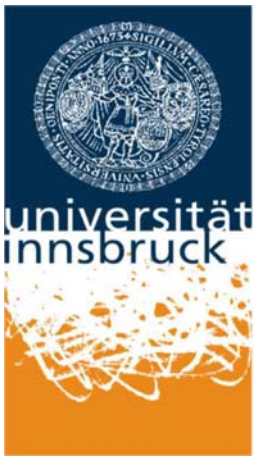
University of Innsbruck



Working Papers in Economics and Statistics

The relationship between Stress, Strain and Social Capital

Martin Gächter, David A. Savage and Benno Torgler

2010-04

The relationship between Stress, Strain and Social Capital

Martin Gächter*, David A. Savage† and Benno Torgler‡

Abstract

This paper analyzes the effectiveness of social capital in reducing the negative externalities associated with stress, as well as the physical and psychological strain indicators among police officers. Despite the fact that there is a large multidisciplinary literature on stress or on social capital, the link between both factors is still underexplored. In this empirical paper we therefore aim at reducing such a shortcoming. We focus on a strategically important work environment, namely law enforcement agents, that is not only characterized as physically and emotionally demanding, but also as an essential part for a well-functioning society due to the fact that inefficiencies in the police force can induce large negative externalities. Using a multivariate regression analysis focusing on eight different proxies for stress and strain, and two proxies for social capital and conducting several robustness checks, we find strong evidence that an increased level of social capital is correlated with a lower level of strain. From a policy perspective, our findings suggest that stress reduction programs should actively engage employees to build stronger social networks.

JEL classification: I1, I31, J24, J81, Z13
Keywords: Social Capital; Trust; Stress and Strain; Gender; Police Officers; Burnout

*University of Innsbruck, Department of Economics and Statistics; Universitaetsstrasse 15, A-6020 Innsbruck, Austria; University of Linz, Department of Economics; *The Austrian Center for Labor Economics and the Analysis of the Welfare State*, Altenberger Strasse 69, A-4040 Linz, Austria. E-Mail: martin.gaechter@uibk.ac.at.

†School of Economics and Finance, Queensland University of Technology, GPO Box 2434, Brisbane, QLD Australia. E-Mail: david.savage@qut.edu.au.

‡School of Economics and Finance, Queensland University of Technology, GPO Box 2434, Brisbane, QLD Australia; CREMA - Center for Research in Economics, Management and the Arts, Gellertstrasse 18, CH-4052 Basel, Switzerland; CESifo, Poschingerstrass 5, D-81679 Munich, Germany. E-Mail: benno.torgler@qut.edu.au.

1 Introduction

The concept of stress has become so inexorably linked to that of modern society that the topic is researched and discussed across a diverse range of fields including: economics, social psychology, sociology, management, and in particular also health and medicine. The economic costs of the negative externalities generated by stress are considerable. This not only includes the cost of administering mental and physical support for sufferers but also the lost work hours. International Labor Organization (ILO) reports estimate that in the US one in ten workers are diagnosed with depression at a cost of between US$30-$44 billion treating depression, resulting in, approximately 200 million lost working days each year (Gabriel and Liimatainen 2000).

Public service workers, like police officers, have jobs that are recognized as suffering from high levels of stress through performing work that is both physically and emotionally draining (Kopel and Friedman 1999, Schwartz and Schwartz 1981, Stotland 1991). Numerous research studies have demonstrated that the high levels of stress in these professions can lead to detrimental health consequences (strains). These consequences can include mental and physical illnesses; aggressive and violent behavior; alcohol abuse and decreased work performance (McCarty et al. 2007, Morash and Haarr 1995, Swatt et al. 2007). Although the literature on stress has explored a large set of factors that determine stress, the examination of whether social capital has an effect on stress or strains is still to our knowledge an underdeveloped topic. For the purposes of consistency in this work we utilize the following definitions: stressors are characteristics of the work environment that cause strain and strains are the labels for the resulting physical or psychological impacts such as burnout or ill-health (O'Driscoll and Dewe 2001). We contend that greater levels of social capital should alleviate work related strain levels and in this paper we explore this relationship within police officers using an interesting survey dataset conducted with police officers from the Baltimore Police Department in Maryland, USA (Gershon 1999, 2000). The survey covers many job related factors (both positive and negative), as well as personal, organisational and social questions. The sample is representative of the demographic characteristics of the police department due to well developed sampling strategies and a very high response rate. From a theoretical and empirical perspective it is important to analyse data where individuals have a similar job profile, as many of the potential stress factors are common across a large group of individuals. Remaining differences within the homogenous environment can then be controlled as good as possible in a multivariate analysis. Thus, the advantage of focusing on a particular profession such as police officers within a regional department is the chance of improving the ceteris paribus assumption, holding important potential factors constant. For example, environmental factors are better controlled or isolated compared to the case where individuals within a survey have heterogeneous job

profiles and are acting in different environments (noisy stress comparison).

Searching for improvements for law enforcers can generate large societal benefits. Social capital might be a good alternative in situations where traditional stress reducing instruments fail or where the necessary information to design and enforce suitable instruments and directives cannot be effectively used. Coleman (1988, p. 304) points out that social capital works by „facilitating the achievement of goals that could not be achieved in its absence or could be achieved only at higher cost“. This can be accomplished through a shared sense of identity (or sense of belonging/solidarity), reciprocity and norms of cooperation that induces a sense of obligation to help others, along with a confidence that such assistance will be returned (Putnam 1983). This is especially true in groups where trust is vital to increase survival outcomes and task competition, such as police or military. It is through the generation of trust and cooperation that individuals are able to decrease stress levels and strain outcomes, via shared workloads and shared negative experiences.

The paper is structured as followed. Section two briefly reviews the theoretical background of our paper by explaining major concepts of stress and social capital on the basis of related literature. Section three explains our dataset as well as the methods applied. Section four presents our main empirical results, which are discussed in section five. Finally, section six draws some conclusions and policy implications.

2 Theoretical Background

A general definition of stress covers conditions of a physical, biological or psychological nature that strain an organism beyond its power to adapt. Psychological and sociological literature has identified numerous factors associated with stress, which include: work and time pressures, auditory overload and interference, performance pressure, environmental, fatigue, extreme heavy or prolonged workloads and social pressures (Bourne and Yaroush 2003; Cannon-Bowers and Salas 1998). Research has identified several of the coping mechanisms utilized by police officers to alleviate stress, with positive and negative outcomes such as: social and spiritual support systems, alcohol and substance abuse, and violence (Gershon et al. 2009, Haarr and Morash 1999, Swatt et al. 2007). Police officers are exposed to a vast array of these stresses as a routine part of the job. Stresses can be classified by the frequency by which they occur as well as the intensity of the impact on the officer (Brown et al. 1999). Many police stressors are comparable to other work environments due to workplace issues that are driven by the organizational structure, social interactions, and job requirements (e.g., shift work, excessive overtime, heavy workload, discrimination and harassment, poor working conditions, strong interactions with the public). In addition, police officers can encounter, witness or hear about fellow

officers' involvement in extreme situations such as physical or even life threatening danger and the exposure to disturbing events in general (Gershon et al. 2009). Therefore, analyzing police officers can generate some interesting new insights. Certainly, major incidents such as shootings, attachment to the victim, or the attendance of a gruesome crime scene, are low-frequency events, but can have a very high stress impact. This type of stress impact has been identified as a known trigger for mental disorders such as Post Traumatic Stress Disorder (PTSD) (Stephens et al. 1997).

(Table 1 about here)

As can be seen from the impact of stressful incidents, the different events can have a broad range of impact responses. Attending a police funeral and being the subject of an IID investigation clearly rate as being some of the highest impact events. On the other hand, it is surprising to observe that chemical spills, violent crime scenes and hostage events are viewed as having little or no impact. However, these are self reported impacts, and it may be interesting to examine the relationship between the strain outcomes and the stress events themselves, in the form of health effects (see e.g. Gächter, Savage and Torgler 2009). The more frequent but low-impact events can be viewed as routine in this aspect. However, there is still a certain probability that an extreme event could happen. These events can affect officers in several ways, either physically, psychologically or both (Gershon 2000). Some of the noted physical strains associated with police stress include: hypertension, stroke, ulcers, high blood pressure, or sexual dysfunction (Bartollas and Hahn 1999, Berkman and Syme 1979, Kroes 1985, Mitchell and Bray 1990, Peak 1993, Stratton 1984, Violanti et al. 1983). The psychological strains associated with police stress can include: depression, PTSD, burnout, suicide and alcoholism (Hawkins 2001, Kawachi et al. 1996, Kopel and Friedman 1999, Schaufeli and Enzmann 1998, Schwartz and Schwartz 1981, Stephens et al. 1997).

In this paper we emphasize and explore empirically the important association between social capital and stress. We propose that higher levels of social capital can reduce stress levels and strain outcomes at the individual level, and therefore, potentially contribute to an improvement of law enforcement efficacy which generates positive spillovers at the aggregated level for the public. Game theory and experimental findings have shown that a high level of social capital enables co-operation between actors and facilitates superior social outcomes (Boix and Posner 1998). Social capital within a work environment may be a breeding ground for social stability among workers. That is, a lower level of stress is generated if trust and cooperation is established between co-workers and units. If, for example, new or potential challenges must be tackled, police officers or unit environments

with a higher level of social capital are more flexible in coping or adapting to such circumstances. In addition, social capital may reduce polarization within the unit and enhance social cohesion which may reduce transaction costs. According to Dasgupta (1999), social capital can lead to more efficient transactions by giving agents access to more information, enabling them to coordinate activities for mutual benefit, and, through frequent transactions with the same person, reducing therefore the likelihood of opportunistic behavior. It has also been suggested that low levels of social capital exacerbate these problems, as lack of social capital indicated a predisposition for depression (Brown and Harris 1978, Caplan 1974). More recent studies have shown that social capital in the form of social support buffers individuals against both chronic and acute forms of stress (Cohen and Willis 1985, Prince et al. 1997, Whitley and McKenzie 2005). This is related to the literature on social environment that states that supportive, non-conflictual social relations at work are able to reduce stress, strain outcomes and enhance health, meeting basic human needs such as approval, affiliation, and a sense of belonging (Repetti 1993). Thus, social capital is a resource that police officers can draw upon in their personal and professional lives which should help them to deal with stressful situations. Many authors have singled out social capital as an important feature of productive social relationships (Gambetta 1988, Hardin 1993) and effective leadership facilitating also coordinated actions and the willingness to comply (see, e.g., Alesina and La Ferrara 2002, Knack and Keefer 1997, La Porta et al. 1999, Putnam 1993, Schaltegger and Torgler 2007, Torgler 2007).

Now how can we measure social capital? We are interested not only in an analytical concept but also in an empirical one. Grootaert (2001, pp. 10-11) points out that there are three major views on social capital: First, the concept developed by Putnam (1993) interprets social capital as a social network, as networks of civic engagement facilitating coordination and cooperation. Second, Coleman's (1988, p. 598) approach defines social capital as „a variety of different entities" that consists of social structure aspects, that also facilitate certain actions. This allows taking into account not only horizontal (co-worker) but also vertical social relationships (police officers with different rankings). The third concept considers the social and political environment that enforces norms and shapes social structures. In our case we have the chance to hold such an environment constant as we observe police officers within the same environment.

Social capital is therefore used to describe aspects of social networks, relationships and trust (Coleman 1988, Fukuyama 2003, Portes 1998, Woolcock and Narayan 2000). Putnam's (1983) five principles include: a local/civic identity, a sense of belonging, solidarity, and/or equality with other members of the community, and reciprocity and norms of cooperation inducing a sense of obligation to help others, along with a confidence that such assistance will be returned (Putnam 1993). Similarly, Paldam (2000, p. 630), describes

three families of social capital concepts: trust (cognitive social capital), cooperation (collective action) and networks. He points out that these conceptual families come together because „most people build trust in and networks to others and come to cooperate with them“ (p. 629). Paldam's view is in line with our rationale for working with the following two proxies for social capital, namely whether „there is a good and effective cooperation between units“ and whether one „can trust his/her work partner“. The trust variable that we use can be classified according to Uslaner (2002) as particularized (or personal) trust, a proxy that relies strongly upon experiences. Particularized trust is only related to a specific group such as co-workers, family members, or to specific institutions. Trust is then often connected with the element of reciprocity or interactions depending upon specific individual or group characteristics. This notion is essential for our analysis as we are exploring the work environment and its implication on individuals' stress level. Good effective managerial behavior is crucial to the formation of social capital in a workplace, such that a well organized workplace fosters an environment of trust between all members of staff (Hodson 2005). Thus, one could stress that social capital within any workplace is important but the special nature of police work similar to the military makes trust, reciprocity and cooperation between colleagues even more vital (Torgler 2003). This is partially to be able to handle extreme pressure situations and to trust that your colleagues „have your back“ in a dangerous situation. This has been shown in studies of individual contribution to social capital (Adler and Kwon 2002, Leana and Van Buren 1999). There are also some studies that demonstrate that higher levels of social support decreases strain outcomes for police officers (Morash et al. 2006, Morris et al. 1999). However, previous studies have only utilized a narrow selection of environmental and demographic factors and utilized a single stress variable within the analysis. In this paper we have examined several aspect of stress and strain outcomes (physical, psychological, anxiety, depression and burnout) as well as extended set of control and environmental factors in our multivariate analysis.

3 Methods, Data & Measurement

3.1 Data & Method

The data for our analysis are taken from the study „SHIELDS“ (Study to Help Identify, Evaluate and Limit Department Stress) in Baltimore, Maryland (see Gershon 1999, 2000) which aimed to examine questions about the relationship between police stress and domestic violence in police families. The questionnaire covers questions in four main areas: (1) symptoms of stress and likely stressors, (2) perceived (current) stress, (3) coping strate-

gies and (4) health outcomes. Study participants were recruited from the Baltimore Police Department in Baltimore which provides law enforcement services to about 700,000 inhabitants in Maryland. The five-page questionnaire was administered to a sample of 1,104 police officers and was aimed at a tenth-grade literacy level, taking approximately twenty minutes to complete. Due to the well developed sampling strategies, the sample closely resembles the demographic characteristics of the police department in 1996. At that time, the department had 3,061 sworn employees, including 2,636 males (86%) and 425 females (14%). Thus, the sample covers roughly a third of the whole study population. The response rate which was calculated by the number returned by each precinct compared with the average number of sworn employees at each precinct on the day of the survey was very high, amounting to 68% (Gershon 1999). From approximately 1,200 questionnaires distributed 1,104 were returned (more than 92%).The very high response rate, the excellent sampling strategies and the anonymous nature of the study makes it very interesting to analyse such a dataset. Table 2 presents an overview of the data set. Almost 86% of the employees are male. Regarding the ethnic group, a majority is Caucasian (64%), followed by African-American (33%) and Hispanic (1%). Approximately 26% attended college, while just about 4% hold a graduate degree. The main position was officer (55%), followed by detective and sergeant (13% each). A large majority of employees was either married or had a live-in partner (68%), while 19% declared themselves as singles. The mean age was 36 years, ranging from 20 to 66. On average, people have been working in the department for 11.5 years (lasting from 0 to 44) and have 1.18 children living at home (varying between 0 and 7).

For the purpose of this study, several indices were constructed to measure different aspects of stress. Moreover, to better isolate the impact of social capital on stress we control for factors such as demographic characteristics (age, gender, ethnic group, number of children, marital status), as well as experience and rank within the department as some previous studies report that rank and experience is relevant (for an overview see Brown and Campbell 1990). To check the robustness of the results we are also conducting a sensitivity analysis extending a baseline specification with a trauma index that measures whether police officers have experienced certain potentially dangerous or traumatic events in the line of duty and how much they were emotionally affected by them, and then an index that measures police officers' stability at home.

We are now introducing the key variables of the baseline specifications. For simplicity and comparability we will use the same independent variables for all the eight strain proxies used as dependent variables (see Table 2 for descriptive statistics).

(Table 2 about here)

3.2 Dependent variables

To measure different types, aspects and outcomes of stress, as well as being able to distinguish between certain effects and their specific influences on strain we construct eight different indices of stress. Using a large set of dependent variables also offers a good robustness test for the relationship between social capital and stress. Following Kurtz (2008, p. 224), we develop indices of psychological and physical strain as well as an index which combines these two factors. Regarding the first index (psychological strain, referred to as strain1), participants were asked if they experienced the following signs of psychological strain in the past 6 months: restlessness, feeling hopeless, panic attacks, irritability, withdrawal, depression, and emotional depletion. A four-point Likert scale (Likert 1932) with possible answers ranging from never (1) to always (4) was used. These items were then used to create a summative scale that ranged from 7 to 28, with higher levels indicating a higher level of (psychological) strain. The measure showed a satisfactory level of internal consistency (Cronbach's α= 0.83). The physical strain index (referred to as strain2) uses five questions assessing whether respondents had experienced nausea, trouble getting breath, a lump in the throat, pains or pounding in the chest, and faintness or dizziness in the 6 months prior to the survey. As the construction of the index is similar as explained above, the summative scale ranged from 5 to 20, with higher levels indicating a higher level of (physical) strain (α=0.72). Our third strain indicator (strain3) combines the psychological and physical components and, therefore, gives an overall indicator of perceived strain ranging from 12 to 48 (α=0.86).

In their paper about the effects of gender and race in police stress, following the Brief Symptom Inventory (BSI), which was developed in 1975 to measure several dimensions of psychological and physical symptoms of stress among community residents as well as psychiatric and medical patients (see Derogatis and Savitz 1999), He et al. (2005, p. 539) propose three different dimensions of strain: first, somatisation reflecting the psychological distress arising from perception of bodily dysfunction; second, anxiety representing general indicators such as restlessness, nervousness, and panic attacks; and finally, depression measuring a broad range of the elements constituting the clinical depressive syndrome. Thus, following their approach, we construct three indices, namely the somatisation index, the anxiety index and the depression index. The somatisation index consists of five questions asking about headaches, pains or pounding in the chest, nausea, trouble getting breath and a lump in the throat (som). As above, the four-point scale of distress ranges from never (1) to always (4). Thus, the index strongly resembles the physical index introduced above and ranges from 5 to 20 (α=0.72). Similarly, the anxiety index (anx) is somehow alike the psychological index. The index considers questions about restlessness, panic, being scared for no reason, feeling of being trapped or caught and irritability, again

ranging from 5 to 20 (α=0.70). Finally, the depression index (dep) - following the symptoms of the clinical depressive syndrome - included withdrawal of interest in activities, depression, hopelessness, lack of interest and thoughts of ending the life. As it covers 5 questions, the index ranges from 5 to 20 (α=0.79).

In addition to these six strain indices, we construct indices considering burnout symptoms and health outcomes. Our burnout index (burn) follows the approach of Kurtz (2008, p. 225), taking into account three questions about burnout syndromes, namely feeling like an automatic pilot most times, feeling burned out from the job, and feeling like being at the end of the rope. The possible answers ranges from strongly disagree (1) to strongly agree (5) resulting in an index from 3 to 15 (α=0.73). Our index of health outcomes (health), as opposed to the indices of psychological strain and anxiety, considers chronic health outcomes, including migraines, diabetes, chronic low back pain, high blood pressure, liver disease, foot problems, heart disease, reproductive problems and chronic insomnia. Possible answers of these questions were yes (1) or no (0). Thus, the index includes nine questions ranging from 0 to 9 (α=0.56) with increasing levels indicating higher levels of burden or negative health outcomes, respectively.

(Table 3 about here)

Correlation coefficients of the eight indices explained above are reported in Table 3. Not surprisingly, as all indices measure various levels of strain, respectively, they show positive correlations. As expected, our index strain2 is considerably correlated to the somatisation index (som), as they are overlapping each other empirically. Similarly, the psychological strain index (strain1) is considerably correlated with the indices anxiety (anx) and depression (dep). The correlation between the psychological (strain1) and the physical (strain2) index with the overall strain index (strain3) is not surprising, since the latter is the sum of the former two aspects of strain. Although we observe high correlations between our different measures of strain, we nevertheless include all indices in our analysis, as it is a good robustness test for investigating the role of social capital in reducing overall stress levels and various aspects and outcomes of stress, respectively.

At this point it seems important to mention the slightly differing number of observations depending on various variables and indices (see Table 2) ranging from 1,060 to 1,104. The reason for this is some missing observations in the data, as some participants did not respond to all questions. However, as the missing observations amount to 44 cases in the worst case (index strain3, not even 4 percent of the data,) this should not be a major problem in our analysis. Moreover, preliminary analyses indicate that excluded cases did not significantly differ from the others on key demographic variables such as gender, age,

rank, or race.

By measuring stress and various aspects of strain by means of eight different indices, we are confident to cover a wide range of stress aspects as well as strain. The following section explains our explanatory variables while focusing on our measure of social capital at work. Moreover, it covers our choice of control variables such as demographic variables and specific characteristics of the current position within the department. The variables used in the extended specifications are explained at a later stage.

3.3 Explanatory and control variables

To address our main research question, we construct as mentioned in the previous theoretical section a narrow index measuring social capital at work (referred to as social capital) by focusing on two specific questions in the survey, namely whether there is good and effective cooperation between units and trust in work partners. Possible answers range from strongly agree (1) to strongly disagree (5). For reasons of simplicity we reversed the index to facilitate a more intuitive interpretation of our results. Thus, the index ranges from 2 to 10 with higher levels indicating a higher level of social capital. Although the level of internal consistency was at the lower bound of acceptability (α=0.53) we included it in our following regressions as such moderate level of Cronbach's alpha could also be due to the low number of items included in the index. Moreover, the low ? also indicates that there is lower redundancy in our index of social capital, as the index is measuring different dimensions of social capital. However, in such a situation it is important that we check the results splitting up the index of social capital to examine the effects of the single parts of the index for all the dependent variables (see Table 6).

Additionally, we add the number of years working for the department to control for experience (referred to as exp), age and ranking (rank) as explanatory variables. We use all these three factors to isolate their effects even though they are correlated with each other. However, as our results indicate that there is enough remaining variation on each of the variables when the other two variables are held constant. In addition, when assuming multicollinearity issues, although it would be difficult to get distinct coefficient estimates for them, it would only affect the coefficient estimates for those variables that are collinear and not the coefficient estimates of our main independent variable, namely the social capital index. Nevertheless, we have run estimations with these single factors independently without observing major changes in the reported results. As further control variables we include the number of children (ranging from 0 to 7, referred to as child), as well as dummies for the ethnic group (1 if Caucasian, referred to as caucasian) and the marital status (1 if married or live-in partner, referred to as marital status). To consider

possible differences between genders, we simply constructed a gender dummy with value 1 if female and 0 otherwise (female).

For robustness purposes, we extended our model by including indices for „trauma“ and „stability at home“ in our empirical analysis. Following Swatt et al. (2007), trauma was measured using a nine-item negative work-related events scale. More detailed, participants were asked whether they have experienced certain potentially dangerous or traumatic events in the line of duty and how much it emotionally affected them. In total we included nine incidents such as a violent arrest, shooting someone, being the subject of an IID investigation, responding to a call related to a chemical spill, responding to a bloody crime scene, personally knowing the victim, being involved in a hostage situation, attending a police funeral and experiencing a needle stick injury or other exposure to blood and body fluids. For each event officers were asked if they ever experienced this event, and if so, how much it affected them. Possible answers ranged from „not experienced“ (0), „not at all“ (1), „a little“ (2) to „very much“ (3). Thus, we assume that experiencing an event, although without affecting the officer emotionally, was more stressful than not experiencing the event at all. The resulting summative scale ranged from 0 to 27 with higher levels indicating more individual trauma (α=0.79).

To construct an index on „stability at home“ (referred to as home) we consider questions about reliability on support from the family, friends etc. and talking about problems with the spouse, relative or friend (He et al. 2002, Howard et al. 2004). For constructing the index, we had to recode the question about reliability on the family („I feel that I can rely on support from my family, friends etc.“), as the answers originally ranged from strongly agree (1) to strongly disagree (5). On the contrary, the second question („I talk with my spouse, relative or friend about problems“) could be answered with never (1) to always (4). Therefore, we reverse the measure of the first question by putting the numbers upside down from strongly disagree (1) to strongly agree (5). Subsequently, we construct an index ranging from 2 to 9 with a moderate level of internal consistency (α=0.53).

4 Results

4.1 Baseline Model

Our findings in the baseline model are presented in Table 4. In all regressions we use standard errors robust to heteroskedasticity of unknown form. Remarkably, in all eight models, the measure of social capital has the expected negative sign, being highly statistically significant at the 1% level in all eight cases (see models 1 to 8). The estimated regression coefficients indicate that with each additional one unit increase in

social capital strain decreases on average between 0.120 and 0.782 points. Interestingly, social capital affects psychological and physical strain in quite a similar way, as the standardized beta coefficients for the first six equations vary between -0.201 and -0.287. Standardized coefficients convert all the variables into standard deviations inducing the same metric which allows us to compare them across different variables. Thus, a one standard deviation increase of social capital reduces strain by more than 0.2 standard deviations. The same applies to our measurement of burnout (standardized β=-0.287) whereas the effects on health outcomes is slightly smaller (β=-0.142) but still highly significant. Remarkably, the magnitude of our standardized beta coefficient of social capital is quite high as compared to other explanatory variables in our estimation which shows the relative importance of social capital.

(Table 4 about here)

Looking at the control variables we observe that strain levels are negatively correlated with increasing age holding ranking and experience constant, while our measure of experience (number of years worked in the department) has ceteris paribus a positive sign. In almost all the cases both coefficients are statistically significant. On the other hand, the ranking position is not statistically significant in most of the regressions. For our burnout index there is a negative relationship observable that is statically significant at the 1% level. The dummy variable for ethnic group (caucasian) is also statistically significant, indicating that white employees experience higher strain levels, particularly in psychological terms, while there is no statistically significant difference between races for our health measure. Furthermore, while our gender dummy variable is not statistically significant in our measures for psychological strain (Models 1, 5, 6 and 7), the coefficient turns out to be highly statistically significant in all physical aspects of strain (Models 2, 3, 4 and 8). Thus, as compared to men, women report suffering from higher levels of physical strain, while there is no significant difference between genders in terms of perceived levels of psychological strain and its aspects, such as anxiety, depression and burnout. Overall, the number of children, marital status and the current rank do not seem to have a reliable influence on our measurements, although a higher rank within the department seems to reduce the liability for burnout.

4.2 Extensions of the model

To check the reliability of these results, we test the robustness by including the indices „trauma“ and „stability at home“ (see Table 5). The variable „trauma“, as explained

above, allows controlling for experiencing extreme situations, while such a potential stressor is not found in many other job profiles. Not surprisingly, we observe a strong relationship between trauma and strain. The trauma index influences the strain level positively, as more trauma leads to a higher level of (perceived) stress and thus higher levels of strain. This relationship holds for all our eight specifications. On the contrary, as expected, stability at home reduces stress at work, being highly statistically significant in all nine regressions. The impact is quite strong, as shown by means of the standardized beta coefficients. Moreover, the results of this extension once again confirm the baseline model. The index for social capital is still highly statistically significant, while the magnitude of the coefficients does not change drastically. Remarkably, the magnitude of the standardized beta coefficient for trauma is comparable to the influence of our social capital variable. Thus, even under high trauma levels strain levels do not increase if there is a certain degree of social capital within the police unit. It seems that social capital consisting of trust between working partners and effective cooperation between units is able to absorb a considerable level of trauma within a job. Considering the relative magnitude of the coefficients (by comparing standardized betas) it is obvious that social capital in general, particularly at work, plays a major role in reducing perceived stress levels and negative strain effects.

(Table 5 about here)

4.3 Further robustness tests

Taking into account the rather low level of internal consistency of our measure of social capital we conducted further robustness tests by splitting up the social capital variable into its two single parts, namely the question about good and effective cooperation between units (cooperation) and trust in work partners (trust). For reasons of simplicity, just the coefficients for the single measures of social capital are shown, while we use the same set of control variables reported in the previous specifications in Table 5. As expected, the results reported in Table 6 are very robust and do not change. Both single factors are still highly statistically significant in almost all specifications reporting comparable quantitative effects between trust and cooperation, with slightly lower coefficients than in former regressions as they are just measuring one part of the original social capital index. Thus, although the index of social capital exhibits only a moderate scale of internal consistency the estimates of the influence of social capital on strain is confirmed by these regressions including the splitted-up variables.

(Table 6 about here)

4.4 Taking account of the endogeneity problem

Surprisingly, very few previous studies raised the question about possible endogeneity issues in this context. However, as various stress measures are investigated, questions about causality between strain and, e.g. aspects of work environment, camaraderie, unfairness, coping mechanisms etc. necessarily rises. On the other hand, in case of potential causality problems the endogeneity problem leading to inconsistent OLS estimators would vary between stress variables. Finding a very robust and statistically significant relationship between stress and social capital therefore shows the optimistic picture that the effect of social capital cannot be neglected.

Nevertheless, to our best knowledge, not many studies have taken account of this endogeneity issues so far when examining this specific or other kind of datasets, although endogenous variables can lead to a strong bias of the estimates, as the estimates are neither efficient nor consistent in such a case of misspecification. This problem may also apply to our measure of social capital. That is, that our measurement of social capital not only influences stress in a certain positive way, but also that our indices of stress/strain levels influence social capital. For example, a higher stress level may lead to a lower willingness to cooperate with others and may reduce the trust in others. Thus, we ran a Durbin-Wu-Hausman specification test which indicated endogeneity issues. Therefore, we approach this issue by using an instrumental two-stage-least square setting where the index of social capital is assumed to be endogenous. In this setting, potential instrumental variables should be strongly correlated with the instrumented variable, but not with the error term. Thus, we use personal characteristics and personal perceptions of the environment as excluded instruments. As an instrument for a personal characteristic we include a dummy for multiple marriages (1 if at least twice being married) as we assume that interpersonal skills of such individuals are lower and, thus, influence the perception of social capital at work in a negative way. The number of persons who married at least twice is surprisingly high, amounting to 258 individuals (23%) in the sample. Besides a multiple-marriage dummy, the two further questions included are „I feel that I am less likely to get chosen for certain assignments (assignments) because of 'who I am' (e.g. race, gender, sexual orientation, physical characteristics)“ and „When I am assertive or question the way things are done, I am considered militant“ (militant). Possible answers range on a five-point Likert scale from „strongly agree“ (1) to „strongly disagree“ (5). More precisely, we assume that personal characteristics and personal perceptions of the environment have a significant impact on the personal perception of social capital at

work, namely whether the individual is well integrated into the department or not. In other words, even if there is a considerable degree of social capital in a department, certain individuals who have difficulties with interpersonal relationships in general should report a lower degree of social capital in that specific department (as they are not able to participate in this social process), although other more socialized employees may experience high trust and good cooperation, respectively.

(Table 7 about here)

As expected, the two questions about personal perception used as instruments in our 2SLS estimation appear as highly significant in the first stage regression. Furthermore, the dummy of multiple marriages is significant at the 10% level. The resulting F-statistic for the three included instrument amounts to F=31.64, being highly significant. At the same time, the correlation between our measurements of stress and our instruments is not very high. Thus, the two conditions for valid instruments, namely non-correlation (or low correlation) between the instruments and the dependent variable in the structural equation (statistical independence from the disturbance process) as well as quite high explanatory power of the excluded instruments for the endogenous variable (in our case the index for social capital) are fulfilled. This is confirmed by a number of tests we conducted to assess the reliability and efficiency of the IV estimations[1].

[1]First, we report the Sargan-Hansen test which is an over-identification test for the validity of the instruments for models with the number of instruments exceeding the number of endogenous regressors. Overidentifying restrictions produce more efficient estimates in a large sample such as the one that we are using (Baum, 2008). Under the null hypothesis, the instruments are valid instruments, thus uncorrelated with the error therm. In other words, the excluded instruments are correctly excluded from the estimated equation. As the Sargan statistic amounts to 0.906 with a $\chi^2(2)$ p-value of 0.6356 the null hypothesis that the instruments are valid is not rejected. A rejected null hypothesis would indicate that there are problems with the instruments (one or more of the instruments do not appear to be uncorrelated with the disturbance process). Second, we report Shea's (1997) partial R^2 measure taking into account the intercorrelations among the instruments. It amounts to R^2=0.089 and passes the instrument relevance test. Additionally, we ran an underidentification test whether the equation is identified, or in other words, whether the excluded instruments are relevant, thus correlated with the endogenous regressors. The null hypothesis that the model is underidentified is easily rejected by both the Anderson canonical correlations test ($\chi^2(3)$=87.64 with p=0.000) as well as the Cragg-Donald Wald statistic ($\chi^2(3)$=96.20 with p=0.000). Furthermore, we run a test on weak identification, meaning that the excluded instruments are correlated with the endogenous regressors, but only weakly leading to poorly performing estimators. However, the weak identification test reports a Cragg-Donald Wald F-statistic of F=31.64 which is way above the critical values reported by Stock and Yogo (2005). Finally, we also included two statistics for testing the significance of the endogenous regressors in the structural equation being estimated (Anderson-Rubin test and the closely related Stock-Wright LM test). The null hypothesis tested in both cases is that the coefficients of the endogenous regressors in the structural equation are jointly equal to zero and that the over-identifying restrictions are valid. Both tests are robust to the presence of weak instruments. Both the Anderson-Rubin Wald and the Stock-Wright LM test easily reject the null hypothesis that the endogenous regressor in the structural equation are jointly equal to zero in all models.

Thus, after conducting all these tests, we are confident to apply the 2SLS setting in this form to our specifications. The results of our 2SLS estimation taking into account the endogeneity of our social capital index confirm the results derived from our former models. The index for social capital reduces strain significantly for all eight measurements which confirm the importance and significance of social capital and interpersonal skills at work for reducing strain, even when controlling for endogeneity of the social capital estimator.

5 Discussion & Conclusions

The aim of this paper was to investigate the effect of social capital on a large set of strain indices among police officers and within a physically and emotionally stressful work environment. Many police stressors are comparable to other work environments (e.g., shift work, excessive overtime, heavy workload, poor working conditions, strong interactions with the public), but police officers can also encounter, witness or hear about fellow officers' involvement in extreme situations such as physical or even life threatening danger and the exposure to disturbing events in general. It is also useful to focus on police officers as they are an essential part for a well-functioning society. We illustrate in this paper that social capital within a work environment is a breeding ground for social stability among workers. In other words, a lower level of stress is generated if trust and cooperation is established between co-workers and units. New or potential challenges can be tackled in a better manner in high social capital environments as employees are better able to cope and adapt to such circumstances. Social cohesion reduces transaction costs and a better access to information enables a better coordination of activities. Thus, social capital is a resource that police officers can draw upon in their personal and professional lives which should help them to deal with stressful situations. In this paper we explore the relationship between stress, strain and social capital within police officers using data on officers from the Baltimore Police Department in Maryland, USA (Gershon 1999, 2000). Despite the fact that there is a large multidisciplinary literature on stress or on social capital, the link between both factors is still underexplored. By using eight different proxies for stress and conducting a large set of robustness tests, we find strong empirical support that social capital is helpful in reducing stress and strain. Social capital has therefore shown to be extremely effective in negating the impacts of the majority of the strains, and significantly reduces the impact of the major trauma events (shootings, hostages and funerals etc). This finding would indicate that police management and police officers themselves would be greatly benefited through the implementation of social programs that enhance social capital, in our case measured by trust and cooperation between units. It may also be interesting to explore police environments in different countries to check whether the

extrapolation of the results is possible. Brown and Campbell (1990), e.g., point to the fact that there are divergent traditions between countries and results from the USA cannot be extrapolated to other countries such as the UK. Moreover, the source of stress may be driven by the nature of the organization itself. However, it is also useful to test whether the obtained results may also hold in other environments that are comparable to the police one (e.g., military). Nevertheless, additional studies of highly stressed work employees and environments in other areas would contribute to a better understanding of the relationship between stress, strain and social capital and may improve the quality of relief programs and greatly reduce the costs and its externalities accumulated through strained employees. Currently, the predominant stress reduction programs are counselling services, utilised in the hope that this will stem the flood of stress related retirements and burnouts. This hope has been labelled occasionally as too simplistic given the very complex relationships between stressful incidents, individual demographic variables and organisational structure (Dick 2000). In addition, social capital might be a good alternative instrument in situations where common stress reducing instruments fail or where the necessary information to design and enforce suitable instruments and directives cannot effectively be used.

6 References

Adler, P. S. and Kwon, S. W. (2002) Social capital: prospects for a new concept. *Academy of Management Review*,27: 17-40.

Alesina, A. and La Ferrara, E. (2002) Who Trusts others? *Journal of Public Economics*, 85: 207-234.

Bartollas, C. and Hahn, L. D. (1999) Policing in America. Needham Height: Allyn and Bacon.

Baum, C. F. (2006) An introduction to modern econometrics using Stata. College Station: Stata Press.

Berkman, L. and Syme, S. (1979) Social networks, host resistance and mortality: a nine year follow-up study of Alameda County residents. *American Journal of Epidemiology*, 109: 186-204.

Boix, C. and Posner, D. (1998) Social capital: explaining its origins and effects on government performance. *British Journal of Political Science*, 28: 686-695.

Bourne, L. E. and Yaroush, R. A. (2003) Stress and Cognition: A Cognitive Psychological Perspective. National Aeronautics and Space Administration (N.A.S.A.).

Brown, J. M., and Campbell, E. A. (1990) Sources of occupational stress in the police. *Work & Stress*, 4: 305-318.

Brown, G. W. and Harris, T. O. (1978) Social origins of depression. London: Tavistock.

Brown, J., Fielding, J. and Grover, J. (1999) Distinguishing traumatic, vicarious and routine operational stressor exposure and attendant adverse consequences in a sample of police officers. *Work & Stress*, 13(4): 312-325.

Cannon-Bowers, J. A. and Salas, E. (1998) Individual and Team Decision Making Under Stress: Theoretical Underpinnings. In J. A. Cannon-Bowers and E. Salas (Eds.), Making Decisions Under Stress. Washington DC: American Psychological Associations.

Caplan, G. (1974) Support systems and community mental health. New York: Behavioral.

Cohen, S. and Willis, T. A. (1985) Stress, social support and the buffering hypothesis. *Psychological Bulletin*, 98: 310-357.

Coleman, J. S. (1988) Social capital in the creation of human capital. *American Journal of Sociology*, 94: 95-120.

Dasgupta, P. (1999) Economic progress and the idea of social capital, in Dasgupta, P. and Serageldin, I. (Eds.), Social Capital: A Multifaceted Perspective. Washington DC: World Bank.

Derogatis, L. and Savitz, K. (1999) The SCL-90-R, brief symptom inventory and matching clinical rating scales. In M. Maruish (Ed.), The Use of Psychological Testing for Treatment, Planning and Outcomes Assessment. Mahwah: Lawrence Erlbaum Associates Inc.

Dick, P. (2000) The social construction of the meaning of acute stressors: a qualitative study of the personal accounts of police officers using a stress counselling service. *Work & Stress*, 14(3): 226-244.

Fukuyama, F. (2003) Social Capital and Civil Society. In E. Ostrom and T. K. Ahn (Eds.), Foundations of social capital. Cheltenham: Edward Elgar Pub.

Gabriel, P. and Liimatainen, M. R. (2000) Mental Health in the Workplace. Geneva: International Labor Office.

Gächter, M., Savage, D. A. and Torgler, B. (2009) The role of social capital in reducing negative health outcomes among police officers, *mimeo*, Queensland University of Technology.

Gambetta, D. (1988) Trust, Making and Breaking Cooperative Relations. Oxford: Blackwell.

Gershon, R. (1999) Project SHIELDS. Washington DC: National Institute of Justice.

Gershon, R. (2000) Police stress and domestic violence in police families in Baltimore, Maryland, 1997-1999. Ann Arbor: Inter-University Consortium for Political and Social Research.

Gershon, R., Barocas, B., Canton, A. N., Li, X. and Vlahov, D. (2009) Mental, Physical, and Behavioral Outcomes Associated With Perceived Work Stress in Police Officers. *Criminal Justice and Behavior*, 36: 275-289.

Grootaert, C. (2001) Social capital: the missing link? In Dekker, P. and Uslaner, E. (Eds.), Social Capital and Participation in Everyday Life. London: Routledge.

Haarr, R. N. and Morash, M. (1999) Gender, race, and strategies of coping with occupational stress in policing. *Justice Quarterly*, 16: 304-332.

Hardin, R. (1993) The street-level epistemology of trust. *Politics and Society*, 21: 505-531.

Hawkins, H. C. (2001) Police officer burnout: a partial replication of Maslach's burnout inventory. *Police Quarterly*, 4(3): 343-360.

He, N., Zhao, J. and Archibold, C. A. (2002) Gender and police stress: The convergent and divergent impact of work environment, work-family conflict, and stress coping mechanisms of female and male police officers. *Policing: An International Journal of Police Strategies & Management*, 25: 687-708.

He, N., Zhao, J. and Ren, L. (2005) Do race and gender matter in police stress? A preliminary assessment of the interactive effects. *Journal of Criminal Justice*, 33: 535-547.

Hodson, R. (2005) Management Behavior as Social Capital: A Systematic Analysis of Organizational Ethnographies. *British Journal of Industrial Relations*, 43(1): 41-65.

Howard, G. W., Howard, H. D. and Boles, J. S. (2004) Inter-domain work-family, family-work conflict and police work satisfaction. *Policing: An International Journal of Police Strategies & Management*, 27: 380-395.

Kawachi, I., Colditz, G. A. and Ascherio, A. (1996) A prospective study of social networks in relation to total mortality and cardiovascular disease incidence in men. *Journal of Epidemiology and Community Health*, 50: 245-251.

Knack, S. and P. Keefer (1997) Does Social Capital Have an Economic Payoff? A Cross-Country Investigation. *Quarterly Journal of Economics* 4: 1251-1288.

Kopel, H. and Friedman, M. (1999) Effects of exposure to violence in South African police. In J. Violanti and D. Paton (Eds.), Police trauma: Psychological aftermath of civilian combat. Springfield: Charles C. Thomas.

Kroes, W. H. (1985) Society's victim, the police: An analysis of job stress in policing (2nd ed.). Springfield: Charles C. Thomas.

Kurtz, D. L. (2008) Controlled Burn: The Gendering of Stress and Burnout in Modern Policing. *Feminist Criminology*, 3(3): 216-238.

La Porta, R., Lopez-de-Silanes F., Shleifer, A. and Vishny, R. (1999) The Quality of Government. *Journal of Law, Economics, and Organization*, 15: 222-279.

Leana, C. R. and Van Buren, H. J. (1999) Organizational social capital and employment practices. *Academy of Management Review*, 24: 538-555.

Likert, R. (1932) A technique for the measurement of attitudes. *Archives of Psychology*, 140: 1-55.

McCarty, W. P., Zhao, J. S. and Garland, B. E. (2007) Occupational stress and burnout between male and female police officers: Are there any gender differences? *Policing: An International Journal of Police Strategies & Management*, 30(4): 672-691.

Mitchell, J. and Bray, G. (1990) Emergency services stress: Guidelines for reserving the health and careers of emergency service personnel. Englewood Cliffs: Prentice-Hall.

Morash, M., Haarr, R. and Kwak, D. H. (2006) Multilevel influences on police stress. *Journal of Contemporary Criminal Justice*, 22(1): 26-43.

Morash, M. and Haarr, R. N. (1995) Gender, workplace problems, and stress in policing. *Justice Quarterly*, 12(1): 113-140.

Morris, A., Shinn, M. and DuMont, K. (1999) Contextual factors affecting the organizational commitment of diverse police officers: levels of analysis perspective. *American Journal of Community Psychology*, 27: 75-105.

O'Driscoll, M.P. Dewe, P. (2001) Mediators and moderators of stressor-strain linkages, In P. L. Perrewe and D.C. Ganster (Eds.). Research in occupational stress and wellbeing: Exploring theoretical mechanisms and perspectives. New York: Elsevier.

Paldam, M. (2000) Social Capital: One or Many? Definition and Measurement, *Journal of Economic Surveys*, 14: 629-653.

Peak, K. (1993) Policing America: Methods, issues, challenges. Englewood Cliffs: Prentice Hall.

Portes, A. (1998) Social Capital: Its Origins and Applications in Contemporary Sociology. *Annual Review of Sociology*, 24: 1-24.

Prince, M., Harwood, R. H., Blizard, R. A., Thomas, A. and Mann, A. H. (1997) Impairment, disability and handicap as risk factors for depression in old age: The Gospel Oak Project V. *Psychological Medicine*, 27: 311-321.

Putnam, R. (1993) Making democracy work: civic traditions in modern Italy. Princeton: Princeton University Press.

Repetti, R. L. (1993) The Effects of Workload and the Social Environment at Work on Health. In: L. Goldberger and S. Breznitz (Eds.). Handbook of Stress: Theoretical and Clinical Aspects.

Schaltegger, C. A. and Torgler, B. (2007) Government accountability and fiscal discipline: A panel analysis using Swiss data. *Journal of Public Economics*, 91: 117-140.

Schaufeli, W. B. and Enzmann, D. (1998) The Burnout Companion to Study and Practice: A Critical Analysis. London: Taylor & Francis.

Schwartz, J. and Schwartz, C. (1981) The personal problems for the police officer: A plea for action. In L. Territo and H. Vetter (Eds.), Stress and police personnel. Boston: Allyn and Bacon.

Stephens, C., Long, N. and Miller, I. (1997) The impact of trauma and social support on post traumatic stress disorder in New Zealand police officers. *Journal of Criminal Justice*, 25: 303-314.

Stock, J. H. and Yogo, M. (2005) Testing for weak instruments in linear iv regression. In D. W. K. Andrews and J. H. Stock (Eds.), Identification and Inference for Econometric Models: Essays in Honour of Thomas Rothenberg. Cambridge: Cambridge University Press.

Stotland, E. (1991) The effects of police work and professional relationships on health. *Journal of Criminal Justice*, 19: 371-379.

Stratton, J. G. (1984) Police passages. Manhattan Beach: Glennon.

Swatt, M. L., Gibson, C. L. and Piquero, N. L. (2007) Exploring the utility of general strain theory in explaining problematic alcohol consumption by police officers. *Journal of Criminal Justice*, 35: 596-611.

Torgler, B. (2003) Why Do People Go to War? *Defense and Peace Economics*, 14: 261-280.

Torgler, B. (2007) Tax Compliance and Tax Morale: A Theoretical and Empirical Analysis. Cheltenham, UK: Edward Elgar.

Uslaner, E. M. (2002) The Moral Foundation of Trust. Cambridge: Cambridge University Press.

Violanti, J. M., Marshall, J. R. and Howe, B. (1983) Police occupational demands, psychological distress and the coping function of alcohol. *Journal of Occupational Medicine*, 25: 455-458.

Whitley, R. and McKenzie, K. (2005) Social Capital and Psychiatry: Review of the Literature. *Harvard Review of Psychiatry*, 13(2): 71-84.

Woolcock, M. and Narayan, D. (2000) Social Capital: Implications for Development Theory, research and Policy. *The World Bank Research Observer*, 15(2): 225-249.

7 Appendix

Table 1: Descriptive Statistics

Freq. of impact from incident	**Not at all**	**A Little**	**Very Much**	**N/A**	**Total**
	(1)	(2)	(3)	(0)	
Making a Violent Arrest	220	554	210	105	1089
Shooting Someone	98	92	90	813	1093
Subject of IID Investigation	86	258	370	378	1092
Respond to Chemical Spill	267	197	49	581	1094
Respond to Bloody Crime Scene	378	445	170	100	1093
Personally Know Victim	121	323	180	469	1093
Involved in Hostage Situation 249 311	86	447	1093		
Attending Police Funeral	41	262	602	186	1091
Experience Needle Stick Injury	76	198	325	494	1093

Table 2: Descriptive Statistics

Variable		**count**	**percent**	**n**	**mean**	σ^2	**min**	**max**
Gender	Male	943	85.73%	1,100				
	Female	157	14.27%					
Ethnic Group	African-American	355	32.51%	1,092				
	Caucasian	696	63.74%					
	Hispanic	14	1.28%					
	Other	27	2.47%					
Current Rank	Officer Trainee	91	8.27%	1,100				
	Officer	601	54.64%					
	Agent	62	5.64%					
	Detective	144	13.09%					
	Sergeant	143	13.00%					
	Lieutenant or above	59	5.36%					
Marital status	Married	658	59.87%	1,099				
	Live-in partner	88	8.01%					
	Divorced/Separated	135	12.28%					
	Single	213	19.38%					
	Widowed	5	0.45%					
Age				1,081	36.04	9.09	20	66
Experience				1,078	11.52	9.28	0	44
Children				1,090	1.18	1.16	0	7
Strain1				1,064	10.57	3.02	7	28
Strain2				1,086	6.61	1.84	5	20
Strain3				1,060	17.18	4.36	12	48
Somatisation				1,087	7.05	2.01	5	20
Anxiety				1,074	6.82	1.81	5	20
Depression				1,067	7.24	2.18	5	20
Burnout				1,092	7.91	2.56	3	15
Health				1,104	1.18	1.35	0	9
Social Capital				1,075	7.19	1.60	2	10
Home Index				1,078	6.60	1.41	2	9
Trauma Index				1,077	11.98	5.79	0	27

Table 3: Dependent Variables: Cross-correlation table

Variables	strain1	strain2	strain3	som	anx	dep	burn	health
strain1	1.000							
strain2	0.587	1.000						
strain3	0.940	0.828	1.000					
som	0.614	0.933	0.818	1.000				
anx	0.857	0.610	0.852	0.633	1.000			
dep	0.924	0.561	0.878	0.582	0.743	1.000		
burn	0.586	0.371	0.566	0.390	0.482	0.571	1.000	
health	0.440	0.529	0.527	0.552	0.442	0.419	0.340	1.000

Table 4: Baseline Model

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
Dep. Var.	strain1	strain2	strain3	som	anx	dep	burn	health
social capital	-0.519***	-0.246***	-0.782***	-0.252***	-0.256***	-0.369***	-0.460***	-0.120***
	(-7.390)	(-5.588)	(-7.612)	(-5.379)	(-5.812)	(-6.991)	(-8.909)	(-4.041)
	-0.275	-0.214	-0.287	-0.201	-0.227	-0.271	-0.287	-0.142
child	0.046	0.044	0.075	0.036	0.007	0.039	-0.005	-0.023
	(0.565)	(0.873)	(0.634)	(0.657)	(0.132)	(0.644)	(-0.066)	(-0.646)
	0.018	0.028	0.020	0.021	0.004	0.021	-0.002	-0.020
rank	-0.053	-0.024	-0.083	-0.012	0.017	-0.075	-0.184***	0.034
	(-0.642)	(-0.472)	(-0.682)	(-0.221)	(0.333)	(-1.246)	(-2.728)	(0.906)
	-0.024	-0.019	-0.027	-0.009	0.013	-0.049	-0.102	0.036
exp	0.077***	0.049***	0.127***	0.052***	0.038***	0.063***	0.060***	0.040***
	(3.881)	(3.720)	(4.286)	(3.598)	(3.091)	(4.405)	(3.076)	(4.525)
	0.238	0.250	0.271	0.243	0.194	0.267	0.216	0.276
age	-0.066***	-0.028**	-0.093***	-0.040***	-0.037***	-0.045***	-0.049***	-0.007
	(-3.569)	(-2.252)	(-3.424)	(-2.877)	(-3.211)	(-3.471)	(-2.748)	(-0.830)
	-0.197	-0.140	-0.195	-0.181	-0.188	-0.189	-0.175	-0.046
female	0.228	0.759***	0.954**	0.984***	0.141	0.112	-0.182	0.507***
	(0.788)	(3.806)	(2.208)	(4.721)	(0.792)	(0.536)	(-0.820)	(3.955)
	0.026	0.142	0.075	0.169	0.027	0.018	-0.025	0.130
caucasian	0.773***	0.122	0.919***	0.238*	0.333**	0.304**	0.008	0.037
	(3.777)	(0.946)	(3.041)	(1.697)	(2.554)	(2.070)	(0.048)	(0.418)
	0.123	0.032	0.101	0.057	0.088	0.067	0.001	0.013
marital status	-0.059	0.040	-0.021	-0.007	-0.094	-0.093	0.055	-0.061
	(-0.272)	(0.301)	(-0.067)	(-0.044)	(-0.710)	(-0.587)	(0.299)	(-0.632)
	-0.009	0.010	-0.002	-0.002	-0.024	-0.020	0.010	-0.021
constant	15.406***	8.660***	24.199***	9.425***	9.345***	10.852***	12.841***	1.714***
	(20.203)	(18.414)	(22.389)	(18.530)	(20.435)	(18.917)	(19.405)	(5.351)
R^2	0.112	0.097	0.127	0.093	0.075	0.105	0.097	0.113
F	13.681***	12.831***	16.313***	11.496***	9.261***	12.237***	12.619***	14.416***
N	991	1009	987	1010	998	993	1019	1024

Notes: t-statistics in parentheses. *, **, *** denote 10%, 5% and 1% significance levels. Regressions with robust standard errors, beta coefficients are reported below t-statistics.

Table 5: Extension - including an „index for trauma“ and „stability at home“

	Model 9	**Model 10**	**Model 11**	**Model 12**	**Model 13**	**Model 14**	**Model 15**	**Model 16**
Dep. Var.	strain1	strain2	strain3	som	anx	dep	burn	health
social capital	-0.441***	-0.212***	-0.667***	-0.220***	-0.205***	-0.315***	-0.392***	-0.093***
	(-6.516)	(-4.956)	(-6.858)	(-4.768)	(-4.950)	(-6.099)	(-7.566)	(-3.208)
	-0.232	-0.184	-0.244	-0.175	-0.181	-0.231	-0.245	-0.110
child	-0.025	0.014	-0.027	-0.002	-0.025	-0.006	-0.069	-0.051
	(-0.321)	(0.278)	(-0.246)	(-0.028)	(-0.504)	(-0.105)	(-1.003)	(-1.463)
	-0.010	0.009	-0.007	-0.001	-0.016	-0.003	-0.031	-0.044
rank	-0.144*	-0.067	-0.215*	-0.067	-0.043	-0.132**	-0.271***	-0.009
	(-1.844)	(-1.292)	(-1.850)	(-1.217)	(-0.854)	(-2.273)	(-4.164)	(-0.224)
	-0.067	-0.052	-0.070	-0.047	-0.034	-0.086	-0.150	-0.009
exp	0.026	0.024*	0.051*	0.023	0.009	0.031**	0.015	0.020**
	(1.373)	(1.925)	(1.870)	(1.634)	(0.767)	(2.258)	(0.818)	(2.237)
	0.080	0.124	0.109	0.106	0.045	0.130	0.055	0.139
age	-0.052***	-0.022*	-0.074***	-0.033**	-0.029***	-0.037***	-0.037**	-0.001
	(-2.941)	(-1.865)	(-2.885)	(-2.492)	(-2.667)	(-3.013)	(-2.226)	(-0.131)
	-0.157	-0.111	-0.155	-0.147	-0.147	-0.155	-0.132	-0.007
female	0.414	0.864***	1.230***	1.090***	0.251	0.242	-0.016	0.579***
	(1.554)	(4.455)	(3.090)	(5.425)	(1.534)	(1.241)	(-0.082)	(4.693)
	0.047	0.161	0.096	0.187	0.048	0.038	-0.002	0.148
caucasian	0.699***	0.092	0.803***	0.204	0.288**	0.250*	-0.080	-0.012
	(3.553)	(0.726)	(2.764)	(1.476)	(2.308)	(1.755)	(-0.521)	(-0.142)
	0.111	0.024	0.088	0.049	0.076	0.055	-0.015	-0.004
marital status	0.043	0.072	0.115	0.011	-0.033	-0.014	0.134	-0.042
	(0.203)	(0.532)	(0.366)	(0.071)	(-0.254)	(-0.091)	(0.760)	(-0.433)
	0.007	0.018	0.012	0.002	-0.009	-0.003	0.024	-0.015
home	-0.437***	-0.214***	-0.657***	-0.203***	-0.275***	-0.308***	-0.383***	-0.125***
	(-5.604)	(-4.545)	(-5.813)	(-4.143)	(-5.557)	(-5.374)	(-7.150)	(-3.880)
	-0.205	-0.165	-0.213	-0.143	-0.215	-0.199	-0.212	-0.131
trauma	0.157***	0.077***	0.233***	0.094***	0.090***	0.099***	0.136***	0.066***
	(8.607)	(6.823)	(8.938)	(7.723)	(7.788)	(7.663)	(8.923)	(8.150)
	0.295	0.239	0.305	0.266	0.283	0.257	0.302	0.276
constant	16.241***	9.117***	25.506***	9.679***	9.922***	11.572***	13.614***	1.747***
	(18.052)	(15.943)	(19.393)	(16.277)	(17.875)	(17.157)	(19.370)	(4.538)
R^2	0.220	0.169	0.243	0.169	0.180	0.194	0.212	0.188
F	22.749***	17.872***	26.485***	18.265***	16.925***	19.541***	24.187***	26.186***
N	972	990	969	991	979	974	995	997

Notes: t-statistics in parentheses. *, **, *** denote 10%, 5% and 1% significance levels. Regressions with robust standard errors, beta coefficients are reported below t-statistics.

Table 6: Robustness Test: Splitting up to single factors of social capital

	Model 17	**Model 18**	**Model 19**	**Model 20**	**Model 21**	**Model 22**	**Model 23**	**Model 24**
Dep. Var.	strain1	strain2	strain3	som	anx	dep	burn	health
cooperation	0.475***	0.190***	0.673***	0.228***	0.254***	0.313***	0.325***	0.067
	(5.054)	(3.111)	(4.907)	(3.446)	(4.472)	(4.286)	(3.975)	(1.581)
	0.163	0.107	0.160	0.118	0.146	0.148	0.132	0.052
trust	0.399***	0.240***	0.660***	0.210**	0.145**	0.319***	0.475***	0.124**
	(3.345)	(3.170)	(3.851)	(2.560)	(1.963)	(3.645)	(4.986)	(2.469)
	0.119	0.118	0.136	0.094	0.073	0.132	0.167	0.083
Other control factors	yes	yes	yes	yes	yes	yes	yes	yes
R^2	0.220	0.169	0.243	0.169	0.181	0.194	0.213	0.188
F	20.891***	16.237***	24.140***	16.711***	15.774***	17.852***	22.175***	23.826***
N	972	990	969	991	979	974	995	997

Notes: t-statistics in parentheses. *, **, *** denote 10%, 5% and 1% significance levels. Regressions with robust standard errors, beta coefficients are reported below t-statistics.

Table 7: 2SLS Regression Results

	Model 25	**Model 26**	**Model 27**	**Model 28**	**Model 29**	**Model 30**	**Model 31**	**Model 32**
Dep. Var.	strain1	strain2	strain3	som	anx	dep	burn	health
social capital	-1.305***	-0.439***	-1.744***	-0.500***	-0.640***	-0.947***	-1.581***	-0.309***
	(-6.279)	(-3.654)	(-6.022)	(-3.782)	(-5.157)	(-6.077)	(-7.794)	(-3.519)
child	-0.061	0.007	-0.075	-0.008	-0.044	-0.024	-0.110	-0.059
	(-0.677)	(0.129)	(-0.597)	(-0.140)	(-0.828)	(-0.367)	(-1.276)	(-1.577)
rank	-0.152*	-0.079*	-0.241**	-0.078	-0.048	-0.134**	-0.266***	0.004
	(-1.797)	(-1.648)	(-2.056)	(-1.477)	(-0.966)	(-2.161)	(-3.288)	(0.105)
exp	0.001	0.020	0.024	0.017	-0.005	0.012	-0.015	0.010
	(0.021)	(1.363)	(0.647)	(1.017)	(-0.340)	(0.613)	(-0.576)	(0.865)
age	-0.049**	-0.024*	-0.073**	-0.034**	-0.027**	-0.036**	-0.040*	0.002
	(-2.109)	(-1.830)	(-2.259)	(-2.317)	(-1.982)	(-2.120)	(-1.774)	(0.174)
female	0.153	0.804***	0.929**	1.000***	0.138	0.056	-0.390	0.491***
	(0.506)	(4.685)	(2.200)	(5.298)	(0.774)	(0.252)	(-1.345)	(3.893)
caucasian	0.766***	0.111	0.892***	0.227*	0.318**	0.305*	-0.000	0.008
	(3.576)	(0.912)	(3.001)	(1.696)	(2.516)	(1.950)	(-0.001)	(0.094)
marital status	0.020	0.076	0.099	0.006	-0.045	-0.040	0.057	-0.046
	(0.086)	(0.583)	(0.311)	(0.038)	(-0.335)	(-0.239)	(0.259)	(-0.483)
trauma	0.151***	0.077***	0.227***	0.093***	0.087***	0.093***	0.123***	0.064***
	(7.682)	(6.918)	(8.373)	(7.571)	(7.505)	(6.493)	(6.483)	(7.758)
home	-0.275***	-0.167***	-0.450***	-0.147***	-0.194***	-0.183***	-0.160**	-0.089***
	(-3.481)	(-3.682)	(-4.110)	(-2.936)	(-4.146)	(-3.138)	(-2.104)	(-2.688)
constant	21.731***	10.578***	32.381***	11.485***	12.698***	15.561***	21.380***	3.087***
	(14.092)	(12.013)	(15.095)	(11.853)	(13.867)	(13.584)	(14.209)	(4.776)
N	961.000	979.000	958.000	980.000	968.000	963.000	983.000	985.000
First stage LS	**Dep. Var.**							
Instruments	social capital							
assignments	0.180***							
	(4.51)							
militant	0.270***							
	(5.71)							
multiple marriages	-0.203*							
	(-1.71)							

Notes: t-statistics in parentheses. *, **, *** denote 10%, 5% and 1% significance levels. Regressions with robust standard errors.

Test of excluded instruments:

F(12, 972)=14.95, Partial R^2= 0.09

Underidentification Test:

Anderson stat. Chi-sq(3)=87.64***, Cragg-Donald W Chi-sq(3)=96.20***

Weak identification Test:

Cragg-Donald Wald F-Stat=31.64***

Weak-instrument-robust inference:

Anderson-Rubin Wald test Chi-sq(3)=14.27***, Stock-Wright LM S statistic Chi-sq(3)=14.07***

University of Innsbruck – Working Papers in Economics and Statistics
Recent papers

2010-05 **Martin Gächter, David A. Savage and Benno Torgler:** Retaining the Thin Blue Line: What Shapes Workers' Intentions not to Quit the Current Work Environment

2010-04 **Martin Gächter, David A. Savage and Benno Torgler:** The relationship between Stress, Strain and Social Capital

2010-03 **Paul A. Raschky, Reimund Schwarze, Manijeh Schwindt and Ferdinand Zahn:** Uncertainty of Governmental Relief and the Crowding out of Insurance

2010-02 **Matthias Sutter, Simon Czermak and Francesco Feri:** Strategic sophistication of individuals and teams in experimental normal-form games

2010-01 **Stefan Lang and Nikolaus Umlauf:** Applications of Multilevel Structured Additive Regression Models to Insurance Data

---

2009-29 **Loukas Balafoutas:** How much income redistribution? An explanation based on vote-buying and corruption. *Revised version forthcoming in Public Choice.*

2009-28 **Rudolf Kerschbamer, Matthias Sutter and Uwe Dulleck:** The Impact of Distributional Preferences on (Experimental) Markets for Expert Services

2009-27 **Adrian Beck, Rudolf Kerschbamer, Jianying Qiu and Matthias Sutter:** Car Mechanics in the Lab - Investigating the Behavior of Real Experts on Experimental Markets for Credence Goods

2009-26 **Michael Kirchler, Jürgen Huber and Thomas Stöckl:** Bubble or no Bubble - The Impact of Market Model on the Formation of Price Bubbles in Experimental Asset Markets

2009-25 **Rupert Sausgruber and Jean-Robert Tyran:** Tax Salience, Voting, and Deliberation

2009-24 **Gerald J. Pruckner and Rupert Sausgruber:** Honesty on the Streets - A Natural Field Experiment on Newspaper Purchasing

2009-23 **Gerlinde Fellner, Rupert Sausgruber and Christian Traxler:** Testing Enforcement Strategies in the Field: Legal Threat, Moral Appeal and Social Information

2009-22 **Ralph-C. Bayer, Elke Renner and Rupert Sausgruber:** Confusion and Reinforcement Learning in Experimental Public Goods Games

2009-21 **Sven P. Jost:** Transfer Pricing Risk Awareness of Multinational Corporations - Evidence from a Global Survey

2009-20 **Andrea M. Leiter and Engelbert Theurl:** The Convergence of Health Care Financing Structures: Empirical Evidence from OECD-Countries

2009-19 **Francesco Feri and Miguel A. Meléndez-Jiménez:** Coordination in Evolving Networks with Endogenous Decay

2009-18 **Harald Oberhofer:** Firm growth, European industry dynamics and domestic business cycles

2009-17 **Jesus Crespo Cuaresma and Martin Feldkircher:** Spatial Filtering, Model Uncertainty and the Speed of Income Convergence in Europe

2009-16 **Paul A. Raschky and Manijeh Schwindt:** On the Channel and Type of International Disaster Aid

2009-15 **Jianying Qiu:** Loss aversion and mental accounting: The favorite-longshot bias in parimutuel betting

2009-14 **Siegfried Berninghaus, Werner Güth, M. Vittoria Levati and Jianying Qiu:** Satisficing in sales competition: experimental evidence

2009-13 **Tobias Bruenner, Rene Levinský and Jianying Qiu:** Skewness preferences and asset selection: An experimental study

2009-12 **Jianying Qiu and Prashanth Mahagaonkar:** Testing the Modigliani-Miller theorem directly in the lab: a general equilibrium approach

2009-11 **Jianying Qiu and Eva-Maria Steiger:** Understanding Risk Attitudes in two Dimensions: An Experimental Analysis

2009-10 **Erwann Michel-Kerjan, Paul A. Raschky and Howard C. Kunreuther:** Corporate Demand for Insurance: An Empirical Analysis of the U.S. Market for Catastrophe and Non-Catastrophe Risks

2009-09 **Fredrik Carlsson, Peter Martinsson, Ping Qin and Matthias Sutter:** Household decision making and the influence of spouses' income, education, and communist party membership: A field experiment in rural China

2009-08 **Matthias Sutter, Peter Lindner and Daniela Platsch:** Social norms, third-party observation and third-party reward

2009-07 **Michael Pfaffermayr:** Spatial Convergence of Regions Revisited: A Spatial Maximum Likelihood Systems Approach

2009-06 **Reimund Schwarze and Gert G. Wagner:** Natural Hazards Insurance in Europe – Tailored Responses to Climate Change Needed

2009-05 **Robert Jiro Netzer and Matthias Sutter:** Intercultural trust. An experiment in Austria and Japan

2009-04 **Andrea M. Leiter, Arno Parolini and Hannes Winner:** Environmental Regulation and Investment: Evidence from European Industries

2009-03 **Uwe Dulleck, Rudolf Kerschbamer and Matthias Sutter:** The Economics of Credence Goods: On the Role of Liability, Verifiability, Reputation and Competition. *Revised version forthcoming in American Economic Review.*

2009-02 **Harald Oberhofer and Michael Pfaffermayr:** Fractional Response Models - A Replication Exercise of Papke and Wooldridge (1996)

2009-01 **Loukas Balafoutas:** How do third parties matter? Theory and evidence in a dynamic psychological game.

2008-27 **Matthias Sutter, Ronald Bosman, Martin Kocher and Frans van Winden:** Gender pairing and bargaining – Beware the same sex! *Revised version published in Experimental Economics, Vol. 12 (2009): 318-331.*

2008-26 **Jesus Crespo Cuaresma, Gernot Doppelhofer and Martin Feldkircher:** The Determinants of Economic Growth in European Regions.

2008-25 **Maria Fernanda Rivas and Matthias Sutter:** The dos and don'ts of leadership in sequential public goods experiments.

2008-24 **Jesus Crespo Cuaresma, Harald Oberhofer and Paul Raschky:** Oil and the duration of dictatorships.

2008-23 **Matthias Sutter:** Individual behavior and group membership: Comment. *Revised Version published in American Economic Review, Vol.99 (2009): 2247-2257.*

2008-22 **Francesco Feri, Bernd Irlenbusch and Matthias Sutter:** Efficiency Gains from Team-Based Coordination – Large-Scale Experimental Evidence. *Revised and extended version forthcoming in American Economic Review.*

2008-21 **Francesco Feri, Miguel A. Meléndez-Jiménez, Giovanni Ponti and Fernando Vega Redondo:** Error Cascades in Observational Learning: An Experiment on the Chinos Game.

2008-20 **Matthias Sutter, Jürgen Huber and Michael Kirchler:** Bubbles and information: An experiment.

2008-19 **Michael Kirchler:** Curse of Mediocrity - On the Value of Asymmetric Fundamental Information in Asset Markets.

2008-18 **Jürgen Huber and Michael Kirchler:** Corporate Campaign Contributions as a Predictor for Abnormal Stock Returns after Presidential Elections.

2008-17 **Wolfgang Brunauer, Stefan Lang, Peter Wechselberger and Sven Bienert:** Additive Hedonic Regression Models with Spatial Scaling Factors: An Application for Rents in Vienna.

2008-16 **Harald Oberhofer, Tassilo Philippovich:** Distance Matters! Evidence from Professional Team Sports. *Extended and revised version forthcoming in Journal of Economic Psychology.*

2008-15 **Maria Fernanda Rivas and Matthias Sutter:** Wage dispersion and workers' effort.

2008-14 **Stefan Borsky and Paul A. Raschky:** Estimating the Option Value of Exercising Risk-taking Behavior with the Hedonic Market Approach. *Revised version forthcoming in Kyklos.*

2008-13 **Sergio Currarini and Francesco Feri:** Information Sharing Networks in Oligopoly.

2008-12 **Andrea M. Leiter:** Age effects in monetary valuation of mortality risks - The relevance of individual risk exposure.

2008-11 **Andrea M. Leiter and Gerald J. Pruckner:** Dying in an Avalanche: Current Risks and their Valuation.

2008-10 **Harald Oberhofer and Michael Pfaffermayr:** Firm Growth in Multinational Corporate Groups.

2008-09 **Michael Pfaffermayr, Matthias Stöckl and Hannes Winner:** Capital Structure, Corporate Taxation and Firm Age.

2008-08 **Jesus Crespo Cuaresma and Andreas Breitenfellner:** Crude Oil Prices and the Euro-Dollar Exchange Rate: A Forecasting Exercise.

2008-07 **Matthias Sutter, Stefan Haigner and Martin Kocher:** Choosing the carrot or the stick? – Endogenous institutional choice in social dilemma situations. Revised version forthcoming in *Review of Economic Studies*.

2008-06 **Paul A. Raschky and Manijeh Schwindt:** Aid, Catastrophes and the Samaritan's Dilemma.

2008-05 **Marcela Ibanez, Simon Czermak and Matthias Sutter:** Searching for a better deal – On the influence of group decision making, time pressure and gender in a search experiment. *Revised version published in Journal of Economic Psychology, Vol. 30 (2009): 1-10.*

2008-04 **Martin G. Kocher, Ganna Pogrebna and Matthias Sutter:** The Determinants of Managerial Decisions Under Risk.

2008-03 **Jesus Crespo Cuaresma and Tomas Slacik:** On the determinants of currency crises: The role of model uncertainty. *Revised version accepted for publication in Journal of Macroeconomics.*

2008-02 **Francesco Feri:** Information, Social Mobility and the Demand for Redistribution.

2008-01 **Gerlinde Fellner and Matthias Sutter:** Causes, consequences, and cures of myopic loss aversion - An experimental investigation. *Revised version published in The Economic Journal, Vol. 119 (2009), 900-916.*

2007-31 **Andreas Exenberger and Simon Hartmann:** The Dark Side of Globalization. The Vicious Cycle of Exploitation from World Market Integration: Lesson from the Congo.

2007-30 **Andrea M. Leiter and Gerald J. Pruckner:** Proportionality of willingness to pay to small changes in risk - The impact of attitudinal factors in scope tests. *Revised version forthcoming in Environmental and Resource Economics.*

2007-29 **Paul Raschky and Hannelore Weck-Hannemann:** Who is going to save us now? Bureaucrats, Politicians and Risky Tasks.

2007-28 **Harald Oberhofer and Michael Pfaffermayr:** FDI versus Exports. Substitutes or Complements? A Three Nation Model and Empirical Evidence.

2007-27 **Peter Wechselberger, Stefan Lang and Winfried J. Steiner:** Additive models with random scaling factors: applications to modeling price response functions.

2007-26 **Matthias Sutter:** Deception through telling the truth?! Experimental evidence from individuals and teams*. Revised version published in The Economic Journal, Vol. 119 (2009), 47-60.*

2007-25 **Andrea M. Leiter, Harald Oberhofer and Paul A. Raschky:** Productive disasters? Evidence from European firm level data. *Revised version forthcoming in Environmental and Resource Economics.*

2007-24 **Jesus Crespo Cuaresma:** Forecasting euro exchange rates: How much does model averaging help?

2007-23 **Matthias Sutter, Martin Kocher and Sabine Strauß:** Individuals and teams in UMTS-license auctions. *Revised version with new title "Individuals and teams in auctions" published in Oxford Economic Papers, Vol. 61 (2009): 380-394).*

2007-22 **Jesus Crespo Cuaresma, Adusei Jumah and Sohbet Karbuz:** Modelling and Forecasting Oil Prices: The Role of Asymmetric Cycles. *Revised version accepted for publication in The Energy Journal.*

2007-21 **Uwe Dulleck and Rudolf Kerschbamer:** Experts vs. discounters: Consumer free riding and experts withholding advice in markets for credence goods. *Revised version published in International Journal of Industrial Organization, Vol. 27, Issue 1 (2009): 15-23.*

2007-20 **Christiane Schwieren and Matthias Sutter:** Trust in cooperation or ability? An experimental study on gender differences. *Revised version published in Economics Letters, Vol. 99 (2008): 494-497.*

2007-19 **Matthias Sutter and Christina Strassmair:** Communication, cooperation and collusion in team tournaments – An experimental study. *Revised version published in: Games and Economic Behavior, Vol.66 (2009), 506-525.*

2007-18 **Michael Hanke, Jürgen Huber, Michael Kirchler and Matthias Sutter:** The economic consequences of a Tobin-tax – An experimental analysis. *Revised version forthcoming in Journal of Economic Behavior and Organization.*

2007-17 **Michael Pfaffermayr:** Conditional beta- and sigma-convergence in space: A maximum likelihood approach. *Revised version forthcoming in Regional Science and Urban Economics.*

2007-16 **Anita Gantner:** Bargaining, search, and outside options. *Published in: Games and Economic Behavior, Vol. 62 (2008), pp. 417-435.*

2007-15 **Sergio Currarini and Francesco Feri:** Bilateral information sharing in oligopoly.

2007-14 **Francesco Feri:** Network formation with endogenous decay.

2007-13 **James B. Davies, Martin Kocher and Matthias Sutter:** Economics research in Canada: A long-run assessment of journal publications. *Revised version published in: Canadian Journal of Economics, Vol. 41 (2008), 22-45.*

2007-12 **Wolfgang Luhan, Martin Kocher and Matthias Sutter:** Group polarization in the team dictator game reconsidered. *Revised version published in: Experimental Economics, Vol. 12 (2009), 26-41.*

2007-11 **Onno Hoffmeister and Reimund Schwarze:** The winding road to industrial safety. Evidence on the effects of environmental liability on accident prevention in Germany.

2007-10 **Jesus Crespo Cuaresma and Tomas Slacik:** An “almost-too-late” warning mechanism for currency crises. *(Revised version accepted for publication in Economics of Transition)*

2007-09 **Jesus Crespo Cuaresma, Neil Foster and Johann Scharler:** Barriers to technology adoption, international R&D spillovers and growth.

2007-08 **Andreas Brezger and Stefan Lang:** Simultaneous probability statements for Bayesian P-splines.

2007-07 **Georg Meran and Reimund Schwarze:** Can minimum prices assure the quality of professional services? (*Accepted for publication in European Journal of Law and Economics*)

2007-06 **Michal Brzoza-Brzezina and Jesus Crespo Cuaresma:** Mr. Wicksell and the global economy: What drives real interest rates?.

2007-05 **Paul Raschky:** Estimating the effects of risk transfer mechanisms against floods in Europe and U.S.A.: A dynamic panel approach.

2007-04 **Paul Raschky and Hannelore Weck-Hannemann:** Charity hazard - A real hazard to natural disaster insurance. *Revised version forthcoming in: Environmental Hazards.*

2007-03 **Paul Raschky:** The overprotective parent - Bureaucratic agencies and natural hazard management.

2007-02 **Martin Kocher, Todd Cherry, Stephan Kroll, Robert J. Netzer and Matthias Sutter:** Conditional cooperation on three continents. *Revised version published in: Economics Letters, Vol. 101 (2008): 175-178.*

2007-01 **Martin Kocher, Matthias Sutter and Florian Wakolbinger:** The impact of naïve advice and observational learning in beauty-contest games.

University of Innsbruck

Working Papers in Economics and Statistics

2010-04

Martin Gächter, David A. Savage and Benno Torgler

The relationship between Stress, Strain and Social Capital

Abstract

This paper analyzes the effectiveness of social capital in reducing the negative externalities associated with stress, as well as the physical and psychological strain indicators among police officers. Despite the fact that there is a large multidisciplinary literature on stress or on social capital, the link between both factors is still underexplored. In this empirical paper we therefore aim at reducing such a shortcoming. We focus on a strategically important work environment, namely law enforcement agents, that is not only characterized as physically and emotionally demanding, but also as an essential part for a well-functioning society due to the fact that inefficiencies in the police force can induce large negative externalities. Using a multivariate regression analysis focusing on eight different proxies for stress and strain, and two proxies for social capital and conducting several robustness checks, we find strong evidence that an increased level of social capital is correlated with a lower level of strain. From a policy perspective, our findings suggest that stress reduction programs should actively engage employees to build stronger social networks.

ISSN 1993-4378 (Print)
ISSN 1993-6885 (Online)