ENVIRONMENTAL PERCEPTION OF YOUNG URBAN PLANNERS AFTER AN ECOLOGY COURSE: THE SURPRISE OF A TOTAL DISAGREEMENT

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Abstract. A vast number of studies showed that the environmental perception, essential for a change of the mindset required for diminishing the global changes, can be modeled by education and media. Education appears to be a predictor of the general attitude towards the environment, but in special for the perception of issues specific to the urban environment. This study used a didactic exercise to test whether the importance of environmental issues is agreed upon the course. The findings were surprising; on the one hand, environmental issues were always considered a downside of the urban environment, but on the opposite side, their importance was always disagreed. The results suggest that young urban planners are not as receptive to the environmental issues, and most likely have a different system of values, which explains the lack of environmental concern in the contemporary Romanian cities.

1. INTRODUCTION

Humans get benefits from the environment, through the ecosystem services (Qureshi *et al*., 2013; Perelman *et al*., 2013) and degrade it through the 'global changes' (Sudarmadi *et al*., 2001; Eisler *et al*., 2003; Dale *et al*., 2011). Therefore, especially for the urban areas, the maintenance of a healthy and well connected environment of green infrastructure (Petrişor *et al*., 2016) is crucial for preserving the biodiversity (Clergeau, 2015; Clergeau and Désiré, 1999; Clergeau *et al*., 2016) and maintaining the level of ecosystem services (Badiu *et al*., 2016). However, its preservation depends of the attitude of people in general and planners in special to the environment.

The perceived importance of environmental issues increased due to the constant activity of environmental groups (Dunlap, 1991). Environmental education and media are important in relationship to the global changes, as they

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can increase the environmental awareness (Sudarmadi *et al.*, 2001). If media increases the perceived importance of environmental issues (Gooch, 1996; Castelo Branco *et al.*, 2008), knowledge may increase (or, in some cases, decrease - O'Connor *et al.*, 1999) the perceptions of risk (O'Connor *et al.*, 1999; Henshall Momsen, 2000; Grodzińska-Jurczak *et al.*, 2006; Jim and Chen, 2006; White and Hunter, 2009; Perelman *et al.*, 2013; Qureshi *et al.*, 2013), which determines people to be more willing to take steps that address environmental problems (O'Connor *et al.*, 1999; Gattig and Hendrickx, 2007).

Environmental psychology was developed in the 1960's in the US to look at the relationship between man and the environment (Kollmuss and Agyeman, 2002). In the analysis of factors determining the perception of the environment, the environmental issues must be approached together with social sciences (Sudarmadi *et al.*, 2001); for planning purposes, inter-disciplinary approaches are crucial (Petrişor, 2013). So far, no clear answers have been given to the question on the nexus: possession of environmental knowledge – environmental awareness – pro-environmental behavior (Kollmuss and Agyeman, 2002). Some studies found out that knowledge is essential for a pro-environmental behavior, but found out a weak relationship between knowledge and pro-environmental attitude, concluding that only a small fraction of pro-environmental behavior is directly linked to knowledge and awareness (Kollmuss and Agyeman, 2002); more generally, there are contradictions between the perception and the actual way of life or action (Ittelson, 1978).

In general, the environmental behaviors depend, according to different authors, on past experiences and memory, value and beliefs, and local culture and history (Lo and Jim, 2010), while the perception varies according to socioeconomic differentiation (Lo and Jim, 2010), image, values, preferences, and aesthetics (Ittelson, 1978), level of economic development (White and Hunter, 2009), age, education, income, and residential location (Samdahl and Robertson, 1989), income (Majumder *et al.*, 2007), culture (Eisler *et al.*, 2003) or social conditions (Pacione, 2003; Dulamă and Ilovan, 2015, 2017). Moreover, environmental problems have been perceived as more worrying when they take place at greater distances (García-Mira and Eulogio Real, 2005). Differences were found between urban and rural areas; environmentally-friendly behaviors are more common in rural areas than in the urban ones (Grodzińska-Jurczak *et al.*, 2006); in general, the local environmental conditions are important in shaping environmental concerns (White and Hunter, 2009). Other differences are due to gender - women are often more concerned, but less politically active about the environment than men (Henshall Momsen, 2000), and age - adults with greater social concern are more concerned about environmental issues (White and Hunter, 2009). There is an imperfect match

between real life quality and its perception due to cultural and social differences (Mesch and Manor, 1998). Cultural values influence also the environmental attitude; in Europe and the US, people are considered responsible only for their actions, but in Japan they respond for the others as well; these differences reflect in the different environmental attitudes of Japanese and American students (Eisler *et al*., 2003). Nature seems to be valued by communities with scarce natural areas and social issues (Priego *et al*., 2008).

The urban perception is a particular form of the environmental one (Ittelson, 1978). After 1980s, urban studies focused on defining objective and gradually subjective indicators for measuring the life quality (Senlier *et al*., 2009). The human desire for green spaces results from the appreciation of the benefits and an urge to connect with nature (Jim and Chen, 2006). Different studies revealed preferences for natural features similar to those of rural areas, nature benefits, outdoor activities and exercise, aesthetic values and shading etc. (Jim and Chen, 2006), or for nature observation or contact, aesthetic preferences, recreation and play (Perelman *et al*., 2013), or aesthetics and proximity - differences between residents and visitors (Faggi *et al*., 2013). However, there are differences between the perception and actual use of the urban environment (Priego *et al*., 2008; Faggi *et al*., 2013; Perelman *et al*., 2013; Qureshi *et al*., 2013; Breuste and Rahimi, 2015).

Although the environmental attitude of planners varies even from the early stages in relationship to their exposure to inter-disciplinary issues (Petrişor, 2012), it is expected for education to improve their environmental awareness. Nevertheless, the didactic experience and discussions with former graduates seemed to indicate the contrary.

This study is trying to analyze the pattern of environmental attitudes within the students after a course on environmental issues starting from the basic assumption that the responses are in more agreement in relationship to the environmental issues and their importance.

2. DATA AND METHODS

Data comes from the Master level students of the course "*Environmental analysis and impact studies*", taught at Ion Mincu University of Architecture and Urban Planning since the academic year 2008-2009 during the first year of studies based on selected responses to a specially created didactic exercise, implemented repeatedly since the academic year 2010-2011. The exercise is aimed at familiarizing young urban planners to the participatory nature of the planning process (Lacaze, 1990) by the means of public consultation, and has been described by Petrişor (2011). In summary, students were asked to list five

most prominent urban issues (until the academic year 2014-2015, they were restricted to environmental issues). Each student was asked to consider the issues specific either to his home area, or to the area where he/she lives, if different; overall, it can be considered that the results reflect the issues of Romanian urban areas. The results are grouped in categories and at the end students must rank the importance of each category. The results are ranked using the Delphi method (Devuyst, 1999).

The results of four such exercises, developed in the academic years 2010-2011, 2014-2015, 2015-2016, and 2016-2017, were analyzed by computing Kendal's coefficient of concordance using Microsoft Excel 2003, implementing the formulae presented at http://www.real-statistics.com/reliability/kendalls-w/ In more detail, if m raters are rating k subjects, and r_{ij} is the rating rater j gives to subject i, Kendal's coefficient of concordance (W) is:

$$W = \frac{12 \times S^2}{m^2 \times (k^3 - k)} - \frac{3 \times (k+1)}{k-1},$$

$$\text{where } S^2 = \sum_{i=1}^{k} R_i^2,$$

$$\text{with } R_i = \sum_{j=1}^{m} r_{ij}$$

Under the null hypothesis, W follows a χ^2 distribution with k-1 degrees of freedom. Therefore, the significance of W was computed using Microsoft Excel 2003 based on the χ^2 distribution, as a p-$value$ using the CHIDIST function. The values of Kendal's coefficient of concordance indicate divergent opinions if the associated p-$value$ is less than 0.5 and convergent opinions otherwise.

In order to analyze the prevalence and reoccurrence of some issues, the results of the questionnaire were sorted and ranked, equating some categories (e.g., "lack of green spaces", "green spaces" and "lack of green spaces and water bodies") and ignoring some very generic ones (e.g., "social and health issues", "environmental quality") and some very rare occurrences (e.g., "pressure over the natural resources"). The ranking was performed using Microsoft Excel 2003, based on the scores cumulated over the years of reoccurrence. For a better understanding, the ranks were reverted (i.e., high values correspond to high importance). Also, for the issues occurring at least twice, average ranks were computed separately.

3. RESULTS AND DISCUSSION

The results are presented in Tables 1 and 2. Table 1 presents the groups of raw answers, and Table 2 presents the hierarchy of preferences and statistical results. The findings are surprising and relatively contrasting; on the one hand, environmental issues seem to be always considered important issues of the

Table 1. Grouping issues considered specific to the urban environment

Year	Group	Specific issues
2016-2017	1. Lack of green spaces	Lack of green spaces; insufficient parks in the neighborhoods; insufficient green spaces per person; insufficient green spaces; diminishing green spaces
	2. Social and health issues	Airborne diseases; homeless people; issues related to the health of dwellers; social segregation
	3. Environmental quality	Noise pollution; increased noise; increased temperature; pollution; soil pollution with heavy metals; low environmental quality; underground water pollution; waste; air pollution; water pollution
	4. Traffic and accessibility issues	Traffic jams and agglomeration; hardly accessible public spaces; insufficient public transportation; lack of parking spaces; lack of accessibility; agglomeration; traffic; cars parked on pedestrian areas; increased traffic
	5. Life and habitat quality	Public spaces not landscaped; lack of resting areas and facilities; visual pollution (commercials, kitsch); unsuitable habitat and human agglomeration
2015-2016	1. Pollution	Management of household and industrial waste; lack of efficient collection, sorting, and reuse of waste; light pollution; soil pollution; noise; industrial pollution; water pollution; dust; lack of wastewater treatment plants; quality of drinkable water; air pollution
	2. Urban sprawl	Deforestation; destruction of natural ecosystems within the city; urban sprawl against natural habitats; waste of space; replacement of natural systems; chaotic development of cities
	3. Traffic issues	Agglomeration; excessive use of cars
	4. Green spaces	Green spaces not cared for; insufficient green spaces; lack of green beltlines; lack of green squares
	5. Natural hazards	Low resilience against hazards; heat islands
	6. Built environment issues	Degradation of the building stock; public spaced occupied by cars; buildings not rehabilitated
2014-2015	1. Pressure over the natural resources	
	2. Waste management	
	3. Pollution	
	4. Lack of green spaces	
2010-2011	1. Pollution	Pollution due to traffic; pollution due to the industry
	2. Urban sprawl	Replacement of natural systems; fragmentation of habitats
	3. Lack of green spaces and water bodies	Lack of green spaces; lack of water bodies
	4. Waste management	Solid waste management
	5. Water sewerage and treatment	Wastewater sewerage, treatment and management

urban environment, even when other urban issues "compete" with them, as indicated by their presence in the list. However, on the opposite side, their

Table 2. Hierarchy of issues considered specific to the urban environment. Lower scores indicate increased importance

Year	Issue	Evaluators														Total	Rank	Agreement
		A	B	C	D	E	F	G	H								
2016-2017	1. Lack of green spaces	4	3	2	5	3	3	3	2						25	3	W=0.578, p=0.00985
	2. Social and health issues	1	2	5	2	2	4	1	3						20	2	
	3. Environmental quality	3	5	3	3	4	2	5	5						30	4	
	4. Traffic and accessibility issues	2	1	1	1	1	1	2	1						10	1	
	5. Life and habitat quality	5	4	4	4	5	5	4	4						35	5	
		A	B	C	D	E	F	G	H	I	J	K	L	M	N		
2015-2016	1. Pollution	3	2	1	1	2	3	4	1	1	3	1	1	1	3	27	1	W=0.477, p=0.000003
	2. Urban sprawl	1	3	2	5	3	1	1	3	3	1	4	4	4	1	36	2	
	3. Traffic issues	2	1	4	3	4	2	3	4	4	4	3	5	5	2	46	4	
	4. Green spaces	4	4	3	2	1	4	2	6	5	2	2	3	2	4	44	3	
	5. Natural hazards	6	5	5	4	6	6	6	2	2	5	5	6	3	6	67	5	
	6. Built environment issues	5	6	6	6	5	5	5	5	6	6	6	2	6	5	74	6	
		A	B	C	D	E	F	G	H	I	J	K	L				
2014-2015	1. Pressure over the natural resources	4	4	4	3	1	4	2	4	4	4	4	2			40	4	W=0.336, p=0.007048
	2. Waste management	2	1	3	2	3	2	1	1	1	2	2	1			21	1	
	3. Pollution	3	3	2	4	4	3	4	2	3	3	1	3			35	3	
	4. Lack of green spaces	1	2	1	1	2	1	3	3	2	1	3	4			24	2	
		A	B	C	D	E	F	G	H	I							
2010-2011	1. Pollution	1	1	1	1	1	1	1	1	1						9	1	W=0.573, p=0.000376
	2. Urban sprawl	2	3	3	3	3	3	4	3	5						29	3	
	3. Lack of green spaces and water bodies	4	2	2	2	5	2	2	4	4						27	2	
	4. Waste management	3	5	5	4	2	4	3	5	2						33	4	
	5. Water sewerage and treatment	5	4	4	5	4	5	5	2	3						37	5	

importance is always disagreed, as indicated by the positive significant values of the coefficient.

Taking into account the fact that the exercise occurs close to the end of the course, *after* the exposure of human impact against the environment, the results suggest that young urban planners are not as receptive to the environmental issues, and most likely have a different system of values. In correlation to this, a survey carried out in 2010 (Chiribucă *et al.*, 2010) shows that over 90% of the Romanian architects have a demiurgic attitude, explains to some extent the lack of environmental concern in the contemporary Romanian cities through a biased anthropocentric perspective, exacerbated by the high self-esteem.

Here, an additional explanation is needed; in Romania, "urban planners" are the graduates of Ion Mincu University of Architecture and Urban Planning in this field starting 2002, but also architects who graduated before (or after) and acquired work experience in urban planning (Petrişor, 2010). Another supporting argument comes from the teaching experience; despite the fact that during the course the importance of a holistic understanding of the environment is stressed out at all stages, even during the recapitulative course some students define the environment as "whatever surrounds us". This is probably a sequel of earlier education, where outdater manuals, containing outdated approaches (pure anthropocentric or sectoral-anthropocentric) are still present and used, which cannot be corrected by a single course in the next educational cycle.
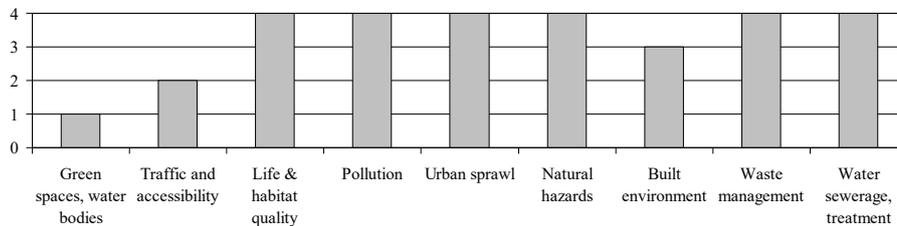

Fig. 1. Importance of the issues specific to the urban environment based on their reoccurrence in the preferences of 2010-2017 urban planning Master's students. High values indicate high importance

It is also worthy looking at the recurrence of some issues over time. The results are presented in Fig. 1 and Fig. 2. Fig. 1 considers most important reoccurring issues, and shows that six of the nine categories (life and habitat quality, pollution, urban sprawl, natural hazards, waste management, and water/sewerage treatment) are considered the most important urban environment issues. The fact that six of the nine categories reoccurred, without having any possibility of discerning among them, reconfirms the previous findings, according to which the preferences are random, resulting from the

unfortunate combination of no previous exposure to environmental issues and no interest in the topic. Fig. 2 identifies the most important issues reoccurring at least twice, based on their average rank; the findings suggest that, in the students' opinion, the most important environmental issues affecting the urban environment are, in decreasing order of importance, urban sprawl, waste management, pollution, traffic and accessibility, and the loss of urban green spaces.
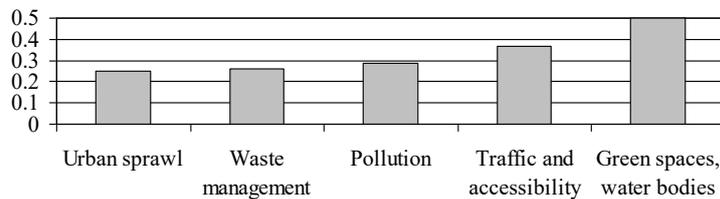

Fig. 2. Most important issues specific to the urban environment based on the preferences of 2010-2017 urban planning Master's students. Low values indicate high importance.

In general, if the issues identified by the students are analyzed using the Batelle-Columbus method (Devuyst, 1999; Petrişor, 2007), they can be grouped, for the purposes of further qualitative analysis, in three large categories: issues generated by human causes, problems related to the structure of ecosystems, and infrastructural issues (Fig. 3). The schematics also allows for grouping the issues in an overall picture.
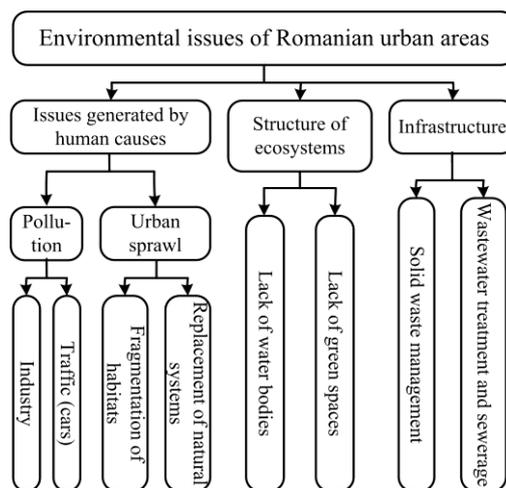

Fig. 3. Environmental issues of Romanian urban areas

Drawing the line, the initial hypothesis according to which education can level up and model the students' view, in particular the main environmental issues and their importance, was not confirmed by the results. These findings suggest the need to seek for alternate explanations, such as the influence of media, social media or other sources of information (e.g., fiends, family etc. that were not ascertained in the present study.

The study is subject to several limitations. First of all, the exercise was performed only four times, which limits the volume of data. Second, the years were not consequent, and data cover a long period (2010-2017), but not continuously. The alternative explanations (media, social media etc.) cannot be ascertained due to this reason. Furthermore, the alternatives cannot be explored, since the data reflects only the perception, but not an explanation. Future studies can address this shortcoming by asking additional questions, such as whether a specific issue was considered important because it was reflected in the media, presented in the course or identified from other sources. Third, the participants are a homogeneous group (people with approximately the same age and interests), and the results cannot be generalized further (e.g., to the student population of Romania, to the entire population etc.)

The possible consequences over the planning process can only be speculated. Romanian planning has undergone several stages, from developing a plan as the result of the planner's vision up to reflecting the vision of a public administration, and finally the vision of the entire community, through the participatory process (Petrişor, 2010; Munteanu and Servillo, 2013). As a result, the question is whether young planners, whose perception of the environmental issues affecting the urban settlements of Romania does not seem to be influenced by a course, can be changed following the discussions with local public administrations and broader public.

CONCLUSIONS

This study aimed to assess the environmental attitudes of urban planners after a course exposing them to the human impact on the environment. The investigation was based on conducting an in-class exercise, with the clear disadvantage of being unable to ascertain the potential influence of alternative explanations, such as the potential influence of mass-media over the assessment of the importance of specific issues.

In a nutshell, the results do not support the original hypothesis according to which the preferences are "modeled" by education, showing that they remain very diverse. In the students' opinion, the most important environmental issues

affecting the urban environment are, in decreasing order of importance, urban sprawl, waste management, pollution, traffic and accessibility, and the loss of urban green spaces. In general, these issues can be grouped by their underlying causes in problems generated by human causes, the structure of ecosystems, and improper infrastructure.

The findings are surprising through their contrast; on the one hand, environmental issues are always part of the agenda, but their importance is constantly disagreed, suggesting that, in addition to a demiurgic attitude, young planners seem to show little consideration to the environmental issues, with possible adverse consequences on the future of Romanian cities. This suggests the need to seek for alternate explanations, such as the influence of media, social media or other sources of information that were not ascertained in the present study.

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