coefficient	-.076**	.118**	.005	.988**
		Sig. (2-tailed)	<.001	<.001	.781	<.001
		N	3340	3334	3113	3341

**. Correlation is significant at the 0.01 level (2-tailed).

a. Inglehart-Welzel / Region and Religion = Middle East Shia

Table 93.

Correlations[a]

			Satisfaction with Life	Highest Educational Attainment	Deficiency Needs Satisfaction	Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	.095**			
		Sig. (2-tailed)	<.001			
		N	6552			
	Deficiency Needs Satisfaction	Correlation Coefficient	.386**	.320**		
		Sig. (2-tailed)	<.001	<.001		
		N	6448	6418		
	Cognitive Needs Satisfaction	Correlation Coefficient	.050**	.214**	.332**	
		Sig. (2-tailed)	<.001	<.001	<.001	
		N	5993	5970	5880	
	Individual's Rationality Minus Average Rationality of The Country	Correlation Coefficient	.056**	.221**	.313**	.986**
		Sig. (2-tailed)	<.001	<.001	<.001	<.001
		N	5993	5970	5880	5997

**. Correlation is significant at the 0.01 level (2-tailed).

a. Inglehart-Welzel / Region and Religion = North America Protestant

Table 94.

Correlations[a]

			Satisfaction with Life	Highest Educational Attainment	Deficiency Needs Satisfaction	Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	.027			
		Sig. (2-tailed)	.163			
		N	2726			
	Deficiency Needs Satisfaction	Correlation Coefficient	.370**	.346**		
		Sig. (2-tailed)	<.001	<.001		
		N	2098	2059		
	Cognitive Needs Satisfaction	Correlation Coefficient	.061**	.193**	.298**	
		Sig. (2-tailed)	.003	<.001	<.001	
		N	2437	2391	1918	
	Individual's Rationality Minus Average Rationality of The Country	Correlation Coefficient	.063**	.193**	.293**	.996**
		Sig. (2-tailed)	.002	<.001	<.001	<.001
		N	2437	2391	1918	2465

**. Correlation is significant at the 0.01 level (2-tailed).

a. Inglehart-Welzel / Region and Religion = Oceania Protestant

Table 95.

Correlations[a]

			Satisfaction with Life	Highest Educational Attainment	Deficiency Needs Satisfaction	Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	.030*			
		Sig. (2-tailed)	.018			
		N	6375			
	Deficiency Needs Satisfaction	Correlation Coefficient	.161**	.272**		
		Sig. (2-tailed)	<.001	<.001		
		N	5316	5323		
	Cognitive Needs Satisfaction	Correlation Coefficient	-.122**	.076**	.075**	
		Sig. (2-tailed)	<.001	<.001	<.001	
		N	5621	5628	4849	
	Individual's Rationality Minus Average Rationality of The Country	Correlation Coefficient	-.124**	.072**	.058**	.974**
		Sig. (2-tailed)	<.001	<.001	<.001	<.001
		N	5621	5628	4849	5630

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

a. Inglehart-Welzel / Region and Religion = South and Southeast Asia Sunni

Table 96.

Correlations[a]

			Satisfaction with Life	Highest Educational Attainment	Deficiency Needs Satisfaction	Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	.129**			
		Sig. (2-tailed)	<.001			
		N	2672			
	Deficiency Needs Satisfaction	Correlation Coefficient	.256**	.157**		
		Sig. (2-tailed)	<.001	<.001		
		N	2526	2511		
	Cognitive Needs Satisfaction	Correlation Coefficient	-.317**	-.153**	.016	
		Sig. (2-tailed)	<.001	<.001	.460	
		N	2339	2330	2210	
	Individual's Rationality Minus Average Rationality of The Country	Correlation Coefficient	-.178**	.014	.023	.899**
		Sig. (2-tailed)	<.001	.502	.288	<.001
		N	2339	2330	2210	2343

**. Correlation is significant at the 0.01 level (2-tailed).

a. Inglehart-Welzel / Region and Religion = Southeast Asia Buddhist

Table 97.

Correlations[a]

			Satisfaction with Life	Highest Educational Attainment	Deficiency Needs Satisfaction	Cognitive Needs Satisfaction
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	.056**			
		Sig. (2-tailed)	<.001			
		N	3460			
	Deficiency Needs Satisfaction	Correlation Coefficient	.323**	.436**		
		Sig. (2-tailed)	<.001	<.001		
		N	2475	2466		
	Cognitive Needs Satisfaction	Correlation Coefficient	.092**	.277**	.294**	
		Sig. (2-tailed)	<.001	<.001	<.001	
		N	2793	2766	2147	
	Individual's Rationality Minus Average Rationality of The Country	Correlation Coefficient	.165**	-.045*	.030	.496**
		Sig. (2-tailed)	<.001	.018	.167	<.001
		N	2793	2766	2147	2795

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

a. Inglehart-Welzel / Region and Religion = West Europe Protestant

Table 98.

For Fisher's r to z procedure, the z score of each correlation coefficient, the SE of each pair of Zs, the Z score of the differences, and the significance tables are presented. Since the correlation between Educational Attainment and Happiness is not statistically significant in 3 groups, the calculations are done for the rest (7 groups). The green cells are p-values (Sig.), and the blue cells are SE of each pair of Zs. (Table 99)

				Z1	Z2	Z3	Z4	Z5	Z6	Z7
	N			2399	3890	5253	2672	6552	3460	6375
		ρ		0.232	0.164	0.140	0.129	0.095	0.056	0.030
			Z	0.2363022055	0.1654945076	0.1409255761	0.1297227936	0.09528734928	0.05605864906	0.03000900486
Z1	2399	0.232	0.2363022055		0.02595977193	0.02464158597	0.02812635503	0.02386347633	0.02656798244	0.02395210002
Z2	3890	0.164	0.1654945076	0.006380		0.02115270238	0.02512610009	0.02024091306	0.02336849909	0.02034532265
Z3	5253	0.140	0.1409255761	0.000109	0.245437		0.02376171093	0.01852005836	0.02189485671	0.01863411265
Z4	2672	0.129	0.1297227936	0.000151	0.154537	0.637310		0.0229537938	0.02575400625	0.02304591595
Z5	6552	0.095	0.09528734928	0.000000	0.000523	0.013730	0.133561		0.0210152919	0.01759226812
Z6	3460	0.056	0.05605864906	0.000000	0.000003	0.000106	0.004232	0.061947		0.02111587285
Z7	6375	0.030	0.03000900486	0.000000	0.000000	0.000000	0.000015	0.000207	0.217333	

Table 99.

Second Specification of the Third Hypothesis

Nest 4 Tables (100 to 103) present the results of Spearman's rho correlation analysis between Happiness, Educational Attainment, Deficiency Needs, and Cognitive Needs Satisfaction, controlling GDP per Capita (PPP).

Correlations[a]

			Satisfaction with Life	Highest Educational Attainment	Deficiency Needs Satisfaction	Rationality
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	.108**			
		Sig. (2-tailed)	<.001			
		N	4823			
	Deficiency Needs Satisfaction	Correlation Coefficient	.350**	.342**		
		Sig. (2-tailed)	<.001	<.001		
		N	4673	4656		
	Rationality	Correlation Coefficient	-.295**	-.008	-.200**	
		Sig. (2-tailed)	<.001	.581	<.001	
		N	4658	4641	4535	
	Individual's Rationality Minus Average Rationality of The Country	Correlation Coefficient	-.163**	.099**	-.005	.911**
		Sig. (2-tailed)	<.001	<.001	.737	<.001
		N	4658	4641	4535	4659

**. Correlation is significant at the 0.01 level (2-tailed).

a. Countries grouped by GDP per Capita (PPP) = From 1,000 to 5,000 $ per year

Table 100.

Correlations[a]

			Satisfaction with Life	Highest Educational Attainment	Deficiency Needs Satisfaction	Rationality
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	.024**			
		Sig. (2-tailed)	<.001			
		N	31178			
	Deficiency Needs Satisfaction	Correlation Coefficient	.219**	.256**		
		Sig. (2-tailed)	<.001	<.001		
		N	25537	25481		
	Rationality	Correlation Coefficient	-.128**	.129**	.035**	
		Sig. (2-tailed)	<.001	<.001	<.001	
		N	24860	24804	22120	
	Individual's Rationality Minus Average Rationality of The Country	Correlation Coefficient	-.099**	.070**	.033**	.937**
		Sig. (2-tailed)	<.001	<.001	<.001	<.001
		N	24860	24804	22120	24883

**. Correlation is significant at the 0.01 level (2-tailed).

a. Countries grouped by GDP per Capita (PPP) = From 5,000 to 15,000 $ per year

Table 101.

Correlations[a]

			Satisfaction with Life	Highest Educational Attainment	Deficiency Needs Satisfaction	Rationality
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	-.028**			
		Sig. (2-tailed)	<.001			
		N	16290			
	Deficiency Needs Satisfaction	Correlation Coefficient	.125**	.265**		
		Sig. (2-tailed)	<.001	<.001		
		N	11573	11536		
	Rationality	Correlation Coefficient	-.093**	.092**	.026**	
		Sig. (2-tailed)	<.001	<.001	.010	
		N	13584	13521	9735	
	Individual's Rationality Minus Average Rationality of The Country	Correlation Coefficient	-.089**	.097**	.032**	.935**
		Sig. (2-tailed)	<.001	<.001	.002	<.001
		N	13584	13521	9735	13613

**. Correlation is significant at the 0.01 level (2-tailed).

a. Countries grouped by GDP per Capita (PPP) = From 15,000 to 25,000 $ per year

Table 102.

Correlations[a]

			Satisfaction with Life	Highest Educational Attainment	Deficiency Needs Satisfaction	Rationality
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	.082**			
		Sig. (2-tailed)	<.001			
		N	40649			
	Deficiency Needs Satisfaction	Correlation Coefficient	.308**	.325**		
		Sig. (2-tailed)	<.001	<.001		
		N	26965	26842		
	Rationality	Correlation Coefficient	.051**	.215**	.305**	
		Sig. (2-tailed)	<.001	<.001	<.001	
		N	28391	28113	20468	
	Individual's Rationality Minus Average Rationality of The Country	Correlation Coefficient	.033**	.142**	.233**	.837**
		Sig. (2-tailed)	<.001	<.001	<.001	<.001
		N	28391	28113	20468	28449

**. Correlation is significant at the 0.01 level (2-tailed).

a. Countries grouped by GDP per Capita (PPP) = 25,000 $ per year and higher

Table 103.

For Fisher's r to z procedure, the z score of each correlation coefficient, the SE of each pair of Zs, the Z score of the differences, and the significance tables are presented (Tables 104 to 107).

Z2	-0.3040340857
Z3	-0.1287060041
Z4	-0.09326951903
Z5	0.05104428613

Table 104.

SE (Zi, Zj)	Z3	Z4	Z5
Z2	0.015965891	0.01697941203	0.01580844216
Z3		0.01066964293	0.008686063038
Z4			0.01043256673

Table 105.

Z Diff	Z3	Z4	Z5
Z2	-10.98141542	-12.41294848	-22.46131328
Z3		-3.321243763	-20.69410381
Z4			-13.83301051

Table 106.

Sig. two-tailed	Z3	Z4	Z5
Z2	0	0	0
Z3		0.0008961722931	0
Z4			0

Table 107.

Third Specification of the Third Hypothesis

Nexst 5 Tables (108 to 112) present the results of Spearman's rho correlation analysis between Happiness, Educational Attainment, Deficiency Needs, and Cognitive Needs Satisfaction, controlling GPI.

Correlations[a]

			Satisfaction with Life	Highest Educational Attainment	Deficiency Needs Satisfaction	Rationality
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	.118**			
		Sig. (2-tailed)	<.001			
		N	12442			
	Deficiency Needs Satisfaction	Correlation Coefficient	.404**	.338**		
		Sig. (2-tailed)	<.001	<.001		
		N	8145	8084		
	Rationality	Correlation Coefficient	.077**	.189**	.324**	
		Sig. (2-tailed)	<.001	<.001	<.001	
		N	10392	10331	7298	
	Individual's Rationality Minus Average Rationality of The Country	Correlation Coefficient	.054**	.146**	.299**	.956**
		Sig. (2-tailed)	<.001	<.001	<.001	<.001
		N	10392	10331	7298	10426

**. Correlation is significant at the 0.01 level (2-tailed).

a. Countries grouped by GPI = Group 1 (1 to 1.499)

Table 108.

Correlations[a]

			Satisfaction with Life	Highest Educational Attainment	Deficiency Needs Satisfaction	Rationality
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	-.017**			
		Sig. (2-tailed)	.004			
		N	26874			
	Deficiency Needs Satisfaction	Correlation Coefficient	.161**	.353**		
		Sig. (2-tailed)	<.001	<.001		
		N	19598	19553		
	Rationality	Correlation Coefficient	-.071**	.263**	.291**	
		Sig. (2-tailed)	<.001	<.001	<.001	
		N	22614	22400	17421	
	Individual's Rationality Minus Average Rationality of The Country	Correlation Coefficient	-.024**	.127**	.162**	.774**
		Sig. (2-tailed)	<.001	<.001	<.001	<.001
		N	22614	22400	17421	22635

**. Correlation is significant at the 0.01 level (2-tailed).

a. Countries grouped by GPI = Group 2 (1.5 to 1.999)

Table 109.

Correlations[a]

			Satisfaction with Life	Highest Educational Attainment	Deficiency Needs Satisfaction	Rationality
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	.052**			
		Sig. (2-tailed)	<.001			
		N	21624			
	Deficiency Needs Satisfaction	Correlation Coefficient	.280**	.273**		
		Sig. (2-tailed)	<.001	<.001		
		N	15842	15738		
	Rationality	Correlation Coefficient	-.118**	.118**	.013	
		Sig. (2-tailed)	<.001	<.001	.119	
		N	18861	18755	14131	
	Individual's Rationality Minus Average Rationality of The Country	Correlation Coefficient	-.108**	.091**	.064**	.888**
		Sig. (2-tailed)	<.001	<.001	<.001	<.001
		N	18861	18755	14131	18888

**. Correlation is significant at the 0.01 level (2-tailed).

a. Countries grouped by GPI = Group 3 (2 to 2.299)

Table 110.

Correlations[a]

			Satisfaction with Life	Highest Educational Attainment	Deficiency Needs Satisfaction	Rationality
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	.050**			
		Sig. (2-tailed)	<.001			
		N	16777			
	Deficiency Needs Satisfaction	Correlation Coefficient	.166**	.241**		
		Sig. (2-tailed)	<.001	<.001		
		N	13633	13590		
	Rationality	Correlation Coefficient	-.086**	.128**	-.027**	
		Sig. (2-tailed)	<.001	<.001	.003	
		N	12355	12309	11931	
	Individual's Rationality Minus Average Rationality of The Country	Correlation Coefficient	-.117**	.111**	.009	.951**
		Sig. (2-tailed)	<.001	<.001	.339	<.001
		N	12355	12309	11931	12358

**. Correlation is significant at the 0.01 level (2-tailed).

a. Countries grouped by GPI = Group 4 (2.3 to 2.899)

Table 111.

Correlations[a]

			Satisfaction with Life	Highest Educational Attainment	Deficiency Needs Satisfaction	Rationality
Spearman's rho	Highest Educational Attainment	Correlation Coefficient	.022*			
		Sig. (2-tailed)	.045			
		N	8571			
	Deficiency Needs Satisfaction	Correlation Coefficient	.267**	.359**		
		Sig. (2-tailed)	<.001	<.001		
		N	6537	6569		
	Rationality	Correlation Coefficient	-.162**	.275**	.109**	
		Sig. (2-tailed)	<.001	<.001	<.001	
		N	5312	5326	4155	
	Individual's Rationality Minus Average Rationality of The Country	Correlation Coefficient	-.083**	.057**	.010	.833**
		Sig. (2-tailed)	<.001	<.001	.511	<.001
		N	5312	5326	4155	5337

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

a. Countries grouped by GPI = Group 5 (2.9 and Higher)

Table 112.

For Fisher's r to z procedure, the z score of each correlation coefficient, the SE of each pair of Zs, the Z score of the differences, and the significance tables are presented (113 to 116).

Z1	0.07715272133
Z2	-0.07111966582
Z3	-0.1185522989
Z4	-0.08621296452
Z5	-0.1634399185

Table 113.

SE (Zi, Zj)	Z2	Z3	Z4	Z5
Z1	0.01185108696	0.01221668227	0.0133104004	0.01686656099
Z2		0.009861026954	0.01118746109	0.01524707862
Z3			0.01157403773	0.01553294789
Z4				0.0164070687

Table 114.

Z Diff	Z2	Z3	Z4	Z5
Z1	12.51129012	16.01949006	12.27353656	14.26447513
Z2		4.81011088	1.349126364	6.05494698
Z3			-2.794127261	2.889832627
Z4				4.706931834

Table 115.

Sig. two-tailed	Z2	Z3	Z4	Z5
Z1	0	0	0	0
Z2		0.000001508465938	0.1772963814	0.000000001404639516
Z3			0.005203999473	0.003854469874
Z4				0.000002514729501

Table 116.

Appendix E

As discussed in the Theoretical Framework chapter, Well-Being could be divided into Deficiency Needs Well-being and Growth Needs Well-being.

$$Wb = Wb_{DN} + Wb_{GN}$$

So the Happiness equation can be written as follows.

$$H = Rt \times (Wb_{DN} + Wb_{GN}) + (1 - Rt) \times (ADS)$$

It was also stated that in the scoop of this study, due to the limitations in the available data, the measurement of Growth Needs Well-being is limited to Cognitive Needs Well-being which is identical to the Coefficient of Rationality. So the equation could be written as follows.

$$H = Rt \times (Wb_{DN} + Rt) + (1 - Rt) \times (ADS)$$

It can also be written as the following.

$$H = Rt^2 + (Rt \times Wb_{DN}) - (Rt \times ADS) + ADS$$

This indicates that rationality probably has a quadratic form in determining happiness. All of these variables might be influenced by the level of education. therefore, for a comprehensive analysis, all of these variables should be measured.