Non-knowledge and the Unexpected in Planning: An Experimentation Account

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Abstract. In previous research stages we have reflected on how uncertainty and the unknown are elements that one can't avoid dealing with during the territorial and environmental planning process. Our lives (in our individual and private choices) and our plans for a city or a territory have to cope with unexpected events, uncertainties, and often with unwanted consequences of our own decisions. We have explored literature and methods and took the first steps toward applied ontologies as a useful conceptual tool for managing non-knowledge aspects affecting decisions in planning. In the present step of our research, we describe an activity which was carried out with the students of the Regional planning program in Polytechnic University of Bari for two consecutive years.

Keywords: spatial planning · uncertainty · knowledge management · ontology

1 Introduction

The topic of uncertainty and the unknown and more specifically of non-knowledge has been widely recognized as inescapable when dealing with life in general, in particular when dealing with decisions that have to define and model strategies and choices for environment, territorial management or urban government. This is because such kind of decisions, strategies and plans has the propriety of being pointed to the future, trying to model one of the possibilities, and trying to give a direction to actions.

In the 1960's the model of all-knowledge and comprehensive rationality removed the heavy burden of the consciousness about the non-knowledge – so promoting, we could say, 'violent' actions in relation with environment and territories, their dynamics and their ecologies. That approach caused consequences of blind choices and therefore unexpected events (indeed more and more frequent). In the following decades consciousness arose about the side effect of actions of transformation.

When managing knowledge, the other coin side of non-knowledge emerges, made of uncertainty, ambiguities, deep unknowns that fatally affect the results of a strategic plan or, more in general, of the efficacy of environmental and planning choices.

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A part of this aspect of the unknown (i.e., unexpected effects generated as consequences of actions) belongs to the set of the deeply unknown (as previously explored [1–3].

The topic of the unexpected events has been treated according to a different point of view in Gaurino and Borgo [4] where this kind of events are treated with a neutral gaze to better understand their intrinsic nature and not according a point of view that has as a-priori focus their riskiness or dangerousness (treated as properties). At the same time a different reading of unexpected is about black unicorns [5]. But still this topic can't be said as completely explored. First, this is due to an ontological (in philosophical terms) and intrinsic propriety of the deep unknown that surrounds our knowledge not only about the future [6]. Also, it depends on our wider present [6], where our individual gaze can't reach (even if arguably a distant present lays in a future present given by the distance needed to reach it). Still, there is the aspect of the the unknown that leads to unexpected events, manifesting themselves through clues and seeds that insurging dynamics form in reality and arise in the final event.

There are two global examples. One is climate change, whose clues devised by scientists and scientific literature tried to sensibilise public opinion. More recently, SARS-COVID-19 outbreak hit us 'unexpectedly' and now we could recognize that the problem was in 'the air' (maybe literally) because there were warnings and previous events that went in that direction. In fact, bird flu, ebola, mad cow disease, etc. had occurred, and also in this case there were comments on literature and warnings from science [7].

Therefore, as argued in previous work, the subject of non-knowledge and the unexpected is complex and multifaceted. With the hindsight, another event that could be expected if not avoided could be the outbreak of war in Ucrayne. Over the last year, this proved to be a shocking event that has affected our lives in general, and our environment too.

The paper is organized as follows. After this brief introduction, we try to sketch out possible paths towards a definition about non-knowledge in planning in Sect. 2. Then a synthetic description of the experimentation follows in Sect. 3. In Sect. 4 some reflexions are carried out about the experimentation responses obtained, followed by some final remarks in the conclusive section.

2 About Non-knowledge in Planning, Search for a Definition

The decisions we make both in our individual lives and in our design, planning, organization and planning activities are primarily based on cognitive materials of knowledge and intentions. It would be interesting to be able to define which genetic material builds intentions intended as objectives, expected and pursued results, both at the individual level and in the actions and decisions which set the management of the territory and the environment. This fascinating topic runs through the vast literature in various scientific disciplines, crossing philosophical, psychological, sociological reflections, as well as spatial planning and cognition reflections, passing through cognitive studies on artificial intelligence, data management and knowledge representation.

In fact, the point is crucial and often remains hidden, in a sort of background where it would be better to go and investigate, shedding light and clarity, in order to be able to

act and organize, even before making decisions. It would be a decision-making system that eliminates blind spots as far as possible and that is aware of the inherent, and too often implicit, risk in the folds of non-knowledge.

The unawareness of non-knowledge can lead to decisions that have often turned out to be harmful, moving in the illusion [8] of a comprehensive rational decision-making cognitive environment. It can lead to drawing lines of action that are too often clear-cut, authoritative and lacking elements of monitoring-mitigation-flexibility, in addition to the (mis)intention to apply the least impact in entering the complex dynamic balance of urban and regional ecosystems.

We have previously addressed some aspects in the definition of a concept such as unawareness, which can be highly elusive due to its negative and unacknowledged nature [2]. On the other hand, by exploring the literature it has been possible to describe, if not define, different nuances of uncertainty and unknown that those who work in planning also for the city often face [1, 9], in addition to the methods and tools that have been developed to act in conditions of deep uncertainty [10–12].

To give an example referring to the city, clearly cities are complex and fundamentally uncertain objects, and urban planning has to constantly deal with 'wicked' problems [13] and since Simon's time there was a conscious sight about the highly distinctive problem of social choice under conditions of uncertainty [14, 15].

In particular, in this contribution we want to reflect on two other aspects when speaking of non-knowledge. One is the concept of belief, that is what is believed and is assumed to be true almost in a dogmatic or uncritical way. The other is the illusion of knowing, i.e. the conviction of not having to implement one's own load of knowledge regarding certain aspects or tasks.

In fact there is a literature exploring this topic. Human judgment under uncertainty has been shown as involving consistent departures from normative rationality. Often humans tend to over-estimate the probability of events with positive personal returns while under-estimating the probability of events with a negative return [16–18].

From the studies carried out for example by Evans [16] it seems that the decision-making aspects even in an environment of uncertainty (and therefore by extension, and even more so, of non-knowledge) are characterized by a sort of blind optimism, and that rather the depressed subjects are bearers of a sort of 'depressive realism'. Dealing with uncertainty is a common problem for agent systems. The ability to reason with uncertain information is an indispensable requirement for modeling intelligent behavior in a complex and dynamic environment [16]. The research was aimed at verifying how adaptive and resilient this trait of optimism was.

3 Starting an Experimentation

We thus began to think about war, an extreme anthropic event, as the possible future of any territory, even other than Ukraine, even close to Italian, in particular southern Italian, areas. Of course we could be differently interested by this kind of destroying event if occurring in our lives and on our territories. Our interest was about how people would react and organize, in a similar circumstance. This was an exercise that led people to imagine situations in which one has to deal with something laying in the layer of the unknown, as hypothesized p.es. in Stufano and Camarda [1].

We envolved students of the Regional planning program at the Polytechnic University of Bari, Italy, for two consecutive academic years in answering a questionnaire about reactions, scenarios and consequences of a possible war event nearby.

In the first year, the questions were formulated in three sections focusing on economy, society, and the environment. Each section was composed of four questions, dealing with economic consequences, which actors would be involved, and what actions would be expected by the decision-makers to cope with the consequences of the war event. In the second year, an additional section four was added, aiming at eliciting comments and suggestions regarding the organization of the questionnaire - for example a missing question, or further categories that could have been added.

In the first year, students were in a situation in which an actual war had unexpectedly started off in Europe, indeed. Their responding mood was of bewilderment and surprise and probably new anguish began to creep latently in their minds. In the second year the same event was still ongoing (it is still ongoing), and the scenario in front of the students was still different. The first reaction of dismay was followed by a sort of long-term concern, looking at the economic consequences of a situation of international tension and uncertainty.

Below is the introduction to the questionnaire, with the instructions (Table 1) and the questions asked, divided into sections (Table 2).

Table 1. Instructions for the questionnaire

Instructions
In recent months we have all been concerned about the war in Ukraine, in particular about the humanitarian catastrophe generated by a conflict on Europe's doorstep. Even the involvement of our Country, currently limited to infrastructural support, raises concerns in each of us. In this dramatic situation, we ask you a reflexive contribution that can be useful both in terms of study and research. This exercise consists of three sections of questions, to which you should answer according to your point of view, placing yourself in the situation described. After filling in a brief personal data section, we ask a reflective stretch of your imagination. Imagine that the war could directly affect Italy and especially the area of your city in the next future (but let's hope not...). Then answer the questions below, according to your point of view.

The present study reports our reflections and analysis about the first seven responses from the second-year exercitation and all the responses from the first year (just seven indeed, as few students were in the class of the first survey) to have a coherent sample. Even if it is a small sample, we think it is useful for a first step of reflection. In the following section, we discuss these first reflections and insights with an eye forward, to the possibility of developing ontology-based models.

Table 2. Questions asked in the questionnaire

Section 1
1.1. What economic damage could the war cause and in which places and sectors of the local organization in your city?
1.2. Which local agents would be involved?
1.3. What behaviors and/or activities would those local agents develop as a result of the damage caused?
1.4. What activities would they develop to promote local recovery/development?
Section 2
2.1. What social damage could it cause and in which places and sectors of the local organization in your city?
2.2 Which local agents would be involved?
2.3. What behaviors and/or activities would local agents develop as a result of damage caused?
2.4. What activities would be developed to promote local recovery/development?
Section 3
3.1. What environmental damage could it cause and in which places and sectors of the local organization in your city?
3.2 Which local agents would be involved?
3.3. What behaviors and/or activities would local agents develop as a result of the damage caused?
Section 4
Any final comments
Below you can express your free comments and suggestions regarding the organization of the questionnaire (for example which question you think is missing, or which other categories you would add.

4 What We Can Elicit from This Sample of Responses

As anticipated in the conclusion of the previous section, the sample available to us is not very large. For the first year we received eight responses of which seven are processable as the eighth seems to be a duplication. In the second year of experimentation we instead obtained 64 responses, all processable.

We would like to point out that this was our first attempt to build a structured experimentation related to this topic, i.e. non-knowledge, in relation to a possible unexpected event (in this case of an anthropic nature). In fact, nothing tells us whether this event could actually occur or not, especially if we go back to the status of knowledge before February 2022 - the event breakout. As a matter of facts, while some of us here were experimenting the pleasantness of a placid dawn, a couple of thousand kilometers away hell was just starting off.

The questions posed to the students were aimed at collecting an effect of absolute surprise (non-knowledge) with respect to an event that from one day to the next triggered an absolutely improbable event, something that until the day before was considered simply impossible.

The questions reported in the previous table (Table 2) invited to reflect on the repercussions relating to the environmental, social and economic spheres of a possible conflict that could affect the territory where the respondents live.

At the moment we are at the first considerations on how to analyze this material, in such a way that it tells about the non-knowledge and possible strategies for limiting this cognitive property (individual and collective). In these conditions, and considering a symmetry of the sample, it was decided in a first screening to explore in parallel the seven responses from the 2022 academic year and seven more responses from the 2023 academic year.

Primarily, two characteristics emerge that seem to differentiate the responses between the two datasets: (i) the first responses come from a homogeneous sample of inhabitants of the city of Taranto in the Apulia region (southern Italy), while the second ones are a non-homogeneous sample of responses, each generated by an inhabitant of a different city in the Apulia region; (ii) the first-year responses were given at a time when emotional surprise and bewilderment were very high and widespread in the public opinion, while the second-year responses come after the constant news experience of a year of conflict.

From these two premises, at least two considerations emerge: (i) for the first sample, the attention towards a focus on the city of Taranto and its present and atavistic problems [19, 20], not being eroded even in the perspective of a disruptive event induced by war; (ii) comparing the responses obtained just after the start of the war and after the first year of conflict, different lengths and articulation of the responses can be noted, thus suggesting a different emotional status between the first and second set - although in the last year the general geopolitical framework seems to be more complicated and less decipherable.

If we reflect on the issues relating to the concept of non-knowledge, indeed what we can deduce seems to relate just to what is not written down. First of all, a real immersion in a non-known scenario does note seem to show up. Yet having to actually face a war scenario, primary issues such as the risk of survival etc. seem to have been underrated if not discarded. Instead, the hypothetical future of the war disaster on one's own territory receives a scenario projection that is often a translation of the economic, social and environmental problems known to the writer's present time.

Another useful note for the comparative reading of the responses received is a greater habituation to news reports and some dynamics relating to a war context. Indeed, explicit emotional participation is apparently lacking, and once again the perception of an unknown and potentially unexpected local war scenario does not sound plausible in the responses, not even in the future - near or far.

Moreover, we can try to sketch out some reference categories relating to the concept of belief and the illusion of knowledge, previously anticipated. To try to outline the cognitive system of non-knowledge, albeit with the risk of a logical oxymoron, we can imagine it with the property of a shape placed in the negative, which has credences and bielefs as an internal boundary. These categories are a most fine grained gaze on

concepts of uncertainty and unknown, or better, they are on a different layer, more abstract, pertaining to epistemological philosophical disciplines.

We can find prodromic significant reflections in this regard in Hume [21], analysing how the cultural context changes these beliefs. For the Maya, the possible non-rising of the sun the next day was a real risk, whereas in Hume's world the sun rising the next day was an established belief, even if perhaps not confirmed - but the opposite was considered as unlikely to occur.

The concept of credence emerged from the work on subjective probability put down by contemporary epistemologists, who highlight a close connection between credence and the more familiar notion of confidence (e.g., Elisabeth Jackson [22]). Here we could find non-knowledge in a form of belief relating to the fact that the respondents to the questionnaire place themselves in a position in which the event, even if they try to articulate hypotheses, would never take place. This seems to be understood in the broad 'sense' and in the tenor of the responses, and matches with an illusion of knowing that the event may never occur - in relation to the habit of life experiences up to now conducted by participants.

5 Conclusion

In dealing with the organization of the questionnaire, we must say that it is always difficult to build up a framework able to capture background emotional aspects, to bring out the psychological attitudes or the individual mental frames from which each response follows. Furthermore, the need to induce the participants to imagine themselves in a different situation (actually quite different) from current events, although necessary in this case, is not easily successful: it is not simple, it strongly depends on the different individual abilities and it is difficult to be operationally managed [23, 24].

In general, a life context with already high risks at present can influence responses often in an optimistic sense (the so-called normalization of deviance already mentioned), thus inducing inadvertently reckless actions (e.g. in business economics [25]). In the case of Taranto, an atavistic familiarity with risk seems to normalize the probable effects of future catastrophes within the same current problem areas, even though they may be exacerbated, thus making the unexpected dangerously implausible.

In general, the two experiments present aspects that are not entirely comparable, as they are diachronically interesting but contextually different situations - a specific area vs. more areas. This contextual 'bio' diversity can be interpreted as bearer of initial bias towards the interpretation of non-knowledge, of the unexpected and the imagination of future scenarios. Furthermore, the redundancy of chronicle and journalistic information of our times determines habituation towards the problematic aspects, thus diminishing their possible scope and range. Our experimentation has therefore, if possible, induced more reasons for reflection than manageable responses.

But we certainly do not expect straight and simplified decision support when speaking of an intrinsically complex conceptual context such as the regional and urban ecosystem. And after all, on closer consideration, all these aspects of reflection, positive or negative, in-depth or superficial, precious or modest, all cognitive behaviors conformist

or eccentric, aware or approximate, rational or emotional, contribute thoroughly to constructing meanings and useful relationships to conceptually characterize an ontology of non-knowledge.

For this reason, ontological approaches and models applied to non-knowledge seem useful to feed decision support architecture construction paths, even in complex fields such as environmental futures in spatial planning. Attempts to use foundational ontologies as analyzers and relational descriptors of the present socio-environmental complexity are already reported in the recent literature, with non-definitive but encouraging results [26–28]. An example is reported in Fig. 1.

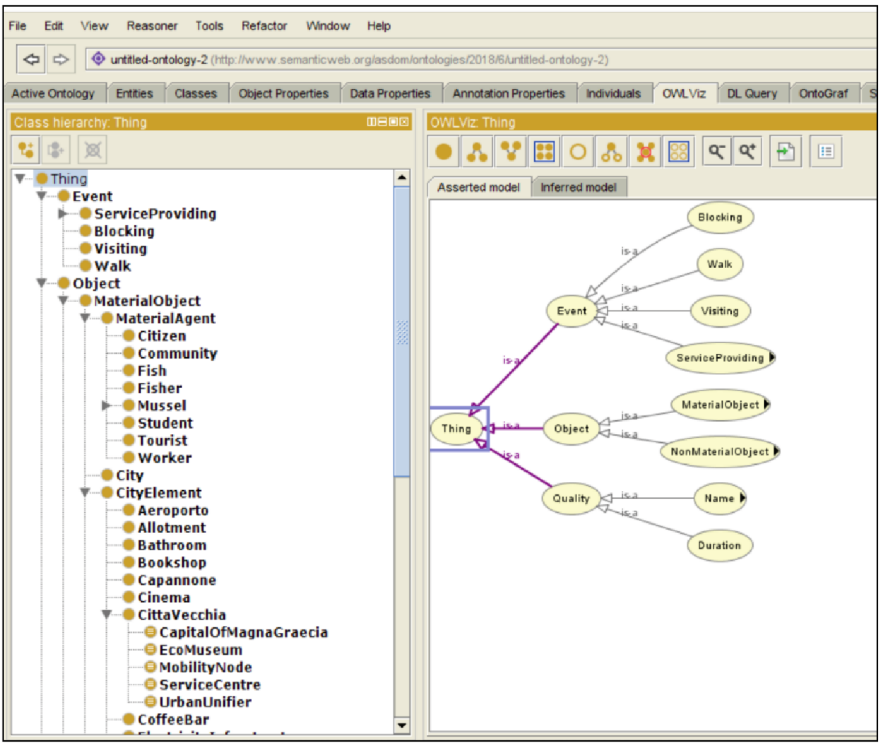

Fig. 1. Example of city classes, properties and features in ontological analysis [29, p. 434]

In the end, we acknowledge that the experiment itself is limited, as the survey had a restricted number of respondents on its first year which conditioned the use of a same sample size in the next year. As a matter of facts, from a scientific point of view, it can be just considered as a pilot experiment, in order to check the importance of carrying out new more robust experiments and reflections with a larger dataset in as a future step. Actually, the whole dataset available in the second year of experimentation includes a fairly numerous population, i.e. 64 respondents. This remarkable increase was due to the extension of the regional area of the experimentation, which will be kept also in the third experiment to be carried out, so possibly envisaging more statistically significant

analyses next year. Indeed, that will be the appropriate context to develop also quantitative or quali-quantitative analysis, which in the present case is not properly carried out due to the objective limitations induced by the small sample.

By now, the intriguing results emerged from this small pilot study did encourage us to further develop the investigation and perhaps consolidate final results. From this perspective, the acknowledgement of this possibility is the most robust result of the pilot study.

Based on the results and theoretical and experimental reflections such as the above, the efforts of our research group will be oriented towards investigating the potential of these models also for the dimensions of the unexpected and non-knowledge, typically embedded in many areas of planning space. In the short term, activity will be instead oriented to increase the develop a closer and a more extensive analysis of the whole sample of experimentation, toward more robust and interpretable results.

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