

Unhappiness and Crime: Evidence from South Africa

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This paper is the first of its kind to study quality of life responses of crime victims. Using cross-sectional data from the OHS97 survey of South Africa, it is shown that victims report significantly lower well-being than the non-victims, *ceteris paribus*. Happiness is lower for non-victimised respondents currently living in higher crime areas. However, some evidence is found that criminal victimization hurts, but hurts less if regional crime rate on our reference group is high.

The one who throws the stone forgets; the one who is hit remembers forever.
Angolean proverb

Fear defeats more people than any other one thing in the world.
Ralph Waldo Emerson

INTRODUCTION

Politicians around the world have been expressing concern for decades about the extent to which rising crime rates can affect the lives of individuals in the society. The growing distress over the effects of crime on individuals in rich and poor countries alike is thought to have been fuelled by the perception that crime victims suffer greatly in terms of financial loss and psychological trauma from their experiences. There is also an increasing awareness among policy-makers that these exposures to crime can have long-lasting impacts on the victims and those close to them. As a result, crime and the perception of personal safety are important factors in any assessment of social well-being and an individual's happiness level. Yet less attention has been paid in terms of research on the link between crime-related variables and measures of satisfaction with quality of life in general.

This paper has two aims. The first is to show that, on average, crime victims report significantly lower levels of subjective well-being than the non-victimised. The second is to present evidence that subjective well-being may be affected by the fear of crime as well as by the direct experience of it. In other words, I test whether crime on others in a region has a negative relationship to the nonvictimised's well-being. I also test the hypothesis that, even though criminal victimization hurts, people may feel relatively better once they know that a large part of the population living in their own neighbourhood are also affected by crime. Using the perceived quality-of-life data taken from the post-apartheid South Africa in 1997, I argue that all of the above ideas are strongly supported by the data and that there is a robust relationship between crime-related variables and subjective measures of well-being. In Section I I briefly

discuss some of the key literature in psychology, sociology and economics. Section II describes the data-set for South Africa. Section III begins empirical analysis on the correlation between criminal victimization and reported well-being. Section IV presents the main results on regional crime rate, and conclusions are set out in Section V.

I. PREVIOUS LITERATURE

Criminal damages have so far been studied by economists in terms of pecuniary costs on individuals and society. The cost of murder, for example, can be measured by loss in earnings for victims and accumulated public spending on the police and court personnel to increase the probability of criminal apprehension and conviction (Becker 1968). The present paper, however, takes a more psychological approach to the analysis of individuals' welfare following criminal victimization by looking directly at the reported subjective well-being of crime victims. Although this is not yet standard in economics, subjective well-being responses have increasingly, and successfully, been applied in studies of unemployment (e.g. Winkelmann and Winkelmann 1998; Frey and Stutzer 1999; Kingdon and Knight 2001; Blanchflower and Oswald 2004), the role of absolute and relative income (e.g. Clark and Oswald 1996; McBride 2001; Easterlin 2001; Stutzer 2002), the impact of macro-economics indicators (e.g. Di Tella *et al.* 2001, 2004), and general development and poverty issues (e.g. Ravallion and Lokshin 2001; Graham and Pettinato 2002; Powdthavee 2003). However, empirical research in economics on the well-being of crime victims is still relatively unexplored, compared with other areas of economic issues mentioned above, simply because adequate data are not readily available or are too unreliable for general public use.

While the link between criminal victimization measures and subjective well-being responses remains largely ignored by economists, the idea has been studied intensively by psychologists and partly by sociologists for decades. A common result from the psychology literature is that crime victims have been shown to suffer from a variety of significant and persistent psychological problems including depression, anxiety, fear and post-traumatic stress disorder, as well as feelings of hostility and personal violation (e.g. Atkeson *et al.* 1982; Davis and Friedman 1985; Kilpatrick *et al.* 1985; Frieze *et al.* 1987; Skogan 1987; Burnam *et al.* 1988, Sorenson and Golding 1990; Norris and Kaniasty 1992). These psychological symptoms commonly found among crime victims, especially fear and anxiety, are shown to be negatively associated with individuals' subjectively measured health (Ross 1993) and measures of subjective well-being and overall perceived quality of life (Michalos 1991). Attitudes towards crime-related issues in the area, i.e. whether or not individuals view local crime to be a problem, has a negative impact on the reported satisfaction with the neighbourhood (e.g. Hartnagel 1979; Parkes *et al.* 2002). Furthermore, using data from the city of Prince George British Columbia survey ($N = 633$), Michalos and Zumbo (2000) show that measures of fear and actual cases of victimization correlate negatively with measures of happiness and satisfaction with life as a whole. A recent study by Kingdon and Knight (2003) reports a similar finding on the correlation between the reported

subjective well-being and the victim-of-crime variable. Using a sample of approximately 900 victimized households from the South African Labour and Development Research Unit (SALDRU) survey of 1993, they have been able to show that crime victims report significantly lower subjective well-being than the non-victimized. However, despite growing attention on the subject by sociologists, the literature on empirical analysis of crime and subjective well-being is still relatively small, compared with studies in psychology on the victim's mental health following criminal victimization.

II. DATA AND DESCRIPTIVE STATISTICS

The current paper uses a rich data-set from the October Household Survey (OHS) study of South Africa. The OHS is an annual and nationally representative survey based on a probability survey of a large number of households, carried out—with different sample designs for each year—by Statistics South Africa (StatsSA). My analysis will refer to the OHS study of 1997, which covers around 30,000 randomly selected households across 3000 community clusters. This general survey contains detailed information on a series of socio-demographic characteristics, including—but not limited to—household composition, education, employment status and expenditure activities. It also includes, in a section to be completed by one of the household representatives, a battery of questions on perceived quality of life and on crime committed on household members over the past year. The proxy utility measure used is the measure of perceived quality of life (henceforth PQOL). This is captured by the question ‘Taking everything into account, how satisfied is this household with the way it lives these days?’ Responses range on a five-point scale from the lowest, ‘1. Very dissatisfied’, to the highest, ‘5. Very satisfied’. The analysis refers to those PQOL respondents of working age (16–65). This produces 24,949 observations in as many as 2500 enumeration areas over all.

Table 1 provides a first look at the distribution of PQOL for the sample population. The distribution in the table shows a skewness in the reported quality of life towards the ‘satisfied’ category commonly found in data on developed nations, with a mean PQOL score of 3.64 and over 16% reporting the maximum score of 5.

Victim-of-crime status is made up from the responses to the two following questions: (i) ‘During the past 12 months, has this household experienced any

TABLE 1
DISTRIBUTION OF PERCEIVED QUALITY OF LIFE FOR SOUTH AFRICA, 1997

Perceived quality of life	Observations	%	Cumulation (%)
Very dissatisfied	860	3.45	3.45
Dissatisfied	2,801	11.23	14.68
Neither	4,951	19.84	34.52
Satisfied	12,238	49.05	83.57
Very satisfied	4,099	16.43	100.00
Total	24,949	100	100

Source: October Household Survey (OHS), 1997.

burglaries, robberies, or housebreaking?’ and (ii) ‘During the past 12 months, has anyone been murdered while he/she was a member of this household?’ The number of property crime (i.e. burglaries, robberies, housebreaking) victims dominates the number of violent crime (i.e. murder) victims by 10 to 1, with $N = 1933$ and 188 reported property and violent crime victims, respectively. I also had to eliminate around thirty observations where respondents had answered ‘Yes’ to both victims of property and violent crime questions for simplicity reasons. The total number of crime victims used in the analysis is therefore 2121, giving an average crime rate across the population sample of 8.5%.

III. CORRELATION BETWEEN CRIMINAL VICTIMIZATION AND PERCEIVED QUALITY OF LIFE RESPONSE

I assume that there exists a reported well-being function of the general form

$$(1) \quad R_h = H(W(VC_h, X_h, Z_h)) + \varepsilon,$$

where R_h represents the well-being at the household level reported by an individual, and is adequately captured by responses to a question on perceived quality of life, on a scale of 1 to 5; $H(\cdot)$ is a non-differentiable function that relates actual to reported well-being, $W(\cdot)$ is the true well-being observable only to that individual, X is a vector of private goods consumed by the entire household, Z is a set of socio-demographic characteristics across household members, and ε is an error term that subsumes the inability of human beings to communicate accurately the true well-being levels, as well as unobserved personal traits such as optimism and intelligence. The variable VC is the victim-of-crime variable, taking the value of 1 if the household has been victimized by crime in the past 12 months and 0 otherwise. This paper aims to test whether the reported perceived quality of life is associated negatively with the victim of crime variable, *ceteris paribus*. Note that measures of subjective well-being and experiences of criminal victimization in the OHS97 are recorded at the household level, not the individual level. This implies that we can make only inter-household comparisons of reported well-being, and not comparisons between individuals living in the same households, in our victim-of-crime analysis.

To provide some information about the correlations in the raw data, Table 2 describes reported PQOL levels for different groups. In consonance with the findings in the psychology literature, respondents from the non-victimized households report, on average, a significantly higher subjective well-being level than the respondents from the victimized households. The means of perceived quality of life for the non-victimized and victimized households are 3.660 and 3.395, respectively. A similar result is obtained for both male and female respondents. The figures in parentheses represent the t -statistic for the null hypothesis that the means of the two groups are the same, and in all cases the test strongly rejects at the conventional level the equality of the means for the two groups. This is our first tentative evidence of lower psychological well-being following criminal victimization.

A more systematic analysis of the reported PQOL data begins in Table 3. As the measure of PQOL is ordinal, not cardinal, the preferred method of estimation is by ordered probit (Zavoina and McKelvey 1975). I also corrected

TABLE 2
 VICTIM OF CRIME AND PERCEIVED QUALITY OF LIFE MEANS, BY CATEGORY^a

Categories	No. of observations	%	Mean perceived quality of life
Non-victim	22,828	91.99	3.660
Victim	2,121	8.01	3.395
			(11.78)
Male; non-victim	7,215	90.46	3.677
Male; victim	761	9.54	3.440
			(6.02)
Female; non-victim	15,613	91.50	3.653
Female; victim	1,360	8.50	3.370
			(10.13)

^aValues in parentheses are *t*-statistics based on the test that the two populations have equal means.

for underestimated standard errors by including enumerator or cluster controls in the estimations so as to capture any grouping effects present within the dataset. (See Moulton, 1990, for more discussions on potential pitfalls in estimating aggregate variables on micro units when standard errors are not corrected for.)

Table 3 explores the relationship between criminal victimization and perceived quality life when other factors are held constant by estimating a simple microeconomic counterpart to equation (1). Descriptive statistics of all variables are provided in Appendix A. The dummy for victim of crime enters the regression in the theoretically expected negative way, with a robust *z*-statistic of -10.99 .

It is worth noting here that the PQOL measure of well-being is rather unusual in the literature, as it is a household and not an individual measure. The question is whether the main respondent is able to evaluate the well-being of all individuals in the household, especially those who have a direct experience of crime. However, considering that both types of crime (e.g. residential burglaries and murder of at least one of the household members in the last 12 months) recorded in the survey are probably better thought of as crimes on households and less so as crimes committed with a specific aim to affect only a particular individual living in the premises, the negative effects may be equally spread across all existing household members, making PQOL a valid measure of the well-being impact of criminal victimization.

Other results from Table 3 show quality of life to associate positively with log of household expenditure, while household size enters the equation with a negative sign. One possible explanation for this is that an increase in the household size may lead to a reduction in household expenditure per capita, and hence may reduce the quality of life for everybody in the household (Graham and Pettinato 2002; Powdthavee 2003). Controlling for household expenditure quintiles and the right to ownership of the dwelling, individuals with a telephone connection in the dwelling have reported, on average, higher PQOL levels than those without one. Black respondents have reported, on average, a significantly lower well-being score than individuals of other races, especially those of mixed race. The searching unemployed (i.e. those unemployed and looking for a job) and part-time workers have significantly

TABLE 3
 PERCEIVED QUALITY OF LIFE REGRESSION WITH VICTIM-OF-CRIME VARIABLE FOR
 SOUTH AFRICA, 1997 (ORDERED PROBIT RESULTS)^a

	Coefficient	z-statistic
Victim of crime (= 1)	- 0.358	(- 10.99)
<i>(A) Household characteristics</i>		
Ln (Household expenditure)	0.081	(6.24)
Household size	- 0.017	(- 4.30)
Urban (= 1)	- 0.071	(- 2.17)
Home ownership (= 1)	0.030	(1.00)
Phone in dwelling (= 1)	0.163	(5.83)
<i>(B) Main respondent's characteristics</i>		
Race: coloured	0.284	(4.84)
Race: Indian	0.082	(1.27)
Race: white	0.054	(1.22)
Male (= 1)	- 0.050	(- 2.13)
Unempl.; looking for work	- 0.124	(- 5.13)
Unempl.; not looking for work	- 0.089	(- 1.41)
Working part-time	- 0.127	(- 2.79)
Housewife/students	- 0.048	(- 2.12)
Retired	0.023	(0.55)
Disabled	- 0.095	(- 1.02)
Education: standard level 1-3	- 0.013	(- 0.26)
Education: standard level 4-6	0.063	(1.90)
Education: standard level 7-9	0.094	(3.05)
Education: standard level 10 and higher	0.160	(4.67)
Age	- 0.011	(- 2.38)
Age ² /100	0.011	(2.03)
Married: civil law	0.122	(3.29)
Married; traditional law (custom)	0.003	(0.09)
Living together with partner	- 0.007	(- 0.16)
Widower/widow	- 0.074	(- 1.67)
Divorced/separated	- 0.100	(- 1.75)
Province dummies (9)		Yes
Relation to head of household (9)		Yes
N		20,634
Log likelihood		- 26491.058
Pseudo R ²		0.0345

^aReference variables are: black (race), working full-time (employment status), no education (education level), never married (marital status). Other controls include unemployment rate measured at the magistrate district level, the ratios of other male members in the household, and the education levels and employment status of household members other than the main respondents.

reported lower well-being than those in full-time employment, while reported well-being is higher for PQOL respondents with higher level of education (measured by the levels of school grade completed by the main respondent). Similar to other findings from developed countries, there is also a U-shaped relationship between well-being response and age for South Africa, minimizing around the early 1940s (Warr 1992; Clark *et al.* 1996). Those who were married under civil law, which is a more recent type of marriage arrangement, rather

than South Africa's customary or traditional law, have the highest level of well-being. One possible explanation for this could be that people who were married under the civil law may have had more freedom in choosing their current partners and more legal rights compared with those married under the customary law. The divorced or separated, on the other hand, have reported the lowest current well-being. The results are robust to controls for average unemployment rates measured at the magistrate district level (which is generated within-sample) and personal characteristics of household members other than the main respondent. Hence it can be concluded that, in most comparable cases, the coefficient signs of the already identified socioeconomic factors in the well-being regression equations are the same in South Africa as in more developed countries.

Of other interest is the role of crime type in the determination of the victim-of-crime variable in these equations. In particular, it would be useful to know whether the negative correlation between victim of crime and perceived quality of life is driven by a single type of crime and not crime in general. A direct test splits the victim-of-crime variable into property and violent cases. The introduction of these split-case variables suggests that victims of residential burglaries report lower well-being than those victims with at least one household member murdered within the last 12 months, contrasting with Davis and Friedman's (1985) finding of lower psychological well-being among violent crime victims, compared with property crime victims. The result thus implies that the negative correlation between victims of crime and perceived quality of life may be driven more by property crimes ($N = 1933$) than by violent crimes ($N = 188$). One possible explanation could be that, while burglaries and housebreaking normally take place in the household, a murder could be committed elsewhere, away from the household. In addition, although property crimes are more likely to affect all household members equally, there may exist a degree of variation in the psychological impact of murder, which can depend upon whether the actual murder victim is closely related to the PQOL respondent. However, it can still be concluded from my estimations that respondents from victimized households, whether from property or violent crimes, have reported lower well-being than the non-victimized households, *ceteris paribus*.

The well-being impacts of crime are quantitatively important as well as statistically significant. Since the coefficients from ordered probits cannot be interpreted directly as marginal effects, 'compensating expenditure variations' can be calculated instead to illustrate the size of the estimated psychological effect of crime on households. Given that our expenditure variable is in terms of log household expenditure, the compensating expenditure variations (CEV) equation can be written as follows:

$$(2) \quad CEV = EP \left(\exp \frac{\beta_1 - \beta_0}{\lambda_{\ln EP}} - 1 \right),$$

where CEV is compensating expenditure variations, i.e. expenditure required to compensate an average household for a drop in psychological well-being resulting from crime; EP is current household expenditure; β_1 represents the reference coefficient for the non-victimized, β_0 is the coefficient for criminal

victimization and λ is the estimated coefficient on log household expenditure. Based on an average crime rate of 8.5% across the population sample, the calculation suggests that it would take an extra household expenditure of around R97,424 (or approximately US\$21,142) per month to compensate for being victimized by crime, for an average household spending R1187 (or US\$240) per month. In other words, an average household would require a financial package worth 82 times of their current spending to make them feel indifferent about their experiences of crime. The estimates of other life events, on the other hand, have quantitatively smaller valuations than the estimated main effect of crime. For example, searching unemployment (compared with employment with regular wages) and no formal education (compared with the highest level of education) for the respondent is estimated to be worth about R4,300 (US\$933) and R7,370 (US\$1,600) on average. Thus, the estimation implies that crime has the largest psychological cost compared with changes in other relevant socio-demographic factors, for an average respondent in the sample. However, as expenditure is potentially endogenous in the happiness regression, the interpretation of these results are only illustrative and therefore should be treated with caution.

IV. THE ROLE OF OTHERS' CRIME RATE, BY REGION

While it has been robustly established in the last section that victims of crimes are worse off than non-victims in terms of their perceived quality of life, the relationship between crime committed on other societal members in the community and measures of subjective well-being remains relatively unexplored. Kingdon and Knight (2003) find the negative relationship between the reported well-being and the victim-of-crime variable to be more significant for poor households (those defined as earning less than the household supplementary level of poverty line), where regional crime rates are lower than in areas lived in by their non-poor counterparts. However, to the best of my knowledge, the only work that explicitly includes a crime rate variable in the happiness regressions comes from a paper by Alesina *et al.* (2001), which compares the effects of inequality on happiness across Europe and America. Using a set of individual-level data from the US General Social Survey (1972–94), they were able to show for the US sample that there is a negative, albeit insignificant, relationship between the murder rate and the reported happiness scores. However, in their regression results they had failed to distinguish the effects of the murder rate between individuals from households with murder victims and those from non-victimized households.

In this section I aim to extend the idea put forward by Alesina *et al.* and examine whether the regional crime rate correlates significantly with the well-being of the non-victimized households. The standard externality of regional crime rate on others is negative; e.g. an increase in the regional crime rate may heighten feelings of fear and insecurity in the non-victimized households in the neighbourhood. The other question of interest is whether certain groups of individuals are hurt less by crime than others. A hypothesis in economics and psychology suggests that the stigmatizing effect from crime may in fact be lower in high-crime-rate regions. With less social disapproval towards crime victims in high-crime areas, the externality from local crime rate on the overall well-being

of the victimized households may be positive; in other words, the higher the regional crime rate, the better I feel about myself for being one of the victims.

Hence, the current section aims to test the following two hypotheses:

1. Crime on 'relevant others'—i.e. other people living in the same region as the respondents—reduces the current well-being of the non-victimized households.
2. The correlation between the victim-of-crime variable and the perceived quality of life is smaller for those crime victims who have been living in an area with a high crime rate.

To this end, I extend the well-being equation (1) to include a measure of crime on relevant others, \overline{VC} , to be estimated in Table 4 as follows:

$$(3) \quad R_h = \beta_1(VC)_h + \beta_2(\overline{VC})_h + \beta_3(VC_h \times \overline{VC}_h) + X'_h\lambda + Z'_h\delta + \varepsilon_h.$$

The analysis will focus on two different measures of crime rates for South Africa in 1997. The first measure comes from within the sample, generated according to the reported crime cases by the magistrate district level in the OHS97. This experimental variable is based on a reasonable sample size with an average of 168.53 households per district area (over 150 data points on regional crime rate), and is allowed to vary across households. The second measure of crime rate comes from Crime Information Analysis Centre (CIAC) reports on the provincial specific crime statistics, published annually since 1994 by the South African Police Service in South Africa. To make it consistent with the crime rate generated within the OHS97 data, I refer only to the reported incidences of residential burglaries and murder at the provincial level for the year 1997. (See Appendix B for the official crime statistics in nine provinces.) In addition to the full sample analysis, I examine the role of others' crime rate on reported well-being levels according to the gender of the PQOL respondents. The current hypothesis is that female respondents who were selected to evaluate the well-being at the household-level for everybody else may possess a very different attitude towards crime-related issues than male respondents. For example, females tend to be more convinced that crime in their region had increased, to be more worried about being victimized (e.g. Giles-Sims 1984; Lira and Andrade-Palos 1993), to perceive more neighbourhood problems, to be less satisfied with their own and their family's safety in their neighbourhood, and to be less likely to walk alone in their neighbourhood at night than males (e.g. Gomme 1988; Sprott and Doob 1997; Michalos and Zumbo 2000). On the other hand, females tend to communicate more with each other about their experiences of crime, whereas males have a greater unwillingness to admit or talk about their fears relating to criminal victimization in general (e.g. Stanko and Hobdell 1993; Walklate 1997).

The first column of Table 4 produces full sample evidence, adding the crime rate measured at the micro level (i.e. by magistrate district) and the macro level (i.e. by province). Note that there is an average of 20 magistrate districts per one province in the OHS97 data. It can be seen in the first panel that the victim-of-crime variable continues to enter the equation with a negative and significant coefficient. The interaction between own experiences of crime and regional crime rate at the magistrate district level attracts a strongly positive coefficient (with a *z*-statistic of 2.06), whereas the main relationship between

TABLE 4
 PERCEIVED QUALITY OF LIFE REGRESSIONS WITH VICTIM OF CRIME VARIABLE AND
 DIFFERENT MEASURES OF CRIME RATES FOR SOUTH AFRICA, 1997
 (ORDERED PROBIT RESULTS)^a

	All	Males	Females
<i>(A) Crime rates at micro level</i>			
Victim of crime (= 1)	- 0.497 (- 6.64)	- 0.533 (- 3.98)	- 0.484 (- 5.59)
Crime rates at the magistrate district levels*	- 0.982 (- 3.51)	- 1.004 (- 2.30)	- 0.973 (- 3.17)
Victim of crime* average crime on others	1.363 (2.06)	1.565 (1.34)	1.292 (1.70)
<i>(B) Crime rates at macro level</i>			
Victim of crime (= 1)	- 0.255 (- 3.10)	- 0.206 (- 1.48)	- 0.290 (- 2.93)
Provincial crime rates: reported burglaries, 1997**	- 0.317 (- 5.36)	- 0.305 (- 3.72)	- 0.316 (- 4.75)
Victim of crime* reported burglaries, 1997	- 0.157 (- 1.30)	- 0.213 (- 1.09)	- 0.112 (- 0.76)
Victim of crime (= 1)	- 0.470 (- 4.04)	- 0.467 (- 2.38)	- 0.493 (- 3.60)
Provincial crime rates: reported murder, 1997***	- 7.103 (- 10.10)	- 7.657 (- 6.89)	- 6.900 (- 9.07)
Victim of crime* reported murder, 1997	1.821 (1.00)	1.759 (0.58)	2.197 (1.02)

^aAbsolute *z*-values in parentheses; other controls as in Table 3.

*Crime rates on others at the magistrate district levels, calculated using the OHS97 data.

**Burglaries—residential premises (and attempt) in South Africa, 1997: ratio per 100 of the population.

***Murder in South Africa, 1997: ratio per 100 of the population.

regional crime rate and reported well-being is negative and significant. This result thus suggests that the well-being gap between crime victims and non-victims may be smaller in high crime rate regions. It is also worth noting here that there is no significant variation in the supply for both police services and victim support programmes by magistrate district (in terms of financial or clinical helps) in South Africa. (In any case, should there be any significant variation in the police support by provincial level, the effects will be captured by the province dummies.)

Consistent with Alesina *et al.*'s results on US data, the main effect of the regional crime rate on the reported well-being scores continues to be negative and significant in the second panel, where the measure of crime rate at the micro level is replaced by the measure of crime rate at the macro level. The estimated coefficients (*z*-statistics in parentheses) for residential burglaries and murder cases per 100 of the population in the two separate regressions are - 0.317 (- 5.36) and - 7.103 (- 10.10), respectively. The coefficient on the crime victim variable remains negative and significant with the introduction of crime statistics at macro level, while the interaction terms are insignificant (with mixed signs) in both of our specifications.

Columns (2) and (3) of Table 4 deviate from the full sample analysis to examine the correlations between crime-related variables and the reported well-being by gender of the main respondent. The victim-of-crime and regional crime rate (both micro and macro-level measures) variables continue to be associated negatively with the reported well-being for both sexes, but are more significant for females than males. The gender results also reveal a positive interaction term between own experiences of crime and crime rate on relevant others measured at the district level for both male and female respondents, but only slightly significant (with a z -statistic of 1.70) for females. The interaction between own experiences of crime and the provincial crime rate of residential burglaries is negative but insignificant for both males and females. Lastly, the interaction term between own experiences of crime and the provincial crime rate of murder is positive but largely insignificant for both sexes. Hence there is some significant evidence in the data-set that crime hurts less in high-crime areas at the magistrate district level, but not at the provincial level.

In order to illustrate how the regional crime rate—at least at micro level—affects the reported well-being of victims and non-victims differently, we can calculate for an average individual the probability of recording the highest level of PQOL (= 5) based on the coefficients of the regression, and see how this probability varies as regional crime rate on others changes. The method generalizes, as it has also been used by Clark *et al.* (2001) to illustrate for Germany the different effects of past unemployment on the reported life satisfaction of the unemployed and those in employment. Figures are presented for the full sample taken from the first column of Table 4.

Table 5 shows how the gap in the probability of recording a PQOL score of 5 between victims and non-victims reduces as the regional crime rate on others rises. An initial increase in the regional crime rate from 0 to 10% reduces this gap from almost 4% to around 3.33%, while a further rise of 10% reduces this gap by a similar amount (from 3.33% to 2.92%). Further calculation implies that, controlling for other relevant factors, an average respondent from a victimized household would have reported the same current well-being as an average respondent from a non-victimized household at a regional crime rate of approximately 36% ($-0.497 + 1.363 \times 0.36 = 0$). This is an unusually high figure for a crime rate at the magistrate district level, and in a sense is a

TABLE 5
PREDICTED PROBABILITIES OF PQOL SCORE OF 5 (HIGHEST LEVEL)^a

	Ordered probit on full sample
Non-victim; magistrate district crime rate of 0%	6.58%
Non-victim; magistrate district crime rate of 10%	6.11%
Non-victim; magistrate district crime rate of 20%	5.66%
Non-victim; magistrate district crime rate of 30%	5.23%
Victim; magistrate district crime rate of 0%	2.64%
Victim; magistrate district crime rate of 10%	2.78%
Victim; magistrate district crime rate of 20%	2.92%
Victim; magistrate district crime rate of 30%	3.06%

^aPQOL = Perceived Quality of Life.

reflection of a small (positive) impact of the crime rate on the well-being of crime victims. However, the limitation of this finding comes from the fact that our regional crime rate variable has been generated within the sample of the OHS97 data-set, and hence the results should be viewed with care.

V. CONCLUSION

The aim of this paper has been to examine the relatively unexplored link between subjective well-being and crime. It estimates for South Africa's micro-econometric well-being equations based on the perceived quality of life response for the year 1997. Controlling for household expenditure and relevant factors, I found that respondents from victimized households report a substantially lower subjective well-being score, on average, than those from non-victimized households. Second, I showed that crime on others in the area is associated with lower levels of perceived quality of life for the respondents from non-victimized households. One interpretation is that crime on others in the neighbourhood may increase the probability of victimization and therefore heighten the levels of fear and anxiety for non-victims living in the area. Third, I showed that, although the victim-of-crime variable is associated sharply with lower levels of subjective well-being, the negative correlation is attenuated—at least at the magistrate district level—as crime on others rises. The estimated coefficients suggest that a representative victim living in an area where roughly 36% of other people are crime victims is indifferent in terms of current subjective well-being between victimization and non-victimization. A possible explanation is that crime victims may feel less victimized if a larger part of the population living in the area also shares their experiences of crime.

The findings reported here have important policy implications. One of them is the need to supply and channel sufficient professional services for the victimized. Despite the evidence presented in this article suggesting an urgent need of mental help services for victims of crime, studies in the medical literature reveal that at present only a small proportion of victims receive such professional help (Golding *et al.* 1988; Norris *et al.* 1990). Furthermore, the weak role of the expenditure variable in well-being regressions casts doubt on the efficacy of governmental policy aimed solely at giving financial support for the victims. Thus, significant improvements in terms of clinical help per case of victimization is needed if the overall levels of quality of life in society are to be raised. Second, the presence of externalities linked to other crime victims at the micro level suggests that not everyone in the region benefits from crime prevention programmes, provided that these programmes are not 100% effective in taking crime away from the neighbourhood. This is because victims of crime may suffer less stigma from victimization in regions with higher crime rates, according to the results in Table 4. Given that this result holds generally, an alternative way of tackling the issue is for the authorities to take some advantages from the externalities linked to regional crime rate by encouraging better contacts among the victimized, especially in areas where there is no centralized victim support unit for crime victims to meet up should they want to. Future research should therefore focus on how these externalities could influence the rates with which these individuals can recover from victimization over time.

APPENDIX A: DEFINITIONS OF VARIABLES

Table A1 presents definitions and means of all the variables used in this study.

TABLE A1
VARIABLE MEANS, STANDARD DEVIATION^a AND DEFINITIONS

Variable	Mean	Definition
Perceived quality of life	3.638 (0.995)	Taking everything into account, how satisfied is this household with the way it lives today? (1 = very dissatisfied, 5 = very satisfied)
Victim of crime	0.085 (0.279)	During the last 12 months, has this household experienced robbery, burglaries, housebreaking, or has any household member murdered? (1 = yes)
Crime at the magistrate district levels	0.085 (0.048)	Average crime on other households in the same magistrate district as the respondents, calculated using the OHS97 information.
In(household expenditure)	6.481 (1.011)	Log of household expenditure per month
Race	1.453 (0.928)	Race of household (1 = African, 2 = coloured (i.e. mixed race), 3 = Asian, 4 = white)
Household size	4.752 (2.655)	Number of persons currently living in the household
Education: standard level 1–3	0.038 (0.192)	Highest education dummy, 1 = completed grade 1–3
Education: standard level 4–6	0.156 (0.363)	Highest education dummy, 1 = completed grade 4–6
Education: standard level 7–9	0.380 (0.486)	Highest education dummy, 1 = completed grade 7–9
Education: standard level 10 and higher	0.287 (0.452)	Highest education dummy, 1 = completed grade 10 and higher
Gender	0.320 (0.466)	Gender dummy, 1 = male
Urban	0.539 (0.498)	Area dummy, 1 = urban
Married – civil	0.355 (0.478)	Marital status dummy, 1 = married under civil law
Married – traditional (custom)	0.147 (0.354)	Marital status dummy, 1 = married under traditional, South African law
Living with partner	0.064 (0.245)	Marital status dummy, 1 = cohabiting with a partner
Widower/widow	0.078 (0.268)	Marital status dummy, 1 = widowed
Divorced/separated	0.042 (0.200)	Marital status dummy, 1 = divorced or separated
Age	38.053 (13.074)	Age of respondents
Age ² /100	16.189 (10.617)	Square of age of respondents/100
Unemployed, looking for work	0.235 (0.424)	Employment status dummy, 1 = unemployed and looking for work

TABLE A1
CONTINUED

Variable	Mean	Definition
Unemployed, not looking for work	0.019 (0.137)	Employment status dummy, 1 = unemployed but not looking for work
Working part-time	0.042 (0.199)	Employment status dummy, 1 = working part-time
Housewife/student	0.304 (0.459)	Employment status dummy, 1 = housewife or student
Retired	0.057 (0.232)	Employment status dummy, 1 = retired
Disabled	0.013 (0.113)	Employment status dummy, 1 = disabled and unable to work
Home ownership	0.808 (0.394)	Whether own household outright (1 = yes)
Phone in dwelling	0.232 (0.423)	Whether have phone in the dwelling (1 = yes)
Proportion of other male household members	0.514 (0.395)	Average male members other than the main respondent in the household
Other household members	0.034 (0.147)	Average number of other household members completed grade 1–3
with education level 1–3		
Other household members	0.145 (0.287)	Average number of other household members completed grade 4–6
with education level 4–6		
Other household members	0.417 (0.402)	Average number of other household members completed grade 7–9
with education level 7–9		
Other household members	0.294 (0.391)	Average number of other household members completed grade 10 and higher
with education level 10 +		
Other unemployed (looking) household members	0.235 (0.349)	Average number of unemployed (looking) members in the household
Other unemployed (not looking) household members	0.020 (0.113)	Average number of unemployed (not looking) members in the household
Other part-time workers in the household	0.038 (0.161)	Average number of part-time workers in the household
Other housewife/student in the household	0.321 (0.369)	Average number of housewives/students in the household
Other retired household members	0.048 (0.174)	Average number of retired members in the household
Other disabled household members	0.009 (0.083)	Average number of disabled members in the household
Relation to head of household	1.996 (1.583)	Relationship between the respondent and the head of household dummies (9)
Provinces	5.114 (2.595)	South African province dummies (9)
No. of observations	24,949	

^aStandard deviations are given in parentheses.

APPENDIX B: CRIME STATISTICS

Table A2 presents crime statistics for South Africa for 1997, by region.

TABLE A2
REPORTED PROVINCIAL CRIME STATISTICS IN SOUTH AFRICA, 1997^a

	Burglaries	Murders
Western Cape	0.986	0.080
Eastern Cape	0.427	0.066
Northern Cape	0.577	0.063
Free State	0.607	0.048
KwaZulu Natal	0.482	0.073
North West	0.462	0.040
Gauteng	1.047	0.076
Mpumalanga	0.570	0.044
Northern province	0.266	0.020

^aper 100 of population.

Source: Crime Information Analysis Centre: Provincial Crime Specific Statistics, 1997. Note that crime statistics for burglaries include only reported burglaries (and attempt) on residential premises, and not on business premises.

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