DYNAMCIAL MODELS OF CRIMINALITY: THE NEW FRONTIER OF MATHEMATICAL APPLICATIONS TO PSYCHOLOGY AND THE SOCIAL SCIENCES[*]

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There is now a growing body of evidence showing that violence has decline over long stretches of time, and today we may be living in the most peaceable era in our species' existence. Criminality, however, has not decline to zero and it is represents one of the most important challenge of modern societies, in particular in the developing world. A new theory of crime, conviction and reconviction has greatly benefited from the application of mathematical models, which have already demonstrated the role of important variables determinants of the types of offenders and conviction as deterrent of crimes. Current models has showed the existence of three types of offenders, who commit crimes at either high or low rates and have either a high or low risk of reoffending. In addition, such models have provided quantitative predictions about criminal careers and age-crime curves and the current theory accurately predicts the prison population contingent on a given security policy. Key conclusion of the models proposed so far is that simply imprisoning offenders will not reduce crime either by individual deterrence or by incapacitation. Although the current models assume that crimes occur at random over time according to a Poisson process, the observed action of organized crime like the ones that currently plague major cities in the developing world does not seem to obey such an assumption. There is now, therefore, a wide avenue of mathematical applications to criminality dynamics open to exploration and this could, perhaps, represent one of the most relevant contribution of mathematics to the modern world.

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