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INFORMATION AND WARNING ON ROAD TRAFFIC NOISE BY VISUAL MEANS

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***Abstract:** Evolution of road traffic in Romania in recent years has led to increased noise levels both in urban environments and on high traffic routes. Measures taken by authorities for noise assessment and noise mapping, as required by European Noise Directive, should be supported by the public to become effective. This requires good information and education of the population in terms of noise pollution, including warnings on the harmful effects of noise exposure. Based on these requirements, a series of graphical objects (poster, brochure and flyer) were developed, focused on road traffic noise, in order to prepare an information and warning campaign. They are original visions of young artists who have transposed into visual form the message to be sent to the target group, depending on their own perception. The paper presents some of these graphic works, in terms of dealing with issues of addressing a quite heterogeneous target group, assimilated to the general audience.*

***Key words:** road traffic noise, noise pollution, acoustics, visual information*

1. INTRODUCTION

Noise is known as one of the environmental pollutants that caused serious concern in recent years due to its interference with important actions in our everyday life and due to the broad spectrum of effects on the health, reaction and behavior of exposed persons, being one of the determinants of environmental comfort. Concerns about reducing the risks increased lately, both in terms of occupational exposure to noise and exposure to environmental noise, in the context of the interest expressed at the level of European Commission of granting priority status to activities related to the assessment, prediction and control of noise as a result of desire and necessity to protect the population against the environmental pollutants.

The transport sector in Romania was affected by major changes in the last twenty years due to several factors including [7]: decline of the industries that most likely use the rail transport; insufficient development of road and rail infrastructure, with low investment; rapid growth in private vehicle ownership; damage of road and rail infrastructure due to

environmental factors. Resulting effects were mainly due to the imbalance between road and rail transport, with emphasis on the first. Such effects are: road congestion, increased operating costs for road vehicles and road journey times, negative impact on competitiveness and investment attractiveness of the Romanian market and, last but not least, increasing environmental degradation and negative effects on humans.

Road traffic noise is recognized as the major source of environmental noise [1], [2], actions already being initiated to avoid harmful effects on the exposed population and to preserve quiet areas. These include assessment of noise exposure and perception, prediction of environmental noise, but also research of new methods and systems for reduction and control of noise at source and on the propagation path. The message to be transmitted by this paper, in the context of the above mentioned, is the need to include - among the actions associated with the concept of road traffic noise management - effective ways for continuous and accurate information of population, enabling individuals to make their own decisions and to take measures for protection.

2. ROAD TRAFFIC NOISE

Further increase in the number of cars and heavy vehicles [7] will result in an upward development of traffic, both in urban and suburban areas, which means inevitably increase in noise emission. In Romania traffic composition has changed in the last twenty years, influenced by economic, technological and social factors. The proportion of heavy vehicles in total traffic had a period of decline (between the years 1990 and 2000), followed by a return which also meant renewing old models with new ones having much higher transport capacities. Road freight traffic has increased in recent years, even in detriment of freight transport by rail, and also the average distance of transportation. A characteristic of the road traffic outside the cities is its focus on a limited number of routes, which makes them become more crowded, to the limit of the transportation capacity. All these have led to sharp increase in road traffic noise in areas near high traffic routes.

The target is to improve the quality of environment, in terms of noise, and to reduce exposure. This noise reduction potential mainly refers to noise reduction at the source. In the case of road transport, sources are divided into: propulsion noise (also called vehicle noise, consisting of engine, transmission and exhaust systems), rolling noise (generated at the contact between tires and the road surface) and aerodynamic noise (caused by turbulent air currents formed on the surface and edges of the car structure). Moreover, single source must be integrated in the concept of road traffic noise, being dependent on a number of other features which influence its characteristics: traffic composition, vehicles speed, traffic flow and speed fluctuations, road dimensions and type, road surface type, a.s.o.

The reduction of road noise, by acting only on the noise emitted by each vehicle, will not have spectacular results, sometimes even satisfactory. Therefore the action on noise control should also include management and planning decisions (structure and road surfaces, noise barriers, speed limits, a.s.o.). A key is to keep in attention the fact that the center of all these actions is the desire to reduce human

exposure to noise. In this context, a first action should be the information of people about the harmful effects of noise and possible means of individual or group protection, knowing that the perception of noise and its effects vary from individual to individual.

3. PUBLIC INFORMATION

Noise abatement actions can be effective only if the information on environmental noise are made public and if people at risk of exposure have at least basic knowledge of noise and are aware that noise is an environmental hazard which needs to be controlled. Moreover, it is important that the information received by the recipient to be correct and to arrive on time. Lack of information causes people to not respond as expected to certain requirements and not comply with certain measures and restrictions imposed by authorities, or to not appreciate the effort made in some actions like noise mapping the urban environments. From a general perspective, one can say that disseminate information on environmental noise to the public is a necessary component of civic education, so we should give it a special attention.

Various public information devices are managed by local or governmental authorities to inform the population on certain topics in order to change different types of behavior and attitudes. The efficiency of advertisements and advertising campaigns as supports for commercial messages has been noticed for a while. In quite the same manner, the governments of the different countries have initiated informational campaigns for public interest (e.g. the USA 1930-1940 hygiene education campaign, or the great number of informational campaigns on health problems, pollution, environmental protection matters, a.s.o.)

Public interest campaigns may be initiated at different levels, involving one or more than just one medium. Greater efficiency has more recently been achieved by combining printed media and moving pictures. A first study in finding a graphic sign for dissemination should begin with a study of the issue itself. Certain messages and certain information may be

received in a number of ways, depending on the existing grounds for perceiving the problem.

There is a problem occurring in such a public information campaign as the protection against noise: the problem of understanding the concept. A solution to reach a response from a targeted public consisting of a population lacking in specialized knowledge of the matter should be searched for in a territory beyond the various definitions and measuring units, whose numbers and scales are not at such a public's hand. A preliminary study reveals the fact that there are a number of signs functioning in the public space - most of them traffic signs - signaling requirements such as "no honking", "speed limit", "residential zone", a.s.o, which implicitly manage limitation, interdiction, or warning against producing a certain level of noise.

A sociological study conducted during 2009 in a Romanian city - Cluj-Napoca - showed that the risks induced by noise pollution are not perceived by the population in their true size, mainly because of poor informing [5], [6]. One conclusion was that the strategy and method of informing public has to be changed, both in terms of information content and its means of dissemination.

Information should refer to the following issues: general concepts about the sources of noise, its propagation and measurement; national legislation; European and international context; local policy on environmental noise; adverse health effects of noise; vulnerable groups; specific noise sources for urban areas; admissible values of noise; existing noise levels for specific environments; administrative measures to prevent and reduce environmental noise; possible alternatives.

4. PUBLIC INFORMING AND WARNING BY GRAPHIC MEDIA

Due to the fact that the target group is quite large and heterogeneous (the population of either a town or a region), the problem of conceiving a number of graphic objects for informing and warning should be dealt with in a general way, rather than be lost about by going into too many details, relying on the

visual impact upon the viewer. One challenge is to choose best graphical objects for the transmission of information about noise effects, with large enough visual impact to bring the message to the forefront.

Exhibition spaces have a key role in choosing the type of graphics solution to transmit the message with greater efficiency. Usually, a poster in the street is supposed to attract the attention and to raise the interest or at least the curiosity of passersby. If this happens we find ourselves standing still in front of it, reading the message of the text and somehow reacting to it.

Naturally, information on the negative effects of the exposure to noise should be placed in passages or waiting areas, where the necessary amount of time to look at a poster or a leaflet concerning the problem of noise is usually greater. The places where the posters or flyers are exhibited should also be significant: the entrance halls of the buildings stepped into from the noisy street, the waiting rooms of doctors or hospitals, a.s.o., where people tend to be more alert about their own health.

There are principles of design according to which the effect on the viewer of a certain poster can be increased [3], [4]. They concern shape, color, and composition, on the one hand, and contrast and proportion; quantity, rhythm, dynamics, a.s.o., on the other. A poster should achieve the greatest impact on the viewer with the least graphic means. There is the concept of sign-signal today, whose function starts from passive communication and information; it may refer to guiding, ordering, warning, interdiction, and instructing.

The poster should be legible and the message should be clear; the poster should be graphically innovative, and should raise interest, and last but not least, should contain a noteworthy element to establish a connection, a dialogue, between the viewer and its subject matter. Its dimensions are also important. The bigger the dimensions and the lesser the number of elements and the more reductive the shapes are, the easier the recognition and the generated response in the viewer tend to be.

The poster addresses the level of combining information and emotion. Detailed information

can only be offered through a brochure or a flyer, which are more appropriate for this kind of informing audiences.

5. GRAPHIC WORKS ON ROAD TRAFFIC NOISE - EXAMPLES

The role of the posters created for the present study is that of raising a question of and to increase the public interest in the problem of the traffic noise. Therefore, a first instance of an informational campaign is that of the production of independent posters that bring to public attention one and the same message by making use of different graphic solutions.

The title of the poster in figure 1 hints at a desire that the sonometer should indicate an acceptable value of the noise level, which comes in contradiction with the image of the sonometer indicating a much higher value (84.4 dB). The presence of an explanatory text with reference to the harmful effects of noise upon the good health of people, which appears on semitransparent diagonal fields, suggests the cumulative effect of the exposure to noise, the abnormal situation. The gray colors emphasize the state of annoyance and anxiety.

The poster “Protect yourself against the noise” (figure 2) uses a background image that has become a symbol of traffic jams (the multilevel road crossing). The “thermometer” creates a suggestion of an excessive increase of a certain level - in our case that of the noise. The value of 93db is itself suggestive for the initiate.



Fig. 1 ”What if the sonometer ... ”
Paul Somlea, student, UAD, Cluj-Napoca

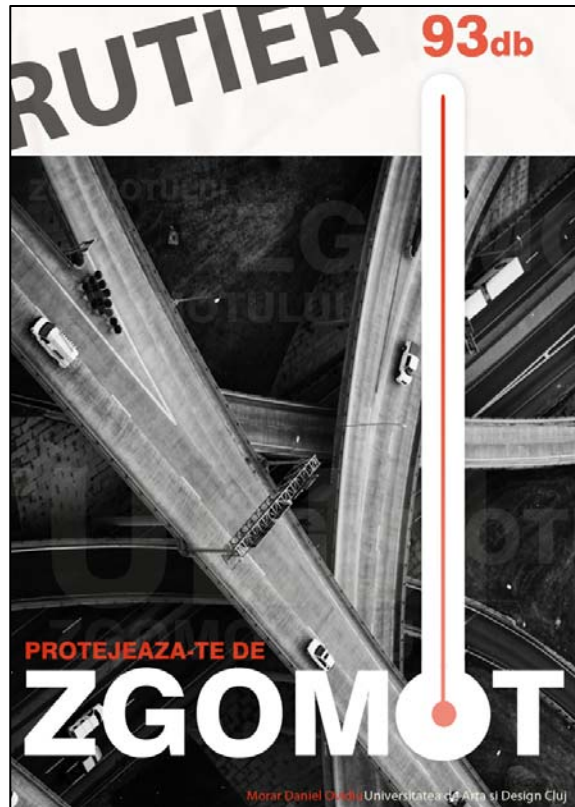


Fig. 2 “Protect yourself against the noise”
Daniel Morar, student, UAD Cluj-Napoca

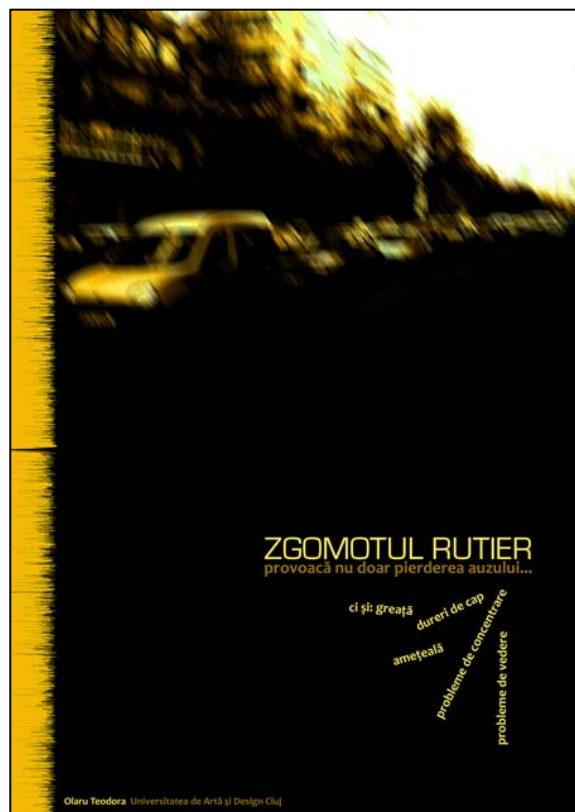


Fig. 3 “Traffic noise causes more than just the loss of hearing”,
Teodora Olaru, student, UAD Cluj-Napoca

The somewhat static image (figure 3), dominated by a dark area as well as the horizontality of the main text suggest the existence of a factual state against which we became tolerant or indifferent. The texts which describe the health hazards caused by the exposure to noise are randomly placed, coming as a side product of the traffic noise.

The graphic work presented in figure 4 makes use of juxtaposed images presenting the human character as a kind of victim. The figure is aggressed by the title of the poster, title which introduces the notion of urban noise besides traffic noise. The character symbolically looks into the empty space inside the letter “O”, which suggests the hazard which may be carried by the immateriality of noise for those who ignore it. The yellow-black combination of colors is reminiscent of the way traffic signs for danger.

Using the same technique of juxtaposed images, the poster in figure 5 combines the image of an overpopulated city in the background with the image of a young female who screams out her stress.



Fig. 4 “Traffic noise /urban noise”
Ioana Andreea Cocis, student, UAD Cluj-Napoca

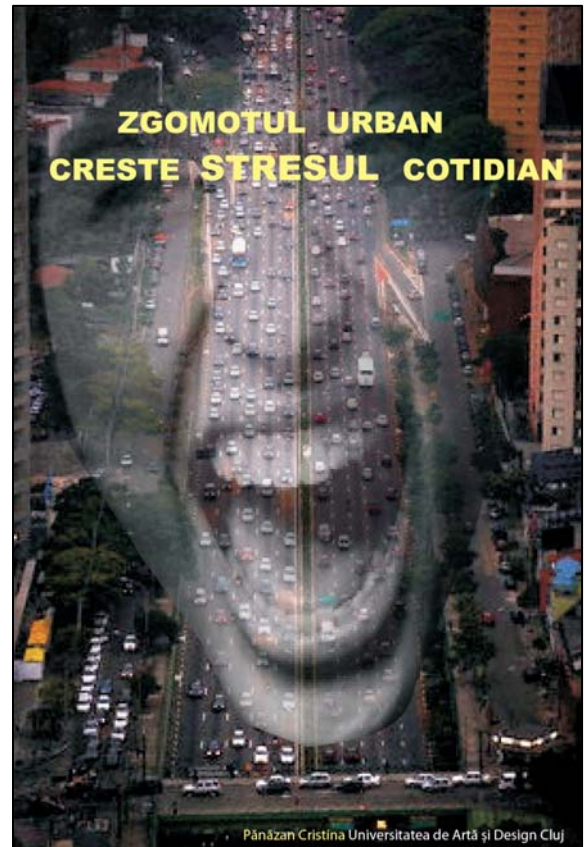


Fig. 5 “Urban noise increases everyday stress”,
Cristina Panazan, student, UAD Cluj-Napoca



Fig. 6 “Noise”, Iulia Tintas, student,
UAD CLuj-Napoca

The author of poster: "Noise" (figure 6) uses a simple formula by which the title of the poster dominates an image of a street. The semitransparent layout in the poster associated with the text appearing in an aggressive zigzag makes yet another suggestion of the effects the traffic noise produces in an urban environment.

Visual means of expression and their possibilities to inform are extremely varied and they evolve according to the social, economic and technological developments of a society. Posters below come to illustrate this. They refer to the problem of noise in general. For example the poster in figure 13 uses the stereotip link between the image of the ear and noise to attract attention.

The white space (poster in figure 8) means peace in which the human element is expressed by those few words: "A little silence doesn't hurt...", written by hand. In figure 9 the image of uncontrolled spots and the word "noise" harmonize to convey the message of an unseen danger. Figure 10 is a familiar image in cinema today, fantomatica and alien, to attract younger people to visit a website where they can find information about the dangers of noise.

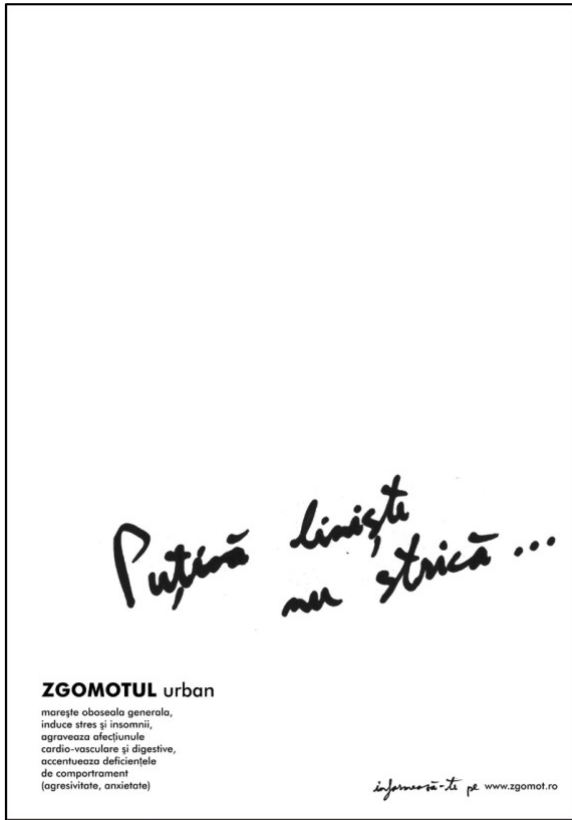


Fig. 8 "A little silence doesn't hurt"

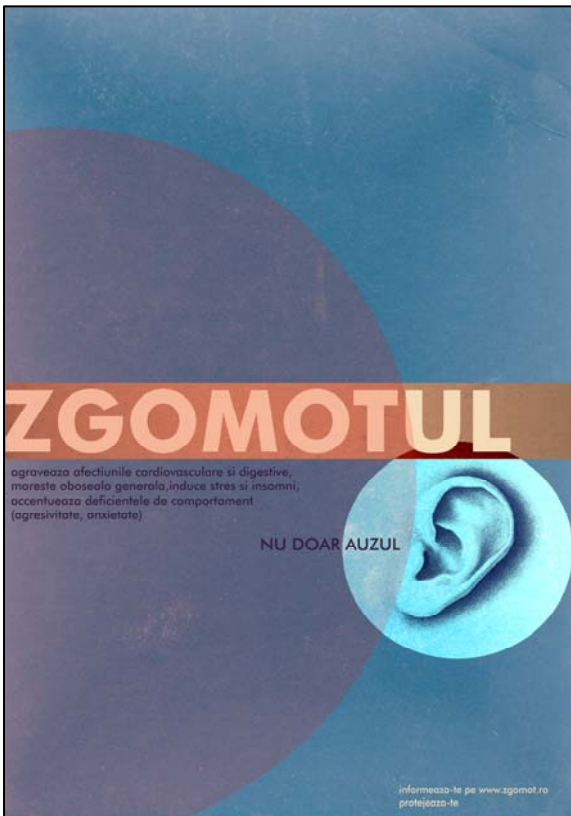


Fig. 7 "Not only your hearing"



Fig. 9 "It's more dangerous than you think"



Fig. 10 “www.nuzgomotului.ro”

There is also the approach of the series of posters treating the problem of the message as a whole. They keep the viewer’s attention within the co-ordinates of a similar graphic image, with an end to achieve a dialogue between the poster and the on-looker. This series is represented here by two works (fig. 11 and 12).

The series may be extended to new solutions and variants. They ought to maintain the red-yellow dominant areas to suggest the idea of danger. The unity of the two posters is given by image, color, and composition, despite the fact that the titles are placed differently. Moreover, the two posters complement each other by making a link between “urban noise” and “traffic noise” (figure 11).

The series of posters in figure 12 shows a somewhat appealing image of two vehicles which, though not completely identifiable, bring about the idea of luxury. The posters attain a strong visual impact which makes them both attractive and memorable by a combination of the geometry of semitransparent angular areas with the text warning against the harmful effects of noise.



Fig. 11 The series titled: “Urban noise-traffic noise”, Anca Pora, student, UAD Cluj-Napoca

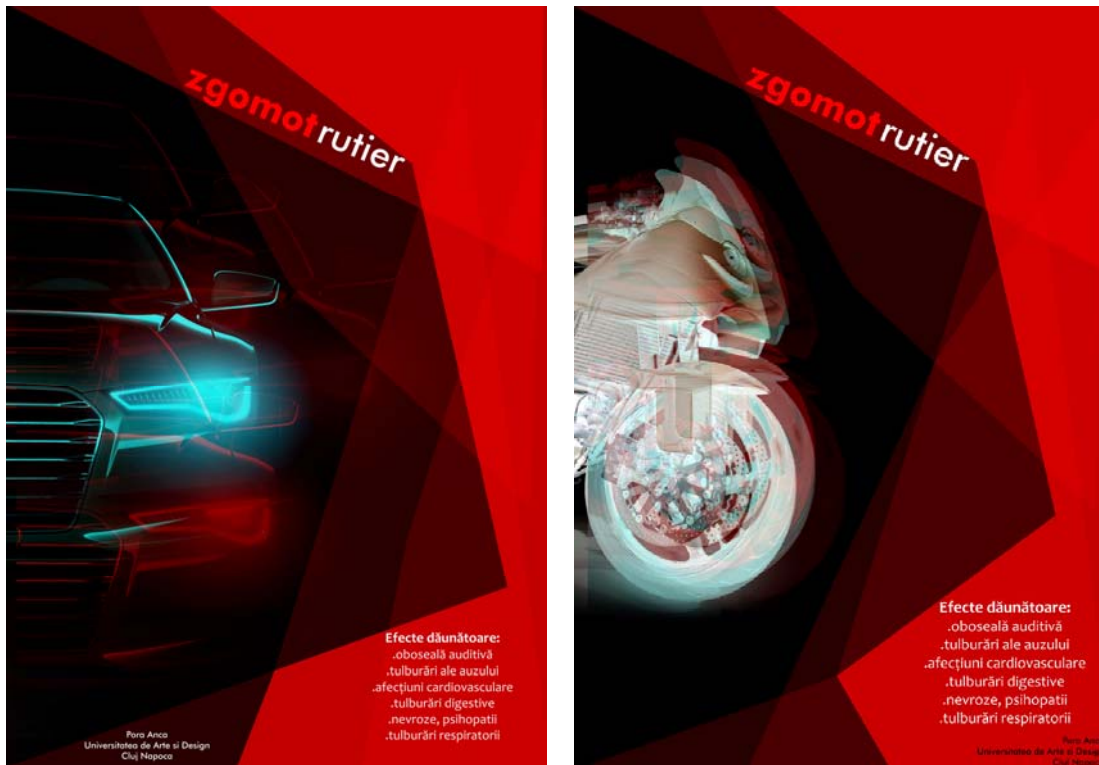


Fig. 12 The series titled: “Traffic noise”, Anca Pora, student, UAD Cluj-Napoca



Fig. 13 The series titled: “Traffic noise”, Teodora Olaru, student, UAD Cluj-Napoca

Another series (figure 13) is conceived as a formal and compositional unity, having chromatic differences. The successive presentation of these posters creates an impression of making topical and bringing up again the problematic of noise. The image metaphorically depicts a road crossing, a “knot” which may symbolize the idea of “problem”

The series of posters and brochures is a solution which offers more ample information (figures 14 and 15). On the one hand the poster

warns about and calls for attention to a certain problem; on the other the brochure may bring about more detailed information. The series of posters presented in figure 14 employs the image of a female character that evolves, along the series, from a state of mere suffering to a state of despair expressed by a scream of protest. Such solutions familiarize the viewer with the depicted character, who may raise empathy, compassion, and consequently interest in the problematic of noise.



Fig. 14 Poster/brochure series, Cristina Kudor, student, UAD, Cluj-Napoca

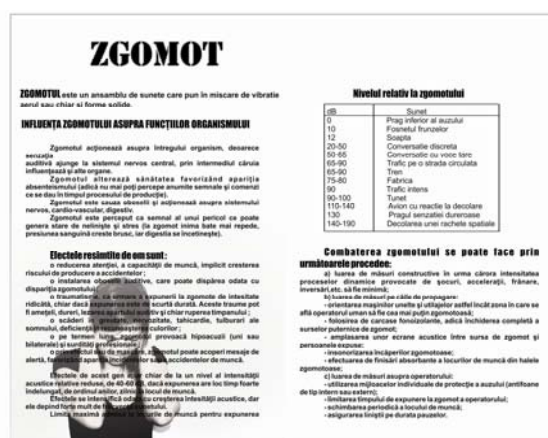


Fig. 15 Brochure covers, Cristina Kudor, student, UAD, Cluj-Napoca

Brochures and leaflets are graphic objects containing a variable number of pages. Nevertheless, they may have the dimensions of a post card which may be handed out or made available to the public. The cover of a brochure - like the one in figure 15 - could also be the face and the verso of a post card or flyer containing key information about the relation between noise and health.

6. CONCLUSION

The traffic plays an important role in the combination of noise sources which generate discomfort and annoyance in the everyday life. The increased traffic volume in the recent years and the change of its composition has led to resultant noise levels, frequently situated above the limits considered safe in terms of human exposure. Various actions already have been started to reduce noise emissions and to restrict the transmission of noise, in order to avoid harmful effects on people and to preserve quiet

areas. Among these actions, dissemination plays an important role, which must be accentuated in the future. People should be informed about the noxious effects of noise, about the existing situations and undertaken measures to reduce noise pollution and should be encouraged to protect themselves against noise.

The study of graphic means for public information about the harmful effects of noise exposure – the sources being the traffic noise or the urban noise - reveals the efficiency of the visual message used as main object in the informational campaign for public interest. As a consequence, the graphic works presented in the paper have been developed as starting elements for a wide information campaign. Favorite was the print media – poster, brochure and flyer – as classic and efficient mean for a large and quite heterogeneous target group. Based on graphic design principles, according to which the effect of transmitted message can be increased, they reflect original visions of

young artists, transposing into visual form their own perception on traffic or urban noise.

An informational campaign may be complemented by web-sites, which are usually accessed by those who need further information on a specific subject. The accessing of such a site presupposes previous information, which means that the signaling purpose of a poster has already had an effect on the viewers.

The TV spot is yet another component of an informational campaign. Being a medium that makes use of sound, one might ask oneself if television is appropriate to fighting against noise. However, the efficiency of a TV spot within an informational campaign - due to its repetitive quality - cannot be denied.

7. ACKNOWLEDGEMENTS

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MIJLOACE VIZUALE DE INFORMARE ȘI AVERTIZARE ASUPRA ZGOMOTUL DATORAT TRAFICULUI RUTIER

Evoluția traficului rutier din România în ultimii ani a condus la creșterea nivelului de zgomot, atât în mediul urban cât și pe rutele cu trafic ridicat. Măsurile luate de către autorități pentru evaluarea și cartografierea zgomotului, în conformitate cu Directiva Europeană de zgomot, trebuie să aibă susținerea populației pentru a deveni efective. Acest lucru necesită o bună informare și educare a populației în ceea ce privește poluarea sonoră, inclusiv avertizarea cu privire la efectele nocive ale expunerii la zgomot. Luând în considerare aceste cerințe, au fost elaborate o serie de mijloace grafice (postere, broșuri și flaiere), axate pe zgomotul datorat traficului rutier, în scopul pregătirii unei campanii de informare și avertizare. Ele conțin viziuni originale ale unor artiști tineri, care au transpus într-o formă vizuală mesajul ce trebuie transmis grupului țintă, în funcție de propria percepție. Lucrarea prezintă o suită de astfel de mijloace grafice, concepute în termenii adresării unui grup țintă destul de eterogen, asimilat audienței generale.

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