Criminal Victimization and Crime Risk Perception: A Multilevel Longitudinal Study

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Abstract In a national sample of the Italian population, surveyed four times between October 2002 and January 2007 ($N = 2,008$), we performed a multilevel longitudinal study aimed at predicting the increase in crime risk perception as a function of three families of independent variables, respectively lying at the within individual level (direct victimization and indirect victimization), at the between-individuals level (being a woman, being an older person, being a poorly educated person and size of area of residence) and at the ecological level (county's crime rate, unemployment rate and immigration rate). Direct and indirect victimization, being a woman, being an older person, living in a large town and in a context characterized by high crime and unemployment rates positively influenced the change in crime risk perception, while the other individual and ecological predictors we used in our predictive model did not. Strengths, limitations, implications and future developments of this research are discussed.

Keywords Crime risk perception · Multilevel analysis · Longitudinal research · Victimization · Fear of crime

1 Introduction

Crime is among the hazards people judge as most risky, both in the Western and in less economically developed countries. For instance, Kpanake et al. (2008) showed that crime ranked 6th among French citizens, 1st among Togolese villagers, and 2nd among Togolese

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urban dwellers out of more than 140 potentially risk factors. Perceived risk of crime is defined in the literature as a cognitive, judgment-based assessment of danger of criminal victimization (Mesch 2000; Rountree and Land 1996). In this light, it should be conceived as the recognition of certain situations or places—typically, people's community—as potentially or actually dangerous in terms of criminality (Gerber et al. 2010; Perkins et al. 1992). If realistic, perceived risk of crime may have a valuable adaptive function, helping people to avoid the risk of victimization and/or of re-victimization (Fattah 1993). Criminological and psychological research converge showing that people tend to overestimate the risk of being a victim of crime as compared to the actual risk (Miceli et al. 2004; Quillian and Pager 2010; Taylor 1995).

This overestimation is particularly interesting because, when disproportionate, perceived risk of crime may exert negative consequences on people's quality of life. At the individual level, it may prevent people from leaving their home at night or even in the day and from avoiding public places such as parks and streets. Moreover, it may encourage them to move away from their neighbourhood and to build physical or symbolic barriers against potential offenders (Skogan 1986). At the community level, it may lower communities' social capital and resources (Patsios 1999). At the societal level, it may foster delegitimization of out-groups, reduction of cohesion and solidarity, and even the spread of a "security ideology" that can turn the legitimate demand for living in safe communities into an attempt to legitimize the most violent racist and xenophobic behaviours (Jeudy 1986; Stafford et al. 2007).

As far as the relationships between negative experiences and risk perception are concerned, results on perceived risk of crime confirmed those obtained in other domains. Research has shown a strong relationship between direct victimization (i.e. being the victim of an offence) and indirect victimization (i.e. an offence involving people of one's own social network) on the one hand and perceived risk of crime on the other hand (Chiricos et al. 2001; Ho and McKean 2004; Kanan and Pruitt 2002; Mesch 2000; Rountree and Land 1996; Santinello et al. 2005; Skogan and Maxfield 1981; Tseloni and Zarafonitou 2008). This is far from surprising considering that victimization, being based on the perpetrator's intention to cause harm (Craig-Henderson and Sloan 2003), jeopardizes people's assumption of being invulnerable to negative events and of living in a substantially benevolent and meaningful world (Janoff-Bulman 1989). Besides criminal victimization, two families of variables have been found to foster perceived risk of crime.

On the one hand, at the individual level, indicators of physical vulnerability (i.e. the perception of a high risk of being physically assaulted due to either limited mobility or the lack of physical strength and competence) and social vulnerability (the lack of material and social resources necessary to protect one's own home and/or retrieve financial losses in the event of victimization) positively influenced crime risk perception (Pantazis 2000). Physical and social vulnerability have been traditionally assessed through socio-demographic variables, and researchers have shown that (1) the elderly (Miceli et al. 2004); (2) women (Rountree and Land 1996); and (3) low socio-economic status groups (Hipp 2010) reported the highest levels of perceived risk of crime.

On the other hand, at the contextual level, ecological associations between crime rate and residents' crime risk perception have been found consistently (Miceli et al. 2004; Rountree and Land 1996). However, since actual crime rates are not typically known and cannot be fully observed, it is plausible that individuals develop their crime risk perceptions at least in part based on other social and community characteristics associated with crime, which may be the basis of a "social amplification" of risk (Quillian and Pager 2010). Indeed, Liska et al. (1982) showed that the percentage of non-whites living in white

participants' communities fosters white residents' crime risk perceptions. Moreover, crime risk perception was found to be fostered by prevalence of physical disorder (disorderly inanimate environments such as those in which there are abandoned cars, vandalized property, litter, graffiti, vacant houses and dilapidated homes) and of social disorder (disruptive behaviours such as loiterers, unruly and rowdy teenagers, gangs, begging, public drunkenness, prostitution and public drug use or dealing) in people's immediate environment (Ferraro 1995; LaGrange et al. 1992). Finally, as concerns the concentration of immigrants, the literature is somewhat contradictory. On the one hand, Taylor and Covington (1993) found the immigrant rate to foster crime risk perception. On the other hand, however, Russo et al. (2011) did not find any significant relation between these two variables.

More recently, two complementary approaches have been used to explore further these results. First, by using hierarchical linear models (HLMs), some authors tried to predict crime risk perception including in the same model both individual and ecological predictors. On the one hand, Quillian and Pager (2010) showed that perceived risk of crime was negatively influenced by the mean income of people's area of residence and positively influenced by the presence of racial minorities in their area. On the other hand, Russo et al. (2011) showed that 11.3 % of Italians' crime risk perception was at contextual level. The following individual variables predicted higher levels of this variable: Physical and social vulnerability (in terms of being a woman, being poorly educated and being an older person), indirect victimization and perceiving high levels of social and physical disorder in one's own area of residence. Among the ecological predictors, the crime rate and unemployment rate predicted higher levels of crime risk perception, while immigrant rate did not. Second, in a two-wave longitudinal study, Russo and Roccato (2010) recently showed that direct and indirect victimization exert enduring effects on crime risk perception.[1]

However, no longitudinal multilevel study aimed at modelling the effects exerted on perceived crime risk by both individual and ecological predictors has been performed. In this paper we have performed such a study.

2 Goals and Hypotheses

The main goal of this study was to analyse longitudinally individual and ecological factors influencing crime risk perception, focusing especially on the effect exerted by victimization experiences on the variation of crime risk perception over time. More specifically, we aimed to test three sets of hypotheses, lying at three different levels of analysis.

At the first level (i.e. at the within-individual level), we hypothesized that both direct (HP1.1) and indirect (HP1.2) victimization experiences would foster crime risk perception levels over time (Chiricos et al. 2001; Ho and McKean 2004; Kanan and Pruitt 2002; Mesch 2000; Santinello et al. 2005).

At the second level (i.e. at the between-individual level), based on previous studies on the effects of physical and social vulnerability on crime risk perception, we hypothesized that women (HP2.1), older people (HP2.2) and poorly educated people (HP2.3) would show higher levels of crime risk perception (Hipp 2010; Miceli et al. 2004; Pantazis 2000;

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[1] Even if these authors framed their article in terms of fear of crime, the dependent variable they used (which was the same we relied on in this study: see below) referred to the cognitive domain more than the affective domain. Thus, based on Ferraro (1995), it should be more properly considered as an assessment of crime risk perception.

Table 1 Sociodemographic differences between our participants and the Italian population

	Italian population	Our participants
Women	52.2 %	53.5 %
Mean age	50.0	49.5 (SD = 17.1)
Years of formal education	9.2	10.9 (SD = 3.9)
People living in large cities (≥100,000 inhabitants)	23.9 %	26.1%

Rountree and Land 1996). Moreover, based on the literature about social and physical disorder (Ferraro 1995; LaGrange et al. 1992), we hypothesized that living in a large town, where disorders are much more widespread than in small centres, would foster crime risk perception (HP2.5).

At the third level (i.e. at the between-counties level), based on Russo et al. (2011), we hypothesized that crime rate (HP3.1) and unemployment rate (HP3.2) would foster crime risk perception. Given the inconsistencies we found in the literature (cf. Taylor and Covington 1993 on the one hand, and Russo et al. 2011 on the other hand), we could not draw a solid hypothesis on the link between immigrant rate and crime risk perception. Thus, we analysed them using an exploratory approach.

3 Data and Methods

3.1 Design

The present investigation used longitudinal data collected by the Observatory of the North West, a research institute of the University of Torino, between October 2002 and October 2007. A sample of over 14-year-olds extracted from the Italian population was surveyed three times a year regarding a number of social issues. In the following four waves, data on criminal victimization and on crime risk perception were available: (1) October 2002 ($N = 4,281$, response rate = 42.3 %), (2) September–October 2004 ($N = 3,325$, response rate = 67.5 %), (3) January–February 2006 ($N = 2,967$, response rate = 44.1 %), and (4) January–February 2007 ($N = 2,814$, response rate = 44.7 %).[2] Each wave's participants were representative of the Italian population according to the main sociodemographic variables (gender, age, education and size of area of residence). However, due to the panel attrition which inevitably characterizes longitudinal research (see Ribisl et al. 1996; Tourangeau and Ye 2009), just 18.4 % of the participants were surveyed in two waves, 8.3 % in three waves and 3.7 % in four waves. In the multilevel perspective, a key advantage of the random-effects approach is that it can be applied when subjects are not measured at the same number of time points (see Hedeker and Gibbons 1997): this gives the researcher the opportunity to successfully manage missing values. For this reason, our

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[2] The first wave has been previously used by Amerio and Roccato (2005) in their one-shot analysis on the predictors of crime risk perception, and by Amerio and Roccato (2007) in their 2002–2004 longitudinal analysis of its trend. The last two waves have been previously used by Russo and Roccato (2010) in their 2006–2007 longitudinal study. However, the four datasets have never been merged, and this is the first time that a longitudinal multilevel analysis of the enduring effects of victimization has been conducted.

final samples (in which we have at least two time point for each respondent) has been composed of 2,008 participants. They were nested in 71 of the 110 Italian counties.[3] Table 1 shows that, as concerns the main sociodemographic variables, this sample did not perfectly fit with the Italian population. However, merging our four files caused only a slight loss in results generalizability.

3.2 Measures

3.2.1 Dependent Variable

For each survey year, we assessed crime risk perception using a four-category item: "Think of micro-criminality. How would you define the situation regarding this problem in your area of residence?", with answers ranging from "very dangerous" (4) to "not dangerous at all" (1).

3.2.2 Within Individual Predictors

We assessed direct and indirect victimization experiences for each survey year. Respondents reported if they had been directly victimized, whether at least one person belonging to their social network had been victimized, or if they had not been victimized at all. We created two dummy variables for each survey year, assessing direct victimization experiences (0 = participants who have not been victimized at all; 1 = participants who have been directly victimized at least once) and indirect victimization experiences (0 = participants whose friends and family members have not been victimized at all; 1 = participants whose friends and family members have been victimized at least once).

3.2.3 Between Individuals Predictors

Three socio-demographic variables from the 2002 survey have been included in the analysis: gender (0 = men, 1 = women), age and years of formal education. Moreover, as previously done (e.g. Russo and Roccato 2010), we considered the size of the area of residence (dummy variable: 0 for people living in towns with less than 100,000 inhabitants and 1 for people living in larger towns) as a proxy of the spread of physical and social disorders in participants' context.

3.2.4 County Level Predictors

In the analysis we considered three county-level variables, gathered from the www.istat.it website: (1) the official crime rate, as the ratio between the entire amount of crimes reported to the police force and the number of people living in each county; (2) the unemployment rate, as the quota of unemployed residents out of the county's population; and (3) the immigration rate, as the ratio between the number of immigrants living in each county and the county population.

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[3] In Italy there are 110 counties, which are local governmental institutions whose jurisdictional territories usually include numerous towns that surround one main city. We excluded from our dataset the participants living in recently founded counties, for which aggregate data are not available yet. Based on Maas and Hox (2005), we also excluded counties where there were less than 10 respondents.

3.3 Analytic Strategy

Given the multilevel nature of the present data (which varied in terms of time, individuals and county), three-level hierarchical regression models were run using the Hierarchical Linear Modelling software (HLM, Raudenbush and Bryk 2002).[4] The within individual influences exerted over time by direct and indirect victimization on crime risk perception were modelled at level 1:

$$Y_{tij} = \pi_{0ij} + \pi_{1ij}(\text{direct victimization}) + \pi_{2ij}(\text{indirect victimization}) + e_{tij}.$$

In this equation, t is the index for observation occasions, i is the index for individuals and j is the index for county. We considered our victimization variables as time-variable predictors, in that they can change over time. The intercept, π_{0ij} represented the expected mean crime risk perception for the ith individual living in the jth county at time 1 (October 2002). π_{1ij} and π_{2ij} account for the change of crime risk perception respectively due to direct and indirect victimization for the ith individual living in the jth county. Finally, e_{tij} represented the random effect for the intercept and slopes. Based on Raudenbush and Bryk (2002), we entered these predictors into our equation as centred variables.

Crime risk perception variations between individuals were modelled at level 2. The intercept at level 1 became the outcomes we tried to explain at level 2:

$$\pi_{0ij} = \beta_{00j} + \beta_{01j}(\text{age}) + \beta_{02j}(\text{gender}) + \beta_{03j}(\text{education}) \\ + \beta_{04j}(\text{size of area of residence}) + r_{0ij}.$$

In this equation β_0's represent the impact of the individual level variables we used (age, gender, education and size of area of residence) on the mean. The random effect for the intercept is represented by r_{0ij}.

Finally, at level 3 the remaining variability between counties on individual's mean outcome was modelled as a function of the crime rate, immigration rate and unemployment rate:

$$\beta_{00j} = \gamma_{000} + \gamma_{001}(\text{crime rate}) + \gamma_{002}(\text{immigration rate}) + \gamma_{003}(\text{unemployment rate}) \\ + u_{00j}.$$

In these equations the u's represent the random coefficients. All other parameters were fixed in the model.

The model was run in three steps. The first step (Model 1) included the within-individuals (between time) victimizations events, in the second step (Model 2) we added our predictors at the individual level (gender, age, education and size of area of residence). Finally, in the third step (Model 3) we entered the predictors at the county level (crime-, immigration- and unemployment-rates), in order to predict intercept (β_{00j}).

4 Results

Table 2 reports the descriptive statistics for the variables we used.

Before running the multivariate models described above, an unconditional model was run. This model aimed to examine the variance of crime risk perception, partitioning it into

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[4] It should be explicitly noted that our main goal was to model the changes in crime risk perception as a function of victimization and of the main characteristics of participants' counties, not as a function of time. Thus, this was not a growth study (Schonfeld and Rindskopf 2007).

Table 2 Within individual, between individual, and county level variables: descriptive statistics

Variables	Mean	SD	Min	Max
Within individual level				
October 2002 (N = 4,281)				
Perceived risk of crime	2.56	0.82	1	4
Direct victimization	0.14	0.35	0	1
Indirect victimization	0.65	0.48	0	1
September–October 2004 (N = 3,325)				
Perceived risk of crime	2.54	0.79	1	4
Direct victimization	0.10	0.30	0	1
Indirect victimization	0.72	0.45	0	1
January–February 2006 (N = 2,967)				
Perceived risk of crime	2.48	0.80	1	4
Direct victimization	0.19	0.40	0	1
Indirect victimization	0.60	0.49	0	1
January–February 2007 (N = 2,814)				
Perceived risk of crime	2.47	0.79	1	4
Direct victimization	0.18	0.38	0	1
Indirect victimization	0.60	0.49	0	1
Between individual level (N = 2,008)				
Age	49.51	17.07	18	94
Gender (1 = woman)	0.54	0.50	0	1
Years of formal education	10.93	3.88	0	18
Size of the area of residence	0.26	0.44	0	1
County level (N = 71)				
Crime rate	0.05	0.02	0.02	0.10
Unemployment rate	6.33	3.79	2.20	16.70
Immigration rate	0.05	0.03	0.01	0.11

within-individuals, between-individuals and between-counties variances. In our sample, 44.18 % of the variation in crime risk perception lied at the within-individual level, 44.88 % was between individuals within counties and 10.94 % was between counties. The estimated county-level variance of crime risk perception was statistically significant, $\chi^2(70) = 497.83$, $p < .001$, and was found to be of sufficient size to allow us to perform multilevel analysis. However, according to the unconditional model in our dataset there was much greater variability within and between individuals and within counties than between counties. Moreover, by comparing the similar size of the two-component variables at Levels 1 and 2 it was apparent that crime risk perception was not a time-stable construct. The estimated reliability with which counties can be distinguished on crime risk perception was 0.737.

The core of the study lays in the examination of the influence of a time-varying covariate (victimization) on fear of crime. Table 3 shows that π_{1ij} and π_{2ij} were both positively related to the dependent variable, $\pi_{1ij} = 0.14$, $t = 3.62$, $p < .001$; $\pi_{2ij} = 0.14$, $t = 6.22$, $p < .001$. Thus, consistent with HP1.1 and HP1.2, our Model 1 showed that direct and indirect victimization episodes increased the individual level of crime risk perception across time. Even though the focus of the study was not on the effect exerted by

time on the levels of crime risk perception, we conducted an exploratory analysis of this effect, which turned out to be non-significant ($\pi_{1ij} = -0.004$, ns). Our within individual (Model 1) predictors explained 49.6 % of the within individual variance in crime risk perception.

Table 3's central columns present the results of our Model 2, in which we added the between-individuals independent variables to predict crime risk perception—expected mean and modification connected to direct victimization—as a function of gender, age, education and size of area of residence (at the individual level). Consistent with HP2.1 and HP2.2, being a woman and being an older person predicted high levels of our dependent variable. Moreover, consistent with HP2.5, living in large towns increased individual crime risk perception. However, contrary to HP2.3, participants' education did not significantly influence our dependent variable. Our between-individuals (Model 2) predictors explained 46.1 % of the between-individual variance in crime risk perception.

When, in Model 3, we added the contextual variables (crime-, immigration- and unemployment-rate), consistent with HP3.1 and HP3.2, the crime- and unemployment-rates were found to increase our participants' crime risk perception. The link between the immigrant rate and the dependent variable, analysed using an exploratory approach, did not reach statistical significance. Our county-level variables (Model 3) in all explained 35.6 % of the between country variance in adjusted country mean crime risk perception.

5 Discussion

The principal aim of the present study was to analyse the longitudinal, multilevel effects exerted on the changes in people's crime risk perception by three families of variables, respectively lying at the within-individual, at the between-individuals and at the contextual levels. Consistent with our hypotheses, our results showed that crime risk perception increased as a function of being involved in direct and/or indirect victimization. Thus, in line with previous research (Amerio and Roccato 2007; Russo and Roccato 2010) performed at the individual level, victimization was found to impact longitudinally on crime risk perception. However, since previous studies used limited times series and did not include contextual factors, the current results can be considered as a step further into the crime risk perception-victimization link analysis. This result can be explained based on the assumptive world perspective (Janoff-Bulman 1989), according to which, like all the negative experiences based on the perpetrator's intention to cause harm (Craig-Henderson and Sloan 2003), victimization should jeopardize people's assumptions of relative invulnerability to negative events and of living in a substantially benevolent and meaningful world.

Our result showed that—beyond direct and indirect victimization— changes in crime risk perception depended both on individual and contextual variables. In particular, as we hypothesized, at the individual level, being a woman, being an older person and living in a large town, i.e. in a context characterized by a high prevalence of social and physical disorder, fostered an increase in crime risk perception. However, contrary to what we hypothesized, being a poorly educated person was not found to be associated with people's increase in crime risk perception. Education is typically included among crime risk perception predictors to control for participants' social vulnerability, as it usually shows strong correlations with people's socio-economic status (White 1982). However, in Italy, starting from the 1970s, the link between people's education and social status became increasingly weaker (Giampaglia and Ragone 1981). Thus, it is plausible that the lack of

Table 3 Correlates of crime risk perception

Variables	Model 1				Model 2				Model 3			
	Coeff.	SE	t ratio	p	Coeff.	SE	t ratio	p	Coeff.	SE	t ratio	p
Intercept	2.45	0.04	67.73	.001	2.44	0.04	67.84	.001	2.45	0.03	77.23	.001
Level 1—within individual (N = 4,980)												
Direct victimization	.14	0.04	3.62	.001	0.13	0.04	3.36	.001	.13	0.04	3.40	.001
Indirect victimization	.14	0.02	6.22	.001	0.14	0.02	6.32	.001	.14	0.02	6.30	.001
Level 2—between individuals (N = 2,008)												
Age					0.01	0.01	2.16	.030	0.01	0.01	2.23	.026
Gender (1 = female)					0.06	0.02	3.07	.003	0.05	0.02	2.72	.007
Education					−0.01	0.01	−0.13	.899	−0.01	0.01	−0.05	.972
Size of area of residence					0.49	0.08	6.21	.001	0.22	0.06	4.03	.001
Level 3 between county (N = 71)												
Crime rate									9.46	1.70	5.57	.001
Immigration rate									2.38	1.31	1.81	.075
Unemployment rate									.05	0.02	2.97	.005
Variance components for π_{0j}	Var.	SD	χ^2	p	Var.	SD	χ^2	p	Var.	SD	χ^2	p
Within individual	0.27	0.52			0.27	0.52			0.26	0.51		
Between individuals	0.28	0.53	6891.22	.001	0.24	0.49	1709.00	.001	0.23	0.48	1231.29	.001
Between county	0.07	0.26	497.86	.001	0.07	0.27	562.55	.001	0.04	.19	178.58	.001

In the table we provided estimates with robust standard errors. The rough estimates, available upon request, were substantially analogous to those we presented

correlation between education and crime risk perception reflected the socio-economic context in which the research has been performed more than an actual absence of links between status and crime risk perception. Longitudinal research performed to test the hypothesis of a link between education and changes in crime risk perception in other contexts would be welcome.

At the ecological level, we confirmed that people's crime risk perception increased as a function of crime rate and unemployment rate. Thus, consistent with Quillian and Pager (2010), we showed that "the case of criminal victimization provides one important illustration of the influence of social context on risk perceptions" (p. 100), which provides a social amplification of perceived risk. These results validated, in a longitudinal study, the conclusions that Russo et al. (2011) reached at the end of their one-shot multilevel study, i.e. that crime risk perceptions have, at least in part, a fairly rational and reasonable basis: indeed, they depend on the crime rate, which can be considered as a proxy of the probability of being victimized (for consistent non-longitudinal data collected in other contexts, see Swaray 2007). On the other hand, the link between crime risk perception and the unemployment rate was consistent with the thesis expressed by the most radical researchers into psychological reactions to crime (e.g. Mathieu 1995). According to them, the spread of crime risk perception has—at least in part—the function of maintaining the *status quo*, disguising the growing sense of economic insecurity experienced by people in Western countries into an insecurity which is much more innocuous for the dominant classes.

The lack of association between immigrant rate and our dependent variable gave further support to the thesis of the (at least partially) rational nature of crime risk perception. According to Blalock's (1967) social threat perspective, a community's ethnic heterogeneity should foster risk perception which, in turn, should mobilize punitive responses. More recently, working in the political psychology domain, Stenner (2005) focused on the role exerted by normative threat—i.e. by threat to "the things that makes us *one and the same*" (p. 17, italics in the original), among which communities' and societies' social heterogeneity –in producing manifest expressions of intolerance via the promotion of the perception of living in a threatening world. Our results showed that these theses cannot adequately be applied to the crime risk perception domain, in which more threatening sources of menace appeared to be crucial. Experimental research, aimed at comparing "normative threat" with criminal and economic threats, in terms of crime risk perception, would be welcome.

Results gained in the current study on the predictors of crime risk perception may well apply to risk perception in general. Indeed, previous research showed that risk perception is shaped by personal experience with hazards, socio-demographic and personality characteristics, as well as environmental and cultural variables (Chauvin et al. 2007; Mullet et al. 2005). We showed that longitudinal multilevel modelling may be a useful analytic strategy to conjointly consider the effects of most of these predictors: we believe that research on risk perception would benefit from such an approach.

5.1 Implications for Decision Making

Starting from the early 1970s, victims support services became of central interest in political and research fields. In a period of significant funding cuts to the welfare state and social services, it seems to be important to keep crime victims at the centre of the debate, instead of simply supporting police control in our cities. Considering that a disproportionate crime risk perception may exert negative consequences on quality of life, we argue

that an effective way of addressing the issue of crime risk perception would be an integration of services intended for crime victims with crime prevention services such as police control. Licensing laws, provision of police services to chronically victimized zones of the city and, in particular, individual and family counselling and visiting of victims constitute at least some possible approaches to the problem. It is assumed in what we are maintaining that the separation of victim support and crime prevention is wholly artificial. This has implications for the relationship between police and victim support, where public policies might play an important role.

Moreover, according to our results (that have shown that crime risk perception increased as a function of the unemployment rate), is it reasonable to sustain that this individual concern operates as a compound of public concerns about social stability and that it stimulates existential anxieties. Working in the direction of reducing social inequalities and reducing rates of unemployment could effectively reduce the overall level of anxiety and crime risk perception.

5.2 Limitations, Strengths and Future Directions

Our research has some strong points, mainly its longitudinal, multilevel approach and the quality of the sample we used. However, it also had some limitations, which were the quasi-inevitable consequences of having performed a secondary analysis. Indeed, we were able to analyse a valuable dataset, much richer than those typically used by researchers into crime risk perception. However, we had to leave some questions unanswered. We will discuss them below, explicitly suggesting new lines of development of our results.

First, Roe-Berning and Straker (1997) showed that, compared to people who did not, South Africans who had experienced human-induced trauma (e.g. criminal or political violence) were significantly less optimistic about *many unrelated events*. The same held true in Brown et al.'s (2005) research on the consequences of sexual victimization. Moreover, Shepperd et al. (2003) showed that the consistency of perceived risk judgments varies over time. Being involved in the 1994 Northridge earthquake produced an initial decrease in risk judgment's consistency, followed by an increased consistency in subsequent judgments. Our longitudinal data allowed us to test the longitudinal effects exerted by criminal victimization on crime risk perception, but not the magnitude and the trend of its correlation with other risk perceptions. New research aimed at deepening this issue would be germane.

Second, other developments of this research could be aimed at investigating the mediators of the victimization-perceived risk of crime links. Brown et al. (2005) showed that perceived similarity to a typical assault victim and psychological distress mediated the relation between sexual victimization and perceived risk of being sexually victimized. A test of the generalizability of this mediated effect in the criminal victimization-perceived risk of crime links would be welcome.

Third, it could be interesting to extend our approach to study the changes in the compared risk of victimization, i.e. that based on the comparison people make between their own and others' risks. Brown et al. (2005) showed that sexual victimization impacts on absolute, but not on comparative risk perception. New research aimed at extending this approach to other crime victimizations would be fruitful.

Fourth, in this research we were able to focus on crime risk perceptions only. However, the literature shows that victimization and the other independent variables we used can have other psychological consequences, mainly in terms of fear of crime, i.e. of a feeling of dread or anxiety about personal safety or about the preservation of personal possessions.

According to Ross and Jang (2000), fear of crime should be conceived as "an affective—or emotional—response characterized by being afraid, worried, and concerned about being victimized" (p. 405). More recently, (Rader 2004; Rader et al. 2007) developed an integrated model of the psychological reaction to crime, focused on a new dependent variable, labelled as "threat of victimization", and composed of three dimensions: (1) crime risk perception, which is the cognitive dimension of the construct; (2) fear of crime, which is its emotional dimension; and (3) constrained behaviours, which are its behavioural dimension. Rader's approach has been often quoted (e.g. Carro et al. 2010; Randa and Wilcox 2010), but seldom used. Moreover, a longitudinal, multilevel study aimed at predicting this variable's increase is not available yet. Such a study would be really interesting.

Fifth, the current study was focused on crime risk perception in Italy only. Moreover, we did not have any indicator of our participants' media exposure. The focus on a single country and the unavailability of such an indicator prevented us to include and test the effects of media policies and of media exposure on the dependent variable. The literature on risk perception showed that media policies may play a role in shaping risk perception (Kpanake et al. 2008). Future studies addressing crime risk perception in multiple countries and including countries' specific media policies as country-level variables would be germane.

Finally, we had to rely on a single item dependent variable when assessing crime risk perception. Even though this crime risk perception measure has been widely used in previous studies on this topic (e.g. Russo et al. 2011), a multiple item measure assessing risk perception for different types of crimes (e.g. Ho and McKean 2004) would improve the quality of the measure.

6 Conclusion

Our analysis of direct and indirect victimization in Italy over a 5-year period and our use of a multilevel approach allowed us to fill an important gap in our understanding of crime risk perception by overcoming limitations in previous studies. The longitudinal multilevel analysis we performed in the present study allowed us to confirm that this phenomenon may be understood by studying both individual and contextual features. Most importantly we showed that crime risk perception varied over time as a function of victimization experiences. When controlling for individual and contextual features, crime risk perception was significantly higher for the people who have been involved in negative experiences of criminality.

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