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Discussing the Influence of Social Networks on Individuals' Health

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Abstract: *Social supports would promote people's mental health(Cohen et al., 2000)[1], but there is still lack of data to support the influence of personal social networks and relationships in maintaining physical health. This article will define social networks, and summarize a review on the role of social networks like family, friends and other comunities in keeping well-being. By multiple regression and moderated mediation methods, this essay will analyze the correlation between social network and physical and mental health with the database of 2018 European Social Survey[2].*

Keywords: *Social Network; Relationships; Health*

1. Introduction

Many research has proved that social support in relationships could benefit people's mental health (Cohen et al., 2000). Also, the influence of supportive social networks on physical health should not be ignored (Fisher et al., 2018) [3]as more and more media reports and medical research have shown the potential link between lacking social support and various diseases. Firstly, families remain the most critical source of social support in individuals' networks. With urban-rural mobility, traditional families become loosened and there are more single parents and adopted children. At the same time, low willingness in pregnancy and a high divorce rate show. A new kind of kinship is brought by homosexual marriage or living with pets. These changes in inner-family relationships, mutual support and intimate interactions lead to mixed consequences (Hendry, 1999)[4]. Furthermore, friendship and peer activities have decreased in number with the emergence of online entertainment with strangers matched in a short time. Although this kind of companionship serves the same function as friends, they provide limited trust and support in real life (Lenhart & Madden, 2007)[5].

American sociologist C. Wright Mills argued that private troubles should be seen as public issues and researchers have to understand and explain them (1970). Whereas, considering the changes in social relationships, the role of one's social network in keeping himself/herself healthy, especially in the physical sphere, is not well researched. In this essay, the role of social networks in the maintenance of health is investigated. Before the literature review, social networks are defined and the social aspects of health in the context of relations and structures are explained. Also, the measures of health levels are clarified in this part. In the literature review, previous studies on social support and health conditions are summarized, especially from the perspectives of family, friends and activities in other social groups. Referring to the historical measurement of social support and intervention, the method and framework used in this essay are introduced. Then, based on the database of Europe Social Surveys in 2018 (ESS Round9 in UK)[6], the method of multivariate regression and moderated mediation are used to analyze the correlation between social networks and health conditions both mentally and physically. Therefore, individuals' health is an important agent to study intimate relationships and social contacts.This study will help to address the significance of social networks and give reference for policymakers and individuals. But the limitation of this study is that, though this research aims to explain the influence of relatives and friends networks on health symptoms and healthy behaviors, it still lacks the analysis of educational systems in reducing diseases.

2. Literature Review

2.1 Concepts of Social Networks and Health

Since the early 20th century, scholars have used the concept of 'social networks' to explain

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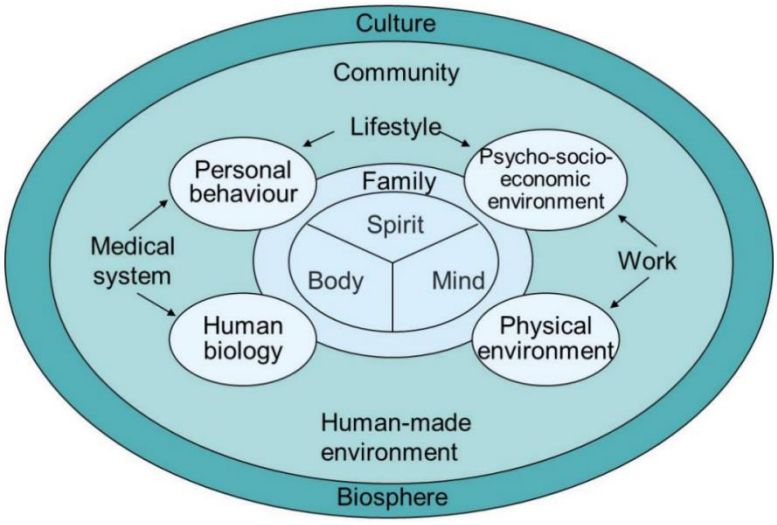
complicated relationships between members of society on various scales in individuals and cross regions (Freeman, 2004)[7]. Social networks could be divided into different types such as media networks, friendship and acquaintance networks, business networks, knowledge networks, working relationships, kinship, or sexual relationships (D'Andrea et al., 2009[8]; Harris, 2009[9]; Pinheiro, 2011; Grandjean, 2016[10]; Nasrinpour et al., 2016[11]; Brennecke et al., 2017[12]; Hagen et al., 2018[13]). Relationships are established when people find themselves similar to others in various ways (Allan, 1989). Knowing what another person knows and when to turn to him or her for information is one of the most important characteristics of social networks (Michelle et al., 2013). The social network perspective tends to put the individuals into a web or net of interactions and provides a method for analyzing the effects of such interactions in this system. Different patterns determined by the relations in social networks will identify a person and examine dynamic changes in his or her life (Wellman, 2008)[14]. In this essay, I will define the social network as a specialized structure composed of a series of subjects like persons and organizations and place emphasis on individuals.

According to the World Health Organization (2006), the concept of 'health' refers to the state of complete physical, mental and social well-being rather than merely the absence of disease and infirmity. Though this definition has been criticized for its broadness, vagueness, and difficulty in measurement, it still includes mental health and physical health in research practices. Factors affecting health are related to individual choices in life behaviors and structural causes such as public healthcare services. General health can be elaborated from the perspectives of the biomedical, psychological, and social aspects (Jonatha, 2014). As for mental health, there are two kinds of unhealthy performances. Distress refers to unpleasant feelings whilst disorder is pathological symptoms diagnosed by medical tools or methods (Payton, 2009). Apart from such biomedical discussion about well-being and health, the ecological models of health emerged and took place of the traditional medical model, which prefers identifying the impacts on people's wellness from the complicated contacts between individuals and the ecological environment cultivated by their characters. Hancock (1985) [15]suggested a model of health and community eco-system, in which factors that affect health are given as concentric nests. Body, mind and spirit are at the center. The outer circle is the social and physical environment, and then further to culture, economic, and societal influences. This model is designed for addressing how the social environments determine the level of health and advising people to focus on multiple and cross-sectoral methods for wellness development.



(Redrawn from: Hancock T, Perkins F. The mandala of health: a conceptual model and teaching tool.Health Education 1985;Summer, pp.8-10.)

Figure 1: The model of health and community eco-system (Hancock, 1985)

2.2 Studies of Social Networks and Health

Firstly, the study of social networks and mental health has a long history. The earliest discussion in this field can be traced back to Durkheim's study of suicide. Durkheim (1951) concluded that social class, culture, religious belief and gender can greatly affect people's decisions about suicide. The act of taking his or her life privately should be understood in social structure. Egoistic suicide happens when individuals find it hard to integrate into society and collectives. However, people who are closely

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connected with society and family also tend to commit suicide. This type of suicide is called altruistic suicide and is led by strict rules and governmental commands. Some scholars also discussed the effect on bodies. Cassel (1976) argues that social support provided by members in the network might resist diseases biologically. He analyzed body factors like blood pressure and endocrine activity and concluded that relationships might influence the states of the body on the disease and genetics. Some recent results indicated that social support is a protective factor for cardiovascular morbidity and mortality and other diseases. Though the evidence needs to be examined in detail, there is a series of basic and potential links between social support and cancer and HIV progression. For example, Lisa Berkman and Leonard Syme (1979) published the links between social relationships to mortality. They connected the degree of groups' social associations with general mortality and found that individuals who had fewer social ties had higher death rates. Some negative examples can also be found. For example, undeveloped and brand-new social networks bring trouble to self-identity and belongings. According to a study focusing on Iraqi refugees in Sweden (Sundvall et al., 2021)[16], social support is still primarily provided by family members and supplemented by governmental assistance. For the refugees, starting new lives can be challenged by weakened social networks, integration barriers, and a lack of cultural and religious belonging. Unable to reunite with their relatives and families, they are particularly troubled by their deep concerns.

2.3 Hypothesis

In contrast to the traditional discoveries in the links between social networks and well-being, this study has four hypotheses: (1) Social network has an impact on the overall level of human health; (2) Physically, a more complex social network, representing social contacts, emotional support and social participation, will increase risks of diseases and lead to poorer physical health; (3) Mentally, stronger social networks will bring a stronger sense of happiness, thus improving the level of mental health. Finally, (4) since the social network changes with age, young people with the simpler social network are more likely to see a weak role in health prediction. However, the moderating effect of age on the other three variables remains unknown.

3. Methodology

3.1 Data Source, Reliability and Validity

The European Social Survey (ESS) is a transnational survey that has been carried out in Europe since 2001. Every two years, face-to-face interviews are conducted with people who are newly selected from over thirty nations. The survey covers a series of questions ranging from attitudes, beliefs to behavior patterns. The European Social Survey (ESS) is a cross-national comparative survey that uses face-to-face interviews and surveys with diverse populations to map behavioral and attitude changes in more than 30 European countries.[17] The ESS employs Survey Quality Predictor (SQP) coding to eliminate any irregularities in the translation process, ensuring cross-national repeatability and information comparability (Schnaudt, 2014:496). The 2018 ESS (ESS9), which was divided into different conceptual areas of analysis, paid special attention to the 'Timing of Life' module, the 'Subjective Well-being' module, and the 'Health and Care' module. To determine the measurement quality of survey questions, ESS9 used an approach with multiple features and methods. A high reaction rate often indicates high quality. In the details of the ESS 9, a target response rate of at least 70% in each country has been identified. What is more, it not only specifies the target to progress towards a high reaction rate but also promotes a reaction rate that is comparable and fair for various subgroups, which is also called a balanced reaction rate. Towards the end of the survey in fieldwork, standard reaction rates are determined by data from the contact structures, on which the results of every visit have been recorded. Likewise, non-response bias analyses are directed. These can distinguish which groups are underrepresented and provide direction for adjustments. To adjust to the inconsistent illustration of subgroups, this survey has to guarantee that the study information focuses on the population aged 15 and above, and concerns age, sexual orientation, schooling.

3.2 Variables and Data Analysis

After data cleaning and reduction, the essay selected 'happy' and 'health' as dependent variables. Since the foundation of social networks changes and gets larger with age, the year of age was also considered. The independent variables of social networks include social contacts (sclmeet), emotional

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support (inprdsc), social participation (sclact) as well as the born year (yrbrn). And the dependent variable is health, which refers to the two indexes of 'happy' and 'health'. The research utilized the stata 16.0 and employed a linear regression and moderation model to analyze their relationship.

The dependent variable (DV), 'social networks', refers to 'happy' and 'health'. 'Happy' measures the participant's support for the statement that 'Taking all things together, how happy would you say you are?'. The measurement has 10 grades, from 'extremely unhappy' to 'extremely happy'. There are 198 missing values in 'happy', including 111 who 'don't know' their situations and 82 who refused to answer this question. Meanwhile, 'health' measures the answer to 'How is your health in general?'. The participants were provided with 5 grades, ranging from 'very good' to 'very bad'. There are 59 missing values in 'health'. 29 participants who refused to answer and 26 participants who showed 'don't know' were excluded from the analysis.

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. misstable summarize happy
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Variable	Obs=.	Obs>.	Obs<.	Unique values	Min	Max
happy		198	49,321	11	0	10

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. misstable summarize health
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Variable	Obs=.	Obs>.	Obs<.	Unique values	Min	Max
health		59	49,460	5	1	5

Figure 2: Regression and Moderation Model of Health

Three independent variables (IVs) were measured against the DV to investigate the relationship between these factors and health and to verify if individuals in denser social networks would be healthier. The multivariate analysis of these dichotomous variables was achieved through the regression of each of the IVs against the DV, as listed below.

Social Contacts(sclmeet):

1=Never,

2=Less than once a month,

3=Once a month,

4=Several times a month,

5=Once a week,

6=Several times a week,

7=Every day.

This variable represents how often participants meet with friends, relatives, or colleagues in social activities. The questionnaire assigns it 7 levels.

Emotional Support(inprdsc)

0=None

1=1,

2=2,

3=3,

4=4-6,

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5=7-9

6=10 or more.

This variable measures the number of participants who are willing to discuss intimate and private matters. The reduction of the variables showing in groups from the answer 4 to '10 or more' may result in a considerable decrease in the resolution of measurements. Considering the number of people they could share troubles with and get emotional support from, people may see it differently, whereas the examination of such short-recoded variables allows the effective test of the influence of emotional support on health.

Social Participation(sclact)

1=Much less than most,

2=Less than most,

3=About the same,

4=More than most,

5=Much more than most.

This variable represents the frequency of participating in social activities with peers of the same age. It is coded with the five-point ordinal level of measurement from 1 to 5.

4. Result

Normally, 2 decimal places are required in the data. Considering the weak changes in data, this study retained 3 decimal places in the analysis.

How social contacts, emotional support, social participation, and born year predict health

Table 1: Regression and Moderation Model of Health

	Model 1				Model 2			
health	**Coef.**	**SE**	**t**	**p**	**Coef.**	**SE**	**t**	**p**
sclmeet	-0.031	0.003	-11.110	0.000	-1.334	0.289	-4.610	0.000
inprdsc	-0.049	0.003	-17.660	0.000	-3.066	0.288	-10.650	0.000
sclact	-0.162	0.005	-34.490	0.000	-2.980	0.471	-6.320	0.000
yrbrn	-0.018	0.000	-88.040	0.000	-0.030	0.001	-36.310	0.000
yr*sclm					0.001	0.000	4.510	0.000
yr*inpr					0.002	0.000	10.490	0.000
yr*scla					0.001	0.000	5.990	0.000
_cons	38.719	0.404	95.890	0.000	61.586	1.615	38.140	0.000
R^2			0.220				0.220	
F			3230.110	0.000			1900.520	0.000

Table 2: The effect of sclmeet, inprdsc and sclact in different levels of yrbrn

		Coef.	**se**	**t**	**p**
	M-SD	-0.042	0.004	-10.640	0.000
sclmeet	M	-0.030	0.003	-10.590	0.000
	M+SD	-0.017	0.004	-4.400	0.000
	M-SD	-0.076	0.004	-18.790	0.000
inprdsc	M	-0.048	0.003	-17.180	0.000
	M+SD	-0.019	0.004	-5.020	0.000
	M-SD	-0.183	0.006	-28.330	0.000
sclact	M	-0.157	0.005	-33.680	0.000
	M+SD	-0.130	0.006	-20.260	0.000

At first, linear regression was employed to analyze the relationship between social contacts, emotional support, social participation, born year, and health. It is shown in the results that social contacts, emotional support, social participation, and born year were all significantly negatively correlated to health. In other words, higher social contacts, emotional support, social participation, and latter born year were correlated with a poorer health condition. However, social participation was the strongest predictor of health, followed by emotional support and social contacts. Then, the moderation model was employed to analyze the interaction of born years and other independent variables. According to the results, a slight but significant interaction between the born year and other independent variables was shown. More specifically, the latter of the born year (meaning younger), the

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weaker the effect size of social contacts, emotional support, and social participation.

How social contacts, emotional support, social participation, and born year predict happiness

Table 3: Regression and Moderation Model of Happiness

	Model 1				Model 2			
health	**Coef.**	**SE**	**t**	**p**	**Coef.**	**SE**	**t**	**p**
sclmeet	0.168	0.007	25.780	0.000	2.479	0.673	3.690	0.000
inprdsc	0.232	0.006	36.780	0.000	5.688	0.654	8.700	0.000
sclact	0.247	0.011	23.340	0.000	6.359	1.076	5.910	0.000
yrbrn	0.005	0.000	11.860	0.000	0.028	0.002	13.760	0.000
yr*sclm					-0.001	0.000	-3.440	0.001
yr*inpr					-0.003	0.000	-8.360	0.000
yr*scla					-0.003	0.001	-5.690	0.000
_cons	-5.226	0.885	-5.910	0.000	-49.166	3.963	-12.410	0.000
R^2			0.114				0.118	
F			1185.060	0.000			687.330	0.000

Table 4: The effect of sclmeet, inprdsc and sclact in different levels of yrbrn

		Coef.	**se**	**t**	**p**
	M-SD	0.186	0.009	20.220	0.000
sclmeet	M	0.165	0.006	25.540	0.000
	M+SD	0.142	0.009	16.080	0.000
	M-SD	0.279	0.009	30.610	0.000
inprdsc	M	0.229	0.006	36.470	0.000
	M+SD	0.176	0.008	20.910	0.000
	M-SD	0.294	0.015	19.770	0.000
sclact	M	0.238	0.011	22.610	0.000
	M+SD	0.179	0.014	12.490	0.000

Similarly, linear regression was applied in the analysis of the relationship between social contacts, emotional support, social participation, born year, and happiness. It can be seen from the results that social contacts, emotional support, social participation, and born year were all significant positive predictors of happiness. That is to say, higher social contacts, emotional support, social participation, and latter born year were correlated with greater happiness. Social participation was also the strongest predictor of health, followed by emotional support, a slightly weaker indicator. Next came the social contacts. Then, the moderation model was employed to analyze the interaction of born years and other independent variables. In the results, a slight but significant interaction between the born year and other independent variables can be found. Specifically, as the born year gets later, the effect size of social contacts, emotional support, and social participation was weakened.

5. Conclusion

Previous studies have proved that social networks have a positive feedback relationship with people's general health: social networks provide more social support, which benefits the health condition. However, the physical and mental health of participants in the same social network has not been measured at the same time. Whether the positive effects of social networks on health apply to both psychological and physiological conditions remains unknown. Therefore, this essay focuses on whether social networks promote people's physical and mental health simultaneously. With the analysis of the ESS9 database, the independent judgments of happiness and health in the UK's 2018 social survey data were selected as the dependent variables and three factors: social contacts, emotional support and social participation, were selected as independent variables. It was found that (1) social contacts, emotional support, and social participation are all negatively related to people's physical health. This means that a higher level of social interaction, emotional support, and social participation are associated with poorer physical health. The strongest predictor is social participation, followed by emotional support and social contacts. (2) Social contacts, emotional support, and social participation are all correlated to happiness in a positive and significant way, which means that stronger social contacts, emotional support, and social participation are related to more happiness and better mental health. Although social participation is the most powerful predictor of health, it is only slightly more powerful of an indicator than emotional support and social contacts. Finally, this study uses an adjustment model to analyze the

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interaction between the birth year and other independent variables. It is shown in the results that there is a slight but significant interaction between the birth year and other independent variables. Specifically, as the year of birth becomes later, the impacts of social contacts, emotional support, and social participation decrease. It should be noted that the measured index of 'health' in this study is subjective judgments of participants' self-happiness and self-wellness, which lacks the objective and scientific data in medicine and physiology as supports. In conclusion, this study demonstrates the important role that personal social networks and social communication perform in the development of health in UK residents. Data from this study also illustrate the age factors that could influence health maintenance and access to support for well-being. This study provides practical insights for professionals in health-keeping services. That is to say, social networks can be employed as a channel for accelerating health in the mental sphere. However, in the biomedical aspect, the situation could be the opposite.

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