Comparative Analysis of the Effects of Negative and Neutral TV News Stories

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Abstract

The current article compares the impact of emotionally negative and neutral TV-plots on psycho-physiological state of a recipient. After introducing the participants to negative and neutral videos, we detected such short-term media effects as changes in mood, emotional well-being, facial reactions, and increase of heart rate.

Keywords: Experiment, Electrocardiogram, Psycho Diagnostics, Emotional State, Media Effect, Facial Reaction.

1. Introduction

There has always been an enormous topicality of an issue of media effects and their impact on the further behaviour of recipients of media content. Rapid development of radio in the U.S. in the 1930s and TV in the 1960s also provoked public concerns about possible impact of its content on the minds and behaviour of the consumers. During the last century the United States were the first country where rapid development of radio and television broadcasting took place.

Special attention was paid to the study of negative impact of mass media. Such negative content often includes materials containing violence. According to the report of the UNESCO "Violence and Terror in the Mass Media" dedicated to the problem of violence on television, the majority of the studies in this area was conducted in the US, "where the study of penetration of the media and public communication (fuelled with commercial and social considerations) show early and rapid progress" (Violence and terror in the mass media). Lots of studies on the impact of viewing violence and group conflicts on the subsequent behaviour have been conducted so far, but this area of research is currently lacking in Ukraine.

2. Objects and methods

Twenty six healthy volunteers (women and men) participated in the study. The volunteers, aged 17 to 20
years, were recruited among first- and second-year students of National Taras Shevchenko University of Kyiv. The study was conducted at the National Taras Shevchenko University of Kyiv, Educational and Scientific Centre “Institute of Biology”, Department of Physiology of Brain and Psychophysiology.

The participants were randomly assigned to two study groups. The first group was offered neutral TV-news’ plots, the second group - emotionally negative TV-news’ plots. The participants were asked to rate videos according the scales "unpleasant - pleasant", and "relaxing - activating" from -5 to +5.

Such tests as State Anxiety Inventory by C. Spielberger, Y. Hanin (Eliseev, 2006), Internal Aggression Test by S. Dayhoff (Anger Management, 2010), and WAM (Well-being, Activity, Mood) (Smirnov & Dolgopolova, 2007; Ilyin, 2001) were administered before and after the experiment. At the end of the experiment we used Aggression Test by A. Assinger (assessment of aggressiveness in the relationship) (Raigorodskij, 2006).

Before the experiment the volunteers received the following instructions: a participant should sit still with his/her eyes closed, open the eyes after the signal of the investigator, remain in this position for certain period of time, watch the videos with pauses between them, sit still with the eyes open again, and close the eyes after the signal. During the experiment the participants were seated in a sound- and light-proof chamber in a comfortable armchair in a reclined position.

The scheme of the experiment was as follows: a participant adapted him/herself to the conditions of the experiment during 30 seconds; background ECG with closed eyes had been recorded during 3 minutes; background ECG with open eyes had been recorded during 1.5 minutes; a participant watched five TV news plots (either neutral or negative) with 1.5-minutes pauses between them (during the pauses volunteers saw a dark monitor). Two aftereffect recordings of ECG with eyes open (1.5 minutes) and eyes closed (3 minutes) were performed after the last TV-plot. After the recording was completed, the participants were requested to fill in an evaluation form, which characterized the plots as pleasant/unpleasant and soothing/exciting.

ECG was used as a physiological indicator to show probable effects of mass media. ECG measurements were performed using the hardware and software complex PC EEG NeuroCom (XAI-Medica of National Aerospace University, Kharkiv).

3. Results

Mood changes, caused by the negative sequence of news’ plots, were found to be almost twice as high as those caused by the neutral sequence, when measured using a mood-ruler: -4.5 while watching the neutral plots, and -8 under the influence of the negative stories. Thus the deterioration of mood was stronger when exposed to the negative sequence of plots. According to WAM questionnaire, the mood of participants improved when viewing neutral subjects, though very slightly. However, viewing negative stories significantly worsened the mood of the participants. If compare the mood dynamics of WAM questionnaire (indirect evaluation of volunteers’ own mood) with the mood-ruler (direct measure), it is clear that the data contradict each other. This suggests that the participants tend to directly assess the worsening of their mood due to neutral news stronger than they do it indirectly.

Another important indicator is the fatigue, caused by the participation in the experiment. Subjects were asked to evaluate their fatigue, caused by participation in experiment, ranging from 1 (they feel tired) or 0 (they do not feel tired). As a result, 30.77 % (8 out of 26) of the participants exposed to the neutral sequence of plots felt tired, and 23.08 % (6 out of 26) of those exposed to the negative sequence felt tired. These data demonstrate almost identical levels of fatigue among two groups of participants. Slight advantage in favour of neutral plots (where the participants experienced more fatigue) can still indicate lower interest to neutral plots.

Well-being among those exposed to the neutral news plots, deteriorated by 2.2 times in comparison to the group exposed to the negative plots. This may indicate a familiarity of negative news to the participants on the one hand, the lack of interest in neutral TV-materials on the other hand, and some discomfort due to this.

As regards activity, the participants felt less active after watching both sequences of plots. However, neutral
plots caused stronger decrease of mental activity, which may be explained by the boredom, experienced by the participants. Negative scenes reduced activity of the participants approximately 1.8 times less than did neutral ones.

Neutral TV-plots were accepted more favourably by the participants, while negative stories were perceived as unpleasant. Negative plots were rated as more activating, neutral - as more relaxing.

In our study situational anxiety was of particular interest. It may be provoked by certain stimuli or situations in everyday life, such as watching television news. Growth of situational anxiety for the participants averaged 1.62 points after viewing emotionally neutral TV-news’ sequence, and 3.5 points – after emotionally negative videos. The difference may indicate that negative videos evoke greater situational anxiety in volunteers than neutral ones.

As regards the level of stable aggression (Aggression Test of A. Assinger), there are almost identical values of indicator for both groups of videos (the difference is less than one percent with advantage for negative plots, which shows a little more aggressive reactions, caused by negative news). The Internal Aggression Test of S. Dayhoff demonstrated a striking difference between rates of perception of negative and neutral TV-news. Each one of the video-sequences has stimulated the participants to increase their internal aggression. Internal aggression (anger) caused by neutral videos declined twice as much as the aggression caused by the negative plots. Slight decrease in aggressiveness, provoked by the negative plots, indicates familiarity of such content for the participants. Stronger reduction of aggressiveness, observed after the demonstration of the neutral plots, caused more disinterest among the participants.

We assume that facial movements of the participants in this study are related to emotional feelings they experience during the experiment, and represent "basic emotional states" (Ekman, 2010). There are 7 such states (sadness, anger, contempt, disgust, fear, surprise and pleasure), and signs of each one are displayed by means of different groups of muscles (for instance, eyebrows, lips, or the muscles around the eyes). In the course of processing the videos with facial reactions of volunteers we haven’t recorded basic emotional states, but only movements that may indicate such states. The main reason is that science cannot yet unequivocally attribute certain facial expression to certain emotional feeling, rather than purely physiological move.

Only explicit facial movements the participants made while watching certain plots were interpreted (during pauses between videos facial expressions of each volunteer haven’t been recorded). Fuzzy changing of facial expressions that are due to weak light and technical capabilities of the camera haven’t been taken into account. We have also disregarded long-term differences of facial reactions, because they reflect sustainable mood characteristics (usually in volunteers at the beginning of viewing a plot was neutral facial expression).

We detected short-term (up to 1 - 2 seconds) and long-term differences between immediate facial reactions. We fixed intermittent facial reactions that indicated changes of emotional state of each volunteer under the influence of various stimuli. In general, 140 facial reactions were observed during the experiment. Of these expressions we recorded 83 (59.29%) facial reactions on negative television plots and 57 (41.71%) - on neutral sequence of videos.

From the analysis of facial expressions we can conclude that in general emotionally neutral plots often cause boredom and sometimes even drowsiness (covered relaxed eyes, sometimes raised relaxed eyebrows, the participant was not looking at the monitor during the display of videos). Instead, negative news stories resulted in completely different reactions of volunteers - concentration, anger, fear and surprise. Complex mimic moves during viewing negative plots included tense eyebrows and rounding (usually not significant) of eyes, compared with a neutral expression. The expression recorded at the first second of each plot was regarded as neutral. Typically, faces of volunteers in those moments expressed serenity.

The most common facial expressions while viewing negative videos were rounding eyes in combination with frowned eyebrows, indicating the "interest or concentration in small manifestations" (Ekman & Friesen, 1975). If eyes were rounded even more, it could be regarded as a sign of fear, and in combination with lowered eyebrows – could mean anger. Rounding eyes during viewing of experimental plots happened 38 times (27.14% of the total array of facial expressions, 43.68% of all reactions only on negative videos). While viewing neutral videos, this
movement occurred only once (0.71% of the total array, 1.75% of the expressions to neutral plots).

As predicted, the negative plots caused more emotions (such as anger, fear, or disgust) and concentration. We analyzed further, which part of the face reacted mostly while viewing two different sequences of videos. Movements of eyebrows were recorded in 35.71% of cases, movements of eyes — in 53.57% of cases, movements of lips — in 5.71% of cases, and movements of jaw — in 5% of cases.

While demonstrating negative plots, we observed significant changes in heart rate. Every next pause after each plot was characterized by the increased heart rate than the previous one. This may indicate a possible effect of being affected by the information a participant has just seen and heard about, or certain associations with a participant’s experience.

The average heart rate was 70.40 beats per minute for neutral and 71.62 beats per minute for negative stories, with the difference of 1.73% between them.

The peak of cardiac activity was observed not while watching plots, but during pauses after plots, when volunteers hadn’t been stimulated by any experimental stimulus. So the strongest impact on the heart rate negative TV-news’ made only some time after viewing such plots. It may indicate that a person needs some time to process the presented information, and we can assume that a particular after-effect may indicate reaction of volunteers to every plot. In case of negative TV-news there was reflection and recollection of details, which led to increase of cardiac activity in pauses after each plot.

4. Conclusion

By the present study we begin a new line of research of media influence on psycho-physiological state of TV audience, in particular influence of negative news.

Negative videos caused our volunteers to react with more concentration, anger, fear, disgust and only sometimes with contempt. When demonstrating neutral videos, we have recorded signs of boredom (distraction and looks aside, narrowing eyes movements, relaxed eyebrows) and contempt. We detected changes in well-being, activity, and mood of the participants after demonstrating them neutral and negative video plots: negative stories significantly worsened the mood of the participants, evoked greater situational anxiety, accelerated heart rate, and increased the level of aggressiveness, although neutral stories caused more significant decrease of mental activity.

As regards further study, the effects of movies, advertisements and other media products should also be examined to reveal their impact on the wellbeing, activity, mood, and level of aggressiveness of audience.

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Appendix 1

List of the emotionally neutral TV-news plots.
1. Lviv Publishers’ Forum, duration 1 min. 25 sec., «24», 10 September 2009 (http://www.youtube.com/watch?v=Nz0DXxzhbwQ)
2. Business kaleidoscope-1, the duration of 1 min. 15 sec., “First Business”, 5 April 2011 (http://www.youtube.com/watch?v=E3P0gmHkOC4)
3. Shale gas, the duration of 1 min. 27 seconds., “First Business”, 21 February 2011 (http://www.youtube.com/watch?v=meCkpAznYwk)
4. Business kaleidoscope-2, the duration of 1 min. 32 sec., “First Business”, 26 March 2011 (http://www.youtube.com/watch?v=Lux2-1u0wSA)
5. The guards, duration 1 min. 30 sec., «UBR», 4 December 2009 (http://www.youtube.com/watch?v=sGw6_cQrNuY)

Appendix 2

List of the emotionally negative TV-news plots.
2. Japan - Tsunami, duration 1 min. 49 seconds., “Channel 5”, 15 March 2011
3. Self-immolation, the duration of 1 min. 22 sec., site Lifenews.ru, 5 April 2011
5. Fighting football fans at the Manege Square in Moscow, duration 1 min. 49 sec., Lifenews.ru, 11 December 2010.