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The Role of Social Capital in Reducing Negative Health Outcomes among Police Officers

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Abstract:

This paper investigates the role of social capital on the reduction of short and long run negative health effects associated with stress, as well as indicators of burnout among police officers. Despite the large volume of research on either social capital or the health effects of stress, the interaction of these factors remains an underexplored topic. In this empirical analysis we aim to reduce such a shortcoming focusing on a highly stressful and emotionally draining work environment, namely law enforcement agents who perform as an essential part of maintaining modern society. Using a multivariate regression analysis focusing on three different proxies of health and three proxies for social capital conducting also several robustness checks, we find strong evidence that increased levels of social capital is highly correlated with better health outcomes. Additionally we observe that while social capital at work is very important, social capital in the home environment and work-life balance are even more important. From a policy perspective, our findings suggest that work and stress programs should actively encourage employees to build stronger social networks as well as incorporate better working/home life arrangements.

Keywords: Health and social capital; negative health outcomes; fairness; trust; cooperation

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I. INTRODUCTION

Modern society is at times viewed as being a fast paced, hectic and somewhat chaotic living environment, never before in human history has the general population had access to so much information or interaction been so complex. This may generate positive effects, but also observe negative externalities such as an increase in stress. The negative health effects generated by the high levels of stress come at considerable economic cost, not only to the individual but also to society in general. These costs include not only the administering of support for sufferers of mental and physical ailments, but can also be measured in lost working hours and lowered productivity. International Labor Organization (ILO) reports estimate that in the US one in ten workers are diagnosed with depression, resulting in approximately 200 million lost working days each year and costing between US$30-$44 billion (Gabriel & Liimatainen, 2000). Because of this, research into the health effects created by stress has generated interest across a diverse range of fields including: economics, social psychology, sociology, management, and in particular also health and medicine. Identifying methods to mitigate or eliminate negative health effects are paramount in many of these studies as is finding causality and determinants.

Policing work is generally recognised as being one of the most stressful and exceedingly difficult careers (Robertson & Cooper, 2004). Officers are recognised to suffer from very high levels of stress through performing work that is both physically and emotionally draining (Dick, 2000; Gershon et al., 2009; He et al., 2005; Kopel & Friedman, 1999; Morash & Haarr, 1995; Schwartz & Schwartz, 1981). Numerous research studies have demonstrated that the high levels of stress in these professions can lead to detrimental health consequences. These consequences can include mental and physical illnesses; aggressive and violent behavior; alcohol abuse and decreased work performance (McCarty et al., 2007; Morash & Haarr, 1995; Swatt et al., 2007). Although the literature on stress has been well explored and a large set of stress factors have been determined, the examination how social capital affects stress or more specifically health, is still an underdeveloped topic. Identifying health improvements in law enforcement officers could have huge flow on societal benefits for all other industries. Social capital may provide an effective panacea when traditional stress reducing instruments fail. 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" (Coleman, 1988).

Thus, in this paper we will investigate the effect that social capital has on reducing the short and long run effects on health, as well as the incidences of officer burnout, utilizing a survey of over 1100 officers from Baltimore in Maryland, USA (Gershon, 1999, 2000; Gershon et al., 2009). The survey covers many job related factors (both positive and negative), as well as personal, organisational and social questions. From a theoretical and empirical perspective it helps to work with data where individuals have a similar job profile, where therefore 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, in other words, 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).

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.

II. THEORETICAL DEVELOPMENT

The central question is how or why does stress appear to have such a large negative effect on an individual's general health? Stress has been defined in many ways across the many fields that have an interest in it but a general definition of stress covers conditions of a physical, biological or psychological nature that strain an organism beyond its power to adapt (Cannon, 1929a, 1929b, 1935; Lovallo, 2005; Selye, 1936). Stress can be explained as a physical process with an almost mechanical or automatic response from the human body. For example, when an individual's core temperature rises, the body evokes a sweating response to shed the excess heat. Similarly, Cannon suggested an automatic response for psychosocial threats (Cannon, 1929a, 1929b, 1935). The General Adaption Syndrome (Selye, 1936) expands on this concept such that

the human body has an innate drive to maintain a biological steady state equilibrium known as homeostasis. Stress, infections and excessive work demands disrupt this equilibrium and trigger the natural response from the body. Over a period of time the body attempts to overcome the disequilibrium and return to homeostasis, this re-equilibrium attempt consumes energy. Over an extended period this can deplete the body's energy reserves and causes exhaustion and in extreme cases, death. Therefore, it is the inability to adapt or extended durations of stress that creates the ill health effect and the larger the stress affect the greater the probability of harmful health consequences. Thus, we observe the true cost of modern society, by living in a fast paced, hectic and chaotic living environment is making it harder for humans to keep up and adapt which in turn creates more and more health problems.

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 & Yaroush, 2003; Cannon-Bowers & Salas, 1998) have been identified. The coping mechanisms utilized by police officers to alleviate stress, similar to other workplaces, can include: social and spiritual support systems, alcohol and substance abuse, and violence (Gershon et al., 2009; Haarr & Morash, 1999; Swatt et al., 2007). Like many other workplaces, police officers are exposed to an array of stresses, which can be 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). These stressors can be categorized by the frequency by which they occur as well, as the intensity of their impact (Brown et al., 1999). Major incidents such as shootings, victim attachment, or gruesome crime scene attendance, are low-frequency events, but can have a very high stress impact. This type of stress impact has shown to be triggers for mental disorders like Post Traumatic Stress Disorder (PTSD) (Stephens et al., 1997). The more frequent but low-impact events are 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 problems associated with police stress include: hypertension, stroke, ulcers, high blood pressure, or sexual dysfunction (Bartollas & Hahn, 1999; Berkman & Syme, 1979; Kroes, 1985; Mitchell & Bray,

1990; Peak, 1993; Stratton, 1984; Violanti et al., 1983). The psychological problems associated with police stress can include: depression, PTSD, burnout, suicide and alcoholism (Kawachi, 1996; Kopel & Friedman, 1999; Schaufeli & Enzmann, 1998; Schwartz & Schwartz, 1981; Stephens et al., 1997).

In this paper we propose that a better stock of social capital can not only reduce stress effects at an individual level but through the reduction in stress have a significant impact on health outcomes. Game theory and experimental findings have emphasized or shown that a high level of social capital enables co-operation between actors and facilitates superior social outcomes (Boix & Posner, 1998). It has also been suggested that low levels of social capital are indicators for a predisposition for depression (Caplan, 1974; Thompson et al., 2005). 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 & Willis, 1985; Prince et al., 1997; Whitley & McKenzie, 2005). How then do we interpret social capital into an empirical context? We include the three major views of social capital, as discussed by Grootaert (2001). Firstly, the view that social capital is a social network facilitating coordination and cooperation (Putnam, 1983). Secondly, social capital as "a variety of different entities" that consists of social structure aspects, that also facilitate certain actions (Coleman, 1988). This aspect can be used to account for both horizontal and vertical social relationships, such as co-workers vs. other officers of higher/lower rank. Finally, that it 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 & Narayan, 2000). Putnam's (1983) 5 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. Paldam (2000, p. 630), describes three families of social capital concepts: trust (cognitive social capital), cooperation (collective action) and networks. This 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.

How an individual perceives their job is not completely isolated from how an individual perceives life outside of work, or their life-satisfaction. If social capital in the workplace has beneficial effects on health, it stands to reason that higher levels of family support, or home social capital, would also have health benefits. Family life can have an effect in two different ways, firstly through spousal support, where officers are able to utilize the social capital of the family network. And secondly, through work-life balance, where insufficient time spent at home creates stress in both the work and home environment. Excessive hours spent at work reduces the amount of time available for leisure and home duties, thus a balance of home and working life creates higher levels of job satisfaction and lower levels of stress (Anderson et al., 2002; White et al., 2003). This is therefore our reasoning for using the following two proxies. Firstly, "there is not enough time at the beginning or end of the day for my chores at home" as a measure of work-life balance. Secondly, "whether they can rely on support from their families and friends" as a measure of family support. As social capital investments are not solely limited to the workplace, it is important to add the external measure as well as the interaction of work and life.

These notions are essential for our analysis as we are exploring the work environment and its implication on individuals' stress and health level. 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), also partially to be able to handle extreme pressure situations. This has been shown in studies of individual contribution to social capital (Adler & Kwon, 2002; Leana & Van Buren, 1999). There are also some studies that demonstrate that higher levels of social support decreases stress effects for police officers (Morash at al., 2006; Morris et al., 1999). However, previous studies have only utilized a narrow selection of environmental and demographic factors within the analysis. In this paper we examine several aspects of health (short run, long run and burnout) as well as an extended set of control and environmental factors in our multivariate analysis.

III. DATA AND METHODS

For the purpose of this analysis, we use an existing dataset from police officers in Baltimore, Maryland (see Gershon, 1999, 2000 for further details). This study "SHIELDS" (Study to Help Identify, Evaluate and Limit Department Stress) aimed to shed some light on police stress and its possible outcomes, particularly domestic violence in police families. The questionnaire covered questions about stress, its outcomes and coping strategies as well as questions related to fairness, social capital (both at work and at home) and working habits. In this study we specifically focus on the influence of social capital (both at work and at home) on health outcomes. Study participants were recruited from the Baltimore Police department which provides law enforcement services to about 700,000 inhabitants in Maryland. The 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. At that time, the department had 3,016 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 this dataset. Table 1 presents descriptive statistics about the data.

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 our empirical investigation, three different indices were constructed to measure different aspects of (negative) health exposure. Moreover, to better isolate the impact of social capital factors (including cooperation between units, trust to working partners, support from family) we also control for factors such as demographic variables (age, gender, ethnic group, number of children, marital status, education), as well as rank within the department and a proxy for work-life balance. To check the robustness of the results we also conduct a sensitivity analysis by extending a baseline specification first with a fairness index (Table 3) measuring fairness within the department and, finally, extending the model further with a strain index (Table 4) measuring 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. For reasons of simplicity and comparability, we use the same explanatory variables in all three specifications.

In order to address our main research question, namely the effect of social capital on negative health outcomes among police officers, we constructed three indices as dependent variables. More precisely, to distinguish certain time effects, we created indices representing "short-term health exposure", "long-term health exposure" and "burnout". While the former two measures differ in terms of strength as well as time, the latter index investigates certain effects of social capital variables on levels of burnout. Using three different dependent variables also offers a good robustness test for the relationship between social capital factors and (negative) health outcomes. Regarding the first index (referred to as *short-term health exposure*), participants were asked seven questions if they experienced the following signs of short-term health outcomes in the past 6 months: pains or pounding in the heart and chest, faintness or dizziness, headaches or pressure in the head, nausea, upset stomach or stomach pains, trouble getting breath, a lump in the throat or a lowered resistance to illness because of their work. 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 ranging from 7 to 28 with higher levels indicating a

higher level of short-term (negative) health exposures. The measure showed a satisfactory level of internal consistency (Cronbach's α=0.77). The second index which aimed to consider a longer timeframe, and thus, chronic and long-term health outcomes (referred to *long-term health exposure*) considers questions on migraines, diabetes, chronic low back pain, high blood pressure, liver disease, foot problems, heart disease, reproductive problems and chronic insomnia. Possible answers were yes (1) or no (0), resulting in an index ranging from 0 to 9 (Cronbach's α=0.56) with increasing levels indicating higher levels of (negative) long-term health exposure or outcomes, respectively. Finally, by following the approach of Kurtz (2008, p. 225), our burnout index (referred to as *burnout*) takes 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 ranging from 3 to 15 with a reasonable level of internal consistency (α=0.73). Increasing values of the index indicate higher levels of burnout syndromes. The number of observations slightly differs depending on various variables and indices (see Table 1) due to some missing observations in the data, as some participants did not respond to all questions. However, as the missing observations amount to 36 cases in the worst case (Short-term Health Exposure, not even 4% of the data) and preliminary analyses indicate that excluded cases do not significantly differ from the others on key demographic variables this should not be a major problem in our analysis.

We used a broad range of explanatory and control variables to address our main research question. As we want to explore the relationship between social capital factors and negative health outcomes, we included as mentioned three proxies into our regression analysis. More precisely, the questions asked were whether there is good and effective cooperation between units (referred to as *cooperation*), whether they have trust in work partners (referred to as *trust*), and additionally, taking into account a proxy for social capital at home, whether they can rely on support from their families and friends (referred to as *family support*). Possible answers ranged from strongly agree (1) to strongly disagree (5). For reasons of simplicity we reversed the variables to facilitate a more intuitive interpretation of the results. In all cases, higher levels of the variables indicate higher levels of (one specific aspect of) social capital. Although we could

have created an index measuring an overall value of social capital, we consciously chose another method by including single proxies of social capital into our regressions to be better able to distinguish between certain effects and magnitudes of different variables, particularly different elements and factors of social capital.

Additionally, we added the variable work-life balance to our regressions, namely whether employees are able to find a balanced way where they can manage their challenges both in the job and at home. Our measurement of work-life-balance includes the question "There is not enough time at the beginning or end of the day for my chores at home" with possible answers ranging from "strongly agree" to "strongly disagree". Thus, higher levels of the variable indicate a higher level of work-life balance (ranging from 1 to 5). To control for differences in demographic characteristics, we also included age, experience (number of years working in the department), rank (from (1) officer trainee to (6) lieutenant or above) as well as dummy variables for having children (1 if the employee has at least one child and 0 otherwise), education (1 if the educational level is college or above and 0 otherwise), gender (1 if female and 0 if male), ethnic group (1 if being Caucasian and 0 otherwise) and marital status (1 if being married or having a live-in partner and 0 otherwise). The following section presents our empirical results.

IV.   EMPIRICAL RESULTS

Empirical results of the baseline model are presented in Table 2. In all regressions we use standard errors robust to heteroskedasticity of unknown form. Interestingly, the proxies for social capital, namely cooperation, work and family support all have the expected negative sign on negative health outcomes, both in the short and long run. The coefficients are always significant in all three models indicating that social capital reduces short- and long-term health exposure as well as burnout syndromes considerably. To be able to compare the magnitude of the coefficients, standardized beta coefficients are also reported. That is, standardized beta coefficients convert all the variables into standard deviation, inducing the same metric and thus, allowing to compare across various variables. Remarkably, our proxy for social capital at home, namely family support, exercise the highest influence on health exposure, as the beta coefficients

range from -0.122 to -0.174. Thus, for instance, a one standard deviation increase of family support reduces burnout syndromes by 0.174 standard deviations. This negative relationship holds true both for long- and short-term health exposure as well as burnout. While private social capital is the most important factor, the two other included social capital variables (cooperation and trust) are highly statistically significant, reducing also the negative health outcomes, including cooperation and trust as well. Thus, in our baseline model we find strong evidence that social ties in form of social capital – both at work and at home – significantly improve perceived health outcomes, both in the short- and also long-term. Similarly, these factors are also highly relevant in reducing the risk of burnout among employees. The relative importance is also visible when comparing standardized beta coefficients in the regressions.

Regarding our control variables, some interesting patterns can be observed. First of all, as expected, work-life-balance, namely whether employees are able to find a balanced way where they can manage their challenges both in the job and at home, also has a high impact on negative health outcomes. In other words, having enough time for the family and people at home besides the job significantly improves health outcomes (both in the short and the long run) and also reduces the risk of becoming burnt out. While marital status, ethnic class, and having children do not seem to have any influence on health, a higher level of education and ranking position significantly reduces the risk of burnout. Those results might indicate that promotion has the effect of reducing stress related burnout, but may also be related to self selection bias where only those individuals get promoted who are able to handle a certain level of stress. However, such a positive effect is not visible when focusing on the other two health proxies. Experience, which is measured by the number of years working in the department, appears significantly positive in all three models. On the other hand, age appears negative in the short-term health exposure measure as well as in our burnout estimation, indicating that older people are better able to handle stress in the job without negative influence on their short-term health status or their risk for burnout. However, this effect vanishes in case of the long-term health outcome, maybe because a learning effect that should contribute to promote a good health status is overshadowed by a biological age effect (as the health status is expected to worsen with increasing age). Finally, females report significantly higher levels of negative health outcomes (both short and long-term) while this effect is reversed in the case of a burnout, where female employees are less likely to report

11

burnout symptoms. As expected from previous work in this field of research, females are in general more likely to report minor physical problems as opposed to males who might follow the stereotype of the "tough" man without having health problems (Copenhaver & Eisler, 1996; Levant & Pollack, 1995; Real, 1997;). This fact might lead to the ability to better handle threats of burnout.

(Table 2 about here)

In our first extension, we add a measure of fairness or justice aspects in the department as explanatory variable (referred to as *fairness*). The constructed index includes questions such as being more likely to be criticized for mistakes than peers (same rank), being less likely to get chosen for certain assignments because of race, gender etc, the frequency of gender related jokes in the department, and being considered militant if questioning the way things are done. Possible answers ranged on a 5-pont scale from "strongly agree" to "strongly disagree". Thus, the index ranges from 4 to 20 with higher levels indicating a higher degree of fairness in the department (α=0.65).

In general, controlling for fairness within the department does not change the results considerably, confirming most of the results obtained above. In all models (*Models 4-6*) the coefficient measuring fairness significantly reduces negative health outcomes as well as burnout syndromes. When taking into account standardized beta coefficients, the high influence of fairness on burnout attracts attention (highest among all included variables). Still, family support and work-life-balance turns out to be very important in order to reduce negative health outcomes, as well as trust and cooperation, albeit with slightly lower beta coefficients. Most of the effects concerning rank, age and experience are confirmed in these specifications. However, the negative coefficient for being female in the estimation of burnout disappears when controlling for fairness.

(Table 3 about here)

12

Finally, we included an index measuring strain in our estimations. Following Swatt et al. (2007), strain 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 strain (α=0.79). This variable allows controlling for experiencing extreme situations and their influence on negative health outcomes.

Again, we observe only minor changes in the coefficients of the variables included before. Importantly, social capital has still overall a strong impact on health, although the impact of cooperation is not anymore statistically significant in specification (8) (effect on long-term health). As expected, strain increases negative health outcomes across all specifications. Interestingly, when controlling for strain in the job, also the coefficient for fairness turns out to be non-significant. Thus, while both factors, fairness and cooperation, are highly relevant both in terms of short-term health exposure and burnout, they show no significant relationship in the long-term health exposure. Interestingly, as individuals age they are expected to have more long-term health problems. In the long-run specifications (considering all nine models), age is always (negatively) statistically significant in short-term health exposure and burnout, while it is not significant in the long-run specifications (see *model 2*, *model 5* and *model 8*). Thus, while in the former cases age is able to absorb most of the positive effect of experience on negative health outcomes, this is not the case in the long-term measure of health outcomes as the overall health status tends to deteriorate with increasing age. Remarkably, the significantly negative effect of being female on burnout disappears once we control for strain and fairness. This could indicate

that female police officers might be advantaged in case of getting less straining tasks to do or in perceiving different levels of fairness within the department. The following final section draws some conclusions about our results and raises questions for future research.

(Table 4 about here)

V. CONCLUSIONS

The aim of this study was to investigate the role of social capital on the reduction of the short and long run negative health effects associated with stress, through the examination of the high stress working environment of police officers. Many of the stresses and health outcomes observed within this environment are common to other workplaces (e.g., shift work, excessive overtime, heavy workload, poor working conditions and strong interaction with the public). However, some stresses and health outcomes are restricted to work places operating under similar work environments and conditions (e.g. military, nurses, emergency response personnel etc). Police officers and others in these high stress work environments can encounter traumatic events like physical or life threatening danger and are exposed to more disturbing events in general. This paper explored whether higher levels of social capital reduce negative health outcomes using data on officers of the Baltimore Police Department in Maryland (USA). Despite the fact that there is a large multidisciplinary literature on health outcomes or on social capital, the link between both factors is still underexplored. Our results provide strong empirical support that social capital helps to reduce negative health outcomes using three different proxies for health and social capital and conducting also several robustness checks. Unlike previous investigations using police data we have included not only demographic and stress variables, but many other mitigation factors to measure the environmental situation at work and at home. Utilizing factors such as effective cooperation between units, trust in the work partner, a work-life-balance, family support, and interactional fairness.

Social capital has therefore shown to be extremely effective in reducing negative health outcomes. To reduce negative health outcomes in high stress work environments more effective stress management programs need to be implemented. Our finding would indicate that police management and police officers themselves would be greatly benefited through the

implementation of social programs that enhance social capital or in our case that it is possible to obtain better health outcomes through manipulation of work hours vs. leisure time. In the majority of current workplaces the main stress reduction program utilized are counseling services, utilized in the hope to stem the tide of stress/health related retirements and burnouts. This hope has been labelled occasionally as too simplistic given the very complex relationships between stress incidents, individual demographic variables and organisational structure (Dick, 2000). Our results indicate that social capital might be a good alternative instrument when common stress reducing instruments fail. Programs that enhance trust, cooperation, and the family network can also be used in parallel with other health improvement programs (such as fitness or medical programs).

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VII. APPENDIX AND TABLES

Table 1: Descriptive Statistics

Variable		count	percent	n	Mean	σ	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
Short-term Health				1,068	9.82	2.67	7	28
Long-term Health				1,104	1.18	1.34	0	9
Burnout				1,092	7.91	2.56	3	15
Fairness				1,104	1.18	1.35	0	9
Strain Index				1,077	11.98	5.79	0	27

Table 2: Baseline Model

Variable	Model 1 Short-Term Health Exposure	Model 2 Long-Term Health Exposure	Model 3 Burnout
Cooperation	-0.382***	-0.088**	-0.299***
	(-4.477)	(-2.049)	(-3.751)
	-0.149*	***-0.068****	***-0.122****
Trust	-0.311***	-0.136***	-0.494***
	(-3.039)	(-2.764)	(-5.405)
	-0.105*	***-0.091****	***-0.175****
Family support	-0.497***	-0.187***	-0.501***
	(-4.528)	(-3.638)	(-5.630)
	-0.166*	***-0.122****	***-0.174****
Work-life-balance	-0.480***	-0.206***	-0.539***
	(-6.521)	(-5.433)	(-7.704)
	-0.199*	***-0.169****	***-0.235****
Children (Dummy)	-0.042	-0.102	0.037
	(-0.238)	(-1.144)	(0.219)
	-0.008	***-0.037***	***0.007***
Education (Dummy)	-0.150	-0.101	-0.294*
	(-0.838)	(-1.092)	(-1.749)
	-0.026	***-0.034***	***-0.053****
Rank	-0.002	0.040	-0.152**
	(-0.022)	(1.030)	(-2.214)
	-0.001	***0.042***	***-0.084****
Age	-0.038**	-0.002	-0.037**
	(-2.225)	(-0.213)	(-2.094)
	-0.131*	***-0.012***	***-0.131****
Experience	0.056***	0.035***	0.042**
	(3.056)	(3.909)	(2.223)
	0.195*	***0.238****	***0.155****
Female (Dummy)	1.168***	0.444***	-0.353*
	(4.447)	(3.618)	(-1.723)
	0.150*	***0.114****	***-0.048****
Caucasian (Dummy)	0.164	-0.001	-0.063
	(0.892)	(-0.017)	(-0.397)
	0.029	***-0.001***	***-0.012***
Marital Status (Dummy)	0.012	-0.048	0.062
	(0.062)	(-0.486)	(0.342)
	0.002	***-0.017***	***0.011***
Constant	16.132***	2.929***	15.667***
	(19.409)	(7.131)	(21.859)
R-Squared	0.185	0.165	0.186
F-statistics	15.295***	15.142***	19.866***
Number of Observations	1002	1030	1028

*Notes: t-statistics in parentheses. Significance levels: * 0.05 < p < 0.10, ** 0.01 < p < 0.05, *** p < 0.01.*

Regressions with robust standard errors, standardized beta coefficients are reported in bold italic.

Table 3: Extension 1 - including Fairness

Variable	Model 4 Short-Term Health Exposure	Model 5 Long-Term Health Exposure	Model 6 Burnout
Cooperation	-0.333***	-0.082*	-0.204**
	(-3.772)	(-1.863)	(-2.526)
	-0.129*	***-0.063****	***-0.083***
Trust	-0.240**	-0.111**	-0.392***
	(-2.287)	(-2.189)	(-4.432)
	-0.081	***-0.074***	***-0.137****
Family support	-0.465***	-0.190***	-0.434***
	(-4.254)	(-3.671)	(-5.140)
	-0.155*	***-0.124****	***-0.150****
Work-life-balance	-0.427***	-0.184***	-0.430***
	(-5.697)	(-4.678)	(-6.254)
	-0.177*	***-0.151****	***-0.188****
Children (Dummy)	-0.027	-0.079	0.050
	(-0.151)	(-0.882)	(0.314)
	-0.005	***-0.028***	***0.010***
Education (Dummy)	-0.068	-0.090	-0.168
	(-0.377)	(-0.968)	(-1.058)
	-0.012	***-0.031***	***-0.030***
Rank	-0.043	0.045	-0.207***
	(-0.563)	(1.134)	(-3.111)
	-0.022	***0.046***	***-0.114****
Age	-0.044***	0.000	-0.042***
	(-2.593)	(0.024)	(-2.625)
	-0.149*	***0.001***	***-0.149****
Experience	0.065***	0.033***	0.054***
	(3.546)	(3.499)	(3.007)
	0.224*	***0.224****	***0.197****
Female (Dummy)	1.165***	0.436***	-0.294
	(4.391)	(3.523)	(-1.428)
	0.150*	***0.112****	***-0.040***
Caucasian (Dummy)	0.227	0.009	0.086
	(1.246)	(0.104)	(0.552)
	0.041	***0.003***	***0.016***
Marital Status (Dummy)	-0.019	-0.072	-0.032
	(-0.094)	(-0.724)	(-0.180)
	-0.003	***-0.025***	***-0.006***
Fairness	-0.098***	-0.035**	-0.217***
	(-3.548)	(-2.493)	(-8.411)
	-0.118*	***-0.082***	***-0.272****
Constant	16.865***	3.150***	17.340***
	(19.675)	(7.399)	(26.265)
R-Squared	0.196	0.174	0.262
F-statistics	15.466***	15.240***	29.852***
Number of Observations	982	1008	1006

*Notes: t-statistics in parentheses. Significance levels: * 0.05 < p < 0.10, ** 0.01 < p < 0.05, *** p < 0.01.*
Regressions with robust standard errors, standardized beta coefficients are reported in bold italic.

Table 4: Extension 2 - Including Strain

Variable	Model 7 Short-term Health Exposure	Model 8 Long-term Health Exposure	Model 9 Burnout
Cooperation	-0.310***	-0.068	-0.188**
	(-3.587)	(-1.580)	(-2.336)
	*-0.120****	*-0.052*	*-0.076***
Trust	-0.296***	-0.135***	-0.426***
	(-2.803)	(-2.678)	(-4.779)
	*-0.099****	*-0.089****	*-0.149****
Family support	-0.491***	-0.197***	-0.449***
	(-4.569)	(-3.876)	(-5.289)
	*-0.162****	*-0.128****	*-0.154****
Work-life-balance	-0.353***	-0.148***	-0.363***
	(-4.788)	(-3.850)	(-5.259)
	*-0.147****	*-0.122****	*-0.158****
Children (Dummy)	-0.130	-0.139	-0.043
	(-0.755)	(-1.571)	(-0.273)
	-0.024	*-0.050*	*-0.008*
Education (Dummy)	-0.106	-0.103	-0.185
	(-0.589)	(-1.138)	(-1.182)
	-0.018	*-0.035*	*-0.033*
Rank	-0.096	0.015	-0.262***
	(-1.258)	(0.380)	(-3.933)
	-0.050	*0.016*	*-0.144****
Age	-0.035**	0.004	-0.035**
	(-2.072)	(0.482)	(-2.239)
	*-0.118***	*0.027*	*-0.125***
Experience	0.029	0.016*	0.026
	(1.619)	(1.726)	(1.421)
	0.101	*0.111**	*0.094*
Female (Dummy)	1.234***	0.456***	-0.245
	(4.770)	(3.746)	(-1.240)
	*0.159****	*0.117****	*-0.033*
Caucasian (Dummy)	0.209	-0.018	0.065
	(1.153)	(-0.201)	(0.423)
	0.037	*-0.006*	*0.012*
Marital Status (Dummy)	-0.043	-0.082	-0.057
	(-0.220)	(-0.833)	(-0.329)
	-0.008	*-0.028*	*-0.010*
Fairness	-0.063**	-0.018	-0.188***
	(-2.235)	(-1.287)	(-7.251)
	*-0.076***	*-0.042*	*-0.236****
Strain	0.124***	0.059***	0.101***
	(7.454)	(7.193)	(6.672)
	*0.263****	*0.247****	*0.226****
Constant	15.297***	2.414***	16.044***
	(17.337)	(5.532)	(23.304)
R-Squared	0.247	0.213	0.297
F-Statistics	18.813***	20.495***	31.664***
Number of Observations	970	995	993

*Notes: t-statistics in parentheses. Significance levels: * 0.05 < p < 0.10, ** 0.01 < p < 0.05, *** p < 0.01.*

Regressions with robust standard errors, standardized beta coefficients are reported in bold italic.