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URBANICITY AND QUALITY OF LIFE

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I would like to dedicate this thesis to my loving parents Seher Gacar and Serdar Gacar and, my closest friends who who have supported and continue to support me heartily.

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SUMMARY

The change created by industrialization deepened the rural and urban distinction. What are the psychological consequences for modern humans living a different life from their ancestors? Urbanized areas are differentiated from rural in terms of density, dominant economic pursuits, etc. and, they have created mental problems such as alienation and different brain activities in their residents. Quality of life is a measure used by social sciences and policymakers, including the mental health of individuals and how happy and satisfied they are with their lives. And it is an effective measurement used to determine in what way and to what extent individuals are affected by the environmental conditions in which they live. This study aims to confirm the accuracy of the effects of urban life on the individual's life satisfaction and uses the German survey results. The thesis is looking for an equation relating to quality of life and possible determinants of German counties. As the result of the thesis, it has been proven that there is a link between urbanicity level and life satisfaction.

1. INTRODUCTION

In 2012, Daron Acemoglu and James Robinson presented a research book entitled "Why Nations Fail: The Origins of Power, Prosperity, and Poverty." They concluded that, in the last two hundred years, as a result of the industrial revolution, all the nations in the world have undergone qualitatively different transformations and produced different outcomes. The inclusive economic and social institutions established in Western European countries ensured the appearance of democracy and pluralism principles, which encouraged individuals to invest and produce new technologies. However, due to the existence of exploiter economic and social institutions, even though they have different production relations, South America, Africa, and Asian countries started to struggle with difficult challenges such as income inequality, poverty, high crime rates, and epidemic diseases. This transformation as emphasized by Acemođlu and Robinson (2012), has deepened the socio-economic and demographic differences between countries and cities. While there are such segregation and inequality around the world, how much does the quality of life of residents change according to social, physical and economic indicators of different cities? Some sociologists claim that urbanized areas are differentiated from rural in terms of density, dominant economic pursuits, etc. and, they have created mental problems such as alienation and different brain activities in their residents. To understand the impact of urbanization on the individual, examining individuals' quality of life is effective. Many studies have been carried out on the relationship between urbanization and quality of life in the world. Each of the studies in this field has focused on specific issues. This study seeks to identify the factors that determine the quality of life in German cities. The German planning bureau uses different classification methods according to the scope of the observations in its determination studies on urbanization. While some classifications are based only on density, others claim that the presence of city-specific features should be used as a method for characterizing an area as urban or rural. This thesis uses urbanicity level which is a classification

based on population size, in order to understand the relationship between urban population and life quality.

The arguments that urbanization brings happiness or hinders happiness are worth examining for the future of urban planning. These arguments will tell the planners and administrators who have the opportunity to manage the city which criteria they should attach importance to. Can income, fear of crime, GDP, forest rate, etc., predict the quality of life? The study aims to establish a link between the variables listed above and the quality of life of city dwellers, their health status, or fear of crime. The argument claimed in the paper is; the related variables can predict the quality of life of a city and, some variables have positive, some variables have a negative impact on the quality of life.

2. LITERATURE REVIEW

2.1 Definition of subjective well-being

In recent years, well-being has become a term that urban planners and psychology have utilized in their analysis, and politicians have employed the term to produce policies. The meaning of the term varies according to different branches of science. For instance, the term is used in the sense of "welfare" in the studies about the economic conditions of the countries. Veenhoven (2000) and Colby (1987) have emphasized the term, which refers to the ability to fulfill the function. Colby (1987), as cited by Veenhoven (2000), described well-being as 'adaptive potential.' Veenhoven (2000) examined the etymological origin of the word, argued that the term well-being, which is used as the counterpart of more than one concept, needs a more precise definition and dealing with only in certain aspects would make research easier. He expressed with the following quotation that the term denotes the mental health state of the individual and the development in life skills, which psychologists also prefer; 'Sometimes the term refers to good mental functioning and then denotes live-ability (Veenhoven, 2011). Since

the definition described as 'mental functioning' does not include the individual's living conditions and subjective evaluation, it was not preferred in this study. Because examining the effect of physical conditions and subjective values on the individual within the scope of well-being plays a significant role in apprehending the relationship between cities and city dwellers.

In this vein, Deiner (1984) and Zapf (1984) suggest a definition of well-being that includes these scopes. According to Zapf (1984), as cited by Veenhoven (2000), when conditions of life score good and objective measures and subjective appreciation of life is positive, one could speak well-being; when both evaluations are negative, it is deprivation. In 1984, Ed Deiner added 'subjective' to the term. He announced the term 'Subjective Well-Being' (abbreviated SWB) as a crucial concept necessary to clarify cognitive judgments and emotional responses that enable people to experience positive experiences. Okulicz-Kozaryn (2016) denoted a parallel definition. He described SWB as a subjective, self-reported, cognitive, and affective evaluation of one's life, usually measured with surveys asking respondents about their happiness. The subjectivity concept of the term that Deiner, Okulicz-Kozaryn, and Zapf referred to in their studies relies on how an individual perceives his situation and his standards, which could differ in accordance with personality, attitudes, and desires goals. Although often the word objectivity in science associates with accuracy and subjectivity associates with unreliableness, the term SWB is a comprehensive and reliable measure to analyze social, psychological, and physical factors in cities.

Deiner (1999) denoted that evaluation of SWB could be based on external criteria (depending on cultures, beliefs, etc.) or personal standards of the respondent to determine the good life. Even though both researchers describe the term as external and internal conditions and the total value of their consequences, Deiner (1999) argues that, unlike Zapf's definition, well-being is not the absence of negative, but the predominance of positive emotional experiences over negative ones.

Many researchers agree on the complexity and multi-component structure of the concept. According to Stones and Kozma (1985), as cited by Deiner et al. (1999), subjective well-being is a broad category that encompasses people's emotional reactions, satisfaction levels, and judgments about life satisfaction. The complexity of subjective well-being derives from not only its components but also the methodology to measure it. Wilson (1967) suggested calculating subjective well-being only by demographic factors. According to Wilson (1967), as reported by Deiner et al. (1999), there are fundamental and universal human needs, and that if one's circumstances allow a person to full fill these needs, he or she will be happy. Instead of Wilson, Ed Diener et al. (1999) proved that such indices like marriage, age, income, education, religion, intelligence, etc., cannot be the only determinant of happiness, and the relationship between happiness and each indicator varies according to society. Due to the intricacy of subjective well-being, it is unlikely to assume that only demographic factors determine SWB. Its needs to be investigated by considering the adaptation ability of individuals to negative or positive circumstances and the genetic tendency to feel emotions. The SWB is also required to be examined with the pattern formed by multiple variables since the role of a single variable on the result cannot be significantly greater. Diener (1984) indicated the importance of multiple variables as cited; "SWB is probably determined by a large number of factors that can be conceptualized at several levels of analysis, and it is perhaps unrealistic to hope that a few variables will be of overwhelming importance." This study found it correct to associate the SWB values of city dwellers with many different demographic characteristics and the part that can not be explained by these indicators are related to personal moods, personal predispositions, and the pattern they created.

2.2 Definition of quality of life

Quality of life has various meanings and definitions across the literature of social sciences. Some researchers could conceive QOL in a narrow sense like the quality of transportation,

housing, or some other domain (Okulicz-Kazaryn 2016). Every society defines its QOL from a different perspective, such as the happiness of citizens or dwelling conditions. However, the term quality of life covers a lot of value and denotes special merits. As reported by Veenhoven (2000), McCall (1975) defined QOL as "necessary conditions of happiness," while Terthune (1973) defined it as "subjective satisfaction itself." As we see in the quotations above, QOL includes both inner and outer conditions and both reasons and outcomes. In this vein, Veenhoven (2000) proposed a classification based on four categories: live-ability of the environment, life-ability of individual, the external utility of life, and inner appreciation of life. The crucial point of this taxonomy is that different indicators of QOL, such as outer indicators like environmental conditions, social isolation, pollution, etc., cannot be summed with inner indicators like the perception of happiness, appreciation of life. Because such an attempt will be pointless as trying to collect apples and oranges in the same unit. Instead of addition, we intend to compare the different indicators of quality of life to achieve comprehensive and accurate value.

Since not all conditions are measurable (such as social segregation and cultural characteristics), we decided to focus on objective components (such as demographic and physical values) and subjective components of quality of life. The subjective component of quality of life is happiness, which can be measured by questionnaires entirely because it is overall judgment. As stated by Veenhoven (2000), "the questionnaires do not measure actual usefulness of life, but rather the person's satisfaction with his perception of this matter." Nonetheless, it includes a comparison of people's notions about their lives and how they should be. Furthermore, if we do not include the subjective components of QOL evaluations, we can make the same mistake of large-scale urban renewal projects. In the modern period, most urban renewal projects assumed that they could procure QOL by only creating clean streets; they ignored the sense of being at home that people feel in their neighborhood. For these reasons, in this QOL research, we

deemed it necessary to include questionnaires that question the happiness and satisfaction of individuals.

As literature reviewed, Quality of life is not measurable like psychological tests, it is a subjective variable, and individuals' statements should be taken as a basis when determining the quality of life. For this reason, in this study, questionnaire data were used that contains the "how satisfied do you feel out of 10" question.

2.3 Urbanization in Germany

Germany was founded as the German Empire in 1871, the Empire ruled until 1918. After the defeat in World War I, the German revolution broke out in 1919. The Weimar Republic was founded after the revolution. The Weimar Republic was founded with a constitution. The constitution provided for a parliamentary democracy in which the Government was ultimately responsible to the people (Library of Congress, 2019). The 'National Socialist German Workers' Party, which came to power during the Weimar Republic, caused havoc in the country that harmed democracy and human rights. After the Second World War, the National Socialist German Workers Party lost its sovereignty, and the country split into East and West Germany. In 1990, the two countries united, and the "Federal Republic of Germany" was established. The capital of the country is Berlin. According to information from OECD (2007), East and West Germany differed in terms of economic development even after unification and high-density cities are concentrated in West Germany, while low-density ones are concentrated in the East (Figure 1). This contrast has created a significant difference between Life Satisfaction values, which today still continues. The following quotation stated by Petrunyk et al. (2016) demonstrates the pattern of life satisfaction in terms of West and East Germany;

“Life satisfaction is on average significantly lower in East than in West German federal states and that part of the raw East-West gap is due to differences in household income

and unemployment status. The conditional East-West gap decreased in the first years after the German reunification and remained quite stable and sizeable since the mid-nineties.”

Germany contains sixteen federal states, which are collectively assigned to as Bundesländer. As of 2017, Germany is divided into 401 districts (Kreise) at a municipal level; these consist of 294 rural districts (Landkreis) and 107 urban districts (Kreisfreie Stadt or Stadtkreis). Every rural and urban district is subdivided into municipalities. There are 12,141 municipalities, which are the minor administrative units in Germany. German Federal Institute for Research on Building, Urban Affairs, and Spatial Development defined a Großstadt (large city) as a city with more than 100,000 inhabitants. As of December 31, 2015, 79 cities full fill this criterion.

After the Second World War, West Germany, with the support of foreign capital, accelerated its industrialization and achieved enormous growth. Within two decades of defeat, it had become one of the world's wealthiest nations, with prosperity that broadened to all segments of the population (Library of Congress, 2019). However, an essential factor determining the social structure of the society is migration. Constant and Massey (2002) have indicated the role of immigration with following statement; "By the end of the second millennium population in Germany had risen to more than 10% while the majority of immigrants in Germany, the guestworkers had been living in Germany for more than a quarter of a century".

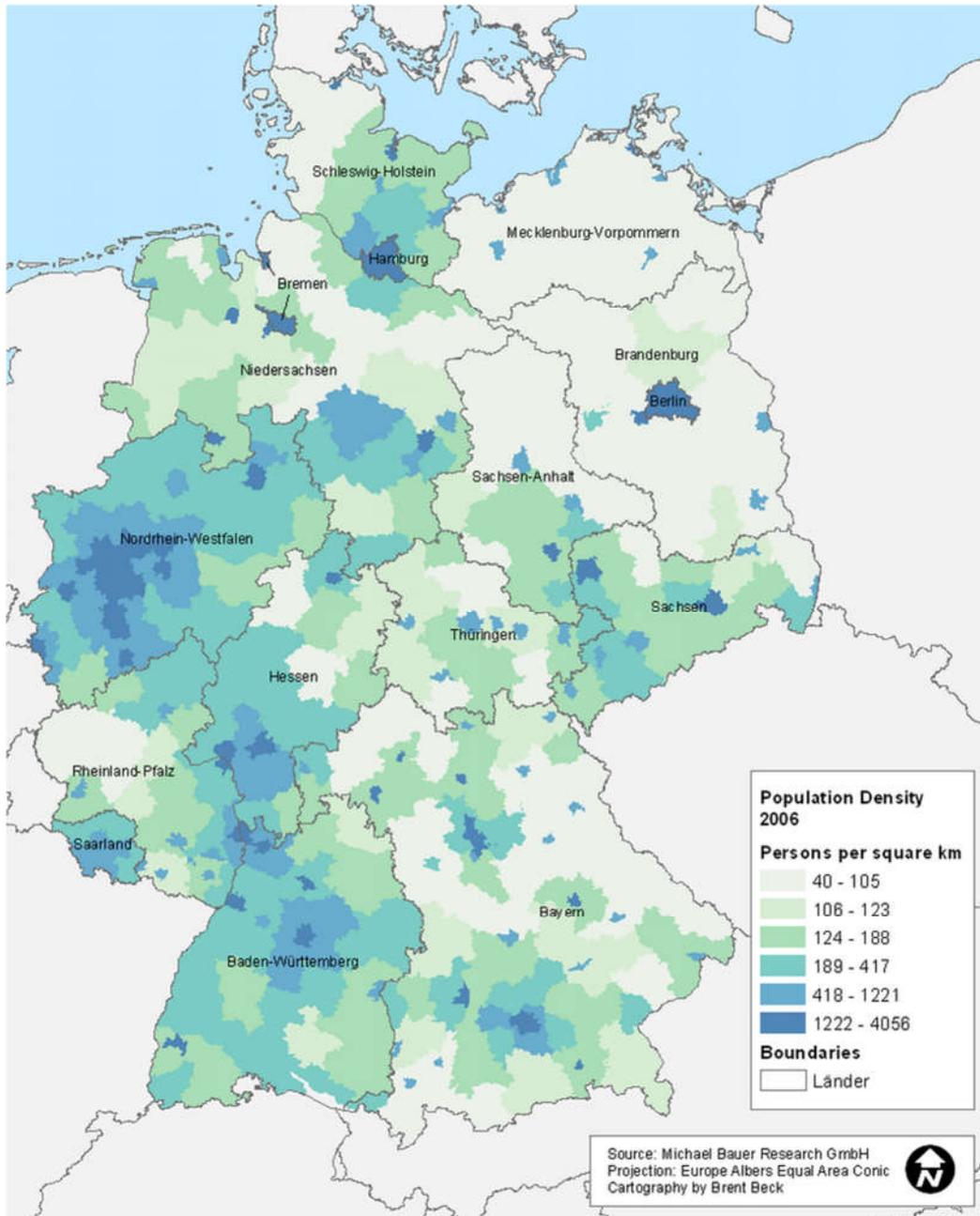


Figure 1 - density levels of Germany

2.4 Review of studies that examines the urban and rural dichotomy

To illustrate the differences between German cities, we need to look at the rich literature that focuses on the well-being of urban and rural regions regarding the social, physical, or psychological aspects.

2.4.1 Urban Studies

In the domain of urban social geography, as Frazier (1979) cited, Robert Park (1916) brought an ecological approach to the urban concept. Knox and Pinch (2006) reported that Park provided a general framework that forms the basis of concept with an analogy between urban life and natural processes as dominance, segregation, competition, and succession. After Park's declaration, Wirth (1938), pointed out that urban life has a peculiar feature, and it is this feature rather than population density that separates the urban from the rural. According to Wirth (1938), the city melts differences in the same pot, and it is a suitable area for biological and cultural fusion. In the city, solidarity has been replaced by competition and control mechanisms. Thus, urban life has directed the individual to superficial relations largely based on namelessness (Louis Wirth, 1938). Wirth was profoundly influenced by George Simmel while creating these arguments. According to Simmel (1903), quantity is substituted for quality in Metropolis life. In the metropolis, the individual is exposed to too many stimuli in the rapid flow of life; these stimuli damage the individual's nerves. There is also a division of labor in metropolitan life, and one-sided success is demanded from the individual. The individual whose nerves are destroyed by the excess of stimuli cannot develop herself outside of his field feels (blasé) malaise (George Simmel, 1903). There are also sociologists who do not agree that cities negatively affect life satisfaction and quality of life. Fischer, however, opposes Wirth's argument that large heterogeneous societies weaken social ties, and he defends the 'subcultural theory.' According to Fischer, the density of urban life strengthens the ties between subcultures and increases their diversity and power; these subcultures create a space for rooting deviant behavior and unconventional norms in the city. To quote, "The more variable and distinct subcultures there are, the more behavior there is that deviates from general norms" (S. Fischer, 1975). Referring to the subcultural theory that Fischer mentioned, Veenhoven (1994) claims that marginal identities that will be labeled as deviant or divergent in rural settlements can live in the city without being oppressed and having to hide, and this will have a positive

impact on the quality of life of these people. Moreover, according to Veenhoven (1994), the increased options in the choice of work and family in the city enabled the individual to have more control over his life, making it possible for individuals to make choices that fit their specific needs and capacities. Gans (1995), on the other hand, indicates the city is quite different from the period in which Wirth and his fellow sociologists lived. Gans (1995) has reported that the dominance of industrialization on the city, which created the negative effects of urbanization, decreased with deindustrialisation and, the modern lifestyle spread to different settlement types. Veenhoven (1994) explained that these changes, expressed by Gans, disprove the argument that urban life creates unhappiness in the individual, with the following quote; “In this view one can also imagine that further developments into post-industrial patterns also affect the balance of advantages and disadvantages, possibly now in the advantage of city life.”

Veenhoven (1994) declares that our ancestors lived in the countryside for thousands of years and it gives rise to thought our genetic structure inherited from them is predisposed to live in the countryside, but it is possible that the adaptability of human beings evolved to be happy in the city over the centuries after the industrial revolution.

David Harvey has conducted more recent studies on the urban concept. Harvey (2003) argued that today's production relations construct urban life both physically and socially. According to him, capitalism encourages the individual to express himself with the goods he consumes; consequently, individual gains obsessional tendency for households to compete with one another and display their wealth through consumer products. (Knox and Pinch, 2010). Class conflicts deepen the segregation of society and increase the need for social isolation; consequently, cities are physically separated, sometimes even accommodating neighborhoods and ghettos surrounded by walls.

Another view on urbanization and quality of life is the optimal size theory. Taylor G. (2007) argues that rather than a linear relationship between urbanity and happiness, there is an optimal

value for which happiness is highest. The city, which reaches excessive size after the optimal value, makes the individual unhappy with its negative features, but the population size before the optimal value does not provide enough opportunity to work and socialize that makes the individual happy enough. The following result of the research done at the European Union supports intermediate-size cities theory. As cited by D'Acci (2021), Sorensen (2014) has elaborated the mean life satisfaction across the European Union Countries, the life satisfaction has measured from 1 to 10, and the intermediate size cities have the highest rate of life satisfaction. (Fig. 2)

As can be seen, there is no consensus on how urban life affects social life. This study will either support or refute the thesis that alienation and anomie effect is present in cities with empirical data analysis. The urban theories I have summarized above are various perspectives towards understanding the city. Of course, it is possible to make a deeper examination of these perspectives. Still, my aim in this chapter is only to underline the significant characteristics of the city, which are revealed by urban theories.

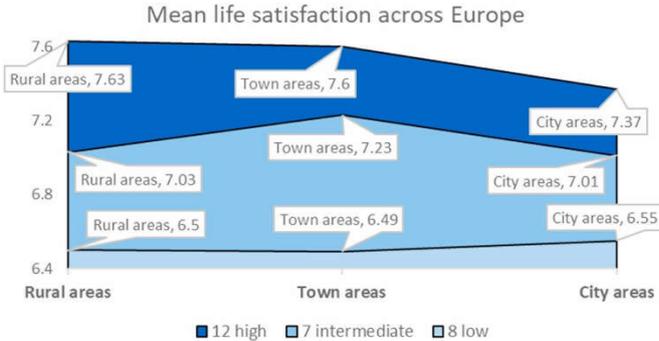


Figure 2 - Source : Elaboration from Sorensen, 2014

2.4.2 Physical and Psychological Studies

To clarify how the city causes the 'malaise,' many researchers have studied the brain activities of urban dwellers by using functional brain imaging and digital monitoring. They aimed to see how people living in cities and rural areas differ in how their brains process stressful situations

(Abbot, 2012). One result they obtained that urban life increases the activity in the amygdala area of the brain. According to Okulicz-Kozaryn (2016), contemporary urban living is associated with amygdala activity, which increased stepwise from living in the country to those living in small towns and is highest in city dwellers. Abbott (2012) acknowledged the relation of the amygdala with urban life with the following words:

"The amygdala which processes emotion showed much greater activity in people who were currently living in the city." According to Abbott, people who grew up in the city, regardless of where they live now, are more aroused to the cingulate cortex. This center regulates the amygdala and manages negative emotions. Another result of these studies is that 'stress' is a necessary intermediary experience linking urban life with mental consequences (Fitzgerald et Al., 2016). In the city, the stress of not getting a stable position in the hierarchy, arising from social inequality, is an essential factor that creates mental health problems (Lederbogen et al., 2011).

Environment influences the health and mood of urban dwellers; a study examining the effect of artificial light on an individual's mood convinces us of this argument. According to Bedrosian and Nelson (2013), individuals synchronize internal biological rhythms to the external world, primarily using light information. They indicated that night-time exposure to light which we can observe in urban areas more than rural areas disrupts circadian organization and contributes to depressed mood. Another crucial physical disadvantage of the city is air pollution. Depending on the number of pollutants in the air, the type of exposure, the age, gender, and circulation of free radicals, consequences ranging from damage to DNA sequencing to Alzheimer's and Parkinson's disease can occur. The brain can shrink its capacity to less exposure to harmful substances. Since children's immune system and cognitive development are in close interaction, the differentiation in the immune system of children exposed to air pollution is also noteworthy

(Brockmeyer & D'Angiulli, 2016). These data allow us to understand the physical characteristics of city life and its impact on individuals.

2.5 Review of Other Quality of Life Studies

In America, Italy and China, the following researches were conducted to establish the relationship between the happiness levels of individuals, their quality of life, and the qualities of the cities they live in. The studies done in the United States declare that people living in small towns are happier than those living in big cities (Okulicz-Kozaryn, 2016). Okulicz-Kozaryn (2016) supported this argument with the following words "People are not happiest neither in cities nor in the suburbs, but in small towns and villages, large cities are likely to have more special polarization, income wealth inequality, residential segregation, and so on." Likewise, Sander (2011) stated in his study that respondents living in less urbanized areas are happier than those living in the largest hundred cities of the USA. In China, the situation is a little different. According to Chen et al. (2015), household wealth is the most consistent and significant predictor of life satisfaction and, a non-linear relationship was observed between city size and life satisfaction. Berry & Okulicz-Kozaryn (2009) agreed that in Asia, life satisfaction increases with big city residence. This opposition can be explained by the fact that, in developing countries, big cities can provide social relations, jobs, and income. In contrast, rural areas cannot provide basic human needs.

Italy has some unique dynamics; for instance, individuals living in the northern regions show higher well-being than urban and rural dwellers. However, rural areas have the highest well-being rates significantly, and the semi-urban regions have the lowest in all regions (Vigano et al., 2019). It proves the argument that rural areas provide better QOL in developed countries.

However, according to the World Database of Happiness report reviewed by Veenhoven (1994), the settlement type with the lowest average happiness in life in Germany in 1988 was

the small rural town (5.7), and the highest values were medium-size towns and villages near the city (6.3).

To conclude, it is impossible to generalize the distribution of life quality between urban and rural on countries that have unique location and level of development. Countries have a relationship between urbanization and quality of life that differs according to their own dynamics and socio-economic distribution of citizens.

3. METHODS

The study area covers the 401 districts of Germany. An independent variables dataset was created by gathering the 2011 version of datasets titled income, population density, social benefit, children's daycare, car density, investment, GDP, waste, unemployment, settlement share, forest from the website of "Statistische Amter des Bundes und der Lände." Annual and daily particulate matter data were obtained from the website of the "umweltbundesamt" institution. I determined which district each of the stations measuring air pollution is in. I have accepted the average value of the station measurements in districts containing more than one station as the air pollution data of that district. I estimated the missing variables in the pm data with the linear interpolation method through the STATA program. Data on life satisfaction, current health status, fear of crime were obtained from the "German Socio-Economic Panel (GESOEP)." After the contract is signed, SOEP shared the survey data conducted in 2011 with the participation of 28,733 people in the file that was prepared on the program called Statistical Package for Social Sciences (SPSS). This dataset includes each participant's "current household number" and their answers to the survey questions. In this data set, the district information of the participants is not available due to the privacy policy; access to county-level data can only be made through the SOEPremote system. For this reason, I applied for permission to access the SOEP-remote system and got approval. The working method of the

SOEP-Remote system, which is designed not to violate the privacy policy, is as follows; SOEP-Remote runs the code list that the researcher sent via e-mail and sends the output to the researcher via e-mail. I prepared a code that would list the district code of each household number and saved this code in do-file format and sent it to the SOEPRemote by e-mail. The system sent me the list of district codes of each household number. In order to obtain the final dataset, I merged the variables by the identifier variable which is “current household number” in STATA.

After creating these datasets, regression and correlation methods were used to analyze the relationship between variables. Pearson Correlation analysis is preferred for the correlation analysis of the data. In regression models, the aim is to establish a statistically acceptable model to define the relationship between dependent and independent variables, using the fewest variables to have the best fit. A mathematical equation determines the relationship between the two variables. And it can be expressed as $Y = f(x)$. In this equation, x is the independent variable, and Y is the dependent variable. When the X value is known, the Y value is found precisely depending on the equality. (Coskun, Kartal, Coskun, & Hudaverdi, 2004). After examining the correlation of the data with each other, the most suitable variables were selected for regression, and the regression model is prepared, and the equation formulating the change in life satisfaction according to the independent variables is obtained. Since the marital status, nationality and gender variables are categorical variables, in order to use it in the linear regression model, it needs to be converted to a numeric variable. For this reason, these variables are converted into separate dummy variables. One of these dummy variables is taken as the reference value and the other dummy variable is included in the regression equation. On September 4, 2011, a regional reform came into Germany and the number of districts in the state of Mecklenburg-Western Pomerania reduced from twelve to six. These districts are not

included in the regression and correlation analysis because the information about these districts, whose district codes were changed, is not available in some data sets

4. OPERATIONALIZATION

Table - 1 Descriptives of variables used

Variable	Observations	Mean	SD	Min	Max
Satisfaction With Life	26131	0	10	7,18	1,742
worried about crime	20792	1	3	1,86	,701
Current Health	28705	1	5	2,59	,977
income	28418	14886	36576	19461,54	2459,340
dpm10	28733	0	67	23,14	10,949
male	28733	0	1	,45	,498
female	28733	0	1	,55	,498
married	27295	0	1	,60	,489
not_married	27295	0	1	,40	,489
population	28733	34161	3300000	417219,81	624451,592
urbanicitylevel	28733	1	4	1,85	,894
west	28733	0	1	,76	,428
east	28733	0	1	,24	,428
german	22483	0	1	,95	,217
foreign	22483	0	1	,05	,217
socialbenefit	28102	1,2	20,6	8,660	4,4450
childrendaycare	28733	,0	60,8	22,145	13,3944
cardensity	28242	323,7	932,9	518,391	72,2873
investment	27598	2,5	73,1	9,127	6,7580
waste	28733	169,0	789,0	458,213	69,2928
unemployment	28242	1,4	16,7	7,155	3,3205
populationdensity	28733	37,5	4393,0	816,697	1036,5679
gdp	28612	13338	128296	32773,95	14529,825

4.1 Reliability of Data

In order to check the reliability of the data, some analyzes were carried out using the SPSS program version 26.0. According to Dođdu (2019), The reliability of the data obtained with a survey is decided according to the Cronbach's Alpha value, and if this value is higher than 0.7, it means that the data is reliable.

Table 2 - Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,703	,747	7

4.2 Dependent Variable (Life Satisfaction)

“Satisfaction With Life at Present” is the dependent variable, measured annually on a 0–10 scale (‘totally dissatisfied’ to ‘totally satisfied’) with a mean of 7.18 and a standard deviation of 1.74. In the dataset, 32 observations are “no answer” and 2570 observations are “not included in this version of the questionnaire”, accepted as missing value.

0	[0] 0 Satisfied: On Scale 0-Low to 10-High
1	[1] 1 Satisfied: On Scale 0-Low to 10-High
2	[2] 2 Satisfied: On Scale 0-Low to 10-High
3	[3] 3 Satisfied: On Scale 0-Low to 10-High
4	[4] 4 Satisfied: On Scale 0-Low to 10-High
5	[5] 5 Satisfied: On Scale 0-Low to 10-High
6	[6] 6 Satisfied: On Scale 0-Low to 10-High
7	[7] 7 Satisfied: On Scale 0-Low to 10-High
8	[8] 8 Satisfied: On Scale 0-Low to 10-High
9	[9] 9 Satisfied: On Scale 0-Low to 10-High

4.3 Independent variables

4.3.1 Current Health

“Current Health” is an independent variable, measured annually on a 0–5scale (‘very good to bad) with a mean of 2.59 and a standard deviation of 0.977. In the dataset, 28 observations are “no answer” and, accepted as missing value.

1	[1] Very Good
2	[2] Good
3	[3] Satisfactory
4	[4] Poor
5	[5] Bad

4.3.2 Worried about Crime in Germany

“Worried about Crime in Germany” is an independent variable, measured annually on a 0–3scale (very concerned to not concerned at all) with a mean of 1.86 and a standard deviation of 0.701. In the dataset, 277 observations are “no answer” and 7664 observations are “not included in this version of the questionnaire, accepted as missing value.

1	[1] Very Concerned
2	[2] Somewhat Concerned
3	[3] Not Concerned At All

4.3.3 Urbanicity level

Classification of urbanicity level is based on population size. 4 levels of urbanicity has created according to classification of OECD.

Urbanicity level 1: Districts with the population lower than 200.000

Urbanicity level 2: Districts have population between 200.000 and 500.000

Urbanicity level 3: Districts have population between 500.000 and 1000.000

Urbanicity level 3: Districts have population more than 1.000.000

In addition, while examining the relationship between city parameters and happiness of survey participants, Germany's 401 districts (landkreise) is preferred as the classification method.

4.3.4 Income (EUR)

To calculate the indicator "Disposable income of private households including private non-profit organizations per inhabitant in EUR," the value of the disposable income in current prices in the year is divided by the number of inhabitants on an annual average. The average yearly number of residents based on the 2011 census is used to calculate the indicator 'Available income of private households including private non-profit organizations per inhabitant in EUR.' The average annual population is the arithmetic mean of the beginning and end of the year (Statistische Ämter des Bundes und der Länder).

4.3.5 Population Density

To calculate the indicator "inhabitants per square kilometer on December 31st," the number of inhabitants is divided by the area. This gives the population density of a regional unit. The population density provides information about the ratio of residents to the district area. Population density is the most common density measure used to distinguish between urban and rural areas. The informative value of the indicator is limited by the fact that the population is not evenly distributed over an area (e.g., forest and agricultural areas are not or only sparsely populated) (Statistische Ämter des Bundes und der Länder).

4.3.6 Children day care (%)

The indicator provides information on the daycare offerings for small children under three years of age in day-care centers. The indicator is based on data from child and youth welfare statistics and from population statistics. Children's daycare is publicly organized and financed. It belongs to the child and youth welfare. It finds its legal basis in the Child and Youth Welfare Act. Daycare includes children's upbringing, education, and care in daycare facilities and in publicly funded daycare.

4.3.7 Car Density

The indicator provides information on the population's car occupancy. The car density is mostly higher in rural regions than in metropolitan areas. The traffic load from through and commuting traffic is not taken into account.

4.3.8 Investment (EUR)

The indicator provides information on investments per employee in manufacturing companies. For the calculation of the indicator 'Investments in manufacturing, mining and quarrying per employee in EUR 1,000', investments in manufacturing companies, as well as mining and quarrying, are divided into 1,000 EUR by the number of Total employees divided.

4.3.9 GDP

Gross domestic product in current prices per inhabitant in EUR. The annual average number of inhabitants is used to calculate the indicator 'gross domestic product in current prices per inhabitant in EUR'. Until 2010, the average annual population is the arithmetic mean of the twelve-monthly averages. These are calculated as the arithmetic mean of the beginning and end of the month in question. The average population in 2011 is the reference date population on May 9, 2011. As of 2012, the average annual population is the arithmetic mean of the numbers at the beginning and the end of the year (Statistische Ämter des Bundes und der Länder).

4.3.10 Waste

The indicator provides information about the average per capita generation of household waste. The indicator is based on data from the "Survey on Public Waste Disposal" and the "Statistics on the extrapolation of the population".

4.3.11 Unemployment (%)

The unemployment rate provides information on how high the proportion of unemployed people registered with the Federal Employment Agency is about all civilian labor force. The unemployment rate shows the relative underutilization of the labor supply.

4.3.12 Settlement Share (%)

The indicator provides information about the use of the non-multipliable total area of an area through the use for settlement and transport purposes. Share of settlement and traffic area in the total area on December 31.

4.3.13 Daily PM

Particulate matter (PM₁₀) comprises the mass of all particles contained in TSP (total suspended particulates) with an aerodynamic diameter of less than 10 µm.

4.3.14 Forest

The indicator provides information about the proportion of forest area in the total area. The floor area of a regional unit (e.g. municipality, non-municipality area, district) is made up of all areas within the defined boundaries of this area.

4.3.15 Social Benefit (%)

The indicator shows the proportion of people in the population who receive benefits from the minimum social security systems in Germany. The "hidden" or "shameful" poverty of eligible people but do not assert them is not recorded.

5. RESULTS

Table 3 - Average values of variables per urbanicity level

urbanicitylevel	1	2	3	4
income (EUR)	19149.75	19492.07	19929.33	20332.59
population density	347.68	618.85	1703.84	3113.84
social benefit (%)	7.27	8.30	10.79	14.76
children day care (%)	24.13	19.69	18.12	30.48
car density	548.48	527.92	465.97	384.23
investment (thousand EUR)	7.98	8.50	13.96	11.19
GDP (EUR)	28693.86	31528.71	44493.33	44407.71
waste (kg)	465.53	454.99	444.99	455.34
unemployment (%)	6.48	6.94	8.45	9.99
settlement share (%)	17.25	23.77	44.79	62.22
daily pm	20.24	23.01	29.59	30.11
forest	30.66	25.64	18.96	13.94
Life satisfaction	7.13	7.18	7.30	7.21
Frequency of being angry	2.74	2.76	2.73	2.80

It is seen that as the urbanicity level rises, the average value of the income variable, the average value of the investment variable, the average value of the social benefit variable, and the average value of the GDP variable increase.

5.1 Correlation among variables

Pearson correlation analysis results show that there is a significant relationship between the variables.

Table 4 - Pearson correlation analysis results

	Satisfaction With Life at Present
current health	-,464**
GDP	,052**
worried about crime in germany	,103**
foreign	-0.007
urbanicitylevel	,023**
unemployment	-,072**
income	,066**
dpm10	-,021
population density	,014*
children day care	-,089**
Forest	-0,16

**Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed).

5.2 Regression Analysis

Among all variables, variables that significantly explain the variation in the dependent variable are selected for regression analysis (current health, urbanicity level, west, ,gender, nationality, marriage status). Multiple linear regression analysis is conducted to determine how much the these selected variables affect Life satisfaction. The model is significant according to the results of the regression analysis. (F=963,411 and p=0.000)

	Sum of Squares	df	Mean Square	F	p-value
Regression	13265,530	6	2210,922	963,411	0,000
Residual	42281,063	18424	2,295		
Total	55546,593	18430			

The adjusted R-square tells what percentage of the total variance is explained by the created model, and the adjusted R-square value obtained from the regression analysis is 0.24. In other words, the independent variables in the regression analysis explain 24 percent of the variance in life satisfaction.

Model (1)	R	R²	Adjusted R²	Estimate SE
	,489	,239	,239	1,515

The table below shows the coefficients, p values and VIF levels of the variables participating in the regression analysis. The B value demonstrates the extent to which each independent variable affects the dependent variable, while other independent variables are constant. The beta value indicates how much a standard deviation change in the independent variable will make a change in the dependent variable. The p-value for each variable describes its significance level to explaining the variation in the dependent variable. The fact that this value is less than 0.05, which is the set point we determined, indicates that the unique contribution of each variable is statistically significant. VIF value of each variable is below 2.5, proving there is no multicollinearity problem among the independent variables in the regression model (Allison, P. D. 1999).

	B	SE	Beta	p-value	VIF
(Constant)	8,683	,049		,000	
female	,085	,022	,024	,000	1,005
current Health	-,853	,012	-,474	,000	1,013
foreign	-,268	,052	-,033	,000	1,019
married	,378	,023	,107	,000	1,017
west	,371	,026	,094	,000	1,020
urbanicitylevel	,047	,012	,025	,000	1,010

Table 5 - **B:** Unstandardized Coefficients **Beta:** Standardized Coefficients **SE:** Std. Error dependent variable: Life Satisfaction

Model 1:

Life Satisfaction = 8,683 – 0,853 x Current Health + 0,371 x West + 0,085 x Female + 0,378 x Married – 0,268 x Foreign + 0,047 x Urbanicity Level

6. DISCUSSION

As can be seen in the literature review, the variance of life satisfaction in each country and the effect of the choice of settlement type on life satisfaction vary according to the unique dynamic structure of the country. Headey et al. (2021) indicate that there is no one strategy for every country that works on determining life satisfaction. Countries differ in terms of "recipes" affecting life satisfaction by sets of personal values, life priorities, behavioral choices, and domain satisfaction (Headey et al.,2021). In this thesis, a dataset is created with the factors and values affecting the quality of life of German cities, and regression and correlation analyses are performed.

In the correlation analysis, it is proved that Life satisfaction is closely related to services provided for the daily care of children, health status, and unemployment, worry about crime, marital status, unemployment, income and, population density. But it is mainly related to economic, health, and safety-related parameters such as current health, fear of crime, unemployment, and income. Table 3 shows that the average amount of investment, income and GDP, social benefits increase with the urbanicity level. The result obtained from the regression equation on the relationship between urbanicity level and life satisfaction is listed below. While gender, health, nationality, west-east values are constant, an individual is most satisfied with living in the urbanicity level 4. There is a positive relationship between the individual's life satisfaction and urbanicity level. Chen et al. (2015) state in their research that it is easier to access essential services such as education and health in regions with high urbanization. Accordingly, high urbanization brings high life satisfaction until a certain point that negative

effects of excess begin to reduce it. In this study, I came to a similar conclusion with Chen; urbanicity level improves satisfaction.

The analysis declares that the cities' urbanicity level is explaining the life satisfaction of dwellers successfully. And in Germany, the urbanicity level has a fair, positive effect on life satisfaction while the control variables are constant. While other control factors (gender, health, nationality, and marital status) are constant, one unit increase in urbanicity level increases life satisfaction by 0.47 units. This result coincides with the results of the research that Veenhoven (1994) reviewed, which was conducted with 18,000 participants from all over the world and declared "Greater life satisfaction in urban areas ($\Gamma=+14$)". In addition, another research that Veenhoven (1994) included in his study reveals that between 1978 and 1988 in Germany, urban life is more satisfying than rural. The result of the regression analysis I obtained also coincides with the research on life satisfaction in Germany cited by Veenhoven (1994).

The literature discourses about the possible negative effects of urban life on life satisfaction. They concluded that in the high populated cities, social classification, the resulting sense of exclusion, immense air pollution, lack of natural environment and green areas, and prolonged waiting times in traffic reduce the individual's life satisfaction. In this vein, D'Acci (2021) has reviewed that crowded cities trigger stress, leading to mental health problems that reduce the quality of life. However, Taylor (2007) claims that there is an optimal size where happiness is maximum. Accordingly, an individual cannot fit to live in a huge crowd but cannot fit to live all alone. The best settlement is an intermediate-size settlement where the individual will adopt most (Veenhoven, 1994). From the perspective of optimal size theory, we can conclude that rather than a negative linear relationship between urbanization and happiness parameters, a relationship progresses until the saturation point positively, and after this point continues negatively. This perspective confirms that urbanization does not negatively impact life satisfaction in Germany, because according to OECD (2007), Germany is the most evenly

distributed population across all OECD countries (OECD 2007). For this reason, the population of any district in the country is not high enough to create problems related to overpopulation. The result of the research in this thesis declares that the breaking point where social control mechanisms will collapse has not been reached in districts of Germany.

The advantage of the city that justifies the result of the regression analysis, which is the "Urbanicity level positively affects life satisfaction," is that the city can melt different identities in one pot. According to the subcultural theory, in contrast to the rural, subcultures have the opportunity to come together in the urban, so they have the freedom to live their preferences. Similarly, the city provides the individual with more alternatives in choosing friends and jobs, enabling them to live the life that best suits their unique needs and capacities (Veenhoven, 1994). In addition, it is true that air pollution, noise, and crowds are higher in cities than in the countryside, but this does not mean that the individual will be unhappy living in the city. According to Veenhoven (1994), although the individual does not live in ideal conditions, she can be satisfied and happy with her life and, the adaptation ability of human beings could facilitate living in conditions different from those of their ancestors.

The result of the research that "the city does not have a negative effect on the happiness level of the individual" can also be explained by the fact that cities no longer have the negative effects expected features as described in the literature. Urbanization is quite different from the period analyzed by Wirth and agreeing sociologists. As Gans (1995) reported, the mass of white-collar workers moving into the suburbs reduced the suffocating density of the urban and, the decentralization of industry changed the urban's pattern. According to Gans (1995), the most important thing is; Wirth and other sociologists attribute modern life and all industrial-specific features to the urban (depersonalization, alienation, etc.). They determined the distinction between urban and rural modern and non-modern. Today, however, the modern lifestyle has spread to different settlement types. Veenhoven (1994) argues that post-industrial

developments in cities blurred the distinction between rural and urban and provided an advantage in favor of the city. When this information and the result of the regression analysis are evaluated together, the argument that urbanization does not have a negative effect on happiness seems possible.

An essential result of the regression analysis is that life satisfaction in West Germany is considerably higher than in East Germany. As Headey (2021) demonstrated, psychologists, sociologists, and economists correlated the variations in life satisfaction with the variables that they divided into social and economic categories. Still, they accepted that these variables would have the same effect on life satisfaction for every country or every individual. It was ignored that the variables might vary according to the countries. Germany also differs in this sense because Germany is unique in its demographic structure and political history. Until 1990, Germany consisted of two separate states, East and West Germany. Even though these states are united today, it has been revealed by various studies that the society and socio-economic structure are still not homogeneously distributed throughout the country. Correspondingly, there is still quite a difference between the life satisfaction values of the two regions. Since most densely populated districts are located in the western part of Germany (mean population density of western districts=556,15 and mean population density of eastern districts=326,07) and taking together the knowledge about better life satisfaction in West Germany from the literature and the regression analysis, it could be concluded that, in Germany, more urbanized places are the places that life satisfaction observed higher. This can be another reason for the positive relationship between urbanicity level and life satisfaction in the regression.

Another result of the regression is the relationship between life satisfaction and marriage. As cited by Diener Et Al. (1999), Wilson (1967) noted a positive relationship between marriage and SWB. I have confirmed this statement by finding a positive coefficient on the "married variable" in regression analysis. According to Wilson (1967), although being a woman or a man

does not significantly affect life satisfaction, my result shows that being a woman positively affects life satisfaction.

The main idea that emerged from this study is that countries can use different parameters to explain the variation in life satisfaction depending on their historical development, and the effect of these parameters may differ from country to country. However, the variation in life satisfaction value can be explained by cities' physical and economic characteristics or the urbanicity level. This effect may be positive depending on the positive aspects of the city; the belief that the rural brings happiness may be an unrealistic belief that is driven by a longing for nature and is not always true.

7. CONCLUSION

In this thesis, statistical analyzes were carried out according to the urbanicity level of German districts. This urbanicity level parameter consists of four levels, and these levels are based on population. The analysis revealed a significant relationship between the quality of life and the preferred place of residence.

Since the reunification of Germany, economically developed independent cities and rural districts that lost their density because of migration and have suffered economic collapse have been derived. Accordingly, high quality of life is observed due to the better welfare in areas more urbanized in Germany.

When other factors are holding constant, the results clearly show that the urbanicity level has a positive relationship with life satisfaction in Germany. Hence, the view that the rural does not bring more happiness than the urban is confirmed.

Another necessary inference is that the factor that has the most impact on quality of life is the health status factor. The effect of health status on life satisfaction is higher than other factors.

In summary, this thesis confirms that one of the crucial factors determining the quality of life is urbanization. However, the effect of urbanization could vary according to country. Depending on the advantages of urbanization, urban can have a positive impact on quality of life. The duty of city planners and administrators is to control the population growth in cities in order to avoid the negative effects of excessive density, but to empower hosting the population that will enable the city to produce its advantages. Suppose further research is carried out in a country like Germany, which has cities with economic development at different extremes. In that case, the accuracy of the arguments made in this thesis will be confirmed.

This study has several limitations. First, traits that might affect the individual's satisfaction with life were not evaluated, such as family relationships, pessimism, or optimism. Second, religion and ethnicity were also not included in the research. These factors are also factors that may be necessary to interpret the quality of life of individuals. I recommend that researchers who will work on this subject in the future consider these criteria.

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