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## A SOCIAL INTERACTION MODEL WITH HOLLING TYPE II FUNCTIONAL RESPONSE

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In this paper, we formulate and analyze a series of dynamical system models of the dilation of crime. These population models of social interactions have been constructed based on predator-prey interaction models with Holling type II functional response and assuming two different types of population in a particular community/society: criminal minded and non-criminal minded. According to law policy for crime control, we scrutinize the dynamic behavior of the model system concerning law enforcement on the criminal minded population. Analytical expressions for the existence of all the equilibrium points and their stability have been investigated. Geometrical interpretations have also been given using different isoclines for existence and stability of equilibria. The ex- pressions obtained for the existence and stability of equilibrium points have been used to examine, in particular, the effects of coefficient of law of enforcement and the logistic growth term on the prevalence of crime. It is observed that for a threshold value of law enforcement, a stable limit cycle exists. More precisely thresholds for law enforcement and carrying capacity have been explicitly explained. In particular, a threshold of law of enforcement is determined beyond which the associated place/community could be made crime free. A threshold value  $R_0$  have also been introduced for our model systems. The threshold value  $(R_0)$  is similar to basic reproduction number in epidemiology. It is obtained that when  $R_0 < 1$ , crime free equilibrium is stable. Theoretical results have been supported via numerical simulations.

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