



INSTITUTO
UNIVERSITÁRIO
DE LISBOA

Two decades of self-transcendence: predictors and differences in contemporary Europe

Natalie Kerschhofer

Master in Sociology

Supervisor:
PhD José Luís Casanova, Associate Professor,
ISCTE-University Institute of Lisbon

September, 2023

Department of Sociology

Two decades of self-transcendence: predictors and differences in contemporary Europe

Natalie Kerschhofer

Master in Sociology

Supervisor:

PhD José Luís Casanova, Associate Professor,
ISCTE-University Institute of Lisbon

September, 2023

Abstract

Acknowledging interconnectedness of humans with others and the environment is vital in the face of rising global challenges, with self-transcendence emerging as a key human value fostering this view. Considering this, the research was founded on Durkheim's Division of Labor and Schwartz's Human Value Theory, with the goal of identifying the subtleties affecting self-transcendence in various geopolitical and economic contexts. This study used quantitative analysis with data primarily from the European Social Survey (ESS), supplemented by datasets from the World Bank, OECD, Eurostat, and DHL, to better understand the factors influencing the value of self-transcendence across diverse European regions, with a particular emphasis on the periods surrounding the 2007-2008 financial crisis and the COVID-19 pandemic. The interdisciplinary methodology carefully constructed together predictor factors from institutional, societal/individual, and spatial spheres. Utilizing descriptive statistics and a multilevel regression analysis, nested by country and year, the relationship between potential predictors and self-transcendence in individuals is investigated. The results indicate significant differences in self-transcendence among European states, emphasising the historical, social, and political impact. The finding of notable gender differences in nations with considerable political conservatism highlights an interweaving of value systems and gender roles. Furthermore, it stood out that self-transcendence at the national level may impact an individual's self-transcendence value. However, the complicated structure of cultures implies that other country level factors potentially interfere with this, indicating the need for additional investigation.

Keywords: Self-transcendence, Durkheim's Division of Labor, Schwartz's human value theory, Interconnectedness, Multilevel regression

Resumo

O reconhecimento da interconexão dos seres humanos com os outros e com o ambiente é vital face aos crescentes desafios globais, com a auto-transcendência a emergir como um valor humano fundamental que promove esta visão. Tendo isto em conta, a investigação baseou-se na Divisão do Trabalho de Durkheim e na Teoria do Valor Humano de Schwartz, com o objetivo de identificar as subtilidades que afectam a auto-transcendência em vários contextos geopolíticos e económicos. Este estudo recorreu a uma análise quantitativa com dados provenientes principalmente do Inquérito Social Europeu (ESS), complementados por conjuntos de dados do Banco Mundial, da OCDE, do Eurostat e da DHL, para compreender melhor os factores que influenciam o valor da auto-transcendência em diversas regiões europeias, com especial ênfase nos períodos em torno da crise financeira de 2007-2008 e da pandemia de COVID-19. A metodologia interdisciplinar reuniu cuidadosamente factores de previsão das esferas institucional, societal/individual e espacial. Utilizando estatísticas descritivas e uma análise de regressão multinível, organizada por país e ano, é investigada a relação entre potenciais factores de previsão e a auto-transcendência dos indivíduos. Os resultados indicam diferenças significativas na auto-transcendência entre os Estados europeus, realçando o impacto histórico, social e político. A constatação de diferenças notáveis entre os sexos em nações com um conservadorismo político considerável realça uma interligação entre os sistemas de valores e os papéis dos sexos. Além disso, foi salientado que a auto-transcendência a nível nacional pode ter impacto no valor de auto-transcendência de um indivíduo. No entanto, a estrutura complexa das culturas implica que outros factores a nível nacional podem interferir com esta situação, indicando a necessidade de investigação adicional.

Palavras-chave: Auto-transcendência, Divisão do trabalho de Durkheim, Teoria do valor humano de Schwartz, Interligação, Regressão multinível

Table of Contents

1. Introduction	1
2. Theoretical framework	5
2.1 Worldviews and Values.....	5
2.2 Durkheim's Division of Labour	7
2.3 The Value Theory by Schwartz	9
2.4 Predictors for self-transcendence and related topics	11
3. Methodology.....	17
3.1 Data sources and sample.....	17
3.2 Variables.....	18
3.3 Analysis	23
4. Results	26
4.1 Descriptive results	26
4.2 Regression results	31
5. Discussion.....	35
5.1 Overall developments of country-level self-transcendence.....	35
5.2 Gender interaction with Political Placement of Country and National Self- Transcendence	36
5.3 The Impact of National Worldview on Individual Values	37
6. Conclusion.....	39
7. Bibliography	41
Appendix	
ESS table	
R Script	

List of Figures

Figure 2.1: Theory of Human Values by Schwartz (Schwartz, 2012).....	9
Figure 4.1.1: National self-transcendence score by year and country.....	27

List of Tables

Table 2.1: Potential predictors of self-transcendence and associated forms of connectedness.....	14
Table 3.1: Operationalization of potential predictor for self- transcendence.....	18
Table 4.1.1: ESS respondents' demographic over time and across countries.....	25
Table 4.1.2: Descriptive statistics and bivariate correlations among variables included in the final model (level-1 n = 78,827; level-2 n = 45).....	28
Table 4.2.1: Unstandardized hierarchical linear model regression coefficients for self-transcendence (level-1 n = 78,827; level-2 n = 45).....	30

List of Abbreviations

GDP – Gross Domestic Product
HNC - Human-Nature Connectedness
ESS - European Social Survey
DHL - A division of the Deutsche Post DHL Group, specializing in international express mail services
GCI - DHL Connectivity Index
MCAR - Missing Completely At Random
MAR - Missing At Random
MNAR - Missing Not At Random
ICC - Intraclass Correlation Coefficient
LMM - Linear Mixed-effects regression Models

1. Introduction

In the early years of the 21st century, the global community is confronted with a multitude of intricate difficulties that exhibit an unparalleled worldwide nature. The difficulties include a wide variety of issues, spanning from environmental concerns to socio-economic and socio-political factors. These challenges are characterized by their intricate nature and the impact they have beyond national boundaries. The contemporary environmental issues that confront us are extensive and complex, including pervasive environmental deterioration, biodiversity depletion, and the increasingly visible consequences of climate change. The concerns arise from a prolonged period of unsustainable human practices that have exerted pressure on the Earth's resources and caused disturbances in ecological systems (Rockström et al., 2009). The environmental problems posed by growing temperatures, such as melting ice caps and rising sea levels, as well as the increased frequency of severe weather events, have significant implications for both human and non-human life on Earth (Slangen et al., 2016; Hoskins & Woolings, 2015). These issues also impair the Earth's ability to support and maintain life (IPCC, 2023). The current society is characterized by the presence of health issues, including both physical and mental dimensions. The current worldwide pandemic has brought attention to the susceptibility of health systems and shown the rapidity with which a health crisis may surpass national boundaries and disturb societal functioning (Legido-Quigley et al., 2020). The prevalence of mental health conditions, ranging from anxiety and depression to more serious psychiatric diseases, has seen an upward trend. This escalation may be attributed to several factors, including the influence of contemporary lifestyles, social isolation, and the psychological ramifications of other worldwide predicaments (Vigo et al., 2016). Socio-economic differences provide an additional global concern. Despite significant economic expansion and breakthroughs in technology, there is an ongoing trend of increasing wealth disparities, which persist at both national and international levels. This phenomenon contributes to social instability, exacerbates poverty, and poses a danger to social cohesiveness (Piketty, 2014). Furthermore, with the increasing interconnectedness of the globe, there has been a heightened visibility and influence of socio-political conflicts. The aforementioned factors include the emergence of populist movements, global wars, challenges of migration, and concerns around human rights and democratic principles (Mudde, 2017).

The obstacles, each essential to overcome, exhibit interconnectedness and mutually reinforce each other, hence engendering a multifaceted global milieu that necessitates

collaborative approaches (Le Blanc, 2015). However, the efficacy of collaboration relies on a crucial element - interconnectivity. This refers to the acknowledgement that as people, we are intricately intertwined within larger networks of connections that extend beyond our local environment. The notion of interconnection has significant importance in several philosophical and sociological systems, functioning as a fundamental principle that fosters society unity and collective harmony (Ives, 2021). This suggests that our actions and choices are not independent occurrences, but rather have reverberating effects across our interconnected networks, influencing both individuals and the larger environment. The acknowledgement and use of interconnection are crucial for the survival and well-being of our species, particularly in a global context marked by escalating complexity and interdependencies (Fuentes, 2020).

Emile Durkheim's sociological framework, namely his conceptualization of "The Division of Labor in Society". He explores the mechanisms via which societies preserve social cohesiveness and solidarity notwithstanding growing intricacy (Durkheim, 2014/1893). Durkheim posits that in traditional civilizations, the attainment of social cohesiveness is facilitated by the presence of shared characteristics among people, which he labels as mechanical solidarity. Nevertheless, with the increasing complexity of civilizations, social cohesiveness arises from the phenomenon of division of labour, whereby people undertake specialized roles that contribute to the holistic operation of the community. The allocation of tasks among people and organizations engenders a situation of interdependence. One significant consequence of this phenomenon is the concept of organic solidarity as coined by Durkheim, which denotes a shared awareness that arises from the interconnections within a given community. The notion of connection is fundamental in both shaping society's structure and facilitating collective responses to difficulties (Durkheim, 2014/1893).

In relation to Durkheim's notes, Schwartz's theoretical framework on values, specifically the aspect of self-transcendence, presents an insightful viewpoint on the motives of individuals that resonate with the interconnection of society. Schwartz's (1992) value theory, developed via cross-cultural investigations, argues that human values include coveted, universally applicable aims that function as fundamental principles directing our actions and decisions in life. These values are categorized based on two fundamental dimensions: self-enhancement vs. self-transcendence, and conservation versus openness to change (Schwartz, 1992). The dimension of self-transcendence, which is of considerable importance in this study, encompasses ideals such as universalism and benevolence. Universalism ideals include the principles of comprehending, acknowledging, tolerating, and safeguarding the well-being of both individuals and the environment. In contrast, benevolence pertains to the act of preserving and adding to

the well-being of others with whom one maintains regular personal connections, such as family members and close acquaintances. Self-transcendence is characterized by a motivational orientation that prioritizes the well-being of others and the natural world, above one's immediate self-interests (Schwartz, 1992; Schwartz, 2012).

In recent years, there has been a notable surge in academic interest in the concept of self-transcendence. This heightened focus may be attributed to its recognized capacity as a reliable predictor of diverse outcomes, spanning across several disciplines of study. Within the field of psychology, a substantial body of research indicates a favourable correlation between self-transcendence and enhanced life satisfaction, resilience, and better mental well-being (Piedmont, 1999; Dambrun & Ricard, 2011). Moreover, within the realm of healthcare and nursing research, there exists a correlation between self-transcendence and enhanced patient outcomes and heightened quality of life. This association is especially evident in patients grappling with chronic diseases or towards the end of their lives (Reed, 1991). Within the field of environmental studies, there exists a correlation between self-transcendence and pro-environmental attitudes and actions. This correlation implies that self-transcendence may have a significant impact in promoting ecological responsibility and sustainable practices (Ives, 2021). The aforementioned results are consistent with the prevailing knowledge of self-transcendence, as it pertains to the advancement of the well-being of both individuals and the environment. This alignment is congruent with the fundamental principles of sustainable development. The concept of self-transcendence has significance in several academic disciplines, including migration studies. Scholars have recognized its crucial role in creating attitudes towards immigrants and its possible impact on the effectiveness of integration procedures (Davidov et al., 2019). Within the realm of education, the development of self-transcendence is often seen as an essential component in nurturing persons who possess qualities such as empathy, compassion, and social responsibility. There is a growing acknowledgement within the corporate sector of the significance of self-transcendence as a crucial attribute in effective leadership. This recognition is accompanied by a push for inclusion, diversity, and the adoption of ethical business practices (Sendjaya, 2015).

Despite the extensive body of research that underscores the significance of self-transcendence, there exists a notable deficiency in comprehending the mechanisms via which this value is nurtured, maintained, and systematically disseminated among various societies. Previous scholarly investigations have initiated the examination of several aspects that influence self-transcendence, including but not limited to spirituality, personal development, and social connectivity (Koltko-Rivera, 2006; Tornstam, 1997). Nevertheless, there is a need

for more exploration into the thorough comprehension of the embeddedness of self-transcendence, specifically within contemporary Europe.

The primary objective of this study is to investigate the existing gap in knowledge, to offer valuable perspectives on the factors that contribute to or hinder the development of self-transcendence in societies. Building upon that, this study has the potential to provide valuable insights for initiatives focused on cultivating self-transcendence on an individual level and within societies, therefore promoting enhanced collaboration and adaptability in the context of global adversities.

After having established the core interest of the research and giving first insights into relevant theories, it is necessary to highlight the multidisciplinary approach for this work. While sociological theory remains the foundation of this study, the complexities of 21st-century adversities require more than a single academic lens. They require a cohesive tapestry of insights from diverse disciplines such as psychology, environmental studies, healthcare, and economics. Such a combination of viewpoints enables us to examine self-transcendence not only as a niche concept, but also as a resonant principle resonating across numerous disciplines and social strata.

In the following is the theoretical background deepened and the methodological foundation for this research explained. This includes demystifying data sources, selecting relevant variables, and strategically applying analytical techniques. In the results section, empirical findings are revealed, dissected into descriptive outcomes and nuances uncovered by regression analysis. The subsequent discussion provides an overview of these findings, situating them within a broader academic and practical context. The narrative of the research culminates in the conclusion, which synthesises our primary findings and considers their broader implications.

2. Theoretical framework

2.1 Worldviews and Values

The notions of worldviews and values are very important in sociological discourse, having a vital influence in moulding individuals' behaviour and society norms. They provide a lens through which we may perceive the dynamic interaction of individual and collective activities within a social system as fundamental structures.

“Worldviews are sets of beliefs and assumptions that describe reality. A given worldview encompasses assumptions about a heterogeneous variety of topics, including human nature, the meaning and nature of life, and the composition of the universe itself, to name but a few issues.” (Koltko-Rivera, 2004, p. 3). This belief system impacts our interpretation of events and our knowledge of the world around us. A worldview, in essence, is the intellectual foundation that informs our ideas, knowledge, and actions.

Values, on the other hand, are defined as general inclinations that prefer some states of affairs over others (Schwartz, 1992). They serve as guiding principles in life, having a significant effect on attitudes, actions, and decision-making. Values represent what a person or society considers important, impacting our decisions and behaviours.

A thorough investigation of worldviews and values demonstrates that they are inextricably linked. It is widely acknowledged that worldviews and values do not exist in isolation; rather, they interact in a dynamic and recursive connection. Worldviews, which are often constructed in response to cultural, historical, and sociological circumstances, have a considerable impact on the values we hold (Berger & Luckmann, 1966). In other words, the framework offered by a worldview assists people and communities in determining what is useful or significant, therefore shaping their values. A person who embraces a humanistic worldview that emphasizes universal respect for all people, for example, may place a high importance on equality and social justice.

The correlation between worldviews and values may be further expanded in the perspective of sociology Emile Durkheim. He proposed that the collective consciousness, which reflects shared beliefs and ideas of a social group, is central to the coherence and continuity of society (Durkheim, 1912). Worldviews and social values are inextricably intertwined in his understanding. Collective consciousness, similar to worldviews, influences societal ideals, which define social norms and actions within a society.

Shalom Schwartz's notion of basic human values provides another viewpoint, adding to our knowledge of values and their interrelationship with worldviews (Schwartz, 1992). Power, accomplishment, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity, and security are among the ten universal values advocated by Schwartz (1992). These values, according to Schwartz, stem from three basic human needs: individual biological needs, the requirements of coordinated social interaction, and community survival and welfare needs. Worldviews, according to Schwartz's model, impact the priority of these fundamental values. This effect is determined by the individual's personal experiences, social circumstances, and biological requirements. As a consequence, a worldview that values individual autonomy may place a larger value on self-direction.

Another important perspective to consider is Marx's idea of worldviews and values which is intertwined with his understanding of ideology and class (Marx 1867). The argument that the economic base, or the modes and relations of production, shapes the superstructure, which includes ideas, culture, and institutions, is central to the Marxist worldview. In the Marxist meaning, ideology refers to the dominant set of ideas and values that help to legitimise and sustain the existing class order. Marx proposed that the ideology of a society's ruling class is the prevailing ideology (Marx & Engels, 1970). Worldviews, as such, are not impartial or objective representations of reality; rather, they are profoundly intertwined with societal material circumstances, reflecting, and sustaining the interests of ruling groups. Thus, according to Marx, class positions greatly influence worldviews, with the ruling class's beliefs acquiring prominence and defining society ideals.

In contrast to that is Weber's definition of worldviews and their relatedness to values. Weber's analytical path departs from the determinism that pervades Marxist philosophy (Weber, 1978). Weber defined worldviews as being inextricably linked to social rationalisation processes inherent in the emergence of capitalism, bureaucracy, and modernity (Weber, 1930). Worldviews, according to Weber, are more than just economic reflections. They originate from a complex interaction of religious, political, and economic influences. Weber's work emphasised the distinct relationship of worldviews with diverse social positions, affecting and being impacted by characteristics such as rank, power, and prestige. This enables a more nuanced view of the complex fabric of social interactions and emphasises the role of individuals in creating perceptions (Kalberg, 1980).

The mentioned sociological perspectives, which includes Marxist, Weberian, and Durkheimian perspectives, provides a comprehensive understanding of the formation of worldviews, interconnectivity, and values. The emphasis on collective consciousness by

Durkheim complements the Marxist and Weberian emphasis on society structures and individual realities. Schwartz's views shed further light on the complex interaction between individual beliefs and wider society standards, bridging personal motives and communal ideology. This embedded reality, which is impacted by spatiality, institutional frameworks, social structures, and human characteristics, functions as both a product of and a cause for self-transcendence. It is critical to consider reciprocal causation although these domains may catalyse self-transcendence, a heightened state of self-transcendence may remodel and redefine these same domains. In summary, the study tries to identify variables that promote or discourages self-transcendence while also acknowledging self-transcendence's transformational ability in shaping perceptions of space, social constructions, and institutions. This intricate symbiotic relationship between an individual's internal transcendental condition and their external environment emphasises the necessity for future empirical investigations to take a multidimensional, integrated approach.

A more detailed overview on Durkheim's and Schwartz's theoretical standpoints follows.

2.2 Durkheim's Division of Labour

Elaborating further on Emile Durkheim's sociological approach, particularly his idea of the division of labour, provides a fascinating lens for comprehending the intricacies of interconnection in complex and diverse cultures. Durkheim dives into the process civilizations use to sustain social cohesiveness and solidarity despite rising complexity.

According to Durkheim (2014/1893), social cohesiveness in ancient civilizations is established by individual similarities - a phenomenon he calls mechanical solidarity. A collective consciousness evolves from common ideas, customs, and values in these cultures, resulting in a strong feeling of solidarity and camaraderie. However, as societies evolve and the dynamic density of people, money, and information rises, the nature of this cohesiveness shifts from one based on similarity to one based on diversity and dependency.

This transformation is facilitated by the division of labour, which is a process in which people do specialised activities that contribute to the general functioning of society. Durkheim saw this division of labour as a kind of social glue, encouraging mutual reliance among people and other socioeconomic groupings. While different and varied, each individual's distinct activities and functions are critical for the collective well-being of society. This culminates in what Durkheim referred to as organic solidarity, or a communal awareness generated from the interdependencies ingrained in society's fabric (2014/1893).

Organic solidarity, unlike mechanical solidarity, transcends the uniformity of shared ideas and rituals. It represents a higher degree of social cohesiveness, one that recognises and celebrates variety while connecting people via their diverse but complementary responsibilities. As a result, organic solidarity arises as a multidimensional social glue that supports interconnectedness and mutual dependence.

Organic solidarity, as defined by Durkheim, provides important insights into the dialectics of individuality and interdependence. Durkheim's theory emphasises the need for interconnectedness in a society where individual experiences, viewpoints, and responsibilities are more diverse. The division of labour acts as a catalyst for encouraging interconnection and shared responsibility as well as a strategy for social productivity and efficiency.

Durkheim believes that the notion of interconnectivity is important in forming collective responses to social difficulties. Organic solidarity acts as a communal immune system in the face of adversity, promoting collective resilience and enabling coordinated responses. Interdependence fosters shared experiences, which build a strong foundation for collective problem-solving, allowing societies to traverse the currents of change and disruption (Durkheim, (2014/1893). Furthermore, Durkheim's theoretical viewpoint connects well with talks about self-transcendence. Durkheim's transition from mechanical to organic solidarity reflects this fundamental change from self-centeredness to a larger, interrelated worldview. The interdependencies that result from the division of labour inherently encourage individuals to recognise their roles within the larger societal framework, fostering a sense of self-transcendence (Maslow, 1971; Tillich, 1952; Reed, 1991).

However, Durkheim's thesis has been criticised for omitting possible conflict and power inequalities inherent in labour division. Critics contend that his notion of organic solidarity provides an idealised perspective of society's cohesiveness that fails to account for the tensions and inequities that might arise from labour division (Marx, 1844; Giddens, 1971). Critics claim that his concept of communal consciousness may inhibit individualistic ideals and goals, implying an inherent conflict between the community and the individual.

The critiques of suppressing individualistic values in favour of communal conscience seem to ignore the transforming character of self-transcendence itself. Self-transcendence, according to scholars, is characterised by a shift away from self-centeredness and towards a higher feeling of togetherness and care for the group (Haidt, 2012; Koltko-Rivera, 2006). Durkheim's idea of collective conscience, in this sense, may be understood as a partial result of self-transcendence rather than a suppressor of individual values.

We could navigate the intricacies of self-transcendence by seeing the interaction between individual and social elements, pulling from both Weber's individual factors and Marx's society dynamics, but ultimately emphasising the collective awareness Durkheim stresses. In this view, self-transcendence appears not just as a personal journey, but also as a requirement for society cohesiveness and a coordinated response to global crises.

It is worth noting that, whereas Durkheim postulated labour division as the driver for organic solidarity and interconnectivity, this investigation recognises that interconnectedness is not only an outcome of divided labour. Individuals' realisation and acknowledgement of interconnectivity play an important part in creating “organic solidarity”. However, this connectivity extends beyond the physical and social spheres, into the realm of self-transcendence.

Individuals who value self-transcendence tend to have a stronger feeling of interconnectivity, not only as a practical requirement, as in the division of labour, but as a deeply ingrained existential viewpoint (Schwartz, 1992). Such people see themselves as vital components of a broader whole, aware of the complex web of social interdependencies that binds society together.

Emphasising self-transcendence may promote the transition from a solitary to a more shared, communal, and linked worldview, which is consistent with Durkheim's idea of organic solidarity. Schwartz (1992) emphasises the importance of self-transcendence in creating social cohesiveness, societal resilience, and harmonious relationships.

While Durkheim's idea of division of labour is useful in understanding the dynamics of social interdependence, a more holistic view necessitates acknowledging the deep role that self-transcendence plays in building organic solidarity. In essence, our interconnectedness stems not only from our collective dependencies, but also from transcendental values that inspire us to perceive ourselves as components of human societies and our environment, fostering a richer understanding of the vast tapestry that is social, environmental, and individual fabrics.

2.3 The Value Theory by Schwartz

As extensively outlined previously the social psychologist Shalom Schwartz and the value of self-transcendence is a cardinal and universal virtue that resists desires to improve the self. Schwartz's definition of this value, which is based on the underlying biological demands of people living and reproducing in groups, emphasises its critical significance in driving human

behaviours throughout cultures. According to Schwartz (2012), "self-transcendence opposes motivations that enhance the self... They express the motivational continuum of self-restraint to selflessness to spirituality" (p. 9). Two fundamental components are important to this concept: social connectivity, which encourages interpersonal trust, empathy, and societal cohesiveness, and nature connectedness, which inspires sustainable behaviours and appreciation for all living forms.

According to Schwartz's fundamental theory on basic human values, these values serve as the major motivators of human behaviour. Figure 1 depicts a circular motivating framework that elucidates how the ten human values link to highlight the subtle interplay of these values. This circle's adjacent values, such as power and accomplishment, often have comparable aims that may be pursued simultaneously. In sharp contrast, competing values, such as power and universalism, represent opposite agendas that seldom match. The closeness or distance between values indicates whether they are motivated in the same way or not. Furthermore, the circle shows two overarching dimensions: self-enhancement values like achievement and power are the exact opposite of self-transcendence values like universalism and benevolence, and conservation values like security, conformity, and tradition are the exact opposite of openness to change values like self-direction and stimulation. Hedonism, on the other hand, is a mix of openness and self-improvement. It is closer to openness than to self-enhancement.

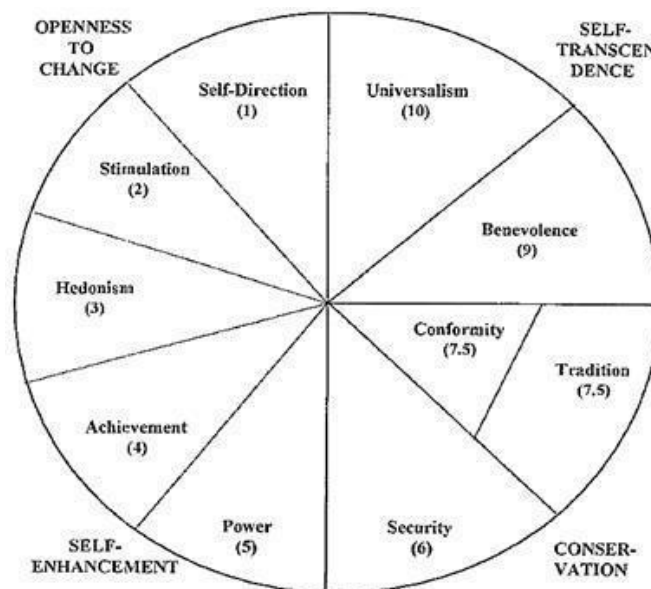


Figure 2.1: Theory of Human Values by Schwartz (Schwartz, 2012).

The Schwartz Value Survey (SVS) and the Portrait Values Questionnaire (PVQ) make it possible to define an individual's location within this value framework. These techniques clarify

not only the predominance of self-transcendence inside a person, but also its overarching influence on their behaviours, choices, and overall life trajectory by collecting numerical ratings for each value.

Beyond Schwartz's description, self-transcendence is often conceptualised as a trait, an experience, and a value. First, represents a lasting pattern of attitudes and behaviours that prioritise communal wellbeing as a characteristic, providing important insights into personality research (Cloninger, 2004) Furthermore, has it been researched as an experience (Yaden et al., 2017) and attributed to different states of perceived oneness, for instance, the states of mindfulness (Davidson et al., 2003), flow (Csikszentmihalyi, 1991), self-transcendent positive emotions such as love and awe (Haidt & Morris, 2009; Van Cappellen, & Rime, 2014), peak experiences (Maslow, 1964), and “mystical” experiences (Hood, 2003; Newberg & d’Aquili, 2000). All experiences share decreased self-awareness and increased connection.

Finally, as a value, self-transcendence contains deep-seated values that influence an individual's activities, and it has proven useful in research on moral and ethical behaviours (Schwartz, 1992).

Reed's Self-Transcendence Scale and Cloninger's character scales within the Temperament and Character Inventory are two other important measures that give empirical support for the theoretical background (Reed, 1991; Cloninger et al., 1993).

Similarly, the Watts connectivity Scale posits three dimensions of connectivity - to self, others, and the world (Watts et al., 2022), which goes into themes comparable to self-transcendence. It is important to note that Schwartz and Durkheim's theoretical frameworks do not take connectivity to self into account. Furthermore, Watts et al. (2022) hypothesise that "having a single measure comprising multiple dimensions of connectedness may help to consolidate the view that these sub-dimensions are interrelated and underpinned by a common generalised connectedness" (p. 3479). Their finding implies that connectivity to people and nature is deeply linked with connectedness to self and that this connection may play a vital role in the theoretical backdrop of self-transcendence.

2.4 Predictors for self-transcendence and related topics

With the intertwine background of self-transcendence with social, nature, and self-connection in mind, this study begins its investigation into possible predictors of various types of connectedness and, hence, of self-transcendence. Because there are no established predictors of self-transcendence, this study is led by the idea that the variables that impact the different types

of connectedness are relevant in understanding the embeddedness of self-transcendence. Moreover, several possible predictors that are either directly related to self-transcendence or the two types of connectivity are explained and under examination.

Education is one such significant predictor. Both formal and informal education have the capacity to broaden one's viewpoint, spark critical thinking, and foster a complete awareness of the interconnectivity of many occurrences (Goldstein, 2016; Braun & Dierkes, 2017).

As a result, education can foster self-transcendence by fostering a feeling of connectivity to a wider reality beyond the self. Informal education, via life experiences and cultural practises, may instil a feeling of connectivity in life, fostering a sense of connection with others and the environment.

We evaluate the influence of a country's socio-political orientation, shifting our attention from the educational to the social domain. A country's sociopolitical orientation influences the collective and individual experiences of its residents. Democratic societies that emphasise freedom, equality, and human rights often cultivate a culture of acceptance for individual diversity, developing self-transcendence via mutual understanding and social connection (Putnam, 2000). Meanwhile, the country's economic might and the degree to which it is globalised may enhance or restrict possibilities for different experiences and contacts that may encourage self-transcendence. Greater economic power may bring resources for personal growth as well as situations that promote self-transcendence. Globalisation, although broadening individual worldviews, may also worsen feelings of detachment owing to the collapse of traditional communal institutions (Sassen, 1998).

Furthermore, a country's geographical qualities are important. Self-transcendence is also influenced by biodiversity, susceptibility to natural catastrophes, and access to green and blue areas. Biodiversity, which reflects the variety of species in a certain habitat or ecosystem, may give the opportunity for awe-inspiring encounters while also developing a feeling of closeness to nature (Pfiff et al., 2015; Hartig et al., 2014). Natural catastrophes may foster a sense of community and mutual assistance, thereby improving social connectivity. Furthermore, access to green/blue environments may promote feelings of calm and connectivity to nature, increasing self-transcendence (White et al., 2013).

Individually, socio-demographic aspects such as age, gender, and the socioeconomic position may influence how people perceive and interact with their environment, hence impacting self-transcendence (Schönbach et al., 2022). Older people, for example, may have more experiences and wider viewpoints, which may enhance self-transcendence.

Being a parent has a major impact on self-transcendence. Parents often describe a higher sense of purpose in life and a change in emphasis away from themselves and towards their children, a dynamic that matches the wider idea of self-transcendence (Nelson-Coffey et al., 2019).

Reflective self-attention and mindfulness affect one's connection with oneself, which may lead to self-transcendence. Reflective self-attention may create a better knowledge of the self in connection to others and the environment by encouraging conscious awareness of one's thoughts, feelings, and behaviours (Richardson & Sheffield, 2015).

Meanwhile, mindfulness, defined as nonjudgmental awareness of present-moment sensations, may have a major influence on self-transcendence, social connectivity, and nature connectedness (Schutte & Malouff, 2018). Mindfulness may catalyse a greater knowledge of oneself in connection to others and the environment by encouraging conscious awareness of one's thoughts, feelings, and actions. It promotes self-transcendence by cultivating a state of open awareness in which people may feel less distinct and more a part of the greater field of consciousness and existence (Davis & Hayes, 2011). Kabat-Zinn (1990) also proposes that mindfulness is a valuable dimension to assess spirituality, hence, are these overlapping topics.

Spirituality is often associated with a belief in a greater life beyond the physical and material world. This sensation of belonging to a larger reality or a higher force may promote self-transcendence (Emmons, 1999). It urges people to look beyond their immediate self-interest and see the connection between all living things. Spirituality may also foster social and environmental connectivity, as well as eudaimonic well-being, leading to a greater potential for self-transcendence (Jasmine et al., 2014; Nisbet, Zelenski, & Murphy, 2011).

The quality and quantity of one's connections have a substantial impact on social connectivity, which is an important component of self-transcendence. A feeling of belonging and connection with others is fostered through high-quality relationships characterised by trust, mutual support, and empathy (Baumeister & Leary, 1995). They provide possibilities for shared experiences and emotional resonance, which improves a person's potential for self-transcendence (McFarland, Webb, & Brown, 2012). On the other hand, the sheer number of contacts made possible by modern technology does not always translate into meaningful social closeness (Skierkowski & Wood, 2012; Deci & Ryan, 2000). As a result, the quality of interactions, rather than the number, has a greater influence on self-transcendence.

Consumption, which is typically linked with materialism, is another feature on the individual level that might hinder self-transcendence and forms of connectivity. Materialistic consumption may encourage individualistic ideals while possibly impeding social bonding

(Kasser, 2016). Sustainable or ethical consumption, in which shopping choices take into account environmental and social implications, on the other hand, may develop a feeling of connectivity to larger social and ecological systems (Jackson, 2005; Boulstridge & Carrigan, 2000). This viewpoint is consistent with self-transcendence principles since it requires seeing beyond one's immediate self-interests. Cultural consumption, such as seeing art or travelling, may also help with self-transcendence. It promotes social and environmental connectivity by encouraging sympathetic understanding and shared experiences (Csikszentmihalyi & Robinson, 1990; Pearce, 2011). As a result, the nature of consuming may both obstruct and assist self-transcendence and connection.

Furthermore, personal health, which includes both physical and mental well-being, may increase a person's potential for meaningful experiences and interactions that foster self-transcendence. Individuals with good physical health may participate in activities that create relationships with nature and others (Lamers et al., 2012). Meanwhile, mental health might cause barriers to participating in social gatherings (Hawkey & Cacioppo, 2010) or seeking out green spaces (De Vries et al., 2003; Townsend & Weerasuriya, 2010). For instance, anxiety disorder might interfere with the attendance of activities that promote social interaction and inhibit the ability to connect with others and nature (Boden et al., 2007).

While physical and mental health are important contributors to an individual's capacity for self-transcendence, it is the emotional aspects of human experience, notably empathy and vulnerability, that add another degree of complexity to our understanding of this phenomenon. Both may improve social connectivity, natural connectedness (Richardson et al., 2022), and self-transcendence. Empathy develops a sense of shared humanity and connectivity (Zaki & Ochsner, 2012). Vulnerability, on the other hand, denotes openness to new experiences, as well as a readiness to confront uncertainties and dangers. Accepting vulnerability may lead to stronger relationships with others and with oneself, boosting self-transcendence (Brown, 2012).

Turning our attention to often-overlooked social issues, we investigate the effects of discrimination and intersectionality on self-transcendence. According to research, many types of discrimination have a substantial influence on an individual's psychological and social experiences, possibly impeding self-transcendence (Schmitt et al., 2014). It fosters a feeling of isolation, which may impede social, natural, and self-connectedness (Major & O'Brien, 2005). Simultaneously, comprehending the idea of intersectionality - the interrelated nature of many social identities and accompanying discrimination - can broaden one's knowledge of the interconnection of society systems (Crenshaw, 1989). According to Purdie-Vaughns and Eibach (2008), "intersectional invisibility is a lack of representational intersectionality or the

degree to which a group is invisible in the media and in the minds of individuals" (p. 385). This insight may allow people to connect more deeply with those who are subjected to similar types of systematic oppression, increasing social connectivity, which is an important part of self-transcendence.

A variety of characteristics have been discovered based on a thorough literature study that might serve as predictors of self-transcendence, a multidimensional concept related to social and nature connectedness. Because the subject of self-transcendence research is still in its early stages, the goal of this study was to gather and categorise potential predictors to guide future empirical investigations. The realm of connection to self is not considered here but has to be further explored and included in the future. Potential predictors are classified into three major categories: institutions, individuals/societies, and spatiality.

Table 2.1. Potential predictors of self-transcendence and associated forms of connectedness

Domain	Potential Predictors
Institutions	Education, socio-political orientation, economic power, degree of globalization
Individual/Society	Socio-demographics, social network, overall health, discrimination, consumption, consciousness (awareness, mindfulness, empathy, vulnerability)
Spatiality	Available nature, nature vulnerability, nature accessibility

The categorization of possible predictors into three primary categories (institutions, individual/society, and spatiality) is remarkably similar to interdisciplinary approaches to Human-Nature Connectedness (HNC). This coincidental convergence highlights the intuitive overlap between the study goals on self-transcendence and HNC. Both notions address the multifaceted character of human experience as seen through many academic perspectives, needing a category-based approach.

“Mind”, “space”, and “experience” are essential components in HNC studies for understanding how humans react to nature (Nisbet, Zelenski, & Murphy, 2009; Brown & Raymond, 2007; Kellert & Wilson, 1993). These domains correspond to the categories defined in the self-transcendence research. The “institutions” category is related to HNC's “mind” domain in that it contains social constructions that often affect individual cognition and

behaviour. The “spatiality” category, with its emphasis on physical and environmental factors, is almost identical to what is sometimes contained under HNC's “space” domain. Finally, the “individual/society” category corresponds to the “experience” domain of HNC, which addresses the intricate interaction of personal, psychological, and societal variables that influence individual relationships with nature.

As a result, the categorical paradigm adopted to comprehend self-transcendence verifies its potential application and significance to HNC research. It also reinforces the view that any full examination of complex, multifaceted phenomena like self-transcendence or HNC requires a multidisciplinary approach, as seen by the categorization of putative predictors into different but connected categories.

However, are these possible indicators not complete, but they serve as a starting point for future empirical research on self-transcendence. When investigating the impacts of these elements on self-transcendence and its forms of connectivity, it is critical to evaluate their dynamic and interconnected interactions.

More study is needed to verify these possible predictors and understand their roles in building self-transcendence and its forms of connectivity. Such research may help us get a better understanding of the complicated web of circumstances that impact our capacity for self-transcendence, which can then be used to drive treatments and policies that support this critical feature of human flourishing.

Given the interdisciplinary approach, it is critical to distinguish the distinctive complexities that sociological views contribute to the study of self-transcendence as compared to more individualistic fields such as psychology and social psychology. While psychological perspectives are concerned with individual cognitive processes, emotions, and behaviours (Bandura, 1986), the sociological approach is concerned with societal structures, collective patterns of behaviour, and the overarching social forces that shape individual and group experiences (Durkheim, 1984). Individual psyches interact with and are impacted by social conditions, according to socio-psychological viewpoints (Allport, 1985). When studying the multidimensional character of self-transcendence, where the delicate dance of individual experiences and collective social effects merge (Taylor, 1989), this difference becomes critical. Recognising this dichotomy allows for the development of a complete analytical framework that can accommodate both personal internal experiences and exterior social influences (Berger & Luckmann, 1966). This ensures a more holistic, integrated, and comprehensive knowledge of the phenomenon, allowing for deeper insights and more informed solutions (Turner, 1986).

3. Methodology

3.1 Data sources and sample

This study used a quantitative method to evaluate the factors that impact the value of self-transcendence. We can identify patterns and correlations that would be difficult to detect using qualitative methods by employing numerical data and statistical approaches (Bryman, 2016). The goal is to understand the depth and breadth of predictors and how they link with self-transcendence as a value in order to represent a larger spectrum of society.

The use of public data from reputable sources such as the European Social Survey (ESS), the World Bank, and Eurostat is a key benefit of this research. These sources provide vast and diversified datasets of excellent quality, which ensures the reliability and validity of our results.

The European Social Survey is the primary data source for our study. It is a biannual survey that collects demographic, socioeconomic, and crucial data on public attitudes and behaviours. Individuals aged 15 and up living in private homes in the designated countries are included in the survey, representing a varied variety of nationalities, citizenships, languages, and legal statuses. This breadth of coverage fosters a comprehensive coverage of the sociocultural influences that may impact our dependent variable, self-transcendence.

The ESS data's legitimacy stems from its constant and stringent data collection process. The ESS incorporates probability sampling procedures to ensure representativeness and cross-national comparability. Furthermore, various data collection modes like face-to-face interviews utilising a standardised questionnaire allow for more reliable data gathering. The ESS methodology's stringent translation standards are an essential component. This guarantees that the questionnaire's meaning stays constant across several languages and cultures, thus increasing the data's dependability (Jowell & The Central Coordinating Team, 2003).

The addition of The Human Values Scale in the ESS since 2002 is significant for our study. This scale is based on the Portrait Values Questionnaires and has a history spanning two decades which provides a chronological perspective on the importance of self-transcendence in many nations.

In addition to the ESS data, this analysis makes use of data from the World Bank, OECD, Eurostat, and DHL (Part of Deutsche Post DHL Group, DHL offers international express mail services and is one of the largest logistics corporations in the world, specialising in sea and aviation mail). These organisations are well-known sources of country-level statistics. While the ESS provides data on individual factors, aggregated nation variables, and outcome variables

of relevance, the OECD, DHL, World Bank, and Eurostat provide important country-level information.

Having stated that, the study is organised around specified geographical and temporal criteria. Our major emphasis was on Europe, a region rich in historical, sociopolitical, and cultural interconnections. To adequately capture the numerous elements of the European experience, nations from the east, west, north, south, and centre areas were aimed to be included. This geographic dispersion enables a larger but nuanced view, encompassing the various ranges of European cultures, each with its own inherent characteristics (Smith, 2016).

The study's timeframes correspond to two momentous global events: the 2007-2008 financial crisis and the COVID-19 epidemic. Such events were selected because of their tremendous socioeconomic consequences, affecting not just countries' financial landscapes, but also the fundamental fabric of society and individual values (King, 2009; Rajan, 2010). The financial crisis, in particular, resulted in profound socioeconomic inequality and political upheavals in many countries, emphasising its significance for our research (Krugman, 2009). Similarly, the COVID-19 pandemic's widespread impact and deep ramifications for global health, economy, and civilizations have been thoroughly reported (Nicola et al., 2020; Hale et al., 2020). With this in mind, particular rounds of the European Social Survey (ESS) were chosen for examination. Wave 1 offered the baseline followed by Wave 4 for a view into the pre-financial crisis period. Wave 5 was after the financial crisis, Wave 9 was before the COVID-19 pandemic, and Wave 10 was during the pandemic.

A methodologically consistent dataset is required for a reliable analysis. To preserve this uniformity, we chose nations with data accessible for all of the specified years. Switzerland, Czechia, Finland, France, Hungary, the Netherlands, Norway, Portugal, and Slovenia were among them. These countries represent a heterogeneity of European areas and exhibit a variety of cultural systems, economic paradigms, and history, expanding our understanding. The timeline for data collection, as well as the quantity of replies by nation and year, are shown in the appendix table 1 (p. 1).

3.2 Variables

As a next step, the operationalization of the potential predictors from theory to empirical is essential. The variables were translated from theoretical background into quantifiable measures. Firstly, the potential predictors are discussed and defined while in the end more information to the outcome variable self-transcendence is reported. The tables that follow provides exclusively

the outcome variables that were selected in conjunction with the previously described areas. The column for unavailable variables is not complete as many country and individual-level variables have been considered but were not sufficient in their quality or time and geographical coverage.

Table 3.1: Operationalization of potential predictor for self-transcendence

Domain	Potential predictors	Available variables	Unavailable variables
Institutions	Education	Governmental Expenditure on Education	Quality of Education
	Socio-political Focus	Governmental Expenditure on: Social Protection, Environment, Health, Recreation/Culture/Religion, Housing/Community, General Services, Public Safety	Government Composition
	Economic Influence	GDP	-
	Global Connectivity	DHL Connectivity Index 2022	-
Individual & Society (aggregated on national level)	Socio-demographics	Age, Gender, Child Household History, Formal/Informal Education, Religious, Political Placement	Total Household Income
	Social Ties	Social Engagement Frequency	Relationship Quality, Media use
	Health Status	Perceived Health, Activity Limitation	-
	Discrimination Experience	Discriminated Group Affiliation	-
	Self-transcendence	Self-enhancement vs. self-transcendence on country level	
	Consumption	-	General and sustainable consumption

	Consciousness	-	Awareness, Mindfulness, Empathy, Vulnerability
Spatiality	Natural Abundance	Red List Index, % of Protected Land	% of protected waters
	Environmental Risk	Extreme Weather Exposure (Heat & Cold)	Coastal flooding, drought, extreme precipitation, river flooding, wildfire, wind threats
	Nature Access	Inland Passenger Rail Transport (per capita)	Inland Passenger Road Transport

A country's commitment to education is expressed in institutional research by its 'Governmental Expenditure on Education' as a percentage of GDP. According to Hanushek and Woessmann (2015), this indicator represents a country's focus on human capital development rather than merely financial commitment. It assists in determining the percentage of a country's economic production reinvested in areas such as education, demonstrating its importance in relation to total economic capability.

Similarly, a country's 'Socio-political Focus' might be deduced. This is characterised by government expenditure in several sectors, each expressed as a proportion of GDP. According to Besley and Persson (2011), analysing these percentages gives a complete insight into a country's fiscal strategy and policies.

The data is accessible through Eurostat, which covers government spending in categories like as Education, Health, and Public Safety as a proportion of GDP (Eurostat, 2023). This information aids in determining a country's sociopolitical orientation. A high GDP percentage for a sector indicates its significance to that country. This strategy, however, has both advantages and disadvantages. While it provides precise numerical data for cross-country comparisons and identifies genuine investment areas, it does not guarantee similar meaningful impacts. Significant education spending, for example, does not guarantee efficient spending or educational quality.

GDP, a measure of a country's economic health (World Bank, 2021a), is not without criticism, particularly for its failure to highlight variations in income distribution or environmental sustainability. However, here the World Bank's GDP (in Billions of US Dollars) statistics is utilized since it is widely accepted and consistent, making it acceptable for cross-national comparisons (World Bank, 2021b).

The “DHL Connectivity Index” (GCI) is used to gauge globalization. It measures a country's global links across several dimensions, including commerce, finance, information, and people mobility (DHL, 2022). The GCI is a composite tool that scores nations on a scale of 1 to 100 by combining multiple data points from 140 countries.

Furthermore, is a person's experience shaped by variables on both the individual and social levels. As a result, the ESS variables have been used in the individual level (as they are collected in the ESS) and have been aggregated on a national level (which represents the societal sphere) after applying appropriate weighting, which in this case means "comparing data from two or more countries but without reference to statistics that combine data from more than one country, only the design weight or the post-stratification weight need be applied." (European Social Survey, 2014, p. 3). For instance, is the political placement of a country the result of aggregating the political placement of individuals per country and adjusted by the weight. In general, the numeric level-1 predictors were centred within each country's population, and the level-2 predictors were centred around its grand mean, as advised by Enders and Tofighi (2007), in order to ensure the right slope parameter for the cross-level interaction.

This counts as well for the value of self-transcendence which here is also used as a predictor in the aggregated form on national level. After applying the above-mentioned weight and calculations it mirrors the value orientation of a country's population. More details to the variable self-transcendence itself follows after the description of predictor variables.

Indeed, scholarly agreement emphasises the inescapable relationship between individual beliefs and macro social institutions. Based on this holistic perspective, the factors at the national level used to predict self-transcendence vary from socio-demographic variables like age, gender, education level, child in household, religion, and political orientation (Giddens, 1984). The age variable measures the numerical value representing the calculated years. The responses are categorised into male (0) or female (1) groups based on gender differences. The children within a home is ascertained using the descriptor known as "Ever had Children Living in Household" and is answered with yes or no while the religiosity of participants is assessed using the religiosity scale, which encompasses a spectrum from 0 = "Not at All Religious" to 9 = "Very Religious". The indicator used to measure informal education is the participation in

knowledge/skill improvement activities indicator which also had to answered with yes or no. On the other hand, is the variable "Years of Full-time Education Completed" offering valuable information on the length of time individuals have spent in formal education, measured in numerical years. The present research assesses political orientation by using the Political Placement on Left-Right Scale, which encompasses a range of orientations extending from the left to the right.

For example, "Social Engagement Frequency" (Putnam, 2000), here measured by asking "How often [the respondents] socially meet with friends, relatives or colleagues" in 0 = "never" and 6 = "every day", provides insight into how social connectivity may impact self-transcendence. Similarly, indices such as "Perceived Health" and "Activity Limitation" (World Health Organisation, 2018) give empirical insights into individual health perceptions, which are influenced by national health norms and standards. The scale for "Perceived Health" has been covered by letting participants indicate their general subjective health from 1 = "very bad" to 5 = "very good" and the "Activity Limitation" as a yes or no answer to if they are "hampered in daily activities by illness/disability/ infirmity/mental problem".

Furthermore, the concrete concept of "Discriminated Group Affiliation" (Pager & Shepherd, 2008) emphasises the importance of social systems in creating individual perceptions of discrimination. In the present study, a comprehensive index was constructed within the methodology to encompass various dimensions of discrimination. This index incorporates the concept of intersectionality by including respondent group markers, such as age, disability, ethnic group, gender, language, nationality, colour or race, religion, and sexuality, among other specified categories. This facilitates a full examination of encountered prejudice, taking into account both individual and intersecting identities.

The natural abundance of a country is measured in the spatiality arena using the "Red List Index" (IUCN, 2021) which shows that 0 = "all species gone" or 1 = "all species not expected to become extinct" and "Percentage of Protected Land" (UN Environment Programme, 2021), converting the quality of accessible nature into recognisable data points. "Extreme Weather Exposure" (IPCC, 2023) gives a quantified insight into environmental dangers and encompasses here the number of days that the population was exposed to hot and icing days. "Inland Passenger Rail Transport" (World Bank, 2021) captures accessibility and transit in passenger-kilometres per person, which are critical in understanding human-environment and social interactions.

However, some limits were discovered during operationalizing. Notably, "Inland Passenger Road Transport" data for certain nations was unavailable, while "Total Household Income" had

scaling anomalies between datasets. Such difficulties highlight the difficulty involved in combining data from many sources. There is, in particular, no international and longitudinal data on consciousness-related factors such as mindfulness, sensitivity, empathy, or awareness. As a result, consciousness may not be reflected at all in the study. Furthermore, the coverage of data for environmental risk is reduced, and only the population's exposure to hot and icy days is covered, which is a thin basis.

Concerning the outcome variable self-transcendence, a 10-item value inventory was inspired by the Portrait Value Survey (Schwartz et al., 2001) utilised in the ESS. Welzel (2010) outlines the creation and structural properties of this scale, demonstrating its broad validity. Respondents are shown brief sentences and asked to identify whether this description is extremely similar to them, similar to them, slightly similar to them, not similar to them, or not at all similar to them. The replies are classified from one to five (1 = very much like me, 5 = not at all like me). In the present research, replies were inverted such that a higher score implies higher identification with the value. The scale has already been evaluated and verified (Welzel, 2010). The discrepancies between the averages for universalism and benevolence items on one side and accomplishment and power value items on the other were used to generate the self-transcendence vs. self-enhancement scores. The primary motivational tensions present in each dimension are captured by these scores (Boer & Fischer, 2013; Schwartz, 1992). These estimates were made using the raw scores. Because the final score is stated as the relative significance of one value score compared to the other, these calculations already take into account any response effects. If there are individual or cultural response inclinations, they are equally applied throughout. The relative difference between the two conceptually opposed value scores already accounts for this response tendency (Fischer, 2004).

All data transformations and data preparations may be found in the chapter “R script” in the appendix.

3.3 Analysis

The statistical program R Studio was used for the analysis. The procedure entails a series of data pretreatment and transformations, followed by statistical analysis methods.

In the field of data analysis, dealing with missing data is critical. Ignoring or treating missing data wrongly might result in biased or misleading conclusions (Little & Rubin, 2019). We discovered missingness trends when reviewing our dataset. The nature of the missingness, whether it was missing completely at random (MCAR), missing at random (MAR), or missing

not at random (MNAR), was a critical initial step (Schafer & Graham, 2002). The *nanian* package in the R statistical programme was used to run Little's MCAR test. Under the MCAR assumption, this test computes a chi-squared statistic based on the difference between observed and predicted counts of missing data. A significant p-value implies that the MCAR hypothesis was rejected.

The dataset's missingness pattern was visualised utilising specialised visualisation tools. This graphic depiction is an effective way of presenting an overview of where missing data occur and in what concentration, allowing for a better understanding of any possible systemic patterns that may exist.

The *missRanger* approach was used to address this missingness rather than the *Mice* imputation due to the considerable processing resources that would have been needed. It is a well-known approach for imputing missing values, especially in mixed datasets with both numerical and categorical variables (Stekhoven & Bühlmann, 2012). The *missRanger* approach predicts and imputes missing data by using the power of random forests. We hoped to detect nuanced patterns in the data that might otherwise be missed by simpler imputation approaches by utilising this method (Breiman, 2001).

Once the imputation was finished, it was critical to assess the quality of the imputed data. This was achieved by contrasting observed and imputed values for numerical and categorical variables. Histograms of observed and imputed values were presented for numerical variables. This visual technique provides information about the distribution of imputed values and how well they match the observed data. Similarly, bar graphs were used to compare observed and imputed counts for categorical variables.

Multilevel model

A multidimensional regression technique has been applied that incorporates linear mixed-effects regression models (LMM) to investigate the complicated interactions among multiple factors and their possible influence on self-transformation. Mixed-effects models allow you to describe clustered or grouped data while taking into account that observations within the same group may be associated (Bates et al., 2015). Our data incorporates measures at two levels: individual-level data nested inside years, and then within nations. The Intraclass Correlation Coefficient (ICC), which quantifies the fraction of total variance owing to group differences, is a critical statistic determining the appropriateness of LMM (Heck, 2013). The ICC was calculated to justify our following modelling decisions. To measure homoscedasticity, residuals

would be visually compared to anticipated values, verifying that there is consistent variation throughout our projected scores. Q-Q plots have also been used to determine the normality of the residuals, which is a critical assumption for linear regression models (Field, 2013).

Following the initial model building, iterative model refining was the next critical phase. This was accomplished by a stepwise method in which the importance of each predictor was assessed by eliminating it from the model and then examining the degradation in the model's probability. If removing the variable did not substantially affect the model's fit ($p > 0.01$), it was permanently eliminated. This iterative method is consistent with James et al. (2013), who highlighted its effectiveness in improving complicated models with many predictors.

Furthermore, possible predictor interactions were looked out for. Iteratively, interaction effects were introduced, and their significance was assessed using likelihood ratio tests. According to Aiken and West (1991), investigating interaction effects may give a more nuanced understanding of how predictors may interact to impact an outcome.

Concerns around Omitted Variable Bias, Suppression Effect, and Multicollinearity were especially noticeable during the refinement process. These reservations could distort the links between national self-transcendence and other country-level factors like government spending on education, and leisure as well as GDP (see table 2 appendix, p. 15-16). Other predictors' effects may be suppressed, making them statistically insignificant. Furthermore, if national self-transcendence is significantly correlated with another variable, adding both to the model may result in multicollinearity and unstable coefficient estimates.

The introduction of interaction variables was seen to be a potential solution to these statistical concerns. Interaction terms enable the testing of conditional effects between predictors, assisting in the unravelling of the complex web of links between national self-transcendence and other country-level factors. After including these interaction factors, it was discovered that there was no significant interaction between national self-transcendence and other associated variables, confirming the model's stability and importance. As a result, this technique successfully minimised the statistical problems, resulting in a more robust and interpretable model that lends itself to more empirical inquiry.

4. Results

In terms of missing instances and imputation, Little's MCAR test on the dataset showed a $\chi^2(6,173) = 42,114$, $p < 0.001$, demonstrating 179 different patterns of missing data. Given this finding, the null hypothesis that the data is MCAR is untenable (Little & Rubin, 1987). As a result, the analysis must proceed with care, bearing in mind the possible consequences of this missing data mechanism while performing subsequent statistical analyses. Although it is not possible to evaluate whether the data is MAR or MNAR, the graphic visualisation of the missingness pattern shown in the appendix figure 1 (p. 10) indicates plausible patterns for the variables "Child in Household" and "Social Engagement." Because of this, as well as the significant number of missing instances ($\text{childhhe.rec} = 37\%$, $\text{scmeet.rec.c} = 17\%$), these two factors are ruled out. For the remaining data, the likelihood of missingness for every variable is calculated using MAR, allowing the imputation procedure to be used.

4.1 Descriptive results

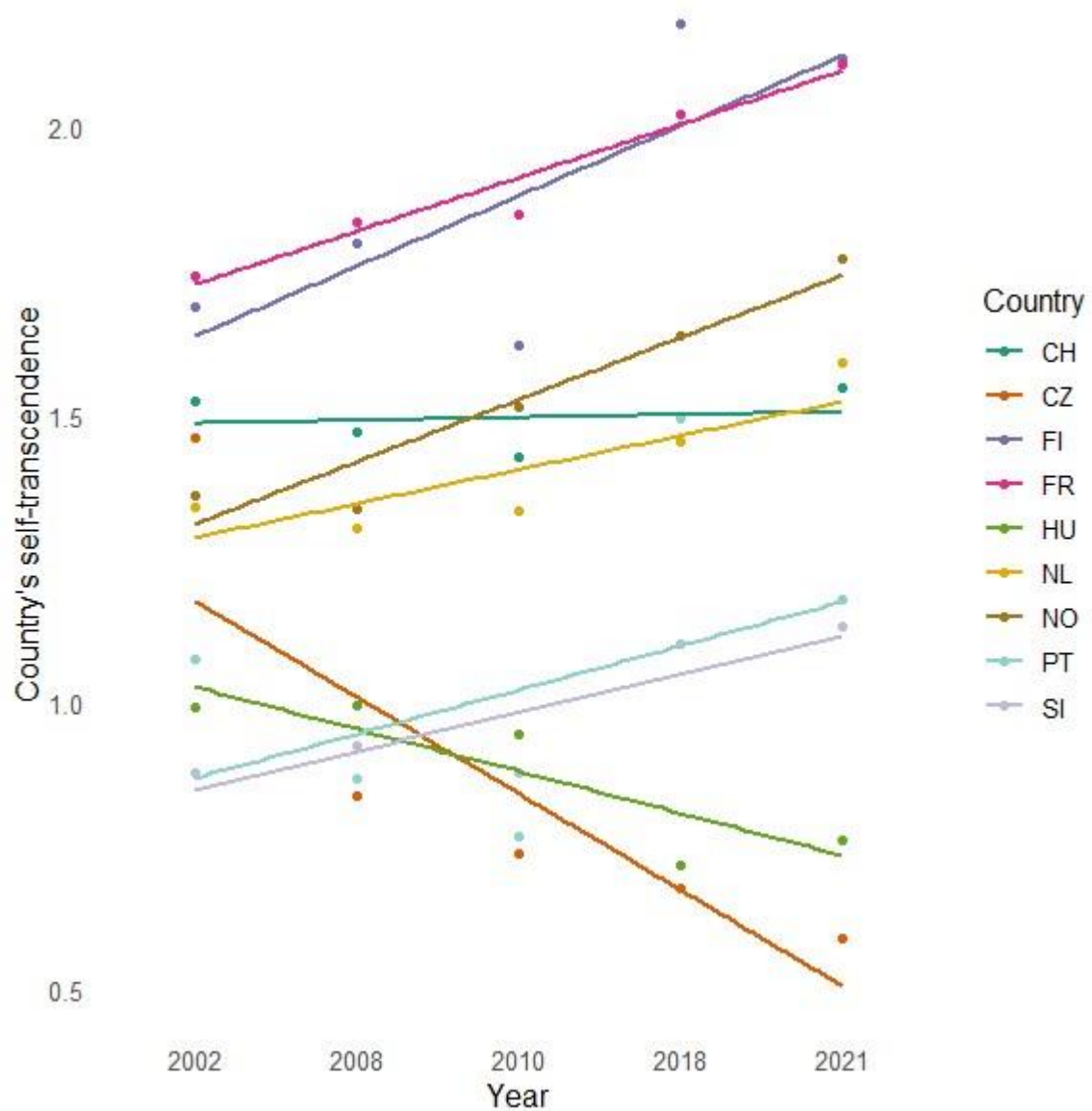
The following table 4.1.1 provides a descriptive summary of European Social Survey participant demographics across selected countries and years. There were substantial changes in male and female participation numbers among the nations examined over time. Most nations had a balance or near balance of male and female participation, with some significant outliers resulting in gender imbalances. Hungary, for example, had a significant gender difference in 2021, with 1150 male participants compared to just 699 females. The overrepresentation of males, in particular, may imply that the viewpoints and experiences of women are not well recorded, limiting the results' generalizability to the total Hungarian population. Countries such as the Czechia, on the other hand, attained an almost perfect gender balance in 2010, with 1196 men and 1190 females. The mean age of participants ranged from the late 40s to early 50s. Certain nations deviated from the overall trend. Portugal, for example, had a mean age of 54.02 in 2021, one of the highest mean ages in the sample.

Table 4.1.1: ESS respondents' demographic over time and across countries

country	year	<i>male</i>	<i>female</i>	<i>mean age</i>
CH	2002	1059	981	47,51
CH	2008	997	822	48,55
CH	2010	734	772	47,75
CH	2018	767	775	47,46
CH	2021	741	782	49,50
CZ	2002	710	650	52,22
CZ	2008	1034	984	47,06
CZ	2010	1196	1190	46,92
CZ	2018	1349	1049	49,00
CZ	2021	1397	1079	48,26
FI	2002	1040	960	45,59
FI	2008	1118	1077	47,94
FI	2010	967	911	48,79
FI	2018	907	848	50,86
FI	2021	797	780	52,57
FR	2002	824	679	47,28
FR	2008	1132	941	48,62
FR	2010	926	802	49,37
FR	2018	1097	913	52,34
FR	2021	1003	974	49,50
HU	2002	876	809	46,10
HU	2008	842	702	47,74
HU	2010	846	715	47,57
HU	2018	955	706	50,94
HU	2021	1150	699	50,45
NL	2002	1322	1042	48,03
NL	2008	960	818	49,27
NL	2010	993	836	50,38
NL	2018	840	833	48,58

NL	2021	720	750	48,61
NO	2002	933	1103	45,79
NO	2008	742	807	45,72
NO	2010	743	805	46,34
NO	2018	629	777	47,14
NO	2021	691	720	47,27
PT	2002	881	630	47,82
PT	2008	1441	926	52,70
PT	2010	1292	858	53,94
PT	2018	610	445	52,44
PT	2021	1066	772	54,02
SI	2002	795	724	44,38
SI	2008	690	596	46,52
SI	2010	750	653	47,40
SI	2018	708	610	49,32
SI	2021	661	591	49,37

Figure 4.1.1 illustrates the trajectory of self-transcendence scores, which have been adjusted for national context, from the years 2002 to 2021 for each country. In a majority of the nations examined, a general and comprehensive increase in self-transcendence ratings was seen. Certain countries exhibited significant variations during the analysed periods, whilst others demonstrated a rather consistent level of stability. During the time under investigation, it was observed that Northern and Central European countries, including Finland and France, regularly achieved higher ratings in self-transcendence. Finland exhibited exceptional performance, with France closely trailing behind. Switzerland's data suggests a lack of growth in the value of self-transcendence at a national scale. In contrast, large reductions were seen in the Czechia and Hungary among the Central and Eastern European nations. In 2021, Finland and France retained their positions at the top of the rankings, whilst the Czechia and Hungary had a downward trend, positioning them near the bottom end of the rankings.



Moving forward, table 4.1.2 provides a comprehensive overview of the descriptive statistics and bivariate correlations among the variables included in the final model. To get a more comprehensive understanding of the relationship among all variables under consideration, please refer to table 2 in the appendix (p. 15-16).

Table 4.1.2: Descriptive statistics and bivariate correlations among variables included in the final model (level-1 n = 78827; level-2 n = 45)

	<i>Mean</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12
1 Selftranscendence	1.34	1.14	1	0.07***	-0.04***	0.38***	0.2***	-0.17***	0.15***	0.12***	0.01**	-0.1***	0.07***	0.1***
2 Country's age	47.7	2.18		1	0.02***	0.17***	0.1***	-0.02***	0.01**	0.12***	-0.03***	0.01*	-0.06***	0
3 Country's political placement	5.21	0.35			1	-0.14***	-0.01**	0.01*	0.03***	-0.08***	0.15***	0.15***	-0.08***	0.05***
4 Country's Selftranscendence	1.32	0.44				1	0	0.04***	0.02***	0.09***	0.11***	-0.02***	0.18***	0
5 Age	0	18.54					1	-0.04***	0.61***	0.21***	-0.26***	0.02***	-0.2***	0.3***
6 Gender	-	-						1	-0.02***	-0.16***	0.03***	0.05***	0.01**	-0.05***
7 Child in Household	-	-							1	0.11***	-0.17***	0	-0.11***	0.2***
8 Religious	-0.01	3.08								1	-0.17***	0.11***	-0.01	0.09***
9 Education	-0.01	4.27									1	0	0.1***	-0.13***
10 Political placement	-0.01	2.21										1	-0.02***	-0.02***
11 Social engagment	0.05	1.38											1	-0.11***
12 Activity limitation	-	-												1

Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The arithmetic mean for self-transcendence is 1.34, with a standard deviation of 1.14. The finding indicates that, on average, individuals exhibited a little inclination towards the self-transcendence end of the self-transcendence versus self-enhancement scale. The standard deviation that accompanies the data demonstrates a wide dispersion of values around the mean, highlighting the extent of variability in the answers. The wide range of scores suggests that the sample consists of people with diverse degrees of self-transcendence.

The examination of the interconnections reveals a significant positive correlation ($r = 0.38$, $p < 0.001$) between an individual's self-transcendence and the self-transcendence score of their country. This suggests the potential existence of common cultural or national-level characteristics that may correlate with inclinations towards self-transcendence. Although this correlation is noteworthy, it does not definitively establish a causal relationship but rather underscores the need for more investigation into cultural intricacies. Simultaneously, the findings suggest a weak inverse correlation ($r = -0.04$, $p < 0.001$) between self-transcendence and a country's political orientation, indicating that individuals residing in nations with conservative political affiliations may exhibit somewhat lower levels of self-transcendence.

The present study examines the correlation between age and self-transcendence, revealing a statistically significant positive relationship ($r = 0.20$, $p < 0.001$). This finding suggests that as people advance in age, there is a potential inclination towards adopting self-transcending beliefs. The question of whether this phenomenon may be attributed to a developmental trajectory is thought-provoking. However, in order to avoid making any causal claims, it is essential to take into account other factors related to different stages of life that may interact with this pattern.

The presence of a child in the household ($r = 0.15, p < 0.001$) and religious affiliation ($r = 0.12, p < 0.001$) are additional indicators of the interconnectedness between various factors and self-transcendence. These findings suggest that relational dynamics and spiritual inclinations may play a role in shaping this construct. In contrast, the correlation between self-transcendence and education ($r = -0.10, p < 0.001$) is a thought-provoking discovery. This prompts a reflection on the potential convergence between educational experiences and transcendental ideals. The observed association between self-transcendence and gender ($r = -0.17, p < 0.001$), with a binary representation of 0 for men and 1 for females, indicates a potential tendency for females to exhibit lower scores in self-transcendence relative to males. Nevertheless, a comprehensive investigation is required to fully understand the intricate details of this correlation. To evaluate the presence of multicollinearity among the predictor variables included in our final model, we used the correlation matrix as a fundamental diagnostic tool.

4.2 Regression results

In addition to providing insights into the relationship between variables, Table 4.1.2 is also essential for assessing the presence of multicollinearity. The matrix generally shows no signs of multicollinearity, which is a crucial assumption to maintain the dependability of regression analysis. Upon comprehensive examination of all possible predictors, it was found that only a singular pair of variables, namely GDP and global connection, had a correlation coefficient that was above the commonly acknowledged threshold of 0.7 (Hair et al., 1995). Considering this fact, and in order to maintain the reliability of the model, the GDP has been excluded from the regression and only the global connectivity score stayed.

As stated in the methodology section, additional assumptions were evaluated before doing the regression analysis. For example, the intra-class correlation (ICC) value for the null model is deemed satisfactory (ICC-cntry:year = 0.14), indicating that 14% of the variability in self-transcendence may be attributed to differences across nations and years. This finding supports the appropriateness of using a linear mixed model (LMM) for further analysis.

Additionally, a plot of residuals versus expected values was conducted to assess the presence of homoscedasticity, which refers to consistent variation across predicted scores, as well as linearity. The results of this analysis can be seen in appendix figure 3 (p. 23) and indicate that these assumptions are met and found acceptable. In addition to this, Q-Q plots were used to assess the normality of the residuals, which is a fundamental assumption for linear regression models (see figure 2 in the appendix, p. 22).

The following section presents the outcomes of the iterative process of model refining for the primary impacts of the predictors and their interactions.

Table 4.2.1: Unstandardized hierarchical linear model regression coefficients for self-transcendence (level-1 n = 78827; level-2 n = 45)

Selftranscendence		<i>Estimate</i>	<i>95%-CI</i>
Level 1			
	Intercept	0,58 ***	0,28;0,89
	Age	0,04***	0,03;0,05
	Gender	-0,49*	-0,86;-0,12
	Religion	-0,07*	-0,11;0,03
	Education	0,01	-0,03;0,06
	Political Placement	0,03***	0,02;0,04
	Social Enagement Frequency	0,01	-0,01;0,04
	Activity limitation	0,08***	0,07;0,10
Level 2			
	Country's age	-0,03***	-0,03;-0,02
	Country's political placement	0,14***	0,11;0,18
	Country's selftranscendencen	1,06***	1,03;1,08
Interactions			
	Age X Gender	-0,00***	0,00;0,00
	Age X Education	0,00***	0,00;0,00
	Age X Political Placement	0,00*	0,00;0,00
	Age X Activity limitation	0,00***	-0,01;0,00
	Gender X Religion	-0,01***	-0,01;0,00
	Gender X Education	0,01***	0,01;0,01
	Gender X Political Placement	-0,01***	-0,02;-0,01
	Religious X Political Placement	0,00***	0,00;0,01
	Education X Political Placement	0,00***	0,00;0,00
	Country's age X Age	0,00***	0,00;0,00
	Country's age X Gender	0,03***	0,02;0,03
	Country's age X Education	0,00*	0,00;0,00
	Country's Political placement X Age	0,01***	0,00;0,01
	Country's Political placement X Gender	-0,17***	-0,21;-0,12
	Country's Political placement X Education	-0,02***	-0,02;-0,01
	Country's Political placement X Religion	0,02***	0,01;0,03
	Country's selftranscendence X Gender	-0,17***	-0,20;-0,14
	Country's selftranscendence X Education	0,01***	0,01;0,02
	Country's selftranscendence X Religion	0,00	-0,01;0,00
	Country's selftranscendence X Political Placement	-0,05***	-0,06;-0,04

p< 0 ***, p<0.001 **, p< 0.01 *, p<0.05 .

The objective of the research was to analyse the factors that contribute to the development of self-transcendence. The coefficient of determination, denoted as R²c, was found to be 0.2405,

suggesting that the factors included in the analysis explain about 24.05% of the variance in self-transcendence.

The Level 1 predictors exhibited a statistically significant intercept of 0.58, accompanied by a 95% confidence interval ranging from 0.28 to 0.89, $p < .001$. There was a favourable link seen between age and self-transcendence. In light of the findings, it is noticeable that there is a positive correlation between age and self-transcendence. Each extra year in age is associated with a 0.04-unit rise in self-transcendence. This relationship is supported by a 95% confidence interval ranging from 0.03 to 0.05. Furthermore, the statistical significance of this association is shown by a p-value of less than 0.001. The variable of gender was operationalized using a coding scheme where men were assigned a value of 0 and females were assigned a value of 1. The analysis found a statistically significant negative connection between gender and self-transcendence. Specifically, being female was linked with a drop of 0.49 units in self-transcendence compared to being male. This correlation fell within a 95% confidence interval ranging from -0.86 to -0.12. The p-value for this association was less than 0.05, showing statistical significance.

The impact of religion on self-transcendence presented to have a little negative effect, with a magnitude of 0.07 units. This association was on the verge of statistical significance, as indicated by the 95% confidence interval ranging from -0.11 to 0.03, with a p-value less than 0.05. It is worth mentioning that the variables of education and social engagement frequency were assessed, but their correlation with self-transcendence did not provide statistically significant results. Consequently, the effects of education and social engagement frequency on self-transcendence remain uncertain since their confidence intervals included zero. The study found that political placement had a significant positive effect on self-transcendence, with an increase of 0.03 units. This effect was confirmed by a 95% confidence interval ranging from 0.02 to 0.04, and the statistical significance was established with a p-value of less than .001. The bivariate variable of activity restriction exhibited a positive correlation, indicating that those without activity constraints saw a 0.08-unit rise in self-transcendence in comparison to those with limitations. This finding was supported by a 95% confidence interval ranging from 0.07 to 0.10, with a significance level of $p < .001$.

In the context of the Level 2 predictors, there exists a negative correlation between the average age of a country's inhabitants and self-transcendence. Specifically, the average age within a country is shown to decrease self-transcendence by 0.03 units, as indicated by the 95% confidence interval ranging from -0.03 to -0.02. This relationship is statistically significant, with a p-value of less than .001 but has a very small effect size. In contrast, the political

orientation of a nation had a significant positive impact on self-transcendence, with a coefficient of 0.14 units. The 95% confidence interval for this coefficient ranged from 0.11 to 0.18, indicating a high level of statistical certainty. The p-value associated with this finding was less than .001, further supporting its significance. The self-transcendence score of a nation had a statistically significant positive effect, increasing it by 1.06 units, with a 95% confidence interval ranging from 1.03 to 1.08, $p < .001$.

Interactions with age have been identified as especially significant. The impact of age on self-transcendence was shown to be contingent upon many individual factors, and a substantial number of these interactions yielded statistically significant results ($p < .001$). The interplay between age and several circumstances, including education, political orientation, and activity constraint, underscores the complex nature of age's influence on self-transcendence.

The analysis of gender-based interactions provided valuable insights into the intricate variances in self-transcendence pathways for both males and females, within the framework of other influencing factors. Nevertheless, the extent of these fluctuations was mostly modest and therefore less impactful. As an example, the findings reveal a little negative association between gender and religion ($\beta = -0.01$, 95% CI: -0.01 to -0.00, $p < .001$), suggesting an almost negligible disparity in self-transcendence scores among individuals of different genders within religious contexts. Within the realm of education, the association between gender ($\beta = 0.01$, 95% CI: 0.01 to 0.01, $p < .001$) suggests a little convergence of self-transcendence scores between genders as educational achievement increases. However, it is important to note that this convergence is of minimal magnitude. Additional investigation into the interplay of gender across different levels of analysis has shown complex and nuanced connections. As an example, the correlation between gender and the average age of a nation had a minimal impact ($\beta = 0.03$, 95% CI: 0.02 to 0.03, $p < .001$).

Moreover, the analysis reveals that the correlation between gender and a country's political orientation ($\beta = -0.17$, 95% CI: -0.21 to -0.12, $p < .001$) provides insight into the phenomenon that in countries leaning towards a right-leaning political stance, females may exhibit a slightly lower self-transcendence score compared to males, while controlling for other factors. Similarly, the correlation between gender and a country's intrinsic self-transcendence rating ($\beta = -0.17$, 95% CI: -0.20 to -0.14, $p < .001$) indicates that in countries with higher levels of baseline self-transcendence, females tend to have slightly lower scores in self-transcendence compared to males.

5. Discussion

5.1 Overall developments of country-level self-transcendence

The observed upward trend in self-transcendence scores across many nations, irrespective of economic or health adversities, may be examined within the framework of globalisation and the emergence of post-materialist ideals. According to Inglehart and Baker (2000), the post-materialism hypothesis proposed by Inglehart suggests that when countries experience more economic stability, there is a notable transition from materialistic values to post-materialistic values, which prioritise self-expression and the overall quality of life. This phenomenon may also be analysed using Maslow's hierarchy of needs. According to Maslow's theory, people undergo a sequential progression of hierarchical demands, beginning with physiological requirements and ending in self-actualization and ultimately self-transcendence (Maslow, 1943; Maslow, 1969). Maslow posits that self-transcendence encompasses the recognition and active pursuit of objectives that extend beyond one's own self, including altruistic behaviours and spiritual endeavours. Consistent with the post-materialism concept proposed by Inglehart and Baker, Maslow's hierarchy posits that if humans have their fundamental needs for safety and physiological well-being fulfilled, they are more inclined to prioritise higher-level wants, such as self-actualization and self-transcendence.

It might be said that when nations attain economic stability, individuals are afforded the prospect of ascending Maslow's hierarchy, ultimately attaining the pinnacle of self-transcendence. The paradigm proposed by Maslow offers an alternative theoretical perspective to comprehend the increasing worldwide scores in self-transcendence, complementing the sociocultural change explained by Inglehart and Baker (2000).

Furthermore, the ability of individuals to maintain a sense of self-transcendence in the face of crises may indicate the inherent human capability to discover significance and establish relationships within challenging circumstances (Frankl, 1963). The concept of resilience may be seen as consistent with Durkheim's idea of collective consciousness, which posits that a society's common beliefs and moral standards can foster solidarity and social cohesiveness in times of upheaval (Durkheim, 2014/1893).

An exception to the general trend is seen in the case of Czechia and Hungary. The decrease in self-transcendence seen in Czechia and Hungary may be situated within the broader historical framework of their post-Soviet era. The shift from a socialist system to a market-oriented economy in post-Soviet countries has resulted in significant social, political, and economic

transformations, causing disruptions in societal values and norms (Sztompka, 1993). The potential impediment to the formation of post-materialist ideals, including self-transcendence, may have been caused by economic difficulties and uncertainties related to the shift, especially if the major focus remains on economic survival (Inglehart & Baker, 2000). The enduring effects of state socialism's political legacies, such as centralised control and diminished individual liberty, might potentially shape communal ideals and attitudes of self-transcendence (Elster et al., 1998). The influence of historical narratives and cultural memories of Soviet rule on national identity and social norms may have an impact on the manifestation and prioritisation of self-transcendence (Todorova & Gille, 2010).

5.2 Gender interaction with Political Placement of Country and National Self-Transcendence

The finding that in politically conservative countries, women may exhibit a little lower score in self-transcendence compared to men may be understood via the lens of gender role theory. According to Eagly (1987), gender role theory suggests that men and women are subject to varying expectations due to the influence of societal norms and values. In contexts characterised by conservative and right-leaning ideologies, conventional gender norms tend to exhibit more prominence. The societal roles assigned to women have the potential to restrict their ability to achieve self-transcendence, perhaps as a result of limitations on their autonomy, access to education, or possibilities for spiritual growth (Hofstede, 2001).

The study examines furthermore the influence of gender on baseline self-transcendence values. In societies where there is a prevalence of high levels of self-transcendence, it is possible to interpret lower scores among females compared to men as a reflection of the gender disparities that exist within that particular cultural context. According to Nussbaum (2000), scholarly investigations have shown that gender disparity may be seen across several domains, including aspects related to spiritual and psychological well-being. Societies that place a significant emphasis on self-transcendence may nonetheless exhibit inherent gender prejudices that impede women's ability to attain or manifest this value, illustrating the intricate interplay between gender and other cultural and social elements (Crenshaw, 1989). In this case, the interconnectedness of gender with other socio-cultural components may explain why elevating self-transcendence as a cultural ideal does not always result in fair results for men and women.

The apparent disparity, as well as psychological research indicating that women have greater degrees of empathy and self-awareness, complicates the matter (Baron-Cohen &

Wheelwright, 2004; Davis, 1980). Empathy and self-awareness have been shown to be substantially connected with self-transcendence (Cloninger, 2004), implying that women might score similarly or even higher than males in this area.

Given that empathy and self-awareness are frequently regarded as foundational components of self-transcendence (Sahdra et al., 2010), this discrepancy raises concerns about the cultural or structural factors that may suppress or overshadow these innate tendencies in women in specific societal contexts. One theory is that, despite their greater degrees of empathy and self-awareness, cultural and societal constructions within a particular community may limit the expression or acknowledgement of women's self-transcendence. For example, if a society emphasises self-transcendence while still maintaining gender norms that restrict women's autonomy and opportunity, self-transcendence expression may become gendered, favouring men's social and psychological experiences over women's (Eagly, 1987; Hofstede, 2001).

Furthermore, it is important to understand how gendered self-transcendence may be socially constructed or understood. Because of prevalent gender stereotypes or cultural norms, traits such as empathy and self-awareness may be regarded differently when shown by men vs. when demonstrated by women (Fiske et al., 2002). As a result, attributes that should theoretically lead to greater self-transcendence may not be assigned comparable weight or priority when grading men and women, contributing to the gender gap in self-transcendence ratings.

5.3 The Impact of National Worldview on Individual Values

The proposition that a nation's self-transcendence score could potentially exert a "pull" influence on individual values is consistent with wider sociological theories concerning the social construction of reality. In their seminal work, Berger and Luckmann (1966) posited that societal norms and values are socially constructed entities that significantly impact individual perception. A higher score in national self-transcendence may indicate the presence of a shared value system that has a significant impact on people within a given culture, consequently influencing their perspectives and ethical principles.

The concept of self-transcendence as a societal norm is a topic of interest and significance in academic discourse. The proposition that the adoption of self-transcendence as a social norm may be contextualised within Schwartz's value theory. According to Schwartz (1992), self-transcendence has been recognised as one of the fundamental values that people prioritise in varying ways, influenced by their cultural background, personal experiences, and biological

requirements. The observed data indicating a noteworthy and affirmative impact of national self-transcendence scores could potentially be attributed to a mechanism in which societal values, such as self-transcendence, become deeply embedded within social norms, practises, and institutions, thereby exerting an influence on individual priorities and behaviours (Schwartz & Bardi, 2001).

The phenomenon of the national self-transcendence score's 'pull' effect may be understood in light of Tajfel's social identity theory. According to this theory, people are susceptible to the impact of the values and norms associated with the groups they are a part of, including their national identity (Tajfel & Turner, 1979). Therefore, the prioritisation of self-transcendence at a national level has the potential to cultivate a common identity and promote shared values. The observed empirical evidence indicating a positive correlation between national self-transcendence and individual scores provides support for theoretical frameworks that explore the interplay between societal norms and individual values. The insight underscores the intricate relationship between personal and communal principles, indicating that self-transcendence is not just an inherent characteristic of individuals, but rather a societal standard influenced by cultural surroundings. Additional investigation has the potential to provide significant knowledge on the processes through which national values manifest in the attitudes and actions of individuals.

However, since national self-transcendence may serve as a proxy for other cultural, social, or economic factors that were not expressly accounted for in the regression analysis, this effect may be much stronger than previously anticipated. A high national self-transcendence score may connect with other national qualities such as social welfare systems, educational achievement, or social capital. Such indicators may also be indirectly impacting individual beliefs and behaviours, adding to our knowledge of the complex causation at work (Putnam, 2000; Sen, 1999).

While the regression analysis in this research did account for a variety of characteristics, the multidimensionality of cultures implies that self-transcendence may be connected to other, unexplored dimensions of national culture. This complicates the interpretation of the "pull" impact of national self-transcendence on individual values. If, at the national level, a high self-transcendence score is indicative of other societal traits, it may be argued that self-transcendence serves not just as a measure of individual desire but also as an indicator of other societal constructions. Future research should investigate these possible links in order to provide a more complete picture of how individual and social values interact (Inglehart & Welzel, 2005).

6. Conclusion

The investigation of self-transcendence in contemporary Europe, within this study, offers a lot more than an empirical analysis of one specific value across different countries. It encourages an important discussion on the multifaceted system of influences that define human values within a globalizing world (Inglehart & Baker, 2000). By incorporating a multidisciplinary approach, this study combines sociological, psychological, and environmental studies and political science perspectives. This all-encompassing lens not only provides a more holistic framework for analysis, but also reflects the complexities and difficulties inherent to the real world. Using descriptive and multilevel regression methods, this study aims to not only identify patterns but also provide interpretations of the underlying connections and interactions.

The analysis reveals a recurring theme of self-transcendence that is present across many settings but is also influenced by socio-political and historical factors. The dichotomy encapsulates the fundamental nature of a globalised society, whereby the proliferation of common values is juxtaposed with the enduring influence of distinct national identities shaped by historical, political, and cultural legacies (Todorova & Gille, 2010; Sztompka, 1993).

The variability revealed in self-transcendence scores throughout Europe, together with its interaction with gender and political orientation, indicates the complex equilibrium between individual liberty and group identity (Eagly, 1987; Hofstede, 2001). The statement reflects the concept proposed by Durkheim on the intricate balance within the division of labour (Durkheim, 2014/1893), as well as Schwartz's theory on values (Schwartz & Bardi, 2001). Both Durkheim and Schwartz emphasise the interdependent connection between the individual and society.

Despite these contributions, numerous limitations need to be addressed. The research specifically excludes consciousness characteristics such as awareness, empathy, and mindfulness. It also excludes potential indicators such as educational quality, government spending in diverse areas, and sustainable consumption habits. Furthermore, the study did not thoroughly investigate in depth the influence of institutional characteristics such as educational, healthcare or welfare systems in developing self-transcendence. The study is also limited by its proximations of factors such as environmental danger and access to nature, which might impact value orientation. Furthermore, the analysis fails to adequately examine outliers such as Slovenia and Hungary, which differ from the usually observed patterns.

Future research should try to close these gaps by including awareness factors, a larger collection of sociopolitical indicators, and an in-depth examination of the function of

institutions. Longitudinal studies may provide more detailed insights into how self-transcendence changes over time in response to dynamic economic, political, and cultural events. Gender, education, and political leanings studies that concentrate on the interconnectedness of these elements with self-transcendence are also relevant. It would also be pivotal to investigate how environmental elements and spatiality influence self-transcendence in a broader spectrum.

7. Bibliography

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Sage.
- Allport, G. W. (1985). The historical background of social psychology. In G. Lindzey & E. Aronson (Eds.), *The handbook of social psychology* (3rd ed., Vol. 1, pp. 1-46). Random House.
- Bai, X., McAllister, R. R. J., Beaty, R. M., & Taylor, B. (2016). Urban policy and governance in a global environment: complex systems, scale mismatches and public participation. *Current Opinion in Environmental Sustainability*, 20, 18–27.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall, Inc.
- Baron-Cohen, S., & Wheelwright, S. (2004). The empathy quotient: An investigation of adults with Asperger syndrome or high functioning autism, and normal sex differences. *Journal of Autism and Developmental Disorders*, 34(2), 163–175.
- Bates, D., Mächler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, 67(1), 1-48.
- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117(3), 497–529.
- Berger, P. L., & Luckmann, T. (1966). *The social construction of reality: A treatise in the sociology of knowledge*. Anchor Books.
- Besley, T., & Persson, T. (2011). *Pillars of Prosperity: The Political Economics of Development Clusters*. Princeton University Press
- Bilsky, W., Janik, M., & Schwartz, S. H. (2011). The structural organization of human values—Evidence from three rounds of the European Social Survey (ESS). *Journal of Cross-Cultural Psychology*, 42(5), 759-776.
- Boden, J. M., Fergusson, D. M., & Horwood, L. J. (2007). Anxiety disorders and suicidal behaviors in adolescence and young adulthood: Findings from a longitudinal study. *Psychological Medicine*, 37(3), 431-440.
- Boer, D., & Fischer, R. (2013). How and when do personal values guide our attitudes and sociality? Explaining cross-cultural variability in attitude–value linkages. *Psychological Bulletin*, 139(5), 1113–1147. <https://doi.org/10.1037/a0031347>
- Boulstridge, E., & Carrigan, M. (2000). Do consumers really care about corporate responsibility? Highlighting the attitude—behavior gap. *Journal of Communication Management*, 4(4), 355–368.
- Breiman, L. (2001). Random forests. *Machine learning*, 45(1), 5-32.
- Brown, B. (2012). *Daring greatly: How the courage to be vulnerable transforms the way we live, love, parent, and lead*. Gotham Books.
- Brown, G., & Raymond, C. (2007). The relationship between place attachment and landscape values: Toward mapping place attachment. *Applied Geography*, 27(2), 89-111.
- Bryman, A. (2016). *Social research methods*. Oxford university press.
- Capaldi, C. A., Dopko, R. L., & Zelenski, J. M. (2014). The relationship between nature connectedness and happiness: a meta-analysis. *Frontiers in psychology*, 5, 976.
- Cloninger, C. R. (2004). *Feeling Good: The Science of Well-Being*. New York: Oxford University Press.
- Cloninger, C. R., Svrakic, D. M., & Przybeck, T. R. (1993). A psychobiological model of temperament and character. *Archives of General Psychiatry*, 50(12), 975-990. doi: 10.1001/archpsyc.1993.01820240059008. PMID: 8250684.

- Crenshaw, K. (1989). Demarginalizing the intersection of race and sex: A black feminist critique of antidiscrimination doctrine, feminist theory and antiracist politics. *University of Chicago Legal Forum*, 1(8), 139-167.
- Csikszentmihalyi, M., & Robinson, R. E. (1990). *The art of seeing: An interpretation of the aesthetic encounter*. Getty Publications.
- Dambrun, M., & Ricard, M. (2011). Self-centeredness and selflessness: A theory of self-based psychological functioning and its consequences for happiness. *Review of General Psychology*, 15(2), 138–157. doi:10.1037/a0023059.
- Davidov, E., Seddig, D., Gorodzeisky, A., Raijman, R., Schmidt, P., & Semyonov, M. (2019). Direct and indirect predictors of opposition to immigration in Europe: Individual values, cultural values, and symbolic threat. *Journal of Ethnic and Migration Studies*, 45(6), 923-940.
- Davidson, R. J., Kabat-Zinn, J., Schumacher, J., Rosenkranz, M., Muller, D., Santorelli, S. F., Urbanowski, F., Harrington, A., Bonus, K., & Sheridan, J. F. (2003). Alterations in brain and immune function produced by mindfulness meditation. *Psychosomatic Medicine*, 65(4), 564-570. doi: 10.1097/01.psy.0000077505.67574.e3. PMID: 12883106.
- Davis, D. M., & Hayes, J. A. (2011). What are the benefits of mindfulness? A practice review of psychotherapy-related research. *Psychotherapy*, 48(2), 198–208.
- Davis, M. H. (1980). A multidimensional approach to individual differences in empathy. *JSAS Catalog of Selected Documents in Psychology*, 10, 85.
- De Vries, S., Verheij, R. A., Groenewegen, P. P., & Spreeuwenberg, P. (2003). Natural environments—healthy environments? An exploratory analysis of the relationship between greenspace and health. *Environment and Planning A*, 35(10), 1717–1731.
- Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227-268.
- DHL. (2022). DHL Global Connectedness Index. Deutsche Post DHL Group.
- Durkheim, E. (1912). *The elementary forms of the religious life*. George Allen & Unwin.
- Durkheim, E. (2014). *The division of labor in society*. (Original work published 1893). Palgrave Macmillan.
- Eagly, A. H. (1987). *Sex Differences in Social Behavior: A Social-Role Interpretation*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Elster, J., Offe, C., & Preuss, U. K. (Eds.). (1998). *Institutional design in post-communist societies: Rebuilding the ship at sea*. Cambridge University Press.
- Emmons, R. A. (1999). *The psychology of ultimate concerns: Motivation and spirituality in personality*. Guilford Press.
- Enders, C.K., Tofighi, D. (2007). Centering predictor variables in cross-sectional multilevel models: a new look at an old issue. *Psychol. Methods* 12(2), 121–138. doi:10.1037/1082-989X.12.2.121
- European Social Survey. (2014). *Weighting European Social Survey Data*. http://www.europeansocialsurvey.org/docs/methodology/ESS_weighting_data_1.pdf
- Eurostat. (2023). Government revenue, expenditure and main aggregates. Retrieved April 27, 2023, from https://ec.europa.eu/eurostat/databrowser/view/gov_10a_main/default/table?lang=en
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. Sage.
- Fischer, R. (2004). Standardization to account for cross-cultural response bias: A classification of score adjustment procedures and review of research in JCCP. *Journal of Cross-Cultural Psychology*, 35, 263–282.
- Fiske, S. T., Cuddy, A. J., Glick, P., & Xu, J. (2002). A Model of (Often Mixed) Stereotype Content: Competence and Warmth Respectively Follow from Perceived Status and Competition. *Journal of Personality and Social Psychology*, 82(6), 878-902.

- Frankl, V. E. (1963). *Man's search for meaning: An introduction to logotherapy*. Washington Square Press.
- Fuentes, A. (2020). *Why We Believe: Evolution and the Human Way of Being*. Yale University Press.
- Giddens, A. (1971). *Capitalism and modern social theory: An analysis of the writings of Marx, Durkheim and Max Weber*. Cambridge University Press.
- Giddens, A. (1984). *The Constitution of Society*. University of California Press.
- Gifford, R., & Nilsson, A. (2014). Personal and social factors that influence pro-environmental concern and behaviour: A review. *International Journal of Psychology*, 49(3), 141-157.
- Goldstein, J. (2016). Emergence, Self-Transcendence, and Education. In: Koopmans, M., Stamovlasis, D. (eds) *Complex Dynamical Systems in Education*. Springer, Cham. https://doi.org/10.1007/978-3-319-27577-2_4
- Granovetter, M. (1973). The strength of weak ties. *American Journal of Sociology*, 78(6), 1360-1380.
- Haidt, J. (2012). *The righteous mind: Why good people are divided by politics and religion*. Pantheon.
- Haidt, J., & Morris, J. P. (2009). Finding the self in self-transcendent emotions. *Proceedings of the National Academy of Sciences of the United States of America*, 106, 7687–7688. <http://dx.doi.org/10.1073/pnas.0903076106>.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (1995). *Multivariate data analysis* (Vol. 3, No. 4). Upper Saddle River, NJ: Prentice hall.
- Hale, T., Angrist, N., Goldszmidt, R., Kira, B., Petherick, A., Phillips, T., ... & Tatlow, H. (2020). A global panel database of pandemic policies (Oxford COVID-19 Government Response Tracker). *Nature Human Behaviour*, 5(4), 529-538.
- Hanushek, E. A., & Woessmann, L. (2015). *The knowledge capital of nations: Education and the economics of growth*. MIT Press.
- Hartig, T., Mitchell, R., De Vries, S., & Frumkin, H. (2014). Nature and health. *Annual Review of Public Health*, 35, 207-228.
- Hawkey, L. C., & Cacioppo, J. T. (2010). Loneliness matters: a theoretical and empirical review of consequences and mechanisms. *Annals of Behavioral Medicine*, 40(2), 218–227.
- Heck, R. H., Thomas, S. L., & Tabata, L. N. (2013). *Multilevel and longitudinal modeling with IBM SPSS*. Routledge.
- Hofstede, G. (2001). *Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations Across Nations*. Thousand Oaks, CA: Sage Publications.
- Holt-Lunstad, J., Smith, T. B., & Layton, J. B. (2010). Social relationships and mortality risk: A meta-analytic review. *PLoS Medicine*, 7(7), e1000316.
- Hood, R. W., Jr. (2003). The relationship between religion and spirituality. In D. Bromley, A. L. Greil, & D. Bromley (Eds.), *Defining religion: Investigating the boundaries between the sacred and the secular: Vol. 10. Religion and the social order* (pp. 241–265). Amsterdam, the Netherlands: Elsevier Science. [http://dx.doi.org/10.1016/S1061-5210\(03\)10014-X](http://dx.doi.org/10.1016/S1061-5210(03)10014-X).
- Hoskins, B. J., & Woolings, T. (2015). "Persistent extratropical regimes and climate extremes". *Current Climate Change Reports*, 1(3), 115-124. This article outlines how changes in atmospheric circulation patterns are contributing to more frequent and intense extreme weather events, such as storms and heatwaves.

- Howell, A. J., Dopko, R. L., Passmore, H. A., & Buro, K. (2011). Nature connectedness: Associations with well-being and mindfulness. *Personality and Individual Differences*, 51(2), 166-171.
- Hox, J. J., Moerbeek, M., & Van de Schoot, R. (2017). *Multilevel analysis: Techniques and applications*. Routledge.
- Inglehart, R., & Baker, W. E. (2000). Modernization, Cultural Change, and the Persistence of Traditional Values. *American Sociological Review*, 65(1), 19-51.
- Inglehart, R., & Welzel, C. (2005). *Modernization, Cultural Change, and Democracy: The Human Development Sequence*. Cambridge: Cambridge University Press.
- IPCC. (2023). *Climate Change 2023 Synthesis Report*. In: *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, pp. 35-115. doi:10.59327/IPCC/AR6-9789291691647
- IUCN. (2021). *The IUCN Red List of Threatened Species*. International Union for Conservation of Nature.
- Ives, C. D., Abson, D. J., von Wehrden, H., Dörninger, C., Klaniecki, K., & Fischer, J. (2021). Reconnecting with nature for sustainability. *Sustainability Science*, 16(2), 831-843.
- Jackson, T. (2005). *Motivating Sustainable Consumption: A Review of Evidence on Consumer Behaviour and Behavioural Change*. Sustainable Development Research Network.
- James, G., Witten, D., Hastie, T., & Tibshirani, R. (2013). *An introduction to statistical learning*. Springer.
- Jasmine L. Trigwell, Andrew J. P. Francis, and Kathleen L. Bagot. (2014). Nature Connectedness and Eudaimonic Well-Being: Spirituality as a Potential Mediator. *Ecopsychology*, 6(4), 241-251. <http://doi.org/10.1089/eco.2014.0025>
- Jowell, R., & The Central Coordinating Team. (2003). *European Social Survey: Technical report*. London: Centre for Comparative Social Surveys.
- Kabat-Zinn, J. (1990). *Full catastrophe living: The program of the Stress Reduction Clinic at the University of Massachusetts Medical Center*. Delta.
- Kalberg, S. (1980). Max Weber's types of rationality: Cornerstones for the analysis of rationalization processes in history. *American Journal of Sociology*, 85(5), 1145-1179.
- Kasser, T. (2016). Materialistic values and goals. *Annual Review of Psychology*, 67, 489–514.
- Kawachi, I., & Berkman, L. F. (2001). Social ties and mental health. *Journal of Urban health*, 78(3), 458-467.
- Kellert, S. R., & Wilson, E. O. (1993). *The Biophilia Hypothesis*. Island Press.
- King, M. (2009). The international financial crisis: causes, consequences and contagion. *World Economics*, 10(3), 91-108.
- Koltko-Rivera, M. E. (2004). The psychology of worldviews. *Review of General Psychology*, 8(1), 3–58.
- Koltko-Rivera, M. E. (2006). Rediscovering the later version of Maslow's hierarchy of needs: Self-transcendence and opportunities for theory, research, and unification. *Review of General Psychology*, 10(4), 302-317.
- Krugman, P. (2009). *The return of depression economics and the crisis of 2008*. WW Norton & Company.
- Lamers, S. M. A., Bolier, L., Westerhof, G. J., Smit, F., & Bohlmeijer, E. T. (2012). The impact of emotional well-being on long-term recovery and survival in physical illness: A meta-analysis. *Journal of Behavioral Medicine*, 35(5), 538–547.
- Berger, P. L., & Luckmann, T. (1966). *The Social Construction of Reality: A Treatise in the Sociology of Knowledge*. New York: Anchor Books.

- Lamers, S. M., Westerhof, G. J., Bohlmeijer, E. T., Ten Klooster, P. M., & Keyes, C. L. (2011). Evaluating the psychometric properties of the Mental Health Continuum-Short Form (MHC-SF). *Journal of Clinical Psychology*, 67(1), 99-110.
- Le Blanc, D. (2015). Towards integration at last? The sustainable development goals as a network of targets. *Sustainable Development*, 23(3), 176-187.
- Legido-Quigley, H., Mateos-García, J. T., Campos, V. R., Gea-Sánchez, M., Muntaner, C., & McKee, M. (2020). The resilience of the Spanish health system against the COVID-19 pandemic. *The Lancet Public Health*, 5(5), e251-e252.
- Little, R. J. A., & Rubin, D. B. (1987). *Statistical analysis with missing data*. John Wiley & Sons.
- Little, R. J., & Rubin, D. B. (2019). *Statistical analysis with missing data*. John Wiley & Sons.
- Major, B., & O'Brien, L. T. (2005). The social psychology of stigma. *Annual Review of Psychology*, 56, 393-421.
- Marx, K. (1844). *Economic & philosophic manuscripts of 1844*. International Publishers Co.
- Marx, K. (1867). *Capital*, volume I. Penguin [Marx, K., & Engels, F. (1970). *The German ideology*. International Publishers.
- Maslow, A. H. (1943). A Theory of Human Motivation. *Psychological Review*, 50(4), 370-396.
- Maslow, A. H. (1964). *Religions, values, and peak-experiences*. Columbus, OH: Ohio State University Press.
- Maslow, A. H. (1969). Various Meanings of Transcendence. In *Toward a Psychology of Being*. New York: Van Nostrand Reinhold.
- Maslow, A. H. (1971). *The farther reaches of human nature*. Viking.
- McFarland, S., Webb, M., & Brown, D. (2012). All humanity is my ingroup: A measure and studies of identification with all humanity. *Journal of Personality and Social Psychology*, 103(5), 830-853.
- Mudde, C. (2017). *Populism: A very short introduction*. Oxford University Press.
- Nelson-Coffey, S. K., Killingsworth, M. A., Layous, K., Cole, S. W., & Lyubomirsky, S. (2019). Parenthood is associated with greater well-being for fathers than mothers. *Personality and Social Psychology Bulletin*, 45(9), 1378-1390.
- Newberg, A. B., & d'Aquili, E. G. (2000). The neuropsychology of religious and spiritual experience. *Journal of Consciousness Studies*, 7(11-12).
- Nicola, M., Alsafi, Z., Sohrabi, C., Kerwan, A., Al-Jabir, A., Iosifidis, C., ... & Agha, R. (2020). The socio-economic implications of the coronavirus pandemic (COVID-19): A review. *International Journal of Surgery*, 78, 185-193.
- Nisbet, E. K., Zelenski, J. M., & Murphy, S. A. (2009). The Nature Relatedness Scale: Linking individuals' connection with nature to environmental concern and behavior. *Environment and Behavior*, 41(5), 715-740.
- Nisbet, E. K., Zelenski, J. M., & Murphy, S. A. (2011). Happiness is in our nature: Exploring nature relatedness as a contributor to subjective well-being. *Journal of Happiness Studies*, 12(2), 303-322.
- Nussbaum, M. C. (2000). *Women and human development: The capabilities approach*. Cambridge University Press.
- Otto, S., & Pensini, P. (2017). Nature-based environmental education of children: Environmental knowledge and connectedness to nature, together, are related to ecological behaviour. *Global Environmental Change*, 47, 88-94.
- Pager, D., & Shepherd, H. (2008). The sociology of discrimination: Racial discrimination in employment, housing, credit, and consumer markets. *Annual Review of Sociology*, 34, 181-209.

- Pearce, P. L. (2011). *Tourist behaviour and the contemporary world*. Channel View Publications.
- Piedmont, R. L. (1999). Does spirituality represent the sixth factor of personality? Spiritual transcendence and the five-factor model. *Journal of Personality*, 67(6), 985-1013.
- Piff, P. K., Dietze, P., Feinberg, M., Stancato, D. M., & Keltner, D. (2015). Awe, the small self, and prosocial behavior. *Journal of Personality and Social Psychology*, 108(6), 883-899.
- Piketty, T. (2014). *Capital in the twenty-first century*. Harvard University Press.
- Purdie-Vaughns, V., & Eibach, R. P. (2008). Intersectional invisibility: The distinctive advantages and disadvantages of multiple subordinate-group identities. *Sex Roles*, 59(5-6), 377-391.
- Putnam, R. D. (2000). *Bowling Alone: The Collapse and Revival of American Community*. New York: Simon & Schuster.
- Rajan, R. (2010). *Fault lines: How hidden fractures still threaten the world economy*. Princeton University Press.
- Ratcliffe, E., Baxter, W. L., & Martin, M. (2021). Parental/Guardians' Connection to Nature Better Predicts Children's Nature Connectedness than Visits or Area-Level Characteristics. *Frontiers in Psychology*, 12, 672689.
- Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (Vol. 1). Sage.
- Reed, P. G. (1991). Self-transcendence and mental health in oldest-old adults. *Nursing Research*, 40(1), 5-11.
- Richardson, M., & Sheffield, D. (2015). Reflective Self-Attention: A More Stable Predictor of Connection to Nature Than Mindful Attention. *Ecopsychology*, 7(3), 166-175. <http://doi.org/10.1089/eco.2015.0010>
- Richardson, M., Hamlin, I., Butler, C. W., Thomas, R., & Hunt, A. (2022). Actively Noticing Nature (Not Just Time in Nature) Helps Promote Nature Connectedness. *Ecopsychology*, 14(1), 8-16.
- Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F. S., Lambin, E. F., ... & Nykvist, B. (2009). A safe operating space for humanity. *Nature*, 461(7263), 472-475.
- Sahdra, B. K., MacLean, K. A., Ferrer, E., Shaver, P. R., Rosenberg, E. L., Jacobs, T. L., ... & Saron, C. D. (2010). Enhanced Response Inhibition During Intensive Meditation Training Predicts Improvements in Self-Reported Adaptive Socioemotional Functioning. *Emotion*, 11(2), 299-312.
- Sassen, S. (1998). *Globalization and its discontents: Essays on the new mobility of people and money*. The New Press.
- Schafer, J. L., & Graham, J. W. (2002). Missing data: our view of the state of the art. *Psychological methods*, 7(2), 147.
- Schmitt, M. T., Branscombe, N. R., Postmes, T., & Garcia, A. (2014). The consequences of perceived discrimination for psychological well-being: a meta-analytic review. *Psychological Bulletin*, 140(4), 921.
- Schnell, T. (2011). Individual differences in meaning-making: Considering the variety of sources of meaning, their density and diversity. *Personality and Individual Differences*, 51(5), 667-673.
- Schönbach, D. M. I., Tiscareno-Osorno, X., MacIntyre, T. E., Smith, S., MacIntyre, D., & Demetriou, Y. (2022). What socio-demographic characteristics of university students in Southern Germany predict their urban nature connectedness?. *PloS one*, 17(8), e0272344. <https://doi.org/10.1371/journal.pone.0272344>
- Schutte, N. S., & Malouff, J. M. (2018). Mindfulness and connectedness to nature: A meta-analytic investigation. *Personality and Individual Differences*, 127, 10-14.

- Schwartz, S. H. (1992). Universals in the Content and Structure of Values: Theoretical Advances and Empirical Tests in 20 Countries. *Advances in Experimental Social Psychology*, 25, 1-65.
- Schwartz, S. H. (2003). A Proposal for Measuring Value Orientations across Nations. *Questionnaire Package of the European Social Survey*, 259-290.
- Schwartz, S. H. (2012). An overview of the Schwartz theory of basic values. *Online Readings in Psychology and Culture*, 2(1), 2307–0919.
- Schwartz, S. H., & Bardi, A. (2001). Value Hierarchies Across Cultures: Taking a Similarities Perspective. *Journal of Cross-Cultural Psychology*, 32(3), 268-290.
- Schwartz, S. H., Melech, G., Lehmann, A., Burgess, S. A. M., & Harris, M. (2001). Extending the cross-cultural validity of the theory of basic human values with a different method of measurement. *Journal of Cross Cultural Psychology*, 32, 519–542.
- Sen, A. (1999). *Development as Freedom*. New York: Alfred A. Knopf.
- Sendjaya, S. (2015). *Personal and organizational excellence through servant leadership*. Springer.
- Skierkowski, D., & Wood, R. M. (2012). To text or not to text? The importance of text messaging among college-aged youth. *Computers in Human Behavior*, 28(2), 744–756.
- Slangen, A. B. A., Church, J. A., Zhang, X., & Monselesan, D. P. (2016). "The sea level response to external forcings in historical simulations of CMIP5 climate models". *Journal of Climate*, 29(21), 7655-7672. This article assesses projections of sea-level rise under different climate scenarios, finding that human activities are the dominant drivers of rising sea levels.
- Smith, T. (2016). *European Societies: Mapping Structure and Change*. Bristol: Policy Press.
- Stekhoven, D. J., & Bühlmann, P. (2012). MissForest—non-parametric missing value imputation for mixed-type data. *Bioinformatics*, 28(1), 112-118.
- Sztompka, P. (1993). *The sociology of social change*. Blackwell Publishers.
- Tajfel, H., & Turner, J. C. (1979). An Integrative Theory of Intergroup Conflict. In W. G. Austin & S. Worchel (Eds.), *The Social Psychology of Intergroup Relations* (pp. 33-47). Monterey, CA: Brooks/Cole.
- Taylor, C. (1989). *Sources of the self: The making of the modern identity*. Harvard University Press.
- Tillich, P. (1952). *The courage to be*. Yale University Press.
- Tina Braun & Paul Dierkes (2017) Connecting students to nature – how intensity of nature experience and student age influence the success of outdoor education programs, *Environmental Education Research*, 23:7, 937-949, DOI: 10.1080/13504622.2016.1214866
- Todorova, M., & Gille, Z. (Eds.). (2010). *Post-communist nostalgia*. Berghahn Books.
- Tornstam, L. (1997). Gerotranscendence: the contemplative dimension of aging. *Journal of Aging Studies*, 11(2), 143-154.
- Townsend, M., & Weerasuriya, R. (2010). *Beyond Blue to Green: The benefits of contact with nature for mental health and well-being*. Beyond Blue Limited.
- Turner, J. H. (1986). *The structure of sociological theory*. The Dorsey Press.
- UN Environment Programme. (2021). *Protected Planet Report 2021*. UNEP-WCMC.
- Van Cappellen, P., & Rimé, B. (2014). Positive emotions and self-transcendence. In V. Saroglou (Ed.), *Religion, personality, and social behavior* (pp. 123–146). New York, NY: Psychology Press.
- Vigo, D., Thornicroft, G., & Atun, R. (2016). Estimating the true global burden of mental illness. *The Lancet Psychiatry*, 3(2), 171-178.
- Watts, R., Kettner, H., Geerts, D., Gandy, S., Kartner, L., Mertens, L., Timmermann, C., Nour, M. M., Kaelen, M., Nutt, D., Carhart-Harris, R., & Roseman, L. (2022). The Watts

- Connectedness Scale: A new scale for measuring a sense of connectedness to self, others, and the world. Original Investigation. *Journal Name*, Volume(Issue), Page Numbers.
<https://doi.org/10.1007/s00213-022-06187-5>
- Weber, M. (1930). *The Protestant ethic and the spirit of capitalism*. Routledge.
- Weber, M. (1978). *Economy and society: An outline of interpretive sociology* (G. Roth & C. Wittich, Eds.). University of California Press.
- Welzel, C. (2010). How selfish are self-expression values? A civicness test. *Journal of Cross-Cultural Psychology*, 41(2), 152–174. <https://doi.org/10.1177/0022022109354378>
- White, M. P., Alcock, I., Wheeler, B. W., & Depledge, M. H. (2013). Would you be happier living in a greener urban area? A fixed-effects analysis of panel data. *Psychological Science*, 24(6), 920–928.
- Whittingham, M. J., Stephens, P. A., Bradbury, R. B., & Freckleton, R. P. (2006). Why do we still use stepwise modelling in ecology and behaviour?. *Journal of Animal Ecology*, 75(5), 1182–1189.
- World Bank. (2021a). World Bank national accounts data, and OECD National Accounts data files. Economic Policy & Debt: National accounts: US\$ at current prices: Aggregate indicators. Retrieved April 27, 2023, from <https://databank.worldbank.org/reports.aspx?source=2&series=NY.GDP.MKTP.CD&country=#>
- World Bank. (2021b). *World Development Indicators*. The World Bank Group.
- World Health Organization. (2018). *Global Health Estimates: Life expectancy and leading causes of death and disability*. WHO.
- Wuthnow, R. (2002). *Loose connections: Joining together in America's fragmented communities*. Harvard University Press.
- Yaden, D. B., Haidt, J., Hood, R. W., Vago, D. R., & Newberg, A. B. (2017). The varieties of self-transcendent experience. *Review of General Psychology*, 21(2), 143–160.
- Zaki, J., & Ochsner, K. N. (2012). The neuroscience of empathy: progress, pitfalls and promise. *Nature Neuroscience*, 15(5), 675–680.
- Zelenski, J. M., Dopko, R. L., & Capaldi, C. A. (2015). Cooperation is in our nature: Nature exposure may promote cooperative and environmentally sustainable behavior. *Journal of Environmental Psychology*, 42, 24–31.

Appendix

ESS table

Table 1: European Social Survey rounds, data collection period, and number of respondents

ESS Data collection	Oldest round	Number of respondents	Before Financial crisis	Number of respondents	After financial crisis	Number of respondents	Before pandemic	Number of respondents	During pandemic	Number of respondents
Wave	1		4		5		9		10	
Czechia	24-11-2002 - 09-03-2003	1360	08-06-2009 - 08-07-2009	2018	20-01-2011 - 08-03-2011	2386	17-11-2018 - 06-02-2019	2398	07-07-2021 - 29-09-2021	22476
Finland	09-09-2002 - 10-12-2002	2000	19-09-2008 - 05-02-2009	2195	13-09-2010 - 30-12-2010	1878	03-09-2018 - 18-02-2019	1755	31-08-2021 - 31-01-2022	1577
France	15-09-2003 - 15-12-2003	1503	28-09-2008 - 31-01-2009	2073	15-10-2010 - 06-04-2011	1728	19-10-2018 - 01-04-2019	2010	23-08-2021 - 31-12-2021	1977
Hungary	29-10-2002 - 26-11-2002	1685	20-02-2009 - 20-04-2009	1544	19-10-2010 - 10-12-2010	1561	31-01-2019 - 22-05-2019	1661	10-06-2021 - 16-10-2021	1849
Netherlands	01-09-2002 - 24-02-2003	2364	08-09-2008 - 28-06-2009	1778	27-09-2010 - 02-04-2011	1829	28-08-2018 - 22-01-2019	1673	01-10-2021 - 03-04-2022	1470
Norway	16-09-2002 - 17-01-2003	2036	25-08-2008 - 20-01-2009	1549	09-09-2010 - 15-02-2011	1548	04-10-2018 - 16-05-2019	1406	10-06-2021 - 04-05-2022	1411
Portugal	26-09-2002 - 20-01-2003	1511	09-10-2008 - 08-03-2009	2367	11-10-2010 - 23-03-2011	2150	27-10-2019 - 23-12-2019	1055	16-08-2021 - 06-03-2022	1838
Slovenia	17-10-2002 - 30-11-2002	1519	20-10-2008 - 20-01-2009	1286	20-10-2010 - 31-01-2011	1403	24-09-2018 - 01-02-2019	1318	18-09-2020 - 26-08-2021	1252
Switzerland	09-09-2002 - 08-02-2003	2040	30-08-2008 - 17-04-2009	1286	02-10-2010 - 23-03-2011	1403	01-09-2018 - 11-02-2019	1318	04-05-2021 - 02-05-2022	1252

R Script

Load packages

```
# Check if packages are installed, and if not, install them
packages <- c("haven", "readxl", "dplyr", "ggplot2", "tidyverse", "foreign", "car",
"apaTables", "broom", "nortest", "leaps",
      "lme4", "lmerTest", "sjPlot", "sjmisc", "MuMIn", "mice", "MASS", "nlme", "lattice",
"openxlsx", "finalfit",
      "naniar", "caret", "doParallel", "foreach", "outliers", "missRanger", "Hmisc",
"parallel", "polycor", "psych", "RColorBrewer")

install_missing_packages <- function(packages) {
  for (package in packages) {
    if (!require(package, character.only = TRUE)) {
      install.packages(package)
      library(package, character.only = TRUE)
    }
  }
}

install_missing_packages(packages)
```

Import data

```
# Import data from Excel file
data_excel <-
map_df(excel_sheets("C:/Users/Admin/Documents/Uni/ISCTE/Master/Data/CountryVariables.xlsx"),
~read_excel("C:/Users/Admin/Documents/Uni/ISCTE/Master/Data/CountryVariables.xlsx",
sheet = .x))
# Import data from SPSS file
data_spss <- read_sav("C:/Users/Admin/Documents/Uni/ISCTE/Master/Data/ESS-Data-Wizard-subset-2023-03-21.1.0.sav")
#filter countries
data_spss <- data_spss[data_spss$cntry %in% c("CH", "CZ", "FI", "FR", "HU", "NL", "NO",
"PT", "SI"), ]
```

Variable transformation

```
# rename excel variables

data_excel <- data_excel %>%
  rename(edu_GovExp = 'GovExp Education',
    socprot_GovExp = 'GovExp Social protection',
    envprot_GovExp = 'GovExp Environmental protection',
    health_GovExp = 'GovExp Health',
    rec_GovExp = 'GovExp Recreation, culture and religion',
    housing_GovExp = 'GovExp Housing and community amenities',
```



```

pubgen_GovExp = 'GovExp General public services',
puborder_GovExp = 'GovExp Public order and safety',
gdp = 'GDP',
global_conn = 'Global connectedness',
redli = 'Red List Index',
proter = 'Protected Terrestrial',
expohot = 'Percentage of population exposure to hot days',
expoice = 'Percentage of population exposure to icing days',
pastrans = 'Rail passenger transport',
population = 'Population',
cntry = 'Country',
year = 'Year')

# Recode country variable in excel

data_excel <- data_excel %>%
  mutate(cntry = case_when(
    cntry == "Czechia" ~ "CZ",
    cntry == "Finland" ~ "FI",
    cntry == "France" ~ "FR",
    cntry == "Germany" ~ "DE",
    cntry == "Hungary" ~ "HU",
    cntry == "Netherlands" ~ "NL",
    cntry == "Norway" ~ "NO",
    cntry == "Poland" ~ "PL",
    cntry == "Portugal" ~ "PT",
    cntry == "Slovenia" ~ "SI",
    cntry == "Spain" ~ "ES",
    cntry == "Sweden" ~ "SE",
    cntry == "Switzerland" ~ "CH"
  ))

#filter countries
data_excel <- data_excel %>%
  filter(cntry %in% c("CH", "CZ", "FI", "FR", "HU", "NL", "NO", "PT", "SI"))

#filter years
data_excel <- data_excel %>%
  filter(year %in% c(2002, 2008, 2010, 2018, 2021))

#variable for exposure to extreme weather days (hot and icy)
data_excel$expweath <- (data_excel$expohot+data_excel$expoice)

# Calculating adjusted pastrans
data_excel$population <- data_excel$population/1000000

data_excel$pastrans <- as.numeric(data_excel$pastrans)
data_excel$population <- as.numeric(data_excel$population)
data_excel$pastrans.cap <- data_excel$pastrans/ data_excel$population

```

```

# GDP in Billion
data_excel$gdp <- data_excel$gdp/10000000000

# recoding gender
data_spss <- data_spss %>% mutate(gndr.rec = ifelse(gndr == 1, 1, ifelse(gndr == 2, 0, NA)))

# excel centering
variables_to_center <- c("edu_GovExp", "socprot_GovExp", "envprot_GovExp",
"health_GovExp",
      "rec_GovExp", "housing_GovExp", "pubgen_GovExp",
      "puborder_GovExp", "gdp", "global_conn", "redli",
      "proter", "expweath", "pastrans.cap")

data_excel <- data_excel %>%
  mutate(across(all_of(variables_to_center), ~ . - mean(., na.rm = TRUE), .names =
"{.col}.c"))

#recode living with children
data_spss <- data_spss %>%
  mutate(chldhhe.rec = if_else(chldhhe == 1, 1,
      if_else(chldhhe == 2, 0, NA_real_)))
# Recode the health
data_spss <- data_spss %>%
  mutate(health.rec = case_when(
    health %in% c(7, 8, 9) ~ NA_real_, # assign NA to 7, 8, 9
    TRUE ~ 6 - health # invert values 1-5
  ))
#recode hampered in daily activities
data_spss <- data_spss %>%
  mutate(hlthhmp.rec = case_when(hlthhmp == 1 | hlthhmp == 2 ~ 1,
    hlthhmp == 3 ~ 0,
    TRUE ~ NA_real_))

#recode extra education
data_spss <- data_spss %>%
  mutate(atncrse.rec = if_else(atncrse == 1, 1,
    if_else(atncrse == 2, 0, NA_real_)))
#recode political placement
data_spss <- data_spss %>%
  mutate(lrscale.rec = if_else(lrscale %in% 0:10, lrscale, NA_integer_))

#recode social time
data_spss <- data_spss %>%
  mutate(sclmeet.rec = case_when(
    sclmeet == 1 ~ 0,
    sclmeet == 2 ~ 1,
    sclmeet == 3 ~ 2,
    sclmeet == 4 ~ 3,
    sclmeet == 5 ~ 4,
    sclmeet == 6 ~ 5,

```

```

    TRUE ~ NA_real_
  ))

# recode ESSround into years
data_spss <- data_spss %>%
  mutate(year = case_when(
    essround == 1 ~ 2002,
    essround == 4 ~ 2008,
    essround == 5 ~ 2010,
    essround == 9 ~ 2018,
    essround == 10 ~ 2021,
    TRUE ~ NA_integer_
  ))

#recode human value variables
data_spss <- data_spss %>%
  mutate(across(impdiff:ipudrst, ~ ifelse(. %in% c(7), NA, 7 - .))) %>%
  rename_with(~paste0(., ".rec"), impdiff:ipudrst)
data_spss <- data_spss %>%
  mutate(across(impdiff.rec:ipudrst.rec, as.numeric))

data_spss$universalism <- rowMeans(data_spss[, c("impenv.rec", "ipeqopt.rec",
"ipudrst.rec")], na.rm = TRUE)
data_spss$benevolence <- rowMeans(data_spss[, c("iphlppl.rec", "iplylfr.rec")], na.rm =
TRUE)
data_spss$achievement <- rowMeans(data_spss[, c("ipshabt.rec", "ipsuces.rec")], na.rm =
TRUE)
data_spss$power <- rowMeans(data_spss[, c("imprich.rec", "iprspot.rec")], na.rm = TRUE)

#hist(data_spss$universalism, main = "Distribution of Universalism", xlab = "Score")
#hist(data_spss$benevolence, main = "Distribution of Benevolence", xlab = "Score")
#hist(data_spss$universalism.un, main = "Distribution of Universalism", xlab = "Score")
#hist(data_spss$benevolence.un, main = "Distribution of Benevolence", xlab = "Score")

data_spss$selftrans <- ifelse(!is.na(data_spss$universalism) & !is.na(data_spss$benevolence)
& !is.na(data_spss$achievement) & !is.na(data_spss$power), ((data_spss$benevolence +
data_spss$universalism) - (data_spss$achievement + data_spss$power))/2, NA)

# create a histogram of the selftrans variable
#hist(data_spss$selftrans, main = "Distribution of Selftrans", xlab = "Selftrans Score")

#summary(data_spss$selftrans)

# compute intersectionality of discrimination variable

data_spss$discint <- rowSums(data_spss[, c("dscrage", "dscrdsb", "dscretn", "dscrngnd",
"dscrIng", "dscrntn",

```

```

      "dscroth", "dscrrce", "dscrrlg", "dscrsex"))))
mean(data_spss$discint)
#barplot(freq_table, main = "Frequencies of Discrimination Intersectionality",
#      xlab = "Number of Types of Discrimination Experienced", ylab = "Frequency",
#      col = "skyblue", border = NA)

#recode religious
data_spss$rlgdgr.rec <- ifelse(data_spss$rlgdgr %in% c(77, 88, 99), NA, data_spss$rlgdgr -
1)

# recode children in household variables
data_spss$chldhhe.rec <- ifelse(data_spss$chldhhe == 1, 1, ifelse(data_spss$chldhhe == 2, 0,
NA))

# centering individual variables - grand-mean
for(var in c("agea", "rlgdgr.rec", "eduyrs", "lrscle.rec", "sclmeet.rec", "health.rec",
"discint")) {
  if(is.numeric(data_spss[[var]])) {
    data_spss[[paste0(var, ".c")]] <- ifelse(is.na(data_spss[[var]]), NA, data_spss[[var]] -
mean(data_spss[[var]], na.rm = TRUE))
  }
}

#weigh the spss variables with

data_spss$selftrans.w <- ifelse(is.na(data_spss$selftrans), NA, data_spss$selftrans *
data_spss$dweight)
data_spss$agea.w <- ifelse(is.na(data_spss$agea), NA, data_spss$agea * data_spss$dweight)
data_spss$rlgdgr.rec.w <- ifelse(is.na(data_spss$rlgdgr.rec), NA, data_spss$rlgdgr.rec *
data_spss$dweight)
data_spss$eduyrs.w <- ifelse(is.na(data_spss$eduyrs ), NA, data_spss$eduyrs *
data_spss$dweight)
data_spss$lrscle.rec.w <- ifelse(is.na(data_spss$lrscle.rec), NA, data_spss$lrscle.rec *
data_spss$dweight)
data_spss$sclmeet.rec.w <- ifelse(is.na(data_spss$sclmeet.rec), NA, data_spss$sclmeet.rec *
data_spss$dweight)
data_spss$health.rec.w <- ifelse(is.na(data_spss$health.rec), NA, data_spss$health.rec *
data_spss$dweight)
data_spss$hlthhmp.rec.w <- ifelse(is.na(data_spss$hlthhmp.rec), NA, data_spss$hlthhmp.rec
* data_spss$dweight)
data_spss$discint.w <- ifelse(is.na(data_spss$discint ), NA, data_spss$discint *
data_spss$dweight)
data_spss$gndr.rec.w <- ifelse(is.na(data_spss$gndr.rec), NA, data_spss$gndr.rec *
data_spss$dweight)
data_spss$chldhhe.rec.w <- ifelse(is.na(data_spss$chldhhe.rec), NA, data_spss$chldhhe.rec *
data_spss$dweight)
data_spss$atncrse.rec.w <- ifelse(is.na(data_spss$atncrse.rec), NA, data_spss$atncrse.rec *
data_spss$dweight)

#country level variables as numeric

```

```

data_spss$agea.w <- as.numeric(data_spss$agea.w)
data_spss$gndr.rec.w <- as.numeric(data_spss$gndr.rec.w)
data_spss$chldhhe.rec.w <- as.numeric(data_spss$chldhhe.rec.w)
data_spss$rlgdgr.rec.w <- as.numeric(data_spss$rlgdgr.rec.w)
data_spss$atncrse.rec.w <- as.numeric(data_spss$atncrse.rec.w)
data_spss$eduyrs.w <- as.numeric(data_spss$eduyrs.w)
data_spss$lrscale.rec.w <- as.numeric(data_spss$lrscale.rec.w)
data_spss$sclmeet.rec.w <- as.numeric(data_spss$sclmeet.rec.w)
data_spss$health.rec.w <- as.numeric(data_spss$health.rec.w)
data_spss$hlthhmp.rec.w <- as.numeric(data_spss$hlthhmp.rec.w)
data_spss$discint.w <- as.numeric(data_spss$discint.w)
data_spss$selftrans.w <- as.numeric(data_spss$selftrans.w)

# calculating the variables on country level with uncentered variables - group-mean centering

```

```

data_spss_cntry <- data_spss %>%
  group_by(cntry, year) %>%
  summarise(agea.w.national = mean(agea.w, na.rm = TRUE),
            gndr.rec.w.national = mean(gndr.rec.w, na.rm = TRUE),
            rlgdgr.rec.w.national = mean(rlgdgr.rec.w, na.rm = TRUE),
            atncrse.rec.w.national = mean(atncrse.rec.w, na.rm = TRUE),
            eduyrs.w.national = mean(eduyrs.w, na.rm = TRUE),
            lrscale.rec.w.national = mean(lrscale.rec.w, na.rm = TRUE),
            health.rec.w.national = mean(health.rec.w, na.rm = TRUE),
            hlthhmp.rec.w.national = mean(hlthhmp.rec.w, na.rm = TRUE),
            discint.w.national = mean(discint.w, na.rm = TRUE),
            selftrans.w.national = mean(selftrans.w, na.rm = TRUE))

```

Joining datasets from SPSS and Excel

```

data_spss_cntry$year <- as.character(data_spss_cntry$year)
data_long <- full_join(data_excel, data_spss_cntry, by = c("year", "cntry"))
data_spss$year <- as.character(data_spss$year)
#data_long$year <- data_long$year.x
#data_long$cntry <- data_long$cntry.x
data_all <- full_join(data_spss, data_long, by = c("year", "cntry"))
#data_all$year <- data_all$year.x
#data_all$cntry <- data_all$cntry.x

data_reg_all <- data_all[c("selftrans", "edu_GovExp.c", "socprot_GovExp.c",
"envprot_GovExp.c", "health_GovExp.c",
"rec_GovExp.c", "housing_GovExp.c", "pubgen_GovExp.c",
"puborder_GovExp.c", "global_conn.c", "gdp.c",
"agea.w.national", "gndr.rec.w.national",
"rlgdgr.rec.w.national", "atncrse.rec.w.national", "eduyrs.w.national",
"lrscale.rec.w.national", "health.rec.w.national",
"hlthhmp.rec.w.national", "discint.w.national", "selftrans.w.national",
"redli.c", "proter.c", "expweath.c",

```

```

"pastrans.cap.c", "agea.c", "gndr.rec", "chldhhe.rec", "rlgdgr.rec.c",
"atncrse.rec",
"eduyrs.c", "lrscale.rec.c", "sclmeet.rec.c", "health.rec.c", "hlthhmp.rec",
"discint.c", "year","cntry")]]

```

```

# Assign variable types

```

```

data_reg_all$selftrans <- as.numeric(data_reg_all$selftrans)
data_reg_all$edu_GovExp.c <- as.numeric(data_reg_all$edu_GovExp.c)
data_reg_all$socprot_GovExp.c <- as.numeric(data_reg_all$socprot_GovExp.c)
data_reg_all$envprot_GovExp.c <- as.numeric(data_reg_all$envprot_GovExp.c)
data_reg_all$health_GovExp.c <- as.numeric(data_reg_all$health_GovExp.c)
data_reg_all$rec_GovExp.c <- as.numeric(data_reg_all$rec_GovExp.c)
data_reg_all$housing_GovExp.c <- as.numeric(data_reg_all$housing_GovExp.c)
data_reg_all$pubgen_GovExp.c <- as.numeric(data_reg_all$pubgen_GovExp.c)
data_reg_all$puborder_GovExp.c <- as.numeric(data_reg_all$puborder_GovExp.c)
data_reg_all$global_conn.c <- as.numeric(data_reg_all$global_conn.c)
data_reg_all$gdp.c <- as.numeric(data_reg_all$gdp.c)
data_reg_all$sagea.w.national <- as.numeric(data_reg_all$sagea.w.national)
data_reg_all$gndr.rec.w.national <- as.numeric(data_reg_all$gndr.rec.w.national)
data_reg_all$rlgdgr.rec.w.national <- as.numeric(data_reg_all$rlgdgr.rec.w.national)
data_reg_all$atncrse.rec.w.national <- as.numeric(data_reg_all$atncrse.rec.w.national)
data_reg_all$eduyrs.w.national <- as.numeric(data_reg_all$eduyrs.w.national)
data_reg_all$lrscale.rec.w.national <- as.numeric(data_reg_all$lrscale.rec.w.national)
data_reg_all$health.rec.w.national <- as.numeric(data_reg_all$health.rec.w.national)
data_reg_all$hlthhmp.rec.w.national <- as.numeric(data_reg_all$hlthhmp.rec.w.national)
data_reg_all$discint.w.national <- as.numeric(data_reg_all$discint.w.national)
data_reg_all$selftrans.w.national <- as.numeric(data_reg_all$selftrans.w.national)
data_reg_all$redli.c <- as.numeric(data_reg_all$redli.c)
data_reg_all$proter.c <- as.numeric(data_reg_all$proter.c)
data_reg_all$expweath <- as.numeric(data_reg_all$expweath.c)
data_reg_all$pastrans.cap <- as.numeric(data_reg_all$pastrans.cap.c)
data_reg_all$sagea.c <- as.numeric(data_reg_all$sagea.c)
data_reg_all$gndr.rec <- as.factor(data_reg_all$gndr.rec)
data_reg_all$chldhhe.rec <- as.factor(data_reg_all$chldhhe.rec)
data_reg_all$rlgdgr.rec.c.c <- as.numeric(data_reg_all$rlgdgr.rec.c)
data_reg_all$atncrse.rec <- as.factor(data_reg_all$atncrse.rec)
data_reg_all$eduyrs.c.c <- as.numeric(data_reg_all$eduyrs.c)
data_reg_all$lrscale.rec.c.c <- as.numeric(data_reg_all$lrscale.rec.c)
data_reg_all$sclmeet.rec.c.c <- as.numeric(data_reg_all$sclmeet.rec.c)
data_reg_all$health.rec.c.c <- as.numeric(data_reg_all$health.rec.c)
data_reg_all$hlthhmp.rec <- as.factor(data_reg_all$hlthhmp.rec)
data_reg_all$discint.c.c <- as.numeric(data_reg_all$discint.c)
data_reg_all$year <- as.factor(data_reg_all$year)
data_reg_all$cntry <- as.factor(data_reg_all$cntry)

```

Missing data and Imputation

```

# Examine the data using ff_glimpse
data_reg_all %>%

```

```
ff_glimpse()
```

```
data_reg_all <- data_reg_all[c("selftrans", "edu_GovExp.c", "socprot_GovExp.c",  
"envprot_GovExp.c", "health_GovExp.c",  
"rec_GovExp.c", "housing_GovExp.c", "pubgen_GovExp.c",  
"pubborder_GovExp.c", "global_conn.c", "gdp.c",  
"agea.w.national", "gndr.rec.w.national",  
"rlgdgr.rec.w.national", "atncrse.rec.w.national", "eduyrs.w.national",  
"lrscale.rec.w.national", "health.rec.w.national",  
"hlthhmp.rec.w.national", "discint.w.national", "selftrans.w.national",  
"redli.c", "proter.c", "expweath.c",  
"pastrans.cap.c", "agea.c", "gndr.rec", "chldhhe.rec", "rlgdgr.rec.c",  
"atncrse.rec",  
"eduyrs.c", "lrscale.rec.c", "sclmeet.rec.c", "health.rec.c", "hlthhmp.rec",  
"discint.c", "year", "cntry")]
```

```
#Imputation
```

```
# Examine the missingness pattern
```

```
missing_pattern <- function(data, dependent, explanatory) {  
  mice::md.pattern(data[, c(dependent, explanatory)])  
}
```

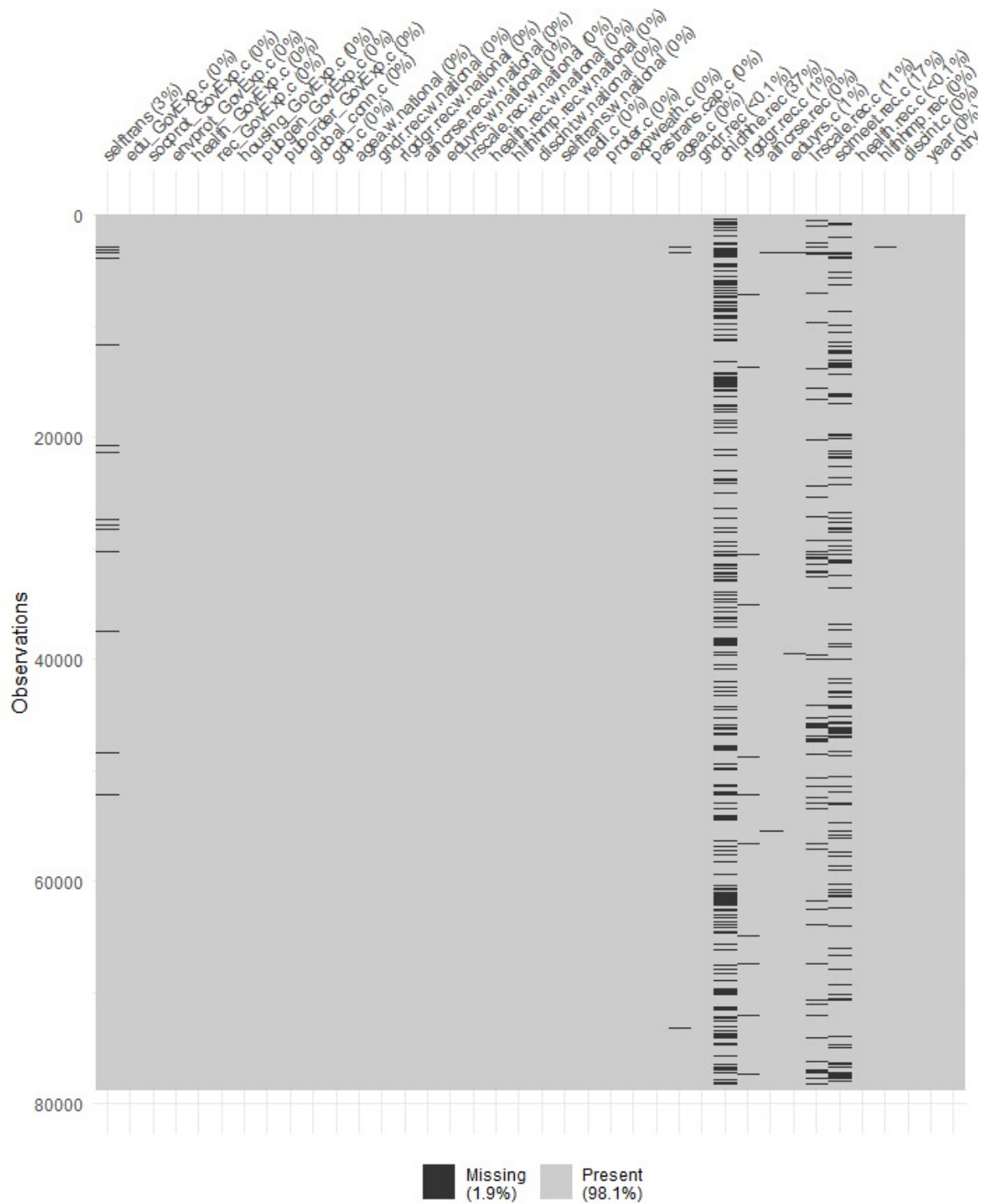


Figure 1: Misssing values of all variables used in the regression model

```
md_test <- md.pattern(data_reg_all)
#print(md_test)
```



```

# Test for MCAR/MAR/MNAR
md_test_mnar <- ampute(md_test)
warnings()
print(md_test_mnar)

result <- mcar_test(data_reg_all)
print(result)

# Visualize missingness
naniar::vis_miss(data_reg_all, warn_large_data = FALSE)

# Run missRanger for imputation
data_reg_all_imp <- missRanger::missRanger(data = data_reg_all, pmm.k = 5, num.trees =
300)
warnings()
data_reg_all_imp <- as.data.frame(data_reg_all_imp)

# After imputation, comparing in the imputed data the observed and imputed values.
#plots for imputation
# list of numeric variables
numeric_vars <- c("selftrans", "edu_GovExp.c", "socprot_GovExp.c", "envprot_GovExp.c" ,
"health_GovExp.c", "rec_GovExp.c", "housing_GovExp.c", "pubgen_GovExp.c",
"puborder_GovExp.c",
"global_conn.c", "agea.w.national", "gndr.rec.w.national", "atncrse.rec.w.national", "hlthhmp.re
c.w.national", "rlgdgr.rec.w.national", "eduys.w.national", "lrscale.rec.w.national",
"health.rec.w.national", "discint.w.national", "selftrans.w.national", "redli.c", "proter.c",
"expweath.c", "pastrans.cap.c", "agea.c", "rlgdgr.rec.c", "eduys.c", "lrscale.rec.c",
"sclmeet.rec.c", "health.rec.c", "discint.c")

# list of factor variables
factor_vars <- c("gndr.rec", "chldhhe.rec", "atncrse.rec", "hlthhmp.rec")

# loop through each numeric variable
for (var in numeric_vars){
  # create a new column "Imputed" to differentiate imputed and observed values
  data_reg_all_imp$Imputed <- ifelse(is.na(data_reg_all[[var]]), "Imputed", "Observed")

  # create histogram for numeric variables
  p <- ggplot(data_reg_all_imp, aes_string(x = var, fill = "Imputed")) +
    geom_histogram(position = "identity", alpha = 0.5, bins = 30) +
    labs(title = paste("Comparison of Observed and Imputed Values for", var), x = var) +
    scale_fill_brewer(palette = "Set1")

  print(p)
}

# loop through each factor variable
for (var in factor_vars){
  # create a new column "Imputed" to differentiate imputed and observed values
  data_reg_all_imp$Imputed <- ifelse(is.na(data_reg_all[[var]]), "Imputed", "Observed")

```

```
# create bar plot for factor variables
p <- ggplot(data_reg_all_imp, aes_string(x = var, fill = "Imputed")) +
  geom_bar(position = "dodge") +
  labs(title = paste("Comparison of Observed and Imputed Values for", var), x = var) +
  scale_fill_brewer(palette = "Set1")

print(p)
}
```

Descriptive Analysis

```
#Before imputation
# Select the variables of interest
variables <- c("selftrans", "edu_GovExp.c", "socprot_GovExp.c", "envprot_GovExp.c",
"health_GovExp.c",
"rec_GovExp.c", "housing_GovExp.c", "pubgen_GovExp.c",
"puborder_GovExp.c", "global_conn.c", "gdp.c",
"agea.w.national", "rlgdgr.rec.w.national", "atncrse.rec.w.national",
"eduyrs.w.national",
"lrscle.rec.w.national", "health.rec.w.national",
"hlthhmp.rec.w.national", "discint.w.national", "selftrans.w.national", "redli.c",
"proter.c", "expweath.c",
"pastrans.cap.c", "agea.c", "gndr.rec", "chldhhe.rec", "rlgdgr.rec.c", "atncrse.rec",
"eduyrs.c", "lrscle.rec.c", "sclmeet.rec.c", "health.rec.c", "hlthhmp.rec", "discint.c")

data_reg <- data_reg_all[variables]

# Convert all variables in data_reg to numeric
data_reg[] <- lapply(data_reg, as.numeric)

# Compute correlations along with p-values
cor_test <- corr.test(data_reg, method = "spearman", adjust = "none")

# Adjusted function to assign significance symbols and round to 2 decimals
assign_significance <- function(cor_val, p_val) {
  rounded_val <- round(cor_val, 2)
  if(p_val < 0.001) return(paste0(rounded_val, "***"))
  if(p_val < 0.01) return(paste0(rounded_val, "**"))
  if(p_val < 0.05) return(paste0(rounded_val, "*"))
  return(as.character(rounded_val))
}

# Create significance-annotated correlation matrix
cor_with_significance <- mapply(assign_significance, cor_test$r, cor_test$p)

# Convert to a matrix with proper dimensions
n <- ncol(cor_test$r)
m <- nrow(cor_test$r)
cor_with_significance_matrix <- matrix(cor_with_significance, ncol = n, nrow = m)
```

```

dimnames(cor_with_significance_matrix) <- dimnames(cor_test$r)

# Compute descriptive statistics only for numeric variables
descriptive_stats <- sapply(data_reg, function(x) {
  c(Mean = mean(x, na.rm = TRUE), SD = sd(x, na.rm = TRUE))
})

# Round the numeric results to two decimal places
descriptive_stats <- round(descriptive_stats, 2)

# Combine the statistics and correlation matrix
descriptive_stats_df <- as.data.frame(t(descriptive_stats))
full_table <- cbind(descriptive_stats_df, cor_with_significance_matrix)

# Add variable names to the full table
full_table$Variable <- rownames(full_table)

# To ensure that the Variable column is the first column in the dataframe
full_table <- full_table[, c("Variable", colnames(full_table)[-which(colnames(full_table) ==
"Variable")])]

# Adjust row names for clarity
rownames(full_table) <- NULL # Clearing row names, so that default numbering is used.

# Add notes for significance levels
notes <- paste0("N =", nrow(data_reg), ". Significance levels: * p < 0.05, ** p < 0.01, *** p <
0.001.")
full_table <- rbind(full_table, c("Notes:", rep("", ncol(full_table)-1)))
full_table[nrow(full_table), 2] <- notes

# Save the final table as an Excel file
wb <- createWorkbook()
addWorksheet(wb, "Table")
writeData(wb, "Table", full_table)
file_path <- "C:/Users/Admin/Documents/Uni/ISCTE/Master/analysis/table_des.xlsx"
saveWorkbook(wb, file_path, overwrite = TRUE)

#after imputation

data_reg_imp <- data_reg_all_imp[variables]

# Convert all variables in data_reg_imp to numeric
data_reg_imp[] <- lapply(data_reg_imp, as.numeric)

# Compute correlations along with p-values
cor_test <- corr.test(data_reg_imp, method = "spearman", adjust = "none")

# Adjusted function to assign significance symbols and round to 2 decimals
assign_significance <- function(cor_val, p_val) {
  rounded_val <- round(cor_val, 2)

```

```

    if(p_val < 0.001) return(paste0(rounded_val, "***"))
    if(p_val < 0.01) return(paste0(rounded_val, "**"))
    if(p_val < 0.05) return(paste0(rounded_val, "*"))
    return(as.character(rounded_val))
  }

# Create significance-annotated correlation matrix
cor_with_significance <- mapply(assign_significance, cor_test$r, cor_test$p)

# Convert to a matrix with proper dimensions
n <- ncol(cor_test$r)
m <- nrow(cor_test$r)
cor_with_significance_matrix <- matrix(cor_with_significance, ncol = n, nrow = m)
dimnames(cor_with_significance_matrix) <- dimnames(cor_test$r)

# Compute descriptive statistics only for numeric variables
descriptive_stats <- sapply(data_reg_imp, function(x) {
  c(Mean = mean(x, na.rm = TRUE), SD = sd(x, na.rm = TRUE))
})

# Round the numeric results to two decimal places
descriptive_stats <- round(descriptive_stats, 2)

# Combine the statistics and correlation matrix
descriptive_stats_df <- as.data.frame(t(descriptive_stats))
full_table <- cbind(descriptive_stats_df, cor_with_significance_matrix)

# Add variable names to the full table
full_table$Variable <- rownames(full_table)

# To ensure that the Variable column is the first column in the dataframe
full_table <- full_table[, c("Variable", colnames(full_table)[-which(colnames(full_table) ==
"Variable")])]

# Adjust row names for clarity
rownames(full_table) <- NULL .

# Add notes for significance levels
notes <- paste0("N =", nrow(data_reg_imp), ". Significance levels: * p < 0.05, ** p < 0.01,
*** p < 0.001.")
full_table <- rbind(full_table, c("Notes:", rep("", ncol(full_table)-1)))
full_table[nrow(full_table), 2] <- notes

# Save the final table as an Excel file
wb <- createWorkbook()
addWorksheet(wb, "Table")
writeData(wb, "Table", full_table)
file_path <- "C:/Users/Admin/Documents/Uni/ISCTE/Master/analysis/table_des_imp.xlsx"
saveWorkbook(wb, file_path, overwrite = TRUE)

```

Table 2: Descriptive parameter and bi-variate correlations of all variables

Variable	Mean	SD	selftrans	edu GovExp.c	socprot GovExp.c	envprot GovExp.c	health GovExp.c	rec GovExp.c	housing GovExp.c	pubgen GovExp.c	puborder GovExp.c
selftrans	1.34	1.14	1	-0.2***	0.1***	0.02***	-0.05***	-0.2***	-0.1***	-0.05***	-0.03***
edu_GovExp.c	-0.04	0.69	-	1	0.2***	-0.24***	-0.11***	0.15***	-0.13***	0.12***	-0.02***
socprot GovExp.c	-0.17	3.08	-	-	1	-0.4***	0.31***	-0.13***	-0.16***	0.53***	-0.24***
envprot GovExp.c	0.03	0.34	-	-	-	1	0.28***	0.39***	0.3***	-0.32***	0.49***
health GovExp.c	0.05	1.84	-	-	-	-	1	0.15***	0.02***	-0.08***	0.03***
rec GovExp.c	0.01	0.43	-	-	-	-	-	1	0.55***	0.22***	0.44***
housing GovExp.c	0.02	0.26	-	-	-	-	-	-	1	0.23***	0.52***
pubgen GovExp.c	-0.06	1.44	-	-	-	-	-	-	-	1	-0.17***
puborder GovExp.c	0.01	0.29	-	-	-	-	-	-	-	-	1
global_conn.c	0.06	7.3	-	-	-	-	-	-	-	-	-
gdp.c	0.03	243.58	-	-	-	-	-	-	-	-	-
agea.w.national	47.7	2.18	-	-	-	-	-	-	-	-	-
rlqdr.rec.w.national	3.33	1	-	-	-	-	-	-	-	-	-
atncrse.rec.w.national	0.32	0.13	-	-	-	-	-	-	-	-	-
eduyrs.w.national	12.27	1.72	-	-	-	-	-	-	-	-	-
lrscale.rec.w.national	5.21	0.35	-	-	-	-	-	-	-	-	-
health.rec.w.national	3.79	0.22	-	-	-	-	-	-	-	-	-
hlthhmp.rec.w.national	0.26	0.05	-	-	-	-	-	-	-	-	-
discint.w.national	0.09	0.04	-	-	-	-	-	-	-	-	-
selftrans.w.national	1.32	0.44	-	-	-	-	-	-	-	-	-
redli.c	0	0.05	-	-	-	-	-	-	-	-	-
proter.c	-0.49	10.54	-	-	-	-	-	-	-	-	-
expweath.c	-0.54	45.93	-	-	-	-	-	-	-	-	-
pastrans.cap.c	11.32	557.59	-	-	-	-	-	-	-	-	-
agea.c	0	18.54	-	-	-	-	-	-	-	-	-
gndr.rec	1.47	0.5	-	-	-	-	-	-	-	-	-
childhhe.rec	1.38	0.49	-	-	-	-	-	-	-	-	-
rlqdr.rec.c	-0.01	3.08	-	-	-	-	-	-	-	-	-
atncrse.rec	1.31	0.46	-	-	-	-	-	-	-	-	-
eduyrs.c	-0.01	4.27	-	-	-	-	-	-	-	-	-
lrscale.rec.c	-0.01	2.21	-	-	-	-	-	-	-	-	-
schmeet.rec.c	0.05	1.38	-	-	-	-	-	-	-	-	-
health.rec.c	0	0.9	-	-	-	-	-	-	-	-	-
hlthhmp.rec	1.27	0.44	-	-	-	-	-	-	-	-	-
discint.c	0	0.38	-	-	-	-	-	-	-	-	-
Notes:	N = 78827. Significance levels: * p < 0.05, ** p < 0.01, *** p < 0.001.										


```

cor_test <- corr.test(data_reg_imp, method = "spearman", adjust = "none")

# Adjusted function to assign significance symbols and round to 2 decimals
assign_significance <- function(cor_val, p_val) {
  rounded_val <- round(cor_val, 2)
  if(p_val < 0.001) return(paste0(rounded_val, "***"))
  if(p_val < 0.01) return(paste0(rounded_val, "**"))
  if(p_val < 0.05) return(paste0(rounded_val, "*"))
  return(as.character(rounded_val))
}

# Create significance-annotated correlation matrix
cor_with_significance <- mapply(assign_significance, cor_test$r, cor_test$p)

# Convert to a matrix with proper dimensions
n <- ncol(cor_test$r)
m <- nrow(cor_test$r)
cor_with_significance_matrix <- matrix(cor_with_significance, ncol = n, nrow = m)
dimnames(cor_with_significance_matrix) <- dimnames(cor_test$r)

# Compute descriptive statistics only for numeric variables
descriptive_stats <- sapply(data_reg_imp, function(x) {
  c(Mean = mean(x, na.rm = TRUE), SD = sd(x, na.rm = TRUE))
})

# Round the numeric results to two decimal places
descriptive_stats <- round(descriptive_stats, 2)

# Combine the statistics and correlation matrix
descriptive_stats_df <- as.data.frame(t(descriptive_stats))
full_table <- cbind(descriptive_stats_df, cor_with_significance_matrix)

# Add variable names to the full table
full_table$Variable <- rownames(full_table)

# To ensure that the Variable column is the first column in the dataframe
full_table <- full_table[, c("Variable", colnames(full_table)[-which(colnames(full_table) ==
"Variable")])]

# Adjust row names for clarity
rownames(full_table) <- NULL # Clearing row names, so that default numbering is used.

# Add notes for significance levels
notes <- paste0("N =", nrow(data_reg_imp), ". Significance levels: * p < 0.05, ** p < 0.01,
*** p < 0.001.")
full_table <- rbind(full_table, c("Notes:", rep("", ncol(full_table)-1)))
full_table[nrow(full_table), 2] <- notes

# Save the final table as an Excel file
wb <- createWorkbook()

```

```

addWorksheet(wb, "Table")
writeData(wb, "Table", full_table)
file_path <-
"C:/Users/Admin/Documents/Uni/ISCTE/Master/analysis/table_des_imp_fin.xlsx"
saveWorkbook(wb, file_path, overwrite = TRUE)

# Table for demographics of sample
table_demog <- data_reg_all_imp %>%
  group_by(cntry, year) %>%
  summarise(
    male_count = sum(gndr.rec == 0, na.rm = TRUE),
    female_count = sum(gndr.rec == 1, na.rm = TRUE),
    mean_original_age = mean(agea.c + 48.8, na.rm = TRUE), # direct calculation of
uncentred age
    .groups = 'drop')

#print(table_demog, n = 45)

# Create a new workbook
wb <- createWorkbook()
# Add a worksheet
addWorksheet(wb, "Demographics")
# Write the data to the worksheet
writeData(wb, "Demographics", table_demog)
# Specify the path where you'd like to save the file
file_path <- "C:/Users/Admin/Documents/Uni/ISCTE/Master/analysis/table_demog.xlsx"
# Save the workbook
saveWorkbook(wb, file_path, overwrite = TRUE)

#plots
table_selftrans.national <- unique(data_reg_all[, c("year", "selftrans.w.national", "cntry")])
print(table_selftrans.national, n = 45)

# Get a colorblind-friendly palette for 9 colors
# Combine two palettes
combined_palette <- c(brewer.pal(8, "Dark2"), brewer.pal(12, "Set3"))

# Choose 9 darker colors from the combined palette
color_blind_friendly_palette <- combined_palette[c(1:7, 9, 11)]

ggplot(data_reg_all_imp, aes(x = year, y = selftrans.w.national, color = cntry)) +
  geom_point() +
  geom_smooth(aes(group = cntry), method = "lm", se = FALSE) +
  scale_color_manual(values = color_blind_friendly_palette) +
  labs(x = "Year", y = "Country's self-transcendence", color = "Country") +
  theme_minimal() +
  theme(panel.grid.major = element_blank(),
        panel.grid.minor = element_blank(),
        text = element_text(family = "Times New Roman", size = 12))

```



```

ggplot(data_reg_all_imp, aes(x = selftrans, y = selftrans.w.national)) +
  stat_density_2d(aes(fill = ..level..), geom = "polygon", colour="white") +
  labs(x = "Self-transcendence", y = "Country's self-transcendence") +
  theme(panel.grid.major = element_blank(),
        panel.grid.minor = element_blank(),
        panel.background = element_blank(),
        text = element_text(family = "Times New Roman", size = 12))

ggplot(data_reg_all_imp, aes(x = selftrans, y = selftrans.w.national)) +
  geom_point(colour = "darkgray") +
  geom_smooth(method = "lm", se = FALSE, color = "black") +
  labs(x = "Self-transcendence", y = "Country's self-transcendence") +
  theme(panel.grid.major = element_blank(),
        panel.grid.minor = element_blank(),
        panel.background = element_blank(),
        text = element_text(family = "Times New Roman", size = 12))

```

Multilevel regression analysis

```

#removed chldhhe.rec and sclmeet.rec.c because of missingness
#models and assumption testing

```

```

data_reg_all_imp <- supply(data_reg_all_imp, as.numeric)
# Compute the correlation matrix to check for Multicollinearity
cor_matrix <- cor(data_reg_all_imp[, c("selftrans", "edu_GovExp.c", "socprot_GovExp.c",
"envvprot_GovExp.c", "health_GovExp.c",
"rec_GovExp.c", "housing_GovExp.c", "pubgen_GovExp.c",
"puborder_GovExp.c", "global_conn.c", "gdp.c",
"agea.w.national", "rlgdgr.rec.w.national", "atncrse.rec.w.national",
"eduyrs.w.national",
"lrscle.rec.w.national", "health.rec.w.national",
"hlthhmp.rec.w.national", "discint.w.national", "selftrans.w.national",
"redli.c", "proter.c", "expweath.c",
"pastrans.cap.c", "agea.c", "gndr.rec", "chldhhe.rec", "rlgdgr.rec.c",
"atncrse.rec",
"eduyrs.c", "lrscle.rec.c", "sclmeet.rec.c", "health.rec.c",
"hlthhmp.rec", "discint.c")], use = "pairwise.complete.obs")

# Create a table for highly correlated pairs
cor_threshold <- 0.7 # Set the correlation threshold
highly_correlated <- which(abs(cor_matrix) > cor_threshold & cor_matrix != 1, arr.ind =
TRUE)
cor_pairs <- data.frame(Variable1 = rownames(cor_matrix)[highly_correlated[, 1]],
Variable2 = colnames(cor_matrix)[highly_correlated[, 2]],
Correlation = cor_matrix[highly_correlated])
cor_pairs <- cor_pairs[order(cor_pairs$Correlation, decreasing = TRUE), ]

# Print the correlation matrix
print(cor_matrix)

```

```

# Print the table of highly correlated pairs
print(cor_pairs) #-> gdp.c removed from regression

# Function to format correlation values
format_cor <- function(x) {
  if (is.na(x)) {
    return("")
  } else {
    return(sprintf("%.2f", x))
  }
}

# Apply formatting to correlation matrix
formatted_cor_matrix <- apply(cor_matrix, 1:2, format_cor)

# Print the formatted correlation matrix
cat("\n")
cat("Correlation Matrix:\n")
cat("\n")
print(data.frame(formatted_cor_matrix, row.names = colnames(cor_matrix), check.names =
FALSE))
cat("\n")

# Check assumptions
data_reg_all_imp <- as.data.frame(data_reg_all_imp)

# Run the nested regression by country
model_cntry <- lmer(selftrans ~ edu_GovExp.c + socprot_GovExp.c + envprot_GovExp.c +
health_GovExp.c +
      rec_GovExp.c + housing_GovExp.c + pubgen_GovExp.c + puborder_GovExp.c
+ global_conn.c +
      agea.w.national + rlgdgr.rec.w.national + atncrse.rec.w.national +
eduyrs.w.national +
      lrscle.rec.w.national + health.rec.w.national +
      hlthhmp.rec.w.national + discint.w.national + selftrans.w.national + redli.c +
proter.c + expweath.c +
      pastrans.cap.c + agea.c + gndr.rec + chldhhe.rec + rlgdgr.rec.c + atncrse.rec +
eduyrs.c + lrscle.rec.c + sclmeet.rec.c + health.rec.c + hlthhmp.rec +
discint.c + (1 | cntry), data = data_reg_all_imp)

# Run the nested regression by year
model_year <- lmer(selftrans ~ edu_GovExp.c + socprot_GovExp.c + envprot_GovExp.c +
health_GovExp.c +
      rec_GovExp.c + housing_GovExp.c + pubgen_GovExp.c + puborder_GovExp.c
+ global_conn.c +
      agea.w.national + rlgdgr.rec.w.national + atncrse.rec.w.national +
eduyrs.w.national +
      lrscle.rec.w.national + health.rec.w.national +
      hlthhmp.rec.w.national + discint.w.national + selftrans.w.national + redli.c +
proter.c + expweath.c +

```

```

    pastrans.cap.c + agea.c + gndr.rec + chldhhe.rec + rlgdgr.rec.c + atncrse.rec +
    eduyrs.c + lrscaler.rec.c + sclmeet.rec.c + health.rec.c + hlthhmp.rec +
    discint.c + (1 | year), data = data_reg_all_imp)

# Run the full regression model
model_all <- lmer(selftrans ~ edu_GovExp.c + socprot_GovExp.c + envprot_GovExp.c +
health_GovExp.c +
    rec_GovExp.c + housing_GovExp.c + pubgen_GovExp.c + puborder_GovExp.c
+ global_conn.c +
    agea.w.national + rlgdgr.rec.w.national + atncrse.rec.w.national +
eduyrs.w.national +
    lrscaler.rec.w.national + health.rec.w.national +
    hlthhmp.rec.w.national + discint.w.national + selftrans.w.national + redli.c +
proter.c + expweath.c +
    pastrans.cap.c + agea.c + gndr.rec + rlgdgr.rec.c + atncrse.rec +
    eduyrs.c + lrscaler.rec.c + health.rec.c + hlthhmp.rec +
    discint.c + (1 | year/cntry), data = data_reg_all_imp)

# 0-models and ICC
# Specify the model
model_0_cntry <- lmer(selftrans ~ 1 + (1 | cntry), data = data_reg_all)
# Specify the model
model_0_year <- lmer(selftrans ~ 1 + (1 | year), data = data_reg_all)
# Specify the model
model_0_all <- lmer(selftrans ~ 1 + (1 | year/cntry), data = data_reg_all)

# ICC for model_cntry
var_cntry_0 <- VarCorr(model_0_cntry)$cntry
ICC_0_cntry <- var_cntry_0 / (var_cntry_0 + sigma(model_0_cntry)^2)

# ICC for model_year
var_year_0 <- VarCorr(model_0_year)$year
ICC_0_year <- var_year_0 / (var_year_0 + sigma(model_0_year)^2)

# ICC for model_all
var_cntry_0 <- unlist(lapply(VarCorr(model_0_all), diag))
ICC_0_all <- var_cntry_0 / (var_cntry_0 + sigma(model_0_all)^2)

# Print ICC values
print(ICC_0_cntry)
print(ICC_0_year)
print(ICC_0_all)

summary(result_cntry)
summary(result_year)
summary(result_all)

# Normality of residuals & Homoscedasticity/Linearity

```

```
residuals_all <- resid(model_all)
qqnorm(residuals_all)
qqline(residuals_all)
```

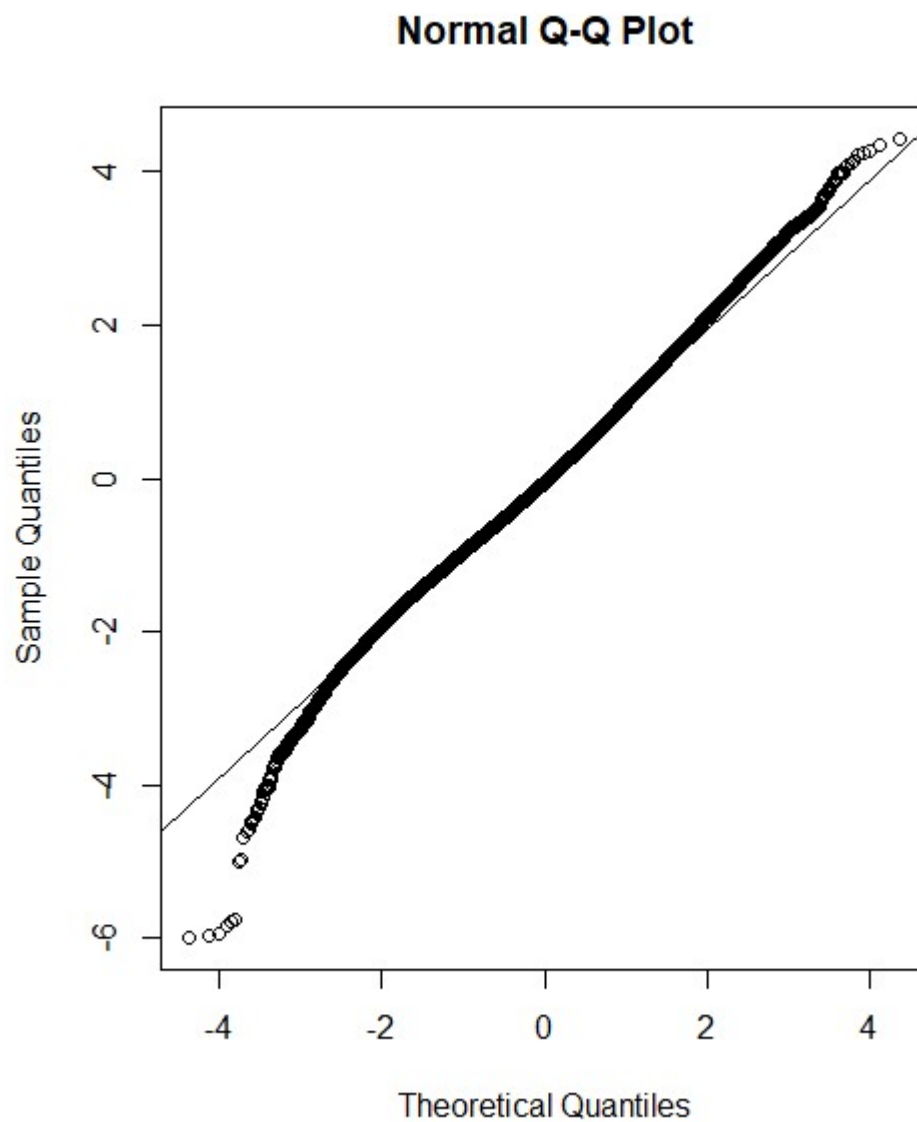


Figure 2: Q-Q plot for residuals of regression model

```
plot(predict(model_all), residuals_all, xlab = "Predicted values", ylab = "Residuals")
```

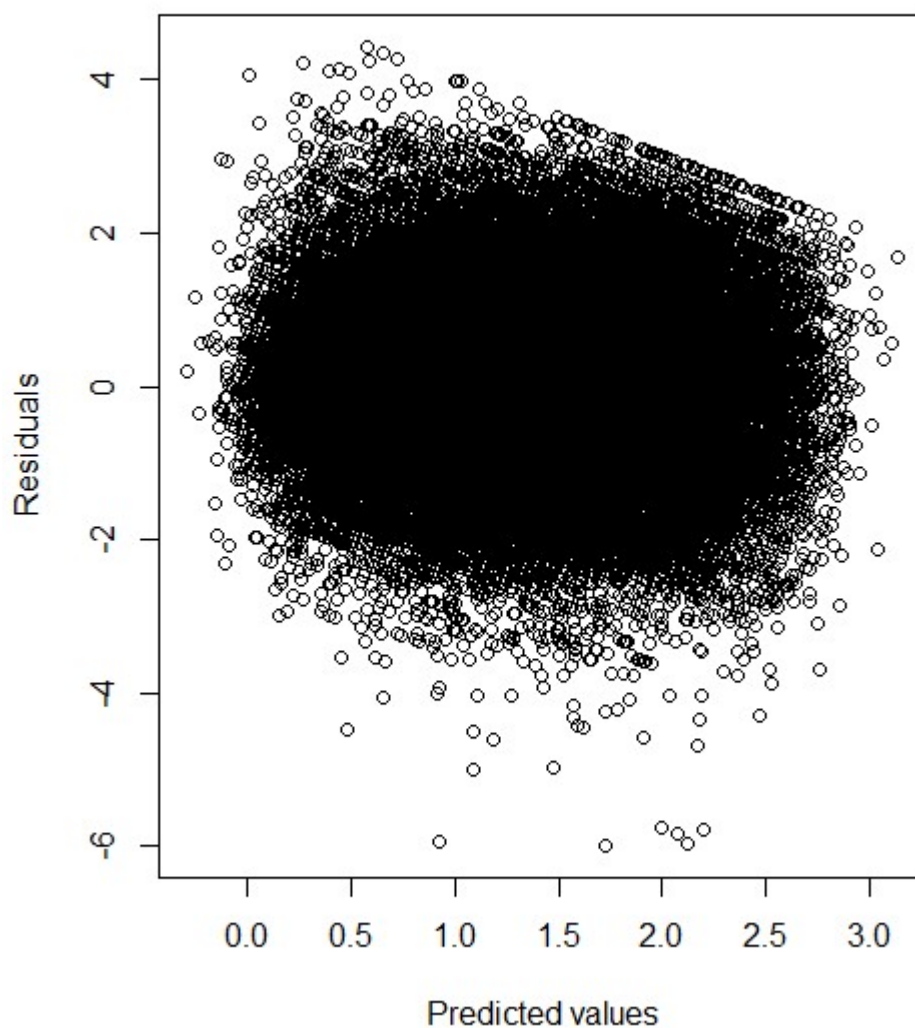


Figure 3: Scatter plot of residuals against predicted values for regression model

#Outliers

```
cook_dist <- cooks.distance(model_all)
```

```
plot(cook_dist, type = "h", main = "Cook's Distance", ylab = "Cook's Distance")
```

```
abline(h = 4 * mean(cook_dist, na.rm = TRUE), col = "red")
```

Iterative model refining

list of variables

```
variables <- c("data_reg_all_imp$edu_GovExp.c", "data_reg_all_imp$socprot_GovExp.c",  
"data_reg_all_imp$envprot_GovExp.c",
```

```
            "data_reg_all_imp$health_GovExp.c", "data_reg_all_imp$rec_GovExp.c",
```

```
"data_reg_all_imp$housing_GovExp.c",
```

```
            "data_reg_all_imp$pubgen_GovExp.c", "data_reg_all_imp$puborder_GovExp.c",
```

```
"data_reg_all_imp$global_conn.c",
```

```

      "data_reg_all_imp$agea.w.national", "data_reg_all_imp$rlgdgr.rec.w.national",
"data_reg_all_imp$atncrse.rec.w.national", "data_reg_all_imp$eduyrs.w.national",
      "data_reg_all_imp$lrscale.rec.w.national",
"data_reg_all_imp$health.rec.w.national", "data_reg_all_imp$selftrans.w.national",
      "data_reg_all_imp$hlthhmp.rec.w.national", "data_reg_all_imp$discint.w.national",
      "data_reg_all_imp$redli.c", "data_reg_all_imp$proter.c",
"data_reg_all_imp$expweath.c",
      "data_reg_all_imp$pastrans.cap.c", "data_reg_all_imp$agea.c",
"data_reg_all_imp$gnldr.rec",
      "data_reg_all_imp$rlgdgr.rec.c", "data_reg_all_imp$atncrse.rec",
      "data_reg_all_imp$eduyrs.c", "data_reg_all_imp$lrscale.rec.c",
"data_reg_all_imp$health.rec.c",
      "data_reg_all_imp$hlthhmp.rec", "data_reg_all_imp$discint.c")

```

```

# Full model

```

```

model_full <- lmer(selftrans ~ edu_GovExp.c + socprot_GovExp.c + envprot_GovExp.c +
health_GovExp.c +
      rec_GovExp.c + housing_GovExp.c + pubgen_GovExp.c + puborder_GovExp.c
+ global_conn.c +
      agea.w.national + rlgdgr.rec.w.national + atncrse.rec.w.national +
eduyrs.w.national +
      lrscale.rec.w.national + health.rec.w.national +
      hlthhmp.rec.w.national + discint.w.national + selftrans.w.national + redli.c +
proter.c + expweath.c +
      pastrans.cap.c + agea.c + gnldr.rec + rlgdgr.rec.c + atncrse.rec +
eduyrs.c + lrscale.rec.c + health.rec.c + hlthhmp.rec +
discint.c + (1 | year/cntry), data = data_reg_all_imp)

```

```

# Start the stepwise procedure

```

```

for (var in variables) {

```

```

  # Remove one variable

```

```

  formula_simplified <- as.formula(paste("selftrans ~ ", paste(setdiff(variables, var), collapse
= "+"), "+ (1 | year/cntry)"))

```

```

  # Fit the simplified model

```

```

  model_simplified <- lmer(formula_simplified, data = data_reg_all_imp)

```

```

  # Compare models with likelihood ratio test

```

```

  lr_test <- anova(model_full, model_simplified)

```

```

  # If the simpler model is not significantly worse

```

```

  if (lr_test$Pr[2] > 0.01) {

```

```

    # Use the simplified model

```

```

    model_full <- model_simplified

```

```

    # Remove the variable from the variables list

```

```

    variables <- setdiff(variables, var)

```

```

    print(paste("Removed", var))

```

```

  }

```

```

}

# Final model
print(summary(model_full))

##### testing interactions #####
# List of variables that could potentially have interactions + highly correlating variables with
selftrans.w.national
interaction_variables <- c("data_reg_all_imp$sagea.w.national",
"data_reg_all_imp$lrscale.rec.w.national",
                        "data_reg_all_imp$selftrans.w.national", "data_reg_all_imp$sagea.c",
"data_reg_all_imp$gnldr.rec",
                        "data_reg_all_imp$rlgdgr.rec.c", "data_reg_all_imp$eduyrs.c",
                        "data_reg_all_imp$lrscale.rec.c", "data_reg_all_imp$hlthhmp.rec")

# Fit the original model without interactions
formula_str <- "selftrans ~ "
formula_str <- paste(formula_str, paste(interaction_variables, collapse = "+"), "+ (1 |
year/cntry)")

model_full <- lmer(formula_str, data = data_reg_all_imp)

# Initialize list to hold variables (including potential interactions)
variables <- interaction_variables

# Add interactions one by one
for (var1 in interaction_variables) {
  for (var2 in interaction_variables) {

    # Don't test a variable with itself
    if (var1 != var2) {

      # Add interaction
      formula_inter <- as.formula(paste("selftrans ~ ", paste(c(variables, paste(var1, var2, sep =
"*")), collapse = "+"), "+ (1 | year/cntry)"))

      # Fit the model with the interaction
      model_inter <- lmer(formula_inter, data = data_reg_all_imp)

      # Compare models with likelihood ratio test
      lr_test <- anova(model_full, model_inter)

      # Check if there is a second row in the lr_test dataframe before accessing it
      if (nrow(lr_test) >= 2 && !is.na(lr_test$Pr[2]) && lr_test$Pr[2] < 0.01) {
        # Update the full model
        model_full <- model_inter
        # Add the interaction to the variables list
        variables <- c(variables, paste(var1, var2, sep = "*"))
        print(paste("Added", paste(var1, var2, sep = "*")))
      }
    }
  }
}

```

```

    }
  }
}
# Final model
# Obtain the summary of the model
model_full_rounded <- summary(model_full)
print (model_full)
rsquared <- r.squaredGLMM(model_full)
print(rsquared)
# Round the coefficients
coefficients <- round(model_full_rounded$coefficients, 3)

# Compute 95% confidence intervals
conf_int <- confint(model_full, level = 0.95)
conf_int_rounded <- round(conf_int, 3)

# Convert the coefficients to a data frame
coeff_df <- as.data.frame(coefficients)

# Filter out only the matching confidence intervals based on row names of coefficients
matched_conf_int <- conf_int_rounded[rownames(coeff_df), ]

# Now add the matched confidence intervals to the dataframe
coeff_df$CI_Lower <- matched_conf_int[, 1]
coeff_df$CI_Upper <- matched_conf_int[, 2]

# Define the file path
file_path <- "C:/Users/Admin/Documents/Uni/ISCTE/Master/analysis/model_summary.xlsx"

# Write the data frame to the Excel file
write.xlsx(coeff_df, file_path, rowNames = TRUE)

# testing model with selftrans.w.national correlation pairs
# list of variables that could potentially have interactions + highly correlating variables with
selftrans.w.national
interaction_variables2 <- c("data_reg_all_imp$agea.w.national",
"data_reg_all_imp$lrscale.rec.w.national",
"data_reg_all_imp$selftrans.w.national", "data_reg_all_imp$agea.c",
"data_reg_all_imp$gndr.rec",
"data_reg_all_imp$rlgdgr.rec.c", "data_reg_all_imp$seduys.c",
"data_reg_all_imp$lrscale.rec.c", "data_reg_all_imp$hlthhmp.rec",
"data_reg_all_imp$edu_GovExp.c", "data_reg_all_imp$rec_GovExp.c", "data_reg_all_imp$at
ncrse.rec.w.national", "data_reg_all_imp$discint.w.national")
# Fit the original model without interactions
formula_str <- "selftrans ~ "
formula_str <- paste(formula_str, paste(interaction_variables, collapse = "+"), "+ (1 |
year/cntry)")

```



```

model_full <- lmer(formula_str, data = data_reg_all_imp)

# Initialize list to hold variables (including potential interactions)
variables <- interaction_variables

# Add interactions one by one
for (var1 in interaction_variables) {
  for (var2 in interaction_variables) {

    # Don't test a variable with itself
    if (var1 != var2) {

      # Add interaction
      formula_inter <- as.formula(paste("selftrans ~ ", paste(c(variables, paste(var1, var2, sep =
"*")), collapse = "+"), "+ (1 | year/cntry)"))

      # Fit the model with the interaction
      model_inter <- lmer(formula_inter, data = data_reg_all_imp)

      # Compare models with likelihood ratio test
      lr_test <- anova(model_full, model_inter)

      # Check if there is a second row in the lr_test dataframe before accessing it
      if (nrow(lr_test) >= 2 && !is.na(lr_test$Pr[2]) && lr_test$Pr[2] < 0.01) {
        # Update the full model
        model_full <- model_inter
        # Add the interaction to the variables list
        variables <- c(variables, paste(var1, var2, sep = "*"))
        print(paste("Added", paste(var1, var2, sep = "*")))
      }
    }
  }
}

# Final model
# Obtain the summary of the model
model_full_rounded <- summary(model_full)
print(model_full)
rsquared <- r.squaredGLMM(model_full)
print(rsquared)
# Round the coefficients
coefficients <- round(model_full_rounded$coefficients, 3)

# Compute 95% confidence intervals
conf_int <- confint(model_full, level = 0.95)
conf_int_rounded <- round(conf_int, 3)

# Convert the coefficients to a data frame
coeff_df <- as.data.frame(coefficients)

# Filter out only the matching confidence intervals based on row names of coefficients

```

```
matched_conf_int <- conf_int_rounded[rownames(coeff_df), ]

# Now add the matched confidence intervals to the dataframe
coeff_df$CI_Lower <- matched_conf_int[, 1]
coeff_df$CI_Upper <- matched_conf_int[, 2]

# Define the file path
file_path <-
"C:/Users/Admin/Documents/Uni/ISCTE/Master/analysis/model_summary3.xlsx"
```