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Social Capital and Health in European Welfare regimes

A multilevel approach

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Introduction

It has been suggested that there could be differences between countries in levels of social capital (Van Oorschot & Arts, 2005) and it therefore seems plausible to expect differences in social capital also between larger clusters of countries, such as welfare state regimes. These diversities could very well be a result of how societies are constructed and welfare distributed (see for example Esping-Andersen, 1990: 1999).

There are additionally explanations about how individual social capital could affect health and wellbeing (Kawachi et al., 2000) but also hypothesis about mechanisms linking the social capital of contextual units such as societies or communities and health. Empirical evidence about associations between social capital and health exists in some contexts or countries (Hyppä et al, 2001; Kawachi et al., 1999) while no association has been found in others (Veenstra, 2000; Kennelly et al., 2003). The results largely depend whether social capital is measured as a contextual or individual level variable and on how social capital is theoretically defined and empirically operationalised. Few studies have however focused on the association between social capital and health in larger contextual units than countries.

The aim of this article is therefore to analyse the association between welfare regime type and self-rated health and to what extent this could be related to social capital. The study examines (1) the variation in the levels of social capital, measured as social trust, between five welfare regimes; (2) the relationship between country level trust and population health; (3) the association between regime type and health; (4) whether this effect persist after controlling for both individual and contextual-level variables, among those individual trust; (5) cross-level interactions between regime type and individual trust.

Definitions of social capital

Several theoretical definitions of social capital have been suggested. Putnam (1993) treats social capital as a mutual resource in the society and defines the concept as “*features of the social organizations such as networks, norms, and trust that facilitate action and cooperation for mutual benefit*” (Putnam, 1993, p 201). Putnam claims that social capital is created through citizen’s active participation in organizations and groups. Participation mainly leads to trust between the members in the society. Coleman (1988) defines social capital as “*a variety of entities with two elements in common: They all consist of some aspect of social structures, and they facilitate certain action of actors – whether persons or corporate actors – within the structure. Like other forms of capital, social capital is productive, making possible*

the achievement of certain ends that in the absence would not be possible” (Coleman, 1988, s 98). Coleman suggests that the difference between social capital and other forms of capital is that social capital doesn't exist within the actors, but instead in the structure of the relations between the actors. Others however have a somewhat different perspective as they suggest that social capital is foremost an individual supply and that it is closely related to personal networks (Bourdieu 1986; Portes, 1998; Lin, 2001). Harpam et al. (2002) further suggest that social capital has two dimensions. The *structural component* of social capital is the extent and intensity of participation in associations and other forms of social activities (e.g. density of civic associations, measures of informal social participation) whereas the *cognitive component* is about peoples perceptions of interpersonal trust, sharing and reciprocity. The structural component consequently seems to have quantitative characteristics while the cognitive dimension is more qualitative in its nature. This article is exclusively going to focus on the cognitive aspect of social capital, namely social trust.

Welfare state regimes and social trust

Esping-Andersen's (1990: 1999) ideas could be useful in explaining eventual differences between welfare states when it comes to social trust. He suggests that there exist three worlds of welfare capitalism with different emphasis when it comes to the direction of welfare and social policy respectively the construction of social insurance systems. Though there are similarities between countries belonging to respective regime type there are also differences and the regime types should therefore be considered as merely idealtypes. In the idealtypical *liberal* regime, means-tested assistance, modest universal transfers, or modest social-insurance plans predominate. The state mainly encourages the market, either passively – by guaranteeing only a minimum of benefits – or actively by subsidizing private forms of welfare systems. This type of regime entails independence from the state and forces citizens to rely on family and friends for help and aid in situations of personal crises. The consequences of this type of regime are high levels of income inequality, high levels of poverty and low levels of de-commodification when compared to the social-democratic and conservative-corporatist regime. The model also creates high levels of class dualism. Countries belonging to the liberal model in this study are United Kingdom and Ireland.

In the second regime-type, *the conservative-corporatist*, preservation of status differentials predominate and rights are therefore attached to class and status. The state only interferes when the family's capacity to service its members is exhausted and then it provides social benefits based on earlier earnings and status in the society. This regime type is also to a

large extent shaped by the church and is focused on preservation of the traditional family. Further, the conservative/corporatist regime creates average levels of class inequality and de-commodification in comparison with other regimes (Esping-Andersen, 1990: 1999). In this article France, Germany, Belgium, The Netherlands, Austria, Luxemburg and Switzerland represent the conservative-corporatist regime type.

Finally, the idealtypical *social democratic* regime's policy of emancipation addresses both the market and the traditional family. These countries are characterized by the highest levels of social security, with mostly universal social benefits. The principle is not to wait until the family's capacity to aid is exhausted, but to pre-emptively socialize the cost of family hood. The ideal is not to maximize dependence on the family, but capacities for individual independence. The result is a welfare state that to a larger extent compared to other regime types grants transfers directly to children, and takes direct responsibility of caring for children, the aged, and the helpless (Esping-Andersen, 1990: 1999). In other words this model is characterized by universalism and solidarity. Compared to the other two regime types, the levels of inequality and poverty are low (Dahl et al., forthcoming). When citizen's to some extent are dependent on the welfare state and at the same time benefit from it, they probably feel more obliged to pay taxes and support state actions. Sweden, Norway, Denmark and Finland are included in the social-democratic regime type in this study.

Some researchers mean that there also exist a fourth type of regime, (Ferrera, 1996; Bonoli, 1997) namely the *Mediterranean* regime type which is supposed to produce even more dependence on family and friends. In this type of regime an underdeveloped system of social security exists, instead of an official level of security, accompanied by a very high degree of familialism. Italy, Spain, Portugal and Greece are included in this regime type.

I will also add a fifth type of welfare-state regime to these, *the post-socialist*, which consists of countries located in the central and eastern parts of Europe. This type of welfare state regime is still moderately theorized and analysed. Aidukaite (2004) however examines whether the Baltic countries, as examples of post-socialist states, have developed into a distinct post-socialist model of social policy or whether they fall into one of the suggested models suggested by Esping-Andersen. The study shows that the Baltic States cannot be placed exactly to any model developed to study social policy. This supports the idea that the East-European constitutes a separate kind of welfare regime. Further the results show that the benefits from social security are very low in the Baltic countries which have resulted in high levels of income inequality and poverty. This means that citizens in post-socialist countries should mainly rely on the family or market for support. However it must be added

that there are also large variations between the post-socialist countries (Deacon, 1993). Czech-Republic, Hungary and Poland are the countries included in the post-socialist regime in this study.

There exist several more detailed hypotheses about which factors seem important for the creation of social trust in societies. These seem very closely linked to Esping-Andersen's (1990) description about welfare state regimes. One of the leading hypothesis suggests that it is mainly associational membership that creates social trust in societies (Putnam, 1993, 2000). Some researchers however mean that there is a risk that universal welfare states, like the social-democratic affects participation in voluntary organisations negatively. A universal welfare state can make voluntary organizations either unnecessary or instruments for the state politics (Wolfe 1989; Fukayama, 2000). Many researchers however claim the opposite, that instead of undermining the civic spirit in the society and making it unnecessary, the welfare state support civic institutions and practice (Torpe, 2003; Klausen & Selle, 1995). Recent empirical evidence almost exclusively support the latter notion (Rothstein, 2001; Van Oorschot & Arts, 2005)

Another hypothesis is that trust among individuals is strongly affected by one's life satisfaction. Social trust should be more easily generated when citizens are happy and satisfied with their lives. Personal experiences of one's health, family, school, workplace, media or interaction with institutions to a large extent affect citizen's life satisfaction (Whitley, 1999; Putnam, 2000).

According to a third hypothesis social trust among citizens is created when they feel trust and confidence in political and state institutions (Fukuyama, 2000; Rothstein, 2000). In countries that have had a stable democracy for a longer time-period and where the corruption is low, we can also expect to find high degrees of trust (Inglehart, 1997; Klingemann 1999; Della Porta 2000). The state and the authorities capacity to overcome social benefit fiddles and their capacity to create an impartial and just bureaucracies constitute reasonable explanations for national differences in the level of social capital (Rothstein et al., 2003; Paldam, 2000).

Individual income has also been put forward as an important resource for the creation of trust among citizen's (Putnam, 2000). However it has also been suggested that the more general level of income-inequality in a society could have implications on the levels of social trust in societies. It is supposed that high levels of income-inequality lead to the destruction of trust and social cohesion among citizens (Wilkinson, 1996).

Finally, some researchers claim that the tension between collectivism and individualism could have large implications on social trust in societies (Allik & Realo, 2004). Some researchers mean that individualism destroys trust, cohesion and civic order in societies. However on the other hand, already Durkheim (1984) and others, claimed that voluntary cooperation and mutual social relationships are only possible when people have autonomy, self-control and a mature sense of responsibility.

With the theoretical assumptions presented as a point of departure it seems quite evident that the social-democratic regime is characterized by factors which reasonably support the creation and preservation of social trust whereas the Mediterranean and post-socialist regime seems worse off. The liberal and conservative regimes are however more difficult to interpret since these hold both social promoting elements but also aspects which could be destructive for the creation of social capital.

Mechanisms linking social trust to health

If there are differences between welfare regimes in the levels of social trust these could explain health levels in, and health inequalities between regimes. An essential question is then how and if social trust is associated with health?

Social trust can influence health in two different ways. The *compositional effect* of social capital on health denotes the individual attributes and activities that contributes to social trust which in turn might influence individual health. In other words one's health could be influenced just by being a trustful individual or being an individual engaged in social activities. However social trust could also influence the socio-political environment in a society and then influences health indirectly. This is called a *contextual effect* of social trust on health. Both these effects are going to be analysed in this article. The separation of these two effects is important otherwise there is a risk of ecological fallacy, i.e. inferring individual level relationships from relationships observed at the aggregate level respectively individualistic fallacy, i.e. inferring aggregate level relationships observed at the individual level (Macintyre & Ellaway, 2000).

Individual level social trust and health

Mutual trust is most likely an important feature of social relations characterized by support, reciprocity and affection. Relations which are supportive are probably also more characterized by trust. It therefore seems reasonable to expect that trust affect individual health in similar ways as qualitative aspects of social networks, like social support. The mechanisms linking

individual social capital and individual health are however complex and multiple mechanisms often act simultaneously.

Most important are probably different kinds of psychological mechanisms related to trust. Social networks and social support with high levels of mutual trust probably affect cognitive and emotional states such as self esteem, self efficiency, social competence etc that in turn affects mental and physical health (Berkman & Glass, 2000). Social networks could also explain psychological pathways related to stress responses which are of significance for health and wellbeing. It is assumed that a person with a large social network will be less likely to experience certain types of events as stressful, and if the event is stressful, a person with many social contacts will be better able to cope successfully (Berkman & Glass, 2000). The stress reducing effect is probably stronger when the social network is characterized by mutual trust.

Further, Berkman & Glass (2000) claim that social networks via social influence and/or supportive functions around for example alcohol consumption, drug abuse, smoking or physical activity affect individual health and wellbeing. It could be expected that this type of social influence is stronger between people who trust one another. Moreover networks based on trust could also be used to spread valuable health information to network members which could have a health promoting impact on these. Finally the exchange of material and economic resources are probably also higher in networks based on trust. These kinds of benefits could be seen as directly or indirectly positive for health (Prestby et al., 1990).

Earlier research by Hyppä & Mäki (2001) revealed that the Swedish minority in Finland have a larger amount of social capital than the majority of Finns and that there also exists a relation between individual social capital, measured as the number of auxiliary friends, mistrust and membership in religious associations, and self-rated health. From this Hyppä & Mäki (2001) suggests that existing differences in health between these two groups can be explained by differences in the amount of social capital. Rose (2000) found that social capital (measured by sense of self-efficacy, trust of others, inclusion or exclusion from formal and informal networks, social support and social integration) in Russia were associated with improved self-reported physical and emotional health. Further, Veenstra (2005) found that individual trust in politicians and governments and trust in other members of the community were among the strongest predictors of health in British Columbia (Canada). However Veenstra (2000) also analysed social capital at the individual level in Saskatchewan (Canada)

and found that neither levels of trust nor civic participation, was correlated with self-rated health.

Contextual level social trust and population health

Why should countries with high levels of social trust have better population health? And in which ways does the level of trust in a country affect the health of individuals living in that specific context?

One hypothesis is that countries with high trust levels produce more egalitarian patterns of political participation that result in the passage of policies which ensure the security and health of all its members. Countries with low levels of trust are thus less likely to invest in human security and social safety nets which protects the whole population. In other words, less generous countries provide less hospitable environments for vulnerable segments of the population which could be devastating for both population and individual health (Kawachi et al., 1997).

Further, higher levels of social trust between citizens in a society may result in quicker diffusion and uptake of health-promoting innovations through established information channels (Kawachi & Berkman, 2000). Trust is also important for collective action among citizens against public health destroying political decisions, e.g. mutual protests among citizens against downsizing the health care system (Kawachi & Berkman, 2000). Further, citizen's who trust one another may also be more effective at exercising informal social control over deviant health behaviours of other citizen's such as smoking and drug and alcohol abuse (Kawachi & Berkman, 2000). All these factors could be considered as promoting both individual health among citizen's and population health in societies. Finally, income inequality via destruction of social trust could explain levels of population and individual health (Wilkinson, 1999). If the income inequality hypothesis is correct, then low trusting individuals and societies probably also have more health problems.

However Macintyre & Ellaway (2000) suggest that there could be complex mechanisms behind an association between social capital and health where multilevel analysis is strongly suggested. An individual level analysis may show that individuals with low social capital have more health problems than others and this could lead to the conclusion that low individual social capital is health damaging. However this may only be true in countries in which the majority has high levels of social capital.

To my knowledge, no studies comparing European countries alone when it comes to the association between social capital and health have been published. Kawachi et al

(1999) used indicators about perceived trust together with questions about membership in a wide variety of voluntary organisations in US states. In their analyses they found a contextual effect of low social capital on risk of self-rated poor health on the state-level. Subramanian et al. (2002) studied the contextual and individual effects of social trust on health in 40 US communities. They found that higher levels of community trust were associated with lower probability of poor health. However, controlled for individual trust the main effect of community trust became insignificant. Further, they found that the health-promoting effect of community trust was greater for high-trusting individuals and the opposite for low-trusting individuals. However in some studies no association between social capital and health are found. For example, Kennely et al (2003) measured social capital by the proportion of people who say that they generally trust other people and by membership in voluntary associations in 19 OECD countries. They found very little statistically significant evidence that social capital had a positive effect on population health measures such as life expectancy at birth, infant mortality and perinatal mortality. Veenstra (2005) used questions about participation in voluntary associations and social and political trust to measure social capital in 25 communities in British Columbia (Canada). The results suggested no community effect of social capital on long-term limiting illness, depression respectively self-rated health.

Data and methods

Primary methods used in this study are correlation analyses and multilevel regression analyses of self-rated poor health among a random sample of 38 341 individuals nested within 20 European countries in the 2002/2003 European Social Survey (ESS). ESS is based on face-to-face interviews¹. The multilevel analyses were performed in Mlwin (version 2.0) while SPSS (version 12.0.1) were used for the other statistical analyses.

Further, Rothman's (2002) model for the analysis of biological interaction was used to examine both the within ecological interaction and the cross level interaction. Rothman's model estimate whether there are cases occurring only in the presence of joint exposures (i.e. if there is a departure from additivity of effects). To quantify interaction the synergy index (S) was used with the formula:

¹ For more information about European Social Survey visit <http://www.europeansocialsurvey.org/>

$$S = \frac{IRR_{11}-1}{(IRR_{10}-1)+(IRR_{01}-1)}$$

IRR denotes the incidence rate ratios with IRR_{00} (unexposed) as a denominator. IRR_{10} and IRR_{01} are the rate ratios for those with one exposure whereas IRR_{11} is the rate ratios for those with both exposures. The index denotes synergy if its value exceeds 1.0 and antagonism if it is less than 1.0. However in this study prevalence and not incidence is studied and therefore we are henceforth going to use the label relative risk instead of IRR.

Variable definitions

Independent variables

Social trust is measured with the question “would you say that most people can be trusted, or that you can’t be too careful in dealing with people?” The alternatives originally range from 0 to 10, where 0 means that “you can’t be too careful” and 10 means that “most people can be trusted”. This scale is used in the population level analyses whereas it is divided into 5 categories in the multi-level analyses, 0-1 (very low level of trust), 2-3 (low level), 4-5 (sufficient level), 6-7 (high level) and 8-10 (very high level). Further, social trust is dichotomised in the cross-level interaction analyses, where 0-5 denotes to low level of trust and 6-10 to high level of trust.

The 20 European countries are classified into the five different welfare state regimes in the variable *regime type*. “The social-democratic” regime consist of Sweden, Norway, Finland and Denmark, “the liberal” of Great-Britain and Ireland, the “conservative/corporatist” is represented by Belgium, France, Germany, The Netherlands, Austria, Luxemburg and Switzerland, whereas the “post-socialist” is composed of Czech-Republic, Hungary and Poland. Finally the “Mediterranean” regime type consists of Portugal, Greece, Italy and Spain.

Dependent variables

Self rated health is measured with the question: How is your health in general? Is it “very good”, “good”, “fair”, “bad”, “very bad”, or “don’t know”. In the initial analyses self-rated health is measured with the original five-grade scale (table 1 and 2). The variable is dichotomized in the multilevel analyses (table 3 and 4). If the respondent answers “fair”,

“bad” or “very bad” he/she is considered as ill. Otherwise he or she is considered as healthy. Self-rated health has been shown to be a very inclusive and reliable health outcome (Manderbacka, 1998). The variable has shown to cover health aspects relevant to for example survival (Mackenbach et al., 2002).

Life expectancy at birth is used as an alternative health outcome in the two initial analyses (table 1 and 2) since strong correlations between self-rated health and the more “objective” measure life expectancy, to some extent could confirm that self-rated health is a sufficient measure of overall health. Life expectancy is based on data from the OECD database (OECD, 2002).

Individual control variables

The individual and multi-level analyses are also controlled for gender, age, ethnicity and education. *Age* has been divided into 8 categories, 15-24 years, 25-34 years, 35-44 years, 45-54 years, 55-64 years, 65-74 years, 75-84 years and more than 85 years. The variable *education* is measured with a question about the highest level of education achieved. The alternatives are “not completed primary”, “primary/basic education”, “lower level secondary/second stage of basic”, “upper/post-secondary”, and “tertiary”. The variable *Ethnicity* is based on a question about if the respondent belongs to an ethnic minority in the country and the alternatives are consequently “yes” or “no”.

Contextual control variables

The multi-level analyses are also controlled for *income inequality* which here is measured as the ratio of total income received by the 20 % of the population with the highest income (top quintile) to that received by the 20 % of the population with the lowest income (lowest quintile). This measure is based on Eurostat-data (Eurostat, 2001)².

Results

Table 1 about here

A first aim with this article was to analyse the variation in the levels of social trust in five welfare regimes. Table 1 suggests clear differences between welfare regimes when it comes to levels of trust. The social democratic countries generally have very high levels of trust

² See europa.eu.int/comm/eurostat/ for more information about this measure.

compared to others. On the other extreme Mediterranean and especially post-socialist countries have very low levels of trust. Somewhere in between we find the liberal and conservative/corporatist countries. There is some variation also within regime types. Spain and Italy for example have much higher trust levels than Portugal and Greece in the Mediterranean regime whereas France have quite low levels of trust compared to the other conservative/ corporatist countries. However these results still suggest that it seems plausible to continue analysing European countries grouped into the five welfare state regimes as indicated in the theoretical part. This implies that the social-democratic regime could be considered as a high-trust context whereas the post-socialist respectively Mediterranean regimes could be considered as low-trust contexts. The liberal and conservative/corporatist regime could be regarded as moderate trust contexts.

Table 1 also shows mean scores on self-rated health and life expectancy at birth in Europe. The table suggests health inequalities between the regime types. Citizens in the Post-communist and Mediterranean regimes seem to have very low levels of self-rated health when compared to other regimes. Further, citizens in post-communist countries also have the lowest life-expectancy when compared to other regime types. The difference in life expectancy between the other regime types is relatively moderate.

Table 2 about here

A second aim was to analyse the relationship between country level social capital and population health. Table 2 shows correlation coefficients between trust, life expectancy and self-rated health in the 20 European welfare countries. The table reveals that trust at the country level is highly, and significantly, correlated with population health. There also seems to be a significant correlation between trust and the more “objective” health indicator, life expectancy. Finally the table also suggests that self-rated health is positively correlated with life expectancy. In other words countries with higher average of self-rated health also have higher life expectancy which to some extent confirms that self-rated health seem to be a sufficient overall measure of overall health in the twenty European countries. However due to the relatively small sample (n=20) it’s important to be careful when drawing conclusions from these results.

Table 3 about here

A third and fourth aim was to analyse if there is an effect of type of welfare regime on individual health and if this association persists after controlling for individual trust and several other contextual and individual variables. Table 3 mainly shows the association of a number of multi-level analyses. Each of the models in table 3 is controlled for various variables. Model 1 only contains welfare regime type and age whereas model 5 could be considered as a full model where several possible individual and contextual confounders are included.

The table reveals that the unexplained variation in self-rated health between countries significantly decreases when type of welfare regime is included i.e. when model 1 is compared to the variation in an empty model. In other words, some of the variation in self-rated health between countries is explained by differences between welfare regimes. Additionally, model 1 shows that the relative risk of poor self-rated individual health is highest in the post-socialist regime when compared to the reference group, the social-democratic regime. Further, the Mediterranean regime also has a high relative risk of self-rated poor health in model 1, however the coefficient is non-significant. Model 1 also indicates higher levels of self-rated health in the liberal than the social-democratic regime.

Model 2 is additionally controlled for the contextual variable, income inequality. The effect of the post-socialist regime, with low trust levels, is however still strong and significant in this model. Further, individual social trust is included in model 3, together with welfare regime and age, and this variable has a strong and significant effect on self-rated health. There is also a clear linear gradient of the relative risks. The effect of the post-socialist regime is somewhat weaker than in model 2. Model 4 is, besides age, adjusted for several other individual variables like gender, education, and ethnicity. Regime-type and individual trust still seems to have strong effects on self-rated poor health. The effect of the Mediterranean regime type seems to disappear once controlled for individual variables. Finally, model 5 includes the contextual and individual variables simultaneously. There remains a very strong and significant effect of the post-socialist regime type on self-rated health together with a strong effect of individual trust.

The results in table 5 consequently indicate that individual trust is a very important predictor of self-rated poor health and that differences in self-rated health between regime types are moderately influenced by individual trust. Finally, the level of income-

inequality influences health only moderately and doesn't seem to explain the association between welfare regime type and self-rated health.

Table 4 about here

Table 4 shows results from cross-level interaction analyses based on the multi-level data. The table reveals that individuals with low social trust have a high relative risk of self-rated poor health in all welfare regimes, except the liberal, when compared to the reference group, high trusting individuals in the social-democratic regime. Low trusting individuals also have a higher relative risk compared to high trusting individuals, in each individual welfare regime type. The table further suggests that it is most detrimental for individual self-rated health to live in the post-socialist regime irrespective level of individual trust. The relative risk of self-rated poor health is 4.06 for low-trusting individuals living in the post-socialist regime relative to high-trusting individuals living in the social democratic regime whereas the relative risk is 2.48 for high-trusting individuals living in the post-socialist regime. The table suggests that the effect of combined exposure exceed the additive effect in the post-socialist regime since the synergy is 1.32. In other words individuals living in the post-socialist regime with low individual social trust seem more vulnerable to the effect of living in that low trust context than high-trusting individuals. However the effect of combined exposure doesn't exceed the additive effect in the other regime types since the synergy is below 0. This indicates that individual trust is more important for health than the type of welfare regime. Finally, table 4 suggests that the liberal regime seems to diverge from other regime types. The relative risks are lower compared to the social-democratic regime which indicates that individuals in liberal countries generally have less self-rated health problems, a result which also appeared in table 3. The difference in relative risks between low and high trusting individuals living in the liberal regime is also relatively small which suggests that individual trust is of less importance for individual health.

Conclusions

A first aim with this article was to examine the levels of social capital, measured as social trust, in five European welfare regimes. Esping-Andersen's (1990: 1999) theory about the three worlds of welfare capitalism suggested crucial differences between welfare state regimes when it comes to direction of social and welfare policy. These differences have crucial implications on the levels of income inequality, degree of individualism, life quality

among citizens, the quality of political and state institutions and civic participation in each regime type, factors which have been suggested as very important also for the levels of social trust in different contexts. With these theoretical arguments as a basis it was assumed that the social-democratic regime have the highest level of trust whereas the Mediterranean and post-socialist have the lowest levels. The liberal and conservative/corporatist regime was expected to be found somewhere in between these extremes. The empirical results almost exclusively confirmed these theoretical assumptions.

However the principal aim was to examine how welfare state regimes, trust and health are interlinked. Some opening results suggested that there exists a strong association between trust and self-rated health at the country level. In other words high-trusting countries appear to have better population health. A relationship between social trust and life expectancy were also found. However due to the small sample size we should be careful when drawing conclusions from these results.

Further, results from the multi-level analyses suggested that people living in the post-socialist regime have a very high relative risk of self-rated poor health relative to the social-democratic regime and this association also persisted after controlling for several variables, among those individual social capital. No significant effects on self-rated health were however found in the other regime types. Since theoretical and empirical evidence indicates that the post-socialist regime has the lowest levels of social trust and that there are associations between trust and self-rated health, it seems reasonable to conclude that the association between the post-socialist regime and self-rated health could be related to regime level social trust. The fact that there were no effects on self-rated health in other regime types perhaps indicate that social trust only has an health effect in contexts with particularly low levels of trust. Further results from the multilevel analyses suggested that individual social capital had very strong associations with self-rated poor health. These results correspond with several earlier studies (Hyppä & Mäki, 2001; Rose, 2000; Veenstra, 2005).

Cross-level interactions were also analysed in the article and these suggested that individuals with low social trust have a high relative risk of self-rated poor health in all welfare regimes, except the liberal, relative to high trusting individuals in the social-democratic regime, but also relative to high trusting individuals in each individual regime type. However it is most detrimental for ones health to live in the low-trusting post-socialist regime irrespective of the level of individual trust. The results suggested that the effect of combined exposure exceeded synergy in this regime i.e. individuals with low individual social trust seem more vulnerable to the effect of living in that low trust context. No synergy was

however found regarding the other regimes types. This indicates that individual trust is more important for self-rated health than contextual trust in these regimes.

To conclude the empirical results indicated associations between the cognitive aspect of social capital and individual respectively population health. The results also suggested an association between regime type and individual health which partly could be explained by levels of social trust. An important suggestion for further research is therefore to continue analysing and theorizing about how different welfare regimes are related to structural and cognitive aspects of social capital and how these may influence different aspects of citizen's health and wellbeing since welfare regime conditions and settings could be considered as exceptionally important in shaping citizen's perceptions of trust in fellow citizen's.

There are however some evident problems in this study. The first is about self-rated health as an outcome measure. Self-rated health has been frequently used in studies about social capital and income-inequalities (see for example Kawachi & Berkman, 2000). It has been shown to be a very inclusive measure of health aspects relevant to for example survival which are not covered by other health indicators (Mackenbach et al., 2002). Also Manderbacka (1998) found that self-rated health is a reliable indicator of overall health. However comparing countries when it comes to self-rated health could cause major problems. There could be crucial cultural differences between people of different nationalities in how they perceive their own health status and how they interpret questions about health and wellbeing. This also holds for questions about trust.

There is also a major problem concerning the causality in this study. Causality between social trust and health cannot be undoubtedly established using cross sectional data like in this study. People with severe health-problems could very well be isolated as a consequence of their health status and this in turn could lead to more suspicious and distrustful attitude towards other fellow citizens. The theoretical arguments about the impact of different types of welfare state regimes on social trust could also suffer from reversed causality since high trusting countries could have very well been developed into social-democratic ones.

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Table 1 Levels of trust (1=you can't be too careful, 10=most people can be trusted), self-rated health (1=very bad, 5=very good) and life expectancy at birth in 20 European countries (mean scores)

	Trust (mean values)	Self-rated health (mean values)	Life expectancy at birth (years) ³
Social-democratic	6.54	3.99	78.55
Sweden	6.09	3.97	79.90
Norway	6.60	4.00	78.95
Finland	6.46	3.83	78.20
Denmark	6.99	4.15	77.15
Liberal	5.26	4.08	77.90
United Kingdom	5.05	3.93	78.05
Ireland	5.46	4.22	77.75
Conservative/corporatist	5.08	3.87	78.79
Belgium	4.81	3.99	78.10
France	4.47	3.70	79.25
Germany	4.61	3.61	78.45
The Netherlands	5.71	3.87	78.35
Austria	5.07	4.04	78.75
Luxemburg	5.21	3.80	78.20
Switzerland	5.65	4.09	80.40
Mediterranean	4.26	3.69	78.61
Portugal	4.00	3.38	77.15
Greece	3.64	4.02	78.05
Italy	4.54	3.73	79.85
Spain	4.86	3.63	79.40
Post-communist	4.00	3.46	74.17
Czech-Republic	4.25	3.44	75.40
Hungary	4.08	3.30	72.55
Poland	3.72	3.53	74.55

n=20

³ Source: OECD 2002

Table 2 Correlations between trust, life expectancy and self-rated health at the population level in 20 European countries (Pearsons correlation coefficient).

	Trust	Self-rated health	Life expectancy
Trust	1.0	0.629**	0.415*
Self-rated health	0.629**	1.0	0.574**
Life expectancy	0.415*	0.574*	1.0

**Significant on the 1% level

*Significant on the 10% level

n=20

Table 3 Multi-level logistic regressions based on cross sectional data which show the associations between regime type and individual self-rated poor health (odds-ratios).

	Model 1		Model 2 ⁴		Model 3 ⁵		Model 4 ⁶		Model 5 ⁷	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Welfare regime										
Social- democratic	1.00		1.00		1.00		1.00		1.00	
Liberal	0.71	0.36-1.39	0.67	0.26-1.68	0.61	0.32-1.19	0.59	0.31-1.12	0.62	0.26-1.50
Conservative/corporatist	1.15	0.71-1.88	1.12	0.64-1.96	0.98	0.60-1.58	1.00	0.63-2.58	1.02	0.60-1.72
Mediterran	1.54	0.89-2.68	1.40	0.43-4.57	1.20	0.70-2.06	1.04	0.62-1.76	1.14	0.37-3.48
Post-socialist	2.98	1.65-5.41	2.93	1.55-5.52	2.26	1.26-4.05	2.22	1.27-3.89	2.26	1.24-4.12
Income inequality	-		1.04	0.67-1.63	-		-		0.96	0.63-1.47
Individual trust	-		-		-		-		-	
Very high levels of trust					1.00		1.00		1.00	
High levels of trust					1.22	1.12-1.33	1.22	1.12-1.34	1.22	1.12-1.34
Sufficient levels of trust					1.59	1.46-1.73	1.51	1.38-1.64	1.51	1.38-1.64
Low levels of trust					1.91	1.74-2.09	1.76	1.60-1.93	1.76	1.60-1.93
Very low levels of trust					2.51	2.25-2.80	2.24	2.00-2.49	2.23	2.00-2.49
Gender	-		-		-		-		-	
Male							1.00		1.00	
Female							1.32	1.25-1.39	1.32	1.25-1.39
Education	-		-		-		-		-	
Tertiary							1.00		1.00	
Upper/post secondary							1.26	1.10-1.45	1.26	1.10-1.45
Lower level secondary/second stage basic							1.65	1.45-1.89	1.65	1.44-1.89
Primary/basic education							2.00	1.75-2.29	2.00	1.75-2.29
Not completed primary							2.60	2.26-3.00	2.60	2.25-3.00
Age										
15-24	1.00		1.00		1.00		1.00		1.00	
25-34	1.09	0.98-1.22	1.09	0.98-1.21	1.06	0.95-1.19	1.18	1.06-1.33	1.19	1.06-1.32
35-44	1.73	1.56-1.91	1.72	1.56-1.90	1.73	1.56-1.91	1.85	1.67-2.04	1.84	1.67-2.04
45-54	3.04	2.76-3.35	3.03	2.75-3.34	3.04	2.76-3.35	3.18	2.88-3.50	3.17	2.87-3.49
55-64	4.72	4.27-5.21	4.70	4.26-5.20	4.66	4.22-5.16	4.72	4.26-5.22	4.70	4.25-5.21
65-74	6.73	6.03-7.50	6.70	6.01-7.48	6.68	5.99-7.46	6.45	5.77-7.21	6.43	5.76-7.19
75-84	10.29	9.01-11.76	10.26	8.98-11.73	10.22	8.93-11.68	9.47	8.27-10.86	9.45	8.25-10.84
85-	12.78	9.71-16.81	12.75	9.69-16.77	12.26	9.29-16.18	10.78	8.14-14.28	10.76	8.13-14.25

⁴ Model 1+income inequality

⁵ Model 1+individual social trust

⁶ Model 3+gender, ethnicity, and education

⁷ Model 4+income inequality

	Model 1	Model 2⁴	Model 3⁵	Model 4⁶	Model 5⁷
	OR	OR 95% CI	OR 95% CI	OR 95% CI	OR 95% CI
Etnicity	-	-	-	1.00	1.00
Don't belong to ethnic minority				1.28 1.11-1.47	1.28 1.11-1.47
Belong to ethnic minority				0.135	0.134
Unexplained variation in individual self-rated health	0.152	0.152	0.146		
(empty model=0.246)					
n=35.554					

Table 4 Evaluation of cross-level interaction effects between individual level social trust and regime type on self-rated health (age adjusted).

	Welfare regime				
	Social democratic	Liberal	Conservative/corporatist	Mediterranean	Post-socialist
Individual level trust					
High	1.00	0.69 (0.36-1.34)	1.05 (0.65-1.69)	1.51 (0.87-2.61)	2.48 (1.37-4.48)
Low	1.83 (1.58-2.11)	1.04 (0.54-2.01)	1.70 (1.05-2.74)	2.05 (1.19-3.51)	4.06 (2.27-7.25)
<i>Synergy index</i>		<i>0.07</i>	<i>0.79</i>	<i>0.78</i>	<i>1.32</i>

n=35.554