

PLAYOFF IN PEDO-PORNOGRAPHIC RINGS

CONFERENCE ABSTRACT, 24 MAY, 2005

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The child pornography criminal market, especially if it takes place into pedophilic rings, reveals to answer accurate mathematical models which prompt to check investigative approaching method to the particular criminal phenomenon.

Keywords: pedophilia, child pornography, mutual involvement, corporative surplus, high tech investigations, pedophile rings.

I. INTRODUCTION

Child pornography on Internet is a wide and worrying phenomenon which marring and wrecks the Net. Nevertheless, the diffusion and divulgation of this kind of unlawful material, take place prevalently on "pseudo-public" channels and dimensions (www, mailing list, newsgroups, BBs, etc.) in which pedo-pornographic thread is interrupted by a long sequence of handing over and mixing up of the material that makes impossible to carry out a reliable investigation about associative dynamics of pedo-pornography producer. In plain words, the investigations which have truly, with evidences, disarticulated pedophiles "Internet based" criminal associations are very few. Analysing the outcomes of one of this investigation (Operation *Hamlet- De Iniqua Turpitudine*) from a scientific point of view it's possible to produce a mathematical model concerning the behaviour of members relatively to their corporative choices and to marginal usefulness that everyone of them finds in adhering to the association. Also the pornographic production, at the base of the pactum sceleris, meets criteria which are mathematically mouldable. The research, the outcomes of which we are presenting, has, therefore, as object the application of Becker's model, about criminal market, in real terms turned, for the first time, to the "Child Pornography" world. The attaining wish is that this research could provide a new tool for an effective contrast to these crimes and a quicker identification of younger victims. In this abstract the formalization of the outcomes is omitted since they have been yet submitted to another Scientific Committee.

II. BACKGROUND

A. "Hamlet – De Iniqua Turpitudine" Operation

The operation "De Iniqua Turpitudine" (D.I.T.) is the Italy-USA joining share of Operation *Hamlet*, an investigation which involved pedophiles and pedo-pornographers coming from many European nations. In particular DIT operation, otherwise than *Hamlet* operation, involved the affiliates of an Internet based criminal association called "Fun Club". This association gathered the interests of 7 pedo-pornographers, who were equipped with their own server in

Wald (CH), strong cryptography systems (PGP & TSM), and above all with the availability of many children, crime victims, linked to the affiliates by family or trusteeship tie, also pediatric (more than 60 victims identified). The activities of this limited, compartments splitted and impenetrable group were about exclusively *Child Pornography*, in harm of aforesaid children, and *Child Erotica*, the latter, in particular, organized roundabout child podalic fetishism. The investigation – and consequent criminal trial due to the arrest of *Fun Club* affiliates – had been carried out thanks to the overcoming of cryptography systems applied to log files of ICQ message system, used by the group, which allowed to rebuild, in detail, all criminals activities in the lapse of time 2000-2002, to recover most of illegal material produced and to identify the victims.

B. Main raised out elements

The scientific research and criminological analysis work about evidences has, briefly, permitted to:

- to stigmatize some recurrent behaviours, yet pointed out in literature, which confirm the deep behavioural difference between producer and user of Child Pornography;
- to point out how pedo-pornographic rings affiliates search firmly for "souvenir boxes", monothematic and multimedia composition each one centered on a single victim (on this point some conversations contents between affiliates are paradigmatic);
- to make possible the application of Becker's mathematical models to pedophiles rings world and in particular to the associative context which, unlike the traditional crime world, is not negotiated, sets the "repetition" vertically as to the opportunism of a single associated, and wanders clearly off marginal utility criteria which can be identified in "web-based" pedo-pornography "normal" user;
- to focus the attention on group internal procedures, called "mutual involvement", which are oriented to avoid law enforcement agencies infiltration risks, to warrant the authenticity of video and graphic material produced and spreaded, to protect themselves from delations and treasons;
- to localize some of auto-financing channels through which the group managed to cover costs necessary to the technical management of the ring, to the XDSL connections, to the payment towards web spaces providers.

III. APPLICATION FIELDS AND UTILITY

This work had been carried out using a great amount of data, related both conversations and talks between “*Fun Club*” members, and seized material, and individual background (criminal and psychological) of every suspect.

The outcomes support the hypothesis of a behavioural repetitiveness according to which the pedo-pornographers respect some paradigms which, suitably modeled, offer the chance for investigators to increase successes with regard to the possibility of identification of victims of pedo-pornographic crimes, till now “lack of success” in this kind of work.

DIT operation, meaningful also for the technical solutions used to recover off-line the *Fun Club* and to follow criminal activities and for the newness of the criminological outcomes, offered a new reading key to apply to the complex, variegated, multiform criminal world of Child Pornography.

IV. PEDOPHILE MODELLING AND FORMALIZATION

C. “*Pedophile payoff*”

The Internet pedo-pornography has been characterized, till now, by some clear distinctive characters which make possible a formalization in the ambit of “*games theory*”.

From a strategical point of view a game has got three elements:

1. A group of players $i \in I$, which is possible to identify in the set $\{1, 2, 3, \dots, I\}$
2. the pure strategy space pure S_i for each player i
3. a payoff function u_i which gives to the i player the utility $u_i(s)$ (of Neumann- Morgenstern) fore each strategy profile $s = (s_1, s_2, \dots, s_I)$.

The cardinal characteristics of this phenomenon which are interesting for its formalization are:

1. “*souvenir box*”, as distinctive element of the material available to the pedo-pornographer;
2. mutual involvement
3. the use of asymmetrical cryptography (e.g. actually PGP, in the future Freenet) to assure confidentiality and privacy of communications inside the group.

The first point has got fundamental importance under two different aspects:

1. *Investigative analysis strategy*: “*souvenir box*” of each pedophile suggests an approach strongly based on the recovery and analysis of contained photos, in order to identify children subject of the violence committed at least by two different pedophiles. In fact it’s possible to demonstrate mathematically, considering also official evaluations, that coming into contact with material belonging to 30 pedophiles, there is a probability, on average, more than 0,5 to find at least 2 photos of the same child.

2. *Evidence of “infinite time repetition”* of the game of pedo-pornographer association on Internet.

The second point suggests the singling out of “*cooperation*” characteristic of the game, by virtue of the fact that any treason or opportunistic behaviour in contrast with group aims is immediately punished with the delivery to the law enforcement agencies of a photo about “mutual involvement”. This refereeing system between members produces a “cooperative surplus”, just payed with the compromising photo, which consists of the difference between the pedophile single action (e.g. the primary school teacher who acts as for him/her trying an approach with his/her pupils) and the cost of pedophile action inside the group. This cooperative surplus allows, in this way, the single member to reach his/her aim (e.g. abuse on many children) with costs lower than an individual solution.

On the other hand, the point 3, establishes a substantial equivalence between the virtual and real worlds respect to the identity of the subjects: the use of the asymmetric cryptography (due to the property of the private key) establishes that all the key-related material should be of the subject.

It’s possible now to formal define the remaining game characteristics of the virtual child-pornography:

- *Incomplete information*, the player don’t know all the previous movements of the other players;
- *N-players*;
- We cannot say it’s a “*zero-sum*” game due to the fact that the players can pay more than one player;

If we define:

- $u_i(s)$ il total payoff of the paedophile;
- p_i , the total advantage of the paedophile activity;
- c_i , the cost (time & money);
- p_l , the cost-opportunity of the paedophile;
- α_i , the likelihood to be discovered;
- r_i , the penalty.

The utility of the paedophile is:

$$u_i(s) = p_i - c_i - p_l - \alpha_i \cdot r_i$$

Future development of the work demonstration of the Nash equilibrium in the game based on the Debreu, Glicksberg e Fan Theorem (1952). New studies about the game evolution due to the presence of new virtual communities access tools.

BIBLIOGRAPHY