

The Effects of Social and Educational Environment on Physiological Reactivity to Polygraph at Young Romanian Exposed to Short-term Violent TV Journals

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Abstract—This research is focused on highlighting the effects of social and educational environment on physiological reactivity of the young Romanian exposed to short-term violent TV journals. The method: The participants were 103 youngsters, aged between 18 and 24 ($m=20.8$, $S.D.=1.6$), 42 males and 61 females, different levels of education, different social levels. The instruments were the followings: 1) The Laffayette Polygraph, LX 4000-Platinum Series; 2) The video stimuli recorded from Romanian TV news from the highest rated TV broadcasting news, scheduled at 17.00 and 19.00 hours (during the afternoon). The results: By applying Mann U nonparametric test for independent experimental groups, the hypotheses regarding the statistically significant differences between the GSR ($p<0.05$), respiration rate ($p<0.05$) and the heart rate ($p<0.05$) during the exposure to TV news involving blood and aggression have been confirmed. The findings provide evidence that young growing and living in violent and aggressive environment (theft, robber, burglars) with low level of education tend to be desensitized and to consider violence, theft, robber and homicide as being normal environment. Young growing and living in secure environment and higher education level overreact to theft, robber, burglar and homicide live TV news because they cannot adapt to violent environment on short-term exposure.

Index Terms—Desensitization, Emotional reactivity, GSR, Social environment.

I. INTRODUCTION

In the last decades, numerous reports of governmental and non-governmental health science organizations conclude that research shows significant harmful effects of exposure to aggressive especially TV news [1], [2], [3], [4], [5]. Therefore, aggression has been validly measured in many different ways, highlighting the aspects of aggression and the multiple research contexts [6], [7]. However, the media companies gain huge profits, and parents receive mixed messages about the effects despite the fact that public health and government agencies have concluded that the effect is real and sufficiently large to warrant action. Reviewing the scientific literature in the last decades, [8] emphasized that [9] found that crime and justice topics represented 20% from the crime storied on local television news, and 12 to 13% on from the network television news and [10] highlighted that broadcast news generally offer more attention to crime reports than newspapers. Furthermore, the same author mentioned that a literature review by [11] showed that 36 of the American content analyses of crime news conducted (between 1960 and 1980) found considerable variation in the proportion of crime: from 1.61% to 33.5%. Also, [10]

emphasized that television, murder and death accounted for represented 53% of all crime stories on Sky News, 42% on ITN, and 38 per cent on BBC1. Other studies presented by [8] confirm the tendency for overrepresentation concerning violent and interpersonal sex crimes to rise [12], [13].

A. Aggression and desensitization on the young

Many researchers showed through experimental and non-experimental studies the correlation between the aggressive behaviour and desensitization [14], [15], [6], [7], [16]. They used measures of physical aggression, because this is the type of aggression most frequently rewarded in violent media programs and TV news. Thus, [17], [18] emphasized that the repeated stimulation of aggressive thoughts (new ones and well-practiced ones) may cause these thoughts to become part of the person's personality. [19] highlighted that one of the most important purposes of the mass media is the education and promoting education through the mass media is possible by using educational programs during the broadcast of TV news scheduled at high rated hours. In this way, the content and presentation of the messages oriented towards all spectators has to be instructive and to be able to fulfill the education function. As the author showed, [20] highlights that while in some countries, instructive programs oriented towards children can remove the flaws of formal education; in others, they are characterized by an enriching and complementary quality. Also, [21] showed the reinforcement of violent actions, desensitization to the real-life consequences of violence and the increase of pro-violence attitudes. [22] emphasized the general aggression model and presented the Internal State box with the interaction of its components. Thus, according to this model repeated exposure to violence may contribute either to the development of an aggressive personality [23] or to the appearance of long-term effects produce by violence on TV [24]. In this way, the studies demonstrated that attributions also increase the likelihood of children behaving aggressively [25] and normative beliefs begin to act as filters to limit inappropriate social behaviors [26]. Furthermore, these normative beliefs are influenced in part by children's observing the types of behaviour around them which include that kind of behaviour observed in the mass media [27]. Long-term effects of socialization from the mass media may also be increased by the way aggression and situations which involve blood affect emotions and social behaviour [28], [29], [30], [31], [32], [33]. Thus, [34] concluded that emotions influence behaviour in social settings which exist outside the media through stimulus generalization. Therefore, a youngster may then react with inappropriate anger or fear in a

new situation similar to the one the youngster has seen in the media. Taking into consideration the economic status, [35] highlighted that the effect of media violence on aggression is essentially the same for low and high socioeconomic status children. Therefore, low socioeconomic status children on average watch more television and television violence than do high socioeconomic children [36] but the socioeconomic status link to television viewing is not the main reason for the overall association between viewing media violence and promote aggression among youth [37].

In the last decades, both on an international level and in Romania, research themes such as: the influence of the family climate on the children's, adolescents' and youngsters' development; the impact of the family climate on the cognitive and emotional development of the children, adolescents and youngsters, etc. have been studied. Furthermore, the foundations of many mental health problems that endure through adulthood are established in early life through the interaction of genetic predispositions and sustained, stress-inducing experiences [38], [39], [40]. Early stress can include child abuse or neglect, family turmoil, neighbourhood violence, extreme poverty, and other conditions in a child's environment that can prime neurobiological stress systems to become hyper-responsive to adversity [41]. [42] proved that exposure is positively associated with heightened levels of aggression in children, teenagers and young adults and negatively associated with prosocial behavior. Furthermore, the authors argued that exposure is positively related to the main mechanism underlying long-term effects of aggressive personality and aggressive cognition development being positively linked to aggressive affect and higher physiological arousal.

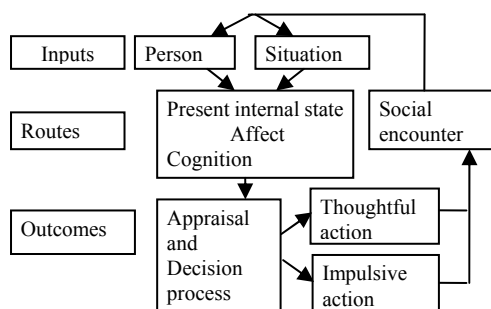


Fig. 1. The general aggression model [22, 42];

In the model from Fig. 1 the Present Internal State box indicates the interaction of components. Thus, according to this model repeated exposure to violent lyrics may contribute to the development of an aggressive personality [42], [43], as it is also true for long-term effects of TV violence [44], [45].

[21] Proved that exposure is positively associated with higher levels of aggression in young adults and children and negatively associated with prosocial behaviour. Furthermore, the authors argued that exposure is positively related to the main mechanism underlying long-term effects of aggressive personality and aggressive cognition development being positively linked to aggressive affect and high physiological arousal cited by [46], [47].

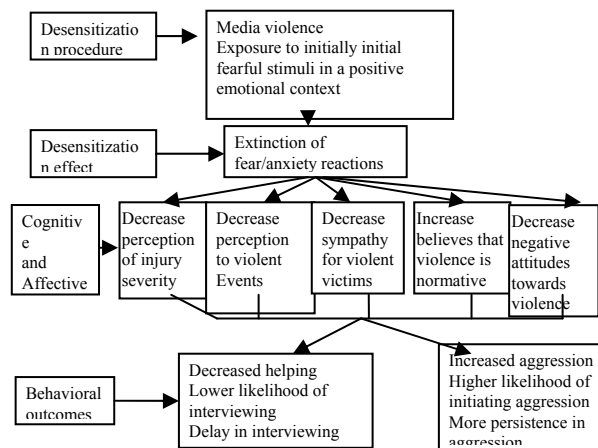


Fig. 2. The model showing the effects of exposure to media violence [21].

B. The impact of social life, education and TV violence on the young Romanian

In most countries, people of all ages get a heavy dose of violent media either in TV programs or video games [48], [49] emphasized that harmful effects of TV aggressiveness have been observed on several of the most important issues. [50], [51], [52], [53], [54], highlighted the impact of television violence on the young.

Nevertheless the social and educational environment has a strong impact on young reactions and behaviour.

Twenty years ago, the collapse of the Romanian communist regime was broadcasted on TV through scenes involving violence and blood. After the revolution the TV news constantly broadcasted either during the day or during the night shocking reports with crimes, young suicide or other aggressive and involving blood images and aggression. Romanian children and teens are daily exposed to stimuli consisting in violent and involving blood videos on TV news channels despite all the warnings coming from governmental and non-governmental health science organizations. Extensive viewing of violence and blood scenes on television (ex: somebody hit his neighbor with the hammer in the head, somebody was decapitated in the bushes) by children causes greater aggressiveness. Later, after the revolution, Romanian psychologists started a prevention campaign for parents in order to raise the alarm that children, teenagers and youngsters watching violent and involving violence and blood TV news can increase aggressiveness. The impact of TV news violence may be immediately evident in the behaviour of a child or a youngster behaviour which affects the family atmosphere and it increases the tendency towards violence.

Taking into consideration that psychology was forbidden by the communist regime for decades, its rebirth which took place twenty years ago was a miracle of the Romanian revolution. Afterwards, psychologists started to do research, to experience different dimensions of psychology and nevertheless to be involved in human development. Furthermore, experimental studies concerning the physiological reactivity to aggressive stimuli started a few years ago in the laboratory of Experimental Psychology, University of Bucharest. Thus, [54] highlighted using the polygraph the influence of violent movies, violent soundtrack and relaxing movies in physiological reactivity. Furthermore, different experimental designs using the

physiological reactivity recorded by the polygraph were completed [55], [56], [57].

II. THE RESEARCH OBJECTIVES AND HYPOTHESES

A. The objective

The objective of this research is focused on highlighting the effects of social and educational environment on physiological reactivity of the young Romanian exposed to short-term violent TV journals.

B. The hypotheses

1) General hypothesis

The social and educational living environment has a statistically significant influence on physiological reactivity recorded by the polygraph sensors of the Romanian youngsters exposed to the short-term violent TV journals.

2) Specifically hypotheses

- The social and educational living environment has a statistically significant influence on GSR amplitude and time to return recorded by the polygraph sensors of the Romanian youngsters exposed to the short-term violent TV journals.
- The social and educational living environment has a statistically significant influence on the heart rate recorded by the polygraph sensors of the Romanian youngsters exposed to the short-term violent TV journals.
- The social and educational living environment has a statistically significant influence on the blood pressure recorded by the polygraph sensors of the Romanian youngsters exposed to the short-term violent TV journals.
- The social and educational living environment has a statistically significant influence on the abdominal respiration rate recorded by the polygraph sensors of the Romanian youngsters exposed to the short-term violent TV journals.

III. THE METHOD

A. The participants

The participants were 103 youngsters, age between 18 and 24 ($m=20.8$, $S.D.=1.6$), 42 males and 61 females, different levels of education, different social levels. The participants from the first experimental group were 51 youngsters, age between 18 and 24 ($m=20.6$, $S.D.=1.52$), level of education: 8 grades, social environment: violence in family, burglars, theft, robber, homicide from tow districts from Bucharest: Ferentari and Rahova. The participants from the second experimental group were 52 youngsters, age between 18 and 24 ($m=20.6$, $S.D.=1.52$), level of education: undergraduate students at the Faculty of Psychology and Educational Sciences, University of Bucharest, social environment: good relationship in the family, high level of education of the parents: doctors, professors, lawyers, engineers from Bucharest and other areas from Romania.

B. The instruments

1) *The Lafayette Polygraph*, LX 4000-Platinum Series, with virtual interface, windows program. The polygraph soft and the GSR sensors are generally fixed about two inches apart, either to the top and bottom of the middle finger or on

the base of two adjacent fingers. Heart rate sensors are generally used to record inter-beat intervals or heart rate variability.

2) *The video stimuli* recorded from Romanian TV news from the highest rated TV broadcasting news, scheduled at 17.00 and 19.00 hours (during the afternoon).

The video stimuli with TV news consisted in 21 aggressive scenes including involving blood together with the commentaries of the news and the soundtrack. For example, the scenes showed an adolescent who committed suicide and jumped from the last floor of the block and his body was found smashed and covered in blood; or a newborn mutilated by his mother and many other scenes of this kind. The duration of the video stimuli was of 7 minutes.

C. The procedure

A polygraph examination took place in the laboratory of Experimental Psychology at the Faculty of Psychology and Educational Sciences.

The length of an examination was between 20 and 30 minutes depending on the adaptation of the participants with the environment and the polygraph sensors. The examination consisted in experimental situation with news showing violence and scenes involving blood from Romanian TV broadcasting news. The polygraph sensors recorded the GSR (Galvanic Skin Response), heart rate and respiration of the participants to the study in both experimental situations.

D. The experimental design

1) The variables

a) The independent variables:

for the experimental situation with the violent scenes from Romanian TV broadcasted news the independent variables were the social and educational environment of the youngsters.

b) *The dependent variables*: the Galvanic Skin Response (GSR) recorded as amplitude and return distance in pixels; Heart Rate and Blood Volume Pulse (BVP) and respiration (amplitude and return distance).

IV. THE RESULTS

Table I shows the descriptive statistics for the dependents variables measured by the polygraph sensors for the first experimental group (living environment: burglars, theft, robbers, homicide) exposed to the experimental situation violent scenes from Romanian TV broadcasted news.

TABLE I. DESCRIPTIVE STATISTICS

No	The first experimental group		
	Variables	Mean	Standard Deviation
1	GSR Amplitude	3.12 div	1.37
2	GSR return distance in pixels	4.19 sec	1.43
3	Heart rate	87 bpm	7.52
4	Blood volume pulse	37 mmHG	1.05
5	Respiration Amplitude P1	3.28 div	0.41
6	Respiration return P1	2.14 sec	0.21

In figure 1 we can see the diagrams of the dependent variables recorded by the polygraph for one of the first group youngsters in the experimental situation with violent TV

Romanian journals. Furthermore, it can be observed in figure 3 the GSR low amplitude and the short length of the line until return.

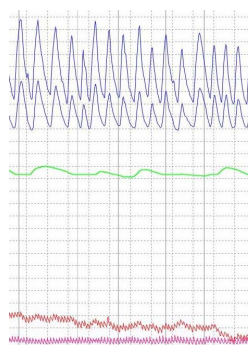


Fig. 3. Physiological reactivity of one participant from first experimental group to violent images from the TV broadcasting news

Table II shows the descriptive statistics for the dependents variables measured by the polygraph sensors for the second experimental group (living environment: doctors, lawyers, engineer, professor) exposed to the experimental situation violent scenes from Romanian TV broadcasted news.

TABLE II. DESCRIPTIVE STATISTICS

No	The nonaggressive experimental situation		
	Variables	Mean	Standard Deviation
1	GSR Amplitude	21.86 div	4.78
2	GSR return distance in pixels	18.4 sec	4.59
3	Heart rate	102 bpm	12.35
4	Blood volume pulse	41 mmHG	2.47
5	Respiration Amplitude P1	2.14 div	0.49
6	Respiration return P1	2.86 sec	0.15

Figure 2 highlights the GSR high amplitude and the length of the long line until the return at the base line for a participant from the second experimental group exposed to the experimental situation with violent TV Romanian journals.

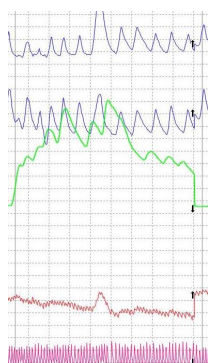


Fig. 4. Physiological reactivity of one participant from first experimental group to violent image from the TV broadcasting news

In order to test the research hypotheses, Man Whitney nonparametric test for independent groups has been used.

The first hypothesis “The social and educational living environment has a statistically significant influence on GSR amplitude and time to return recorded by the polygraph

sensors of the Romanian youngsters exposed to the short-term violent TV journals.” has been confirmed ($p < 0.01$). Therefore, in figure 1 and 2 we can observe the differences between the amplitude and and the time until the return to the base line between two participants from both experimental groups exposed to the same image with violent stimuli from Romanian TV journals the body of three month mutilated baby found by neighbours in the bloc trash bin (figure 3) and (figure 4). This difference concerning the GSR and the confirmation of second hypothesis „The social and educational living environment has a statistically significant influence on the heart rate recorded by the polygraph sensors of the Romanian youngsters exposed to the short-term violent TV journals” shows that pressure emphasises the unconscious impact that the images describing crimes have upon the young viewers. This impact is not only a short-term effect because from the violent images, youngsters learn how to live and adapt to the violent environments suffering a proces of desensitization (figure 1 and 2). Therefore they do learn educational or cultural aspects.

This can be explained by the fact that the young participants from the first experimental group have been exposed to aggressive scenes in their social environment since their childhood and they have consequently suffered from the effects of desensitization [22], [23] (figure 1 and figure 2).

The third hypothesis “The social and educational living environment has a statistically significant influence on the blood preasure recorded by the polygraph sensors of the Romanian youngsters exposed to the short-term violent TV journals.” has not been confirmed ($p < 0.01$) as the first and second hypothesis. In this way, the GSR and heart rate are the most sensible physiological indicators which change at an unconscious level when the video stimuli displaying aggression are shown. Despite this finding, there is the social and educational environment implications which confer to the participants from the first experimental group a violent and agressive environment for living.

Applying Maan U nonparametric test the fourth hypothesis “ The social and educational living environment has a statistically significant influence on the abdominal respiration rate recorded by the polygraph sensors of the Romanian youngsters exposed to the short-term violent TV journals.” has been confirmed ($p < 0.01$) and it highlights that respiration amplitude is a sensible indicator when the participant is exposed to different stimuli situation than those used in the social environment he grewed and lived.

In order to support the confirmed hypotheses, previous studies emphasized mixed methods including the EEG, GSR sensors and heart rate measurement. Therefore, [48] highlighted people's reactions to TV news where the analysing studies in which researchers have monitored the brain waves, skin resistance or heart rate of people watching TV using the Experience Sampling Method.

V. CONCLUSIONS

Following the previous research concerning the influence of violent movies, violent soundtrack and relaxing movies physiological reactivity measured by the polygraph [54], [55],

[56], [57] and the influence of family climate on perception and attention [58], this research highlights the impact of social environment of the physiological reactivity recorded by the polygraph sensors of the Romanian youngsters exposed to violent TV news. According to these findings, the social and educational environment has a strong impact on the Romanian youngsters. Thus, those growing and living in violent social environment, with low educational level are emotionally desensitized during watching a broadcast of the TV news where they saw mutilated bodies as a consequence of a fight between two rival gangs in a bar or club. They perceive as normal environment and consider no threat in those violent video stimuli. Despite the previous results, concerning youngsters' perception of both words and scenes involving blood and aggression from the TV news and the scenes related to culture, education and tourism, where the young undergraduate students have statistically different physiological reactivity than a short time exposure to cultural, educational and turistic TV news broadcasted [59] according this research the young undergraduate students at psychology seems to be influenced in their reactivity to violent scenes by their social and educational high level environment. Although youngsters do not bring to a conscious level the physiological changes concerning the GSR reactivity, the pulse and the blood pressure, these modifications can determine change in emotion and cognition [17], [18] and in personality, leading, therefore, to desensitization[14], [15], [6], [7], [16]. The main highlight of this research emphasises the fact that the youngsters exposed to images from TV news involving aggression and blood, are not conscious about both the negative changes and the appearance of a step by step desensitization. As we mentioned in the previous study concerning the perception of TV news which contain scenes with blood and aggression, the first group of youngsters living in the violent social environment youngsters feel as normal environment the violence TV journal news. These discoveries are also supported by [22] who highlighted that on short term, exposure to media violence causes increases in children's, adolescents', and young adults' physically and verbally aggressive behaviour [57] as well as in aggressive thoughts and emotions that are theoretically linked to aggressive and violent behavior. Also, as a support to this research, different researchers have emphasized through empirical studies that there is a strong statistically significant correlation between fear of crime and exposure to aggressiveness through the TV news [50], [51], [52], [53], [54].

In other studies, [55], [56], [57] also established a complex interrelationship of media content and other dimensions of social structure and experience offensive behaviour and fear of crime.

Concerning the results obtained in this research as well as in previous studies [58], [59] we have an controverse which rise from the social environment and youngsters behavior: „Which is the way to provide the best and the most safety way of living to our youngsters: to grow them in violent social environment, exposing them to violent TV news, video games and films or grow them in a safety and harmonious social environment far from violence, educating them in prestigious Universities?“. In previous research we advise

according the results that parents, psychologists, youngsters, adolescents and other persons should know and educate the children and the youngsters in Romania on how to avoid the aggressive and blood scenes in TV news although these are more attractive having a very high rating compared to TV news or shows having cultural, scientific, educational and touristic themes, [59]. The conclusion of previous research highlights that aggressive and blood scenes in TV news have to be prohibited and replaced with educative and nonviolent news at least at the hours with the highest rating during the day. Quite contrary this study highlights that those youngsters growing and living in violent social enviroment are prepared for living in violence and negative social environment in comparasing with those yougsters growing and living in positive social environment and high level calification. These contoverse rise questions for the future studies: how to adapt the behavior, emotional and cognitive states of the youngsters to both secure social environment and violent environment, retaining the most useful aspects for their life and for their co-habitants life.

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