Enhancing the effectiveness of spatial planning processes: the systemic interplay of analysis, visualisation and communication

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Abstract

Within the last decade, planning literature consistently reports on a gap between the activity of spatial planning and its impact on underlying planning problems. More recently spatial planning in Germany has received unsolicited attention in political circles and from the general public. Large-scale projects like Stuttgart's new underground main station provoked protest movements and calls for a mediation process even after construction had already started. At the same time the national government is cutting subsidies for urban development and demanding the municipalities increase the effectiveness and efficiency of public spending in urban planning.

The design of the planning process is regarded as crucial to the success of spatial planning. Planning theorys' core competence is to provide a knowledge base for the planning process. This paper presents the conception and provisional results of a research project dedicated to investigating the impact of planning methods on the "success" of spatial planning projects. The research project proposes a fundamental approach to the optimization of spatial planning processes' effectiveness. It hypothesises that analysis, visualisation and communication (AVC) are three basic components of planning methods which interact with each other. AVC can be understood as the basic skills set of professional planners that are as yet unequally distributed among the planning discipline's wide range of specialists. Based on the knowledge of the skills' systemic interdependency, more integrated and hence effective ways of their purposeful application in planning practice can be conceived.

The first part of the empirical work in the research project is based on a meta-analysis of multi-disciplinary planning literature between the years 2000-2010. In a multi-stage selection process, 40 international journal articles are chosen that report on the 'successful' application of planning methods that contain AVC in real case spatial planning processes. A profound computer-supported qualitative content analysis helps to identify the methods' major success factors and the associated patterns of AVC interplay. The results of the empirical work are validated in a one-day workshop with experts from planning theory and planning practice in German-speaking countries. Additional semi-structured expert interviews with practitioners help to check the relevance of the findings to today's planning practices in Germany.

The validation supports the importance of the findings to planning practice and education. Our approach is suitable for stimulating cross-disciplinary learning processes on the purposeful design of planning processes. It uncovers and connects the know-how and knowledge on planning methods of practitioners from different disciplinary backgrounds. Making implicit knowledge explicit is a precondition for productive teaching.

Workshop and expert interviews result in three major lessons to be addressed in the coming second part of the research project: 1) deepening the understanding of the 'fundamental particles' AVC and additionally examining the role of framing and conceptualising, 2) elaborating a framework of AVC's impact that also considers the time axis 3) investigating the role of context for the success of the methods, e.g. stakeholders with background knowledge and concerns, organisational structures, financial and human resources, balances of power, legal framework.

1. Introduction

There is a need to enhance the effectiveness of spatial planning. Indeed, current planning literature repeatedly refers to a gap between the activity of spatial planning and its actual impact on spatial development. The survey of planning literature over the last 15 years reveals substantial deficiencies in spatial planning that can be summarized as follows:

Spatial planning's shortfall with regard to complexity and current challenges in actual spatial development. Current challenges include growing scarcity of resources and land use conflicts, spatially significant trends such as mobility and the knowledge economy, generally accumulating complexity of spatial planning's substance, augmented importance of relations and processes in spatial development, or challenges such as the shrinkage of cities and regions (Friedmann 1998; Needham 2000; Altrock, Huning and Peters 2004; van den Berg 2005; Boelens 2006; Breckner 2006; Schönwandt 2006; Friedmann 2007; Schönwandt et al. 2007; Lendi 2008).

Spatial planning's insufficient implementation and target achievement. Planning literature criticises the diminishing steering capacity of public bodies at different spatial scales. There are a growing number of stakeholders that have to be involved. Under these circumstances spatial plans frequently lack feasibility and still await their implementation and target achievement (Archibugi 2001; Informations- und Initiativkreis Regionalplanung der ARL 2005; van den Berg 2006; Schulz 2007, 2007; ARL 2008; Jacoby 2008).

Spatial planning's insignificance, lack of political relevance and awareness. Kunzmann calls strategic spatial planning a secret science without public attention and only a few followers. He observes a growing gap between the planners – those who are professionally involved in planning – and society (Kunzmann 2000). Despite its institutional foundation spatial planning has little political value and is threatened by meaninglessness (Friedmann 1998; Kunzmann 2000; Kegel 2006; Schönwandt and Jung 2006; Lendi 2008; Tschirk 2008).

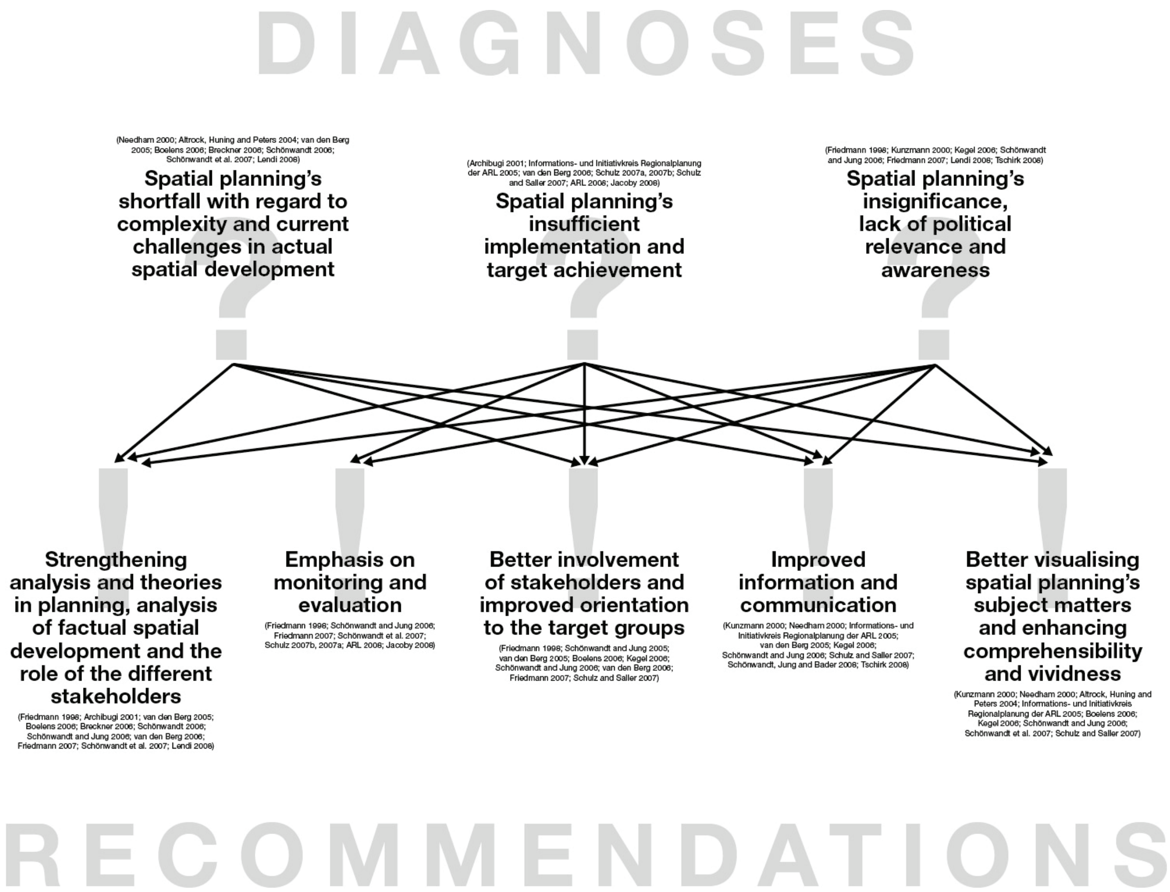

Figure 1: Comparison of diagnoses and recommendations to spatial planning.

Figure 1 shows our schematic overview of diagnoses and recommendations from the literature. Suggestions range from a stronger focus on analysing the factual spatial development and the role of the different stakeholders, to strengthening monitoring and evaluation within spatial planning, to a better involvement of stakeholders and improved orientation to the target groups; finally to better visualising spatial planning's subject matters and enhancing comprehensibility and vividness. The diagnoses open up a broad spectrum of suggestions. The crosslinks between the corresponding skills only become visible in the synopsis beyond the single articles.

"Planning, like most other professions, mobilizes a broad spectrum of skills. (...) The fact that planning calls on many different skills suggests the possibility, that each of these skills could be posited as the centre of planning. Then there would seem to be as many theories of planning as there are types of skilled professionals. This bizarre outcome can be avoided only if we can envisage how these skills work together (…)" (Harris 1999: 322).

Harris' quotation adumbrates the centre of the research project that we will outline in this paper. The project investigates the systemic interplay of three basic skills of spatial planners: analysis, visualisation and communication (AVC). It argues that there is great potential for enhancing the effectiveness of spatial planning when these three skills are knit together in an integrated way instead of further separating them into specialisation and differentiation.

When making planning skills and their effective application in planning practice an object of our investigation, we embed ourselves in an ongoing discourse on the design of planning procedures, planning methods or planning approaches. All three terms will be used synonymously in this paper. We deliberately distinguish planning methods from planning instruments. The latter point at interventions in the – natural, built, social, economic, cultural etc. – environment as the "reality" that spatial planning wants to change or preserve. This is the level of results and products of planning. Planning methods, on the other hand, operate in a preparatory stage to this kind of action. Thus we position this project in parallel to the public dispute on spatial planning in Germany that is currently dominated by themes such as Stuttgart's new underground main station ("Stuttgart 21"), cutting off national subsidies for urban development, angry citizens or energy turnaround. In each of these cases, attention is drawn much more to "how to plan" rather than on "what to plan". Planning procedures that are regulated by law are increasingly regarded as of solving the spatial planning issues at stake. From the planning practice's perspective, legal regulation provides not more than a minimum standard for the complex negotiation processes that are demanded for.

In addition, planning theory acknowledges the planning process as a determining factor in the success of spatial planning. Archibugi (2004) understands planning theory as action oriented analysis that provides a knowledge base for future planning practice. It thus supports the achievement of the goals set within the planning process (Archibugi 2004). Fürst (2006), who comes from the engineering tradition of spatial planning, claims that planning theory should contribute to enhancing the effectiveness of spatial planning in practice (Fürst 2006). Therefore the core competence of planning theory is the planning process (Needham 2000; Archibugi 2004; Fürst 2006; Keller 2006). At the same time authors recognize a lack of knowledge about the planning process that could inform the design of the planning process in practice (Fürst 2006; Keller 2006). The main deficiencies in the research on planning processes are: the predominantly normative approach, the lack of empirical work and the emphasis on single parts of the planning process instead of systems thinking (Huxley and Yiftachel 2000; Needham 2000; Archibugi 2004; Selle 2006, 2006, 2007; Newman 2008).

This research project investigates planning methods primarily from the perspective of the recipient or addressee and only secondarily from the operator or sender perspective. What makes this a useful approach? The project aims to assess the output, outcome and impact of planning methods and the way they contribute to the achievement of the goals of spatial planning projects. As planning is a human activity – carried out by human beings and directed towards human beings – the study of the impact of planning methods has to centre on the recipients. For this reason planning procedures are intrinsically tied to matters of communication. As planning methods exist in a large, almost unmanageable variety of specifications, the research project investigates the basic skills or building blocks of planning methods. Communication, with its different characteristics, is one basic building block that is part of every planning method. We claim that additionally analysis and visualisation can be regarded as basic skills that form planning methods in their different combinations. The three components of AVC are the non-exhaustive building blocks of spatial planning methods. However, we hypothesise that AVC in their various formations significantly determine the potential impact of planning methods.

The paper firstly introduces the conceptual framework (with its basic definitions) that will be applied within the research project. The AVC approach is then linked to main lines of argument from current research. In the second paragraph we show the results of the first empirical research that is based on the meta-analysis of planning literature. The results are discussed in an expert workshop. Its main lessons are part of the third section. We conclude by outlining preliminary implications for planning research, practice and teaching as well as identifying further need for research.

2. Conceptual framework

The project is based on an exploratory and qualitative research approach. Within a tentative conceptual framework two empirical research modules explore the impact and the interplay of AVC within spatial planning processes. This approach aims to generate hypotheses that can be tested in further research. Our research is guided by a primary research question:

> How and to what extent does the integrated application of analysis, visualisation and communication within spatial planning processes support the goal achievement of these processes?

In the following paragraphs we will provide a preliminary definition of our object of investigation and illustrate our understanding of spatial planning process. We base our work on Walter Schönwandt's basic scheme for planning that is part of a "Third Generation" in planning theory (Schönwandt 2002). This basic scheme conceives planning as a systemic cycle in which the "Planning World" is embedded in the "Life World". The "Planning World" includes planners as part of larger "Institutions" that use specific "Approaches" in order to solve spatial problems. The "Life World" has different issues on its "Agenda" set up by the different "Agents" that all together form the "Arena". The two worlds influence each other in a reciprocal manner through a circular process. The individual steps within the planning process split into three steps, that are directly influenced or shaped by the "Planning World", and three steps that operate outside the "Planning World" exclusively within the "Life World". The "Planning World" provides the organisational and theoretical background for the sections called "Comprehension of the Situation", "Elaboration of Instructions", and "Communication of Behaviour". The "Life World" contains the stages "Interventions", "Setting" and "Outcomes" (Schönwandt 2002) (see figure 3).

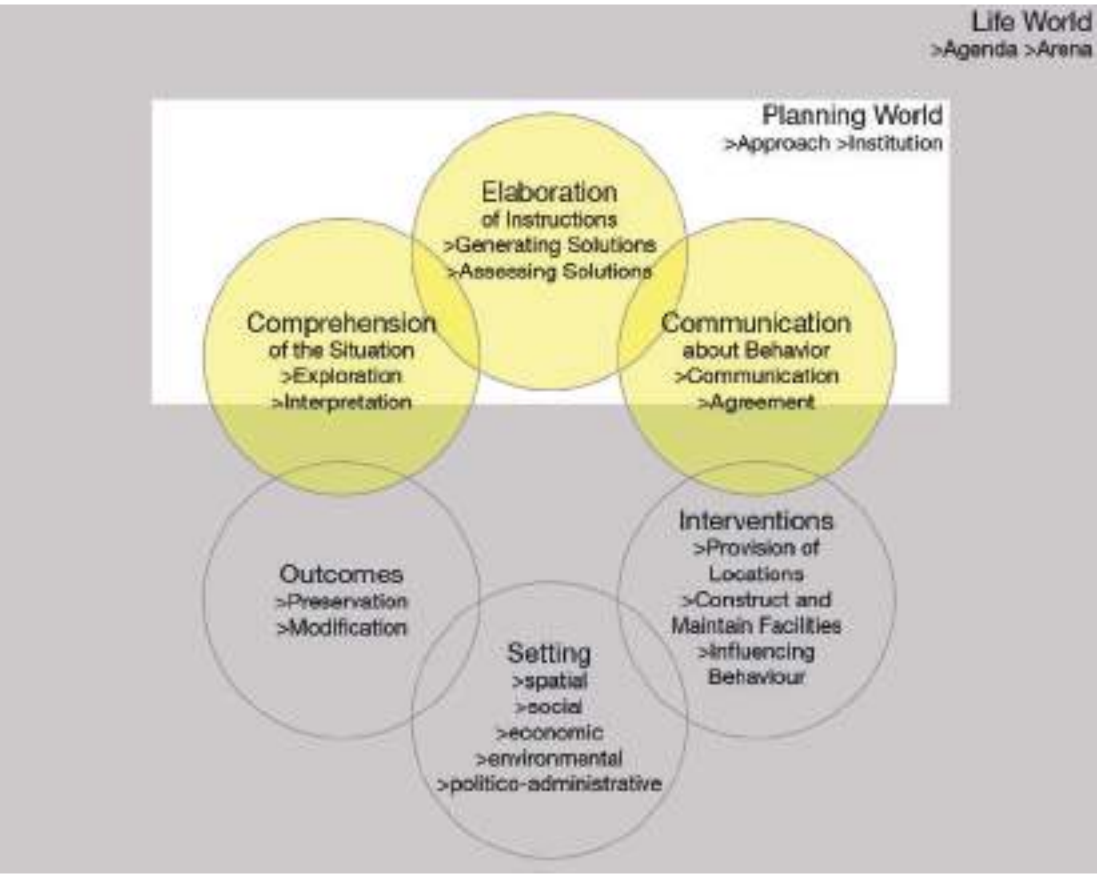

Figure 2: Walter Schönwandt's basic scheme for planning, the three stages that are directly influenced and shaped by the "Planning World" are emphasised in yellow (Schönwandt 2002, author's adaption).

Communicative planning methods

In our research project, this basic scheme for planning is a useful way to contextualize planning methods and their respective outcomes and impact within the circular planning process. We understand planning methods in a broad sense as the procedures that are applied within the three stages "Comprehension of the Situation", "Elaboration of Instructions", and "Communication of Behaviour" in order to work out the expected results of these steps. Planning methods are initiated, shaped and influenced by the "Planning World". We distinguish planning methods from planning instruments or "Interventions" that are to be implemented in the real world (Hübler 2005).

Planning methods are regarded as a "controlled sequence of purposeful operations in order to solve problems" (Schönwandt and Voigt 2005: 772). These sequences are deliberately designed; planning methods require personal, financial, and temporal resources, and an organisational and legal framework. Hence planning methods at least implicitly include an idea of their mode of operation and of desired impact. The outcome and impact of planning methods appear at different levels: shaping the results of the three stages; influencing the application of subsequent methods; modifying "Approaches" and "Institutions" of the "Planning World"; facilitating certain "Interventions" that eventually change the "Settings". In that sense planning methods only indirectly impact the "Outcomes" of planning.

This basic definition points to a broad spectrum of procedures that reaches far beyond standardized or legally regulated operations (Fürst and Scholles 2004). Planning methods are permanently enhanced in an on-going process of variation and modification in order to cope with the changing challenges of spatial planning processes.

When taking the issue of impact as a starting point for the research in planning methods, these methods necessarily comprise purposeful events of communication. On our understanding, communication is a prerequisite to all planning methods. In our research approach we consider only those methods that are directed to a recipient and in that way exceed spontaneous informal two-person or group communication. We restrict the project to medial and public informal communication. An expertise left on the shelf or a simulation tool run only within the walls of a design office, are cut off from audience. In this respect they are incomplete planning methods. Instead these tools have to be set within more complex sequences of operations that in the end also address stakeholders.

In our research project we distinguish planning methods according to different characteristics of communication: format, recipient and degree of interactivity. Planning methods can be shaped by a single communicative event or a sequence of different communicative events that are deliberately linked to one another.

When the “Planning World” applies and carries out planning methods it simultaneously initiates individual steps of communication within the “Planning World” and between the “Planning World” and the “Life World”. Planning methods stimulate the communication process within and between the two worlds. Current communication theory conceives communication as a system that exceeds linear cause-and-effect. Instead back coupling is an important feature (Merten 1999: 114-117). When applied to our research approach, feedback that can be understood as outcome and impact of purposefully applied planning methods.

Planning methods’ analytical and visual ingredients

Beyond the basic communicative challenge, planning methods require further skills and capabilities of spatial planners. We hypothesis that analysis and visualisation make up basic buildings blocks, that in their various formations define the outcome and impact of planning methods. Analytical and visual skills can be regarded as ingredients in more complex “sequences of purposeful operations” (Schönwandt and Voigt 2005: 772).

Analysis points to a systematic search process that aims to gain new knowledge on real world planning situation. Planning methods can be regarded as analytical when they apply scientific research methods and their practical and hands-on modifications. This includes a rich repertoire of scientific research methods ranging from quantitative to qualitative empirical methods as well as non-empirical interpretative methods. By this definition, analysis is no longer restricted to the “empirical-analytical” paradigm of social sciences (Hermann, Heye and Leuthold 2004) or the “analytical philosophy of science” (Boesch 1989). Analysis as basic building block of planning methods should not be put on a level with “linear thinking“ or “scientism“ but potentially embraces further research approaches such as systems theory, phenomenology and hermeneutics (Boesch 1989). In our research project we focus on three basic criteria of analysis: methods and techniques, the connection to communication – analysis as something on-going or as a result – as well as the method of assessment of the analytical results.

Visualisation in the narrower sense applies to the utilisation of pictures as a visual exemplification of a fictional or real situation or matter within planning methods (Sachs-Hombach 2005). In spatial planning typical visual media include maps, plans, blueprints, GIS-visualisations, renderings, photographs, sketches, drawings, mock-ups or diagrams. We restrict visualisations to medial images and ignore their real and mental dimension (Förster and Thierstein 2008). Visualisations are linked to communication as an event or a result. Visualisations as a result gain their weight within planning methods from communicating visual products. In this case the act of visualising is not part of the communicative event. Visualisation as a presentation technique has the ability to – better – communicate certain planning contents. When visualisations emanate from the act of visualising within planning methods, they can be regarded as an event. The action of visualising happens simultaneously with the communicative event. The event of visualising can be both analytic and creative in nature.

The complementary nature of the three building blocks AVC

Today planning theory and practice acknowledge that spatial planning calls for a broad range of different skills and capabilities (Harris 1999; Dangschat, Frey and Hamedinger 2008). However, the evolution of planning theory in the last 60 years is characterized by a sequence of so called "turns" – each of which can be interpreted as the emphasis of certain skills to the detriment of others. The emphasis of the role of analytical or visual or communicative skills within planning theory's turns illustrates the specific capabilities and limitations of each of these skills. For this reason we hypothesise the productive combination of AVC.
Analytical skills are of central importance in the attempt to make spatial planning more scientific early in the 1960s. There is much focus on the study of cause and effect of the built and social environment (Hall 1996; Albers 2004, 2006; Davoudi 2006). When acknowledging the limitations of systems analysis and system optimisation in the 1970s, planning theory is looking for a much more differentiated integration of analytical skills in political as well as design processes (Kunz, Reuter and Rittel 1980; Kunz and Rittel 1984; Harris and Batty 1992; Salama 2008). The turn to "evidence-based planning" from early 2000 capitalizes on analyses as a means of persuasion and engaging planning actors (Böhme and Schön 2006; Faludi and Waterhout 2006). This approach is criticized as follows: the action of analysing cannot be separated from assessing and designing (Harris 1996; Davoudi 2006); therefore analyses have to be embedded in the process of interaction and communication of the different planning actors (Böhme and Schön 2006; Faludi and Waterhout 2006); the interpretation of analytical results demands a creative and iterative process in which visualisations may play an important role (Aring and Sinz 2006; Primas 2008).

Visualisations are fundamental to the understanding of planning as a design-oriented discipline. This goes back to its origins in architecture and engineering. In particular, the synthesis work of spatial planners implies a basic design component that cannot be treated scientifically (Rittel 1988; Hall 1996; Harris 1996; Albers 2004, 2006). Visualisations offer important support to the design process (Rittel 1988; Hacker 1999; Sachse 2002). The creative momentum is also necessary for creating strategies, concepts or plans; in each case the visualisation of spatial patterns and structures is of central importance (Aring and Sinz 2006; Davoudi 2006; Zonneveld 2007; Dangschat, Frey and Hamedinger 2008). The approach of "evidence-based planning" makes use of visualisations to communicate analytical results (Böhme and Schön 2006; Faludi and Waterhout 2006; Zonneveld 2007). Communicative or cooperative planning identifies pictures and visualisations as a means of fostering comprehensibility, clearness and vividness of planning contents as well as awareness among relevant actors – all of this is constitutive in activating stakeholders and players in spatial planning (Faludi 1996; Healey et al. 1999; Salet and Faludi 2000; Fürst 2005; Boelens 2006; Faludi and Waterhout 2006; van den Berg 2006; Zonneveld 2007).

The consideration of communication as a basic skill for spatial planners can be found in the argumentative planning model (Rittel and Webber 1973; Kunz, Reuter and Rittel 1980) and the approach of collaborative / communicative planning (Healey 1992). In this model, planning deals with political and design problems (Rittel and Webber 1973; Harris 1999; Zonneveld 2007). The turn to communicative issues in planning can be traced along the following keywords derived from planning theory and practice: planning is directed towards a process instead of a plan; "governance" in place of "government" as part of a cooperative approach to planning; urban development as a collective process of cooperation and coordination that includes as many players as possible. When broken down into a set of concrete skills that spatial planners need, these approaches require information, cooperation, moderation, mediation, management, bargaining (Healey et al. 1999; Faludi 2000; Salet and Faludi 2000; Knieling, Fürst and Danielzyk 2003; Fürst 2005; Boelens 2006; Heinelt 2006; Knieling 2006; Nadrowski and Wachten 2006; Reiß-Schmidt 2006; van den Berg 2006; Friedmann 2007; Selle 2007; Davoudi 2008; Dangschat, Frey and Hamedinger 2008). Criticism of the one-sided emphasis on communication points up a lack of attention to planning content, deficient expert knowledge of planners (Hall 1996; Huxley and Yiftachel 2000; Schönwandt 2006; Selle 2006) as well as the shortcomings of the creative momentum (Albers 2004, 2006).

This brief synopsis of AVC's roots in planning history shows that AVC emanates from different traditions and working cultures in planning theory and practice. Today these skills form a repertoire that can be drawn on according to the planning problems that have to be tackled – beyond one-sided preferences (Schönwandt 2002; Altrock, Huning and Peters 2004; Fürst 2005). Nevertheless, we would argue that AVC's synergies and complementarities are investigated insufficiently in today's planning research.

3. Meta-analysis of planning literature

The first empirical module of the research project is based on the meta-analysis of international planning literature of the last 10 years. This module points to the exploration of the "space of possibility" of AVC's interplay. The objective is to generate hypotheses that can be tested in real case studies. Based on the primary research question, three questions are examined within the investigation. The first question points to the outcome and impact of planning methods that comprise the skills AVC; the second question focuses on the interplay of AVC within planning methods; the third question investigates external influence on the outcome and impact of methods as well as on the interplay of AVC. The latter includes the three steps within Schönwandt's basic scheme for planning, the different spatial scales of the respective case studies, and the different disciplinary backgrounds of the authors of the scientific articles.

3.1. Meta-analysis – methodology

The meta-analysis is restricted to articles in international peer reviewed planning journals in the period 2000-2011. A systematic screening is carried out along the following criteria: 1) the articles report on the application of planning methods in a real case study; 2) the particular planning methods contain the basic skills communication and/or analysis and/or visualisation; 3) the case studies are located in the Western World; 4) the authors judge the effects – outcome and/or impact – of applied planning methods. The articles report on impact studies, arranged more or less systematically, of planning methods with AVC. The primary quality criterion is the peer review process.

The screening process started with a Boolean search in international search engines that revealed over 2400 findings. These findings were reduced stepwise to 40 articles that feed into the qualitative content analysis. The selection proceeded with 1) a rough selection of nine per cent of all articles by screening title, abstract and keywords 2) a fine selection of 35 per cent of the remaining articles by systematically perusing the abstracts 3) carrying out the content analysis with 152 remaining articles and filtering another 75 per cent that did not fit the predefined criteria. The fine selection included articles from 53 peer review journals that were reduced to 19 journals in the final selection (see table 1).

	Fine selection	Final selection by content analysis	
Journals	Number of articles selected	Number of articles selected	not selected
Futures	20	4	16
Landscape and Urban Planning	18	6	12
disP	12	5	7
Environment and Planning B: Planning and Design	9	3	6
Informationen zur Raumentwicklung	9	4	5
Environmental Impact Assessment Review	5	1	4
Journal of Planning Education and Research	5	2	3
Environment and Planning A	4		4
Archnet-IJAR, International Journal for Architectural Research	3		3
Built environment	3		3
Global Environmental Change	3		3
Integrated Assessment Journal, Bridging Sciences & Policy	3		3
Journal of Environmental Planning and Management	3	2	1
Land Use Policy	3	1	2

Planning Theory & Practice	3	2	1
CoDesign: International Journal of CoCreation in Design and the Arts	2	1	1
Computers, Environment and Urban Systems	2		2
Construction Management and Economics	2		2
Journal of Environmental Management	2		2
Journal of the American Planning Association	2		2
Landscape Research	2		2
Local Environment: The International Journal of Justice and Sustainability	2	1	1
Planning Practice and Research	2		2
Public Administration Review	2	1	1
RaumPlanung	2	2	
Society & Natural Resources: An International Journal	2		2
Agricultural Economics Revue	1	1	
Agriculture, Ecosystems and Environment	1		1
Annals of the Association of American Geographers	1	1	
Community, Work & Family	1		1
Environmental Science & Policy	1		1
European Planning Studies	1		1
Forest Ecology and Management	1		1
Georisk: Assessment and Management of Risk for Engineered Systems and Geohazards	1		1
Interdisciplinary Science Reviews	1		1
International Journal of Geographical Information Science	1		1
International Journal of Urban Sustainable Development	1		1
International Journal of Water Resources Development	1		1
Journal of Ecotourism	1		1
Journal of Flood Risk Management	1	1	
Journal of Location Based Services	1		1
Journal of Project Management	1		1
Management Decision	1		1
Planning Theory	1		1
Political Geography	1		1
Public Choice	1		1
Raumforschung und Raumordnung	1		1
Simulation and Gaming	1		1
Technological Forecasting and Social Change	1		1
Tourism Geographies: An International Journal of Tourism Space, Place and Environment	1	1	
Town planning review	1		1
Transport Planning	1	1	
Water International	1		1
Summe Artikel	**152**	**40**	**112**

Table 1: Planning journals and respective articles in the selection process from fine selection to final selection.

Learning from the omitted papers

During the screening process we evaluated the reasons for removing articles from the hit list. This provides valuable considerations for the state of research in planning methods. The fine selection by perusing the abstracts omitted 65 per cent of the initial selection of articles. The applied evaluation scheme integrated the criteria 1) presence of planning methods and 2) their application in a real case study. The evaluation produced the following results: The most important reason to leave out articles is the absence of a real case study while most of the articles are actually devoted to planning methods. In the chosen period of investigation plenty of scientific literature can be found on planning methods. Only a small part of it, however, deals with their application in planning practice. The rest of the articles presumably focus on theories, techniques, and formula of planning methods.

During the content analysis three quarters of the selected articles did not fit our criteria for delineating the effects of applied planning methods. Fundamental reasons for exclusion were:

- Planning methods lack application in a case study or, when actually applied in a real case, they lack a receptive audience. Therefore the effects and impact of planning methods cannot be observed (Affisco 2000; Anderson, Meaton and Potter 1994; Bell 2001; Carlsson-Kanyama et al. 2008; Dortmans 2005; Fenster 2009; Gertler and Wolfe 2004; Guhathakurta 2002; Hermann 2009; Janssen, Goosen and Omtzigt 2006; Lange and Hehl-Lange 2010; Lange 2001; Luz 2000; Malczewski et al. 2003; Newcombe 2003; Nye and Rydin 2008; Robinson 2003; Sanoff 2008; Sheppard 2006; Vervoort et al. 2010; Walker, Bourne and Shelley 2008; Hanewinkel 2009)
- Planning methods are derived from planning theory and respective articles focus on the development of a theoretical concept for planning methods without application in practice (Alshuwaikhat and Nkwenti 2002; Ball 2001; Beers et al. 2010; Bourne and Walker 2005; Rauschmayer and Wittmer 2006; Renn 2006; Selin 2006; Sheppard 2005).
- Authors focus on techniques and detailed procedural steps of planning methods. They are looking for optimisation and improvement of planning methods for given functions and do not examine their effects in a real case (Appleton and Lovett 2005; Bryan 2003; Dockerty et al. 2006; Jessen 2005; Jetter and Schweinfort 2010; Joerin, Thériault and Musy 2001; Konisky and T.C. 2001; Novakowski and Wellar 2008; Özkaynak and Rodríguez-Labajos 2010; Shaw et al. 2009; Talen 2000; Tansey et al. 2002; van de Kerkhof and Wieczorek 2005).
- Articles only deal with the application of methods in planning practice descriptively (Dühr 2003; Jenssen 2010; Özdemir, Basal and Aslan 2010).
- Planning methods are described in respect to their functions as ex-ante supposed impacts instead of ex-post effects (Celino and Concilio; Finn, Hopkins and Wempe 2007; Garrod 2003; Jacob 2006; Kok 2009; Lange, Schroth and Wissen 2003; Wiek, Binder and Scholz 2006)
- Authors point to the implementation and realisation of planning methods with regard to feasibility, acceptance, and comprehensibility to the addressee without assessing the effect of the methods on the planning process (Ben-Zadok 2009; Jankowski 2009; Lord and Hincks 2010; Palerm 1999; Renn 2006; Sheppard and Meitner 2005; Smith 2002).
- Planning methods are assessed from a normative perspective without looking at their effects in a real case (Bond, Palerm and Haigh 2004; Buchecker, Hunziker and Kienast 2003; Carr and Halvorsen 2001; Chilvers and Burgess 2008; Palerm 1999).

This brief summary of main reasons for omitting articles from the meta-analysis illustrates the current need for research on planning methods. In the last few years scientific literature has over-emphasised the dimensions of technique, formula, function of planning methods to the detriment of studying the actual effects and impacts of planning methods in planning practice.

Selected Database

The selected 40 articles for the meta-analysis come from a broad variety of international journals (see table 1); its authors cover a broad range of different disciplines involved in spatial planning (see table 2). The analysis of disciplines is based on the first authors' education and current field of activity as well as the journal specialism. More than half of the articles have two or more disciplinary backgrounds as indicated by the multiple mentions in table 2.

Discipline (multiple mention)	Number of journal articles
Urban and regional planning	11
Landscape planning	8
Environmental sciences and planning	8
Spatial development and planning	8
Geography	7

Hydrology / water management	5
Administrative sciences	4
Political science	4
Landscape ecology / human ecology	3
Forestry	3
Architecture	3
Geology / geo sciences	2
Transport planning	2
Social scieneces	2
Planning theory	2
Screenwriting	2
Agronomy / agricultural sciences	1
Urban design	1
Tourism	1
Agrology / soil science	1
Number of mentions	**78**
Number of disciplines	**20**

Table 2: Disciplines included in the meta-analysis.

The aggregation of theses different disciplines in the four classes 1) planning disciplines, 2) natural and engineering sciences, 3) social sciences and 4) design gives rise to the following picture: 88 per cent of all articles have a link to planning disciplines – no surprise in our research project. 45 per cent of the articles have a background in natural and engineering sciences. These disciplines seem to claim raised demand and efforts for effective planning methods in spatial planning practice. Only 15 per cent of all articles have a background in design disciplines including urban design, architecture and landscape architecture. How is this to be interpreted? The quality criterion of peer reviewed planning journals might be a significant bias for the different disciplines: design disciplines might publish in these journals less frequently than other disciplines as they have a stronger focus on planning practice. Another assumption is the minimal involvement of design disciplines in the planning issues captured in our literature review.

The case studies in the selected articles range from sector planning issues like transport, water, climate change and tourism to more comprehensive, strategic planning issues. 47 per cent of the articles engage in case studies at the spatial scale of municipalities and cities, 40 per cent tackle regional planning cases and a minority of 13 per cent of the articles report from European planning cases.

The content analysis of the chosen scientific articles is carried out along a coding scheme (see figure 3); coding and its qualitative analysis are computer-assisted. The starting point of the coding process is the identification of planning methods; secondly, these methods cause effects that can be attributed to the different stages within Schönwandt's basic scheme for planning; thirdly, the presence of the basic skills AVC within the coded methods is recorded.

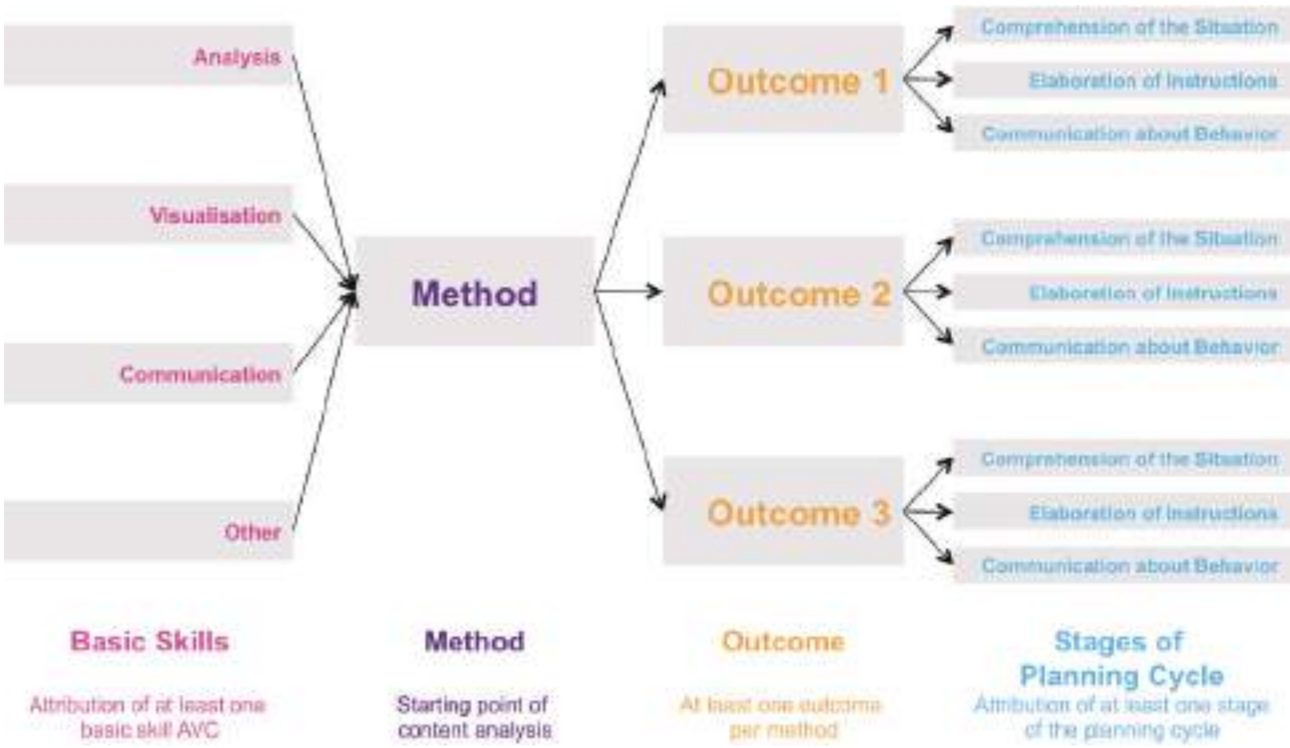

Figure 3: Coding scheme of the content analysis.

The approach of a meta-analysis based on journal articles entails the difficulty that it is not possible to verify the articles' underlying data and its assessment criteria. Moreover, scientific approaches and methods vary from article to article. Nevertheless we regard our approach as adequate to outlining a preliminary "space of opportunities" of AVC's interplay and in this way to conduct an initial test of our general hypothesis.

3.2. Meta analysis – findings

In the subsequent sections we will summarize the results of the meta-analysis. We will focus on research questions one and two. Research question one is:

What positive effects on spatial planning do planning methods that apply the skills AVC generate?

The content analysis assigns 178 codes for effects of planning methods that are subsequently categorised to 27 effects (see figure 4) in a multi-level qualitative analysis process. Effects appear in all three stages of the planning process "Comprehension of the Situation", "Elaboration of Instructions", and "Communication of Behaviour" (see figure 5) and have strong reciprocal effects (see figure 6). The meta-analysis cannot analyse the long-term impacts of these effects to the actual goal achievement of the case studies. The recorded effects should rather be interpreted as impacts that the authors' of the scientific articles perceive and suppose. With the 27 categorized effects, the meta-analysis indicates weighty expectations of spatial planners with regard to the outcomes and impacts of planning methods that apply AVC.

INVOLVEMENT OF LAYMEN
CONSENSUS-BUILDING
SPATIAL CONTEXT
DISCUSSION, EXCHANGE
COMPREHENSIBILITY
COLLABORATIVE SOLUTION FINDING
COMPLEX RELATIONSHIPS
MOBILISATION OF STAKEHOLDERS
IMPLICIT KNOWLEDGE
CREDIBILITY
OPENING UP ALTERNATIVES
AWARENESS-RAISING
COLLABORATIVE ASSESSMENT OF ALTERNATIVES
CONSIDERING DIFFERENT VIEWPOINTS
COLLABORATIVE EVALUATIONS OF PROBLEMS
CREATIVE SOLUTIONS
NEW KNOWLEDGE
EXCHANGE BETWEEN DISCIPLINES
COMPREHENSIVE ASSESSMENT OF ALTERNATIVES
STRATEGIC, LONG-TERM THINKING
REASSESSMENT OF PROBLEMS
COMMON LANGUAGE
SYNTHEZISING VIEWPOINTS
KNOWLEDGE EXCHANGE
SATISFACTION
PERSUASIVE POWER
NEW VIEWPOINTS

Figure 4: 27 individual effects of planning methods with AVC arranged according to frequency in the study sample of 40 scientific articles.

In the content analysis each of the effects is characterized by a bottom-up definition out of the journal articles. In this paper we extract five out of 27 definitions.

Involvement of laymen

→ ***Laymen and affected parties are involved***

Planning methods support the involvement of a broad range of actors from the “Life World” that are predominantly non-professionals: citizens, involved parties, residents, users, and different groups of stakeholders. These actors are integrated in the planning project at different levels of intensity: from information to active participation in the processes of data interpretation or solution finding. This integration makes use of everyday and local understanding and knowledge, of attitudes and mind-sets, issues and concerns, experience, expectations, users’ perspectives, new approaches and arguments.

(Al-Kodmany 1999; Antunes, Santos and Videira 2006; Berchtold and Krass 2009; Frittaion, Duinker and Grant 2010; Lewis and Sheppard 2006; Schroth, Wissen and Schmid 2006; Söderström and Zepf 1998; Van Herzele 2004; Van Herzele and van Woerkum 2008; van Vliet, Kok and Veldkamp 2010; Ward 2001; Wright, Duncan and Lach 2009)

Spatial context

→ ***Spatial and territorial patterns, orientation and context are incorporated***

Planning methods convey and communicate visual and spatial relationships, connections and patterns as well as invisible, hidden functionalities and correlations. They support the spatial and territorial specification and concretisation of planning content and the relation to spatial context. They thereby strengthen the link to the everyday life situation of the planning actors and involved parties and foster the comprehensibility of spatial patterns and relations. They take into account perception of space and spatial images of the concerned actors, support spatial orientation in the planning area, and territorial awareness among the stakeholders.

(Al-Kodmany 1999; Aring and Sinz 2006; Berchtold and Krass 2009; Böhme and Schön 2006; Lewis and Sheppard 2006; Söderström and Zepf 1998; Van Herzele 2004; Van Herzele and van Woerkum 2008; Wright, Duncan and Lach 2009)

Collaborative solution finding

→ ***Solutions are developed collaboratively with the actors of the "Life World"***

Planning methods support the integration of the actors of the "Life World" into the process of generating solutions. They enable the step-by-step development of the solution in a process with different actors and support stakeholders and non-professionals of the "Life World" in proposing solutions. The methods allow for a collective authorship of solutions, improving those solutions through the integration of new perspectives and approaches and facilitating the formulation of practical solutions through affected parties.

(Al-Kodmany 1999; Berchtold and Krass 2009; Deelstra et al. 2003; Frittaion, Duinker and Grant 2010; Sandercock 2003; Schroth, Wissen and Schmid 2006; Söderström and Zepf 1998; Van Herzele 2004; Van Herzele and van Woerkum 2008; Ward 2001)

Complex relationships

→ ***Comprehension of complex relationships is fostered***

Planning methods help structuring and surveying unclear, complex relationships. They support a broad and comprehensive understanding of planning content and foster integrated thinking and system comprehension. They enable the comprehension of spatial functionalities, qualities and problems as well as cause-and-effects amongst the protagonists of the "Planning World" and "Life World".

(Antunes, Santos and Videira 2006; Berchtold and Krass 2009; Frittaion, Duinker and Grant 2010; Jensen et al. 2000; Lewis and Sheppard 2006; Mayer et al. 2005; Van Herzele 2004; van Vliet, Kok and Veldkamp 2010)

Implicit knowledge

→ ***Implicit knowledge of actors and stakeholders is integrated***

Planning methods support the integration of implicit, tacit knowledge that is linked to individuals. That includes subjective assessments, perceptions, and experience – with or without spatial reference. Actors and stakeholders contribute their implicit knowledge, make it explicit and thus support the structuring of problems, assessment of problems and solutions as well as integrated thinking. They localise need for action and potential in city quarters, cities or regions, and introduce new points of view.

(Al-Kodmany 1999; Antunes, Santos and Videira 2006; Berchtold and Krass 2009; Frittaion, Duinker and Grant 2010; Golobic and Marusic 2007; Hasse and Milne 2005; Schroth, Wissen and Schmid 2006; Söderström and Zepf 1998; Van Herzele 2004; Van Herzele and van Woerkum 2008; van Vliet, Kok and Veldkamp 2010

Interplay between the individual effects – interdependency network

Planning methods have the ability to simultaneously initiate different effects. In the study sample planning methods on average trigger 4.8 individual effects. This leads us to the interpretation that planning methods are deliberately implemented to simultaneously generate such effects that mutually depend on or reinforce one another. In this way the individual effects interact in an interdependency network. We carried out a quantitative social network analysis that looked at the inter-linkages between the 27 individual effects of the study sample. The formal network analysis helps – from the perspective of the study sample – to identify the key levers for enhancing the effectiveness of spatial planning processes.

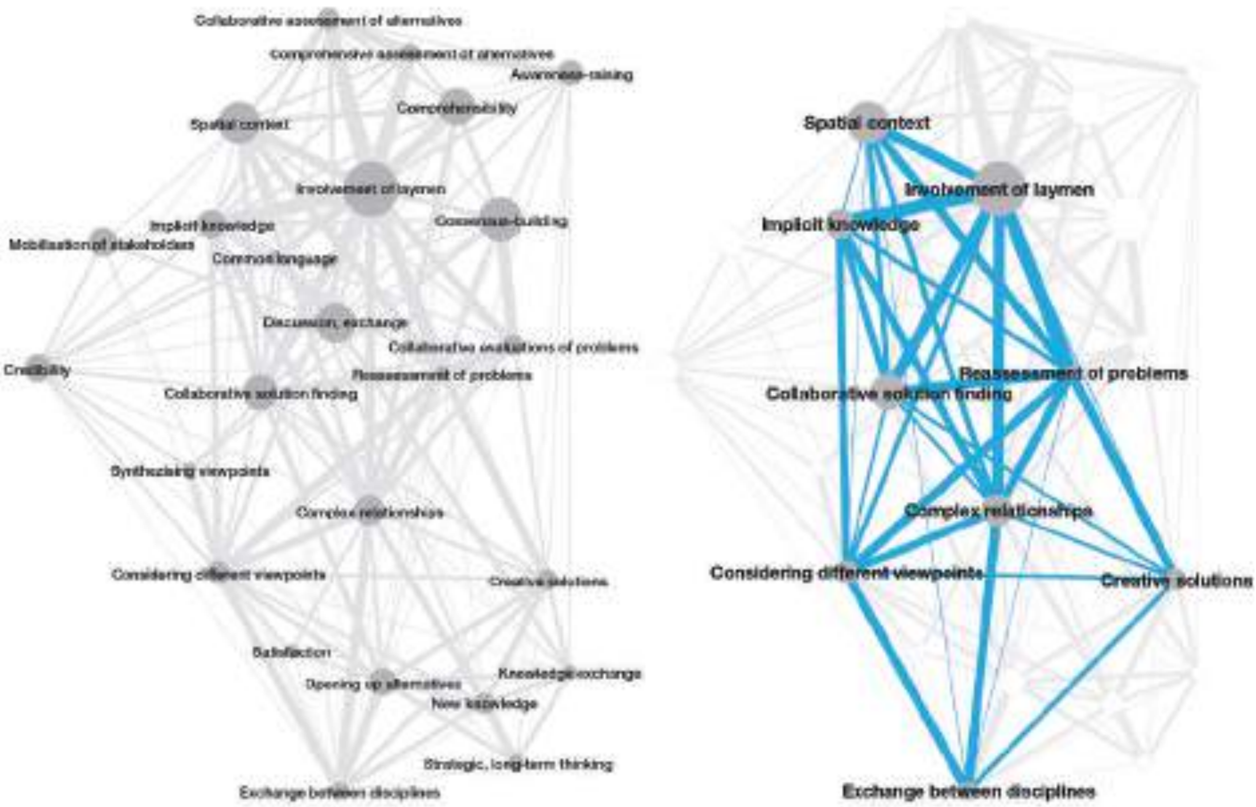

Figure 4: interdependency network of planning methods' individual effects of in the study sample, illustration of all linkages (left) and filter of the most important linkages (right).

The position and relation of an individual effect within the interdependency network demonstrates the importance of an effect for the goal achievement of the study sample's planning projects. The network features a main node "involving laymen" and a secondary node "complex relationships" that are in close exchange. The effects "spatial and territorial dimension" and "implicit knowledge" have a connecting function between these two main nodes.

Effects in the steps of the basis scheme for planning – "specialists" and "generalists"

All coded effects of the study sample feature information on the stages of the planning scheme. This attribution is based on information provided in the journal articles along a rough assessment framework. Consequently the classified 27 effects can be analysed with respect to their approximate position within the scheme of planning (see figure 5).

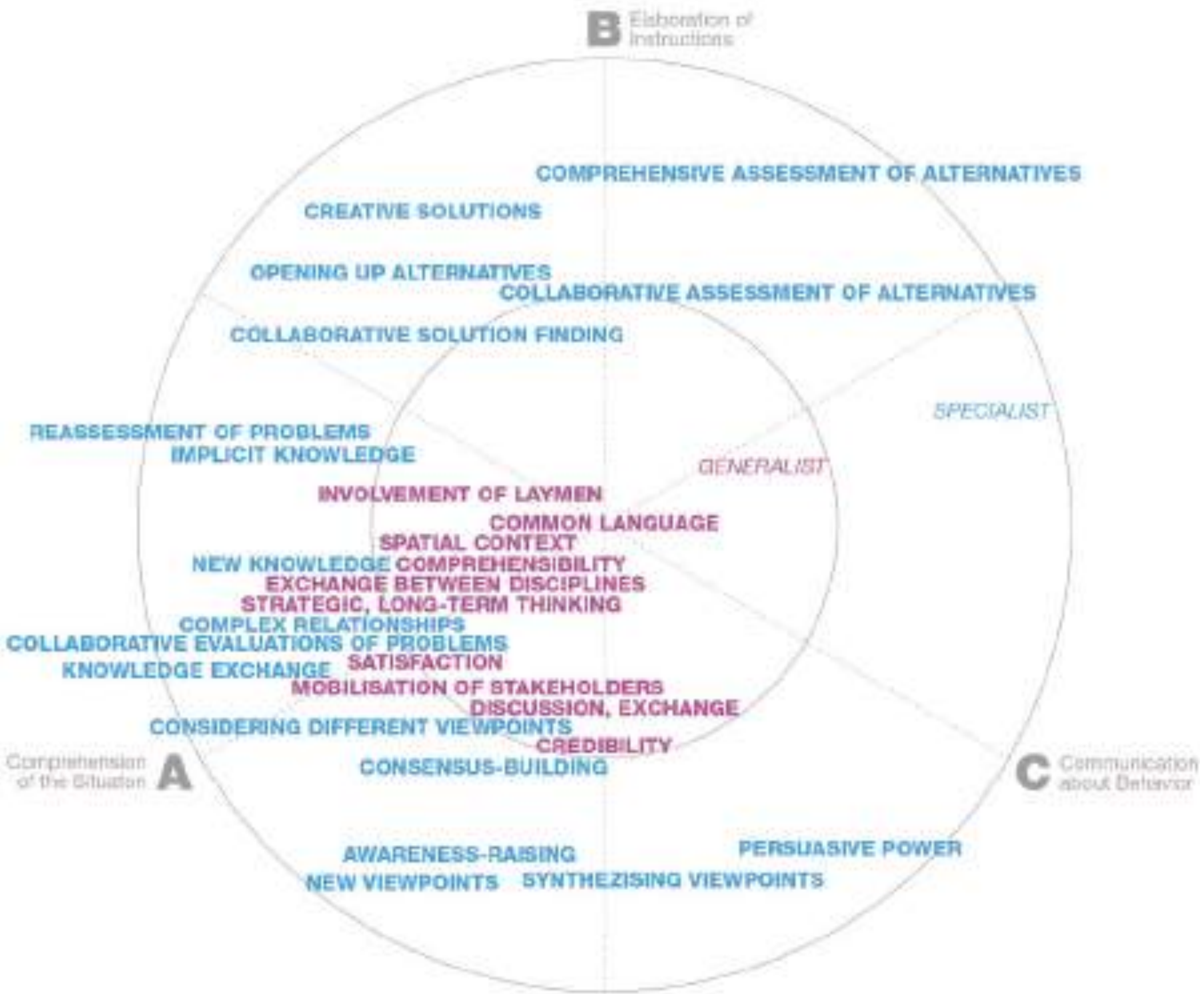

Figure 5: Classification of individual effects of planning methods within the scheme for planning – ranging from “specialist” to “generalist”.

“Specialists” are those effects that primarily operate in the individual stages of the planning process “Comprehension of the Situation”, “Elaboration of Instructions”, and “Communication of Behaviour”. “Generalists”, on the contrary, are effects occurring in all three stages of planning.

This brief and sketchy overview of the results of the meta-analysis related to research question one can be summarized as follows: planning methods with AVC form a dense network of a broad range of expected effects that apply to all three stages of the planning cycle. Although our research approach inevitably captures a diversified understanding of planning methods’ effects, outcomes and impact, we suggest that the AVC approach comprises a suitable scope of skills that significantly determine the potential impact of planning methods.

Research question 2 investigates the interplay of AVC within the planning methods:

How and to what extend does the interplay of AVC contribute to the planning methods’ positive effects?

The meta-analysis shows that the broad range of suggested effects features significantly different characteristics of the basic skills AVC and their respective interplay. The analysis leads us to postulate that the stronger AVC are linked up to one another the more effective the respective methods are. The 27 categories of presumed effects show clearly different profiles in their ACV ingredients (see figure 6). That means that the basic skills AVC, by their complementary nature, add value to spatial planning processes.

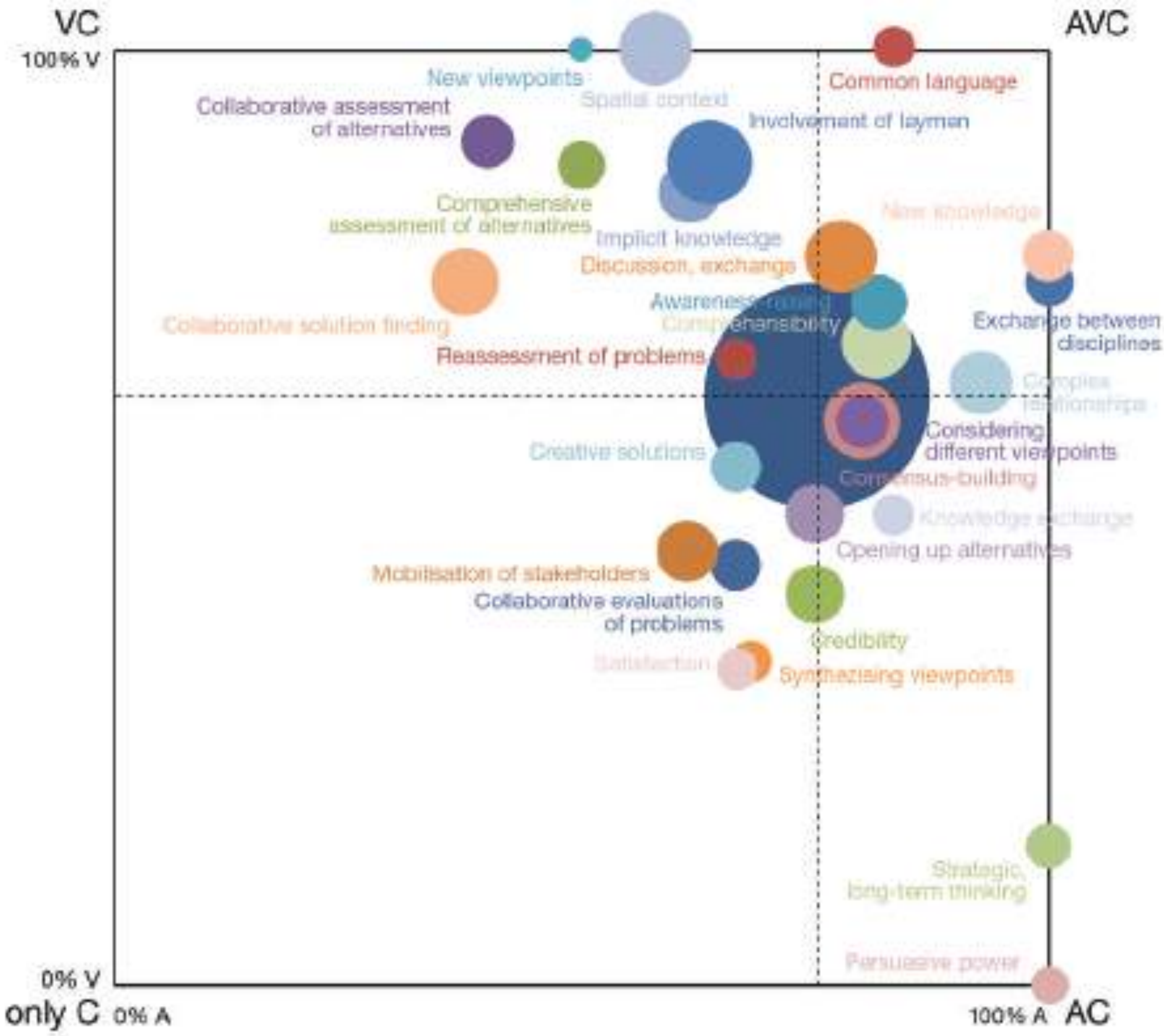

Figure 5: Characteristics of AVC interplay of the different categories of presumed effects within the study sample.

The coding scheme allows correlation of the defined effects with the basic skills AVC that are part of the applied methods. Figure 5 shows the results of the quantitative analysis of AVC ingredients within the 27 categories of effects. The size of the circles indicates the frequency of the effects within the 40 journal articles. The circles' position on the x-axis refers to the portion of analysis within the respective methods; the position on the y-axis reflects the portion of visualisation. Effects that are dominated by predominantly analytical methods, visual methods or a combination of both clearly can be depicted.

The meta-analysis further investigates the relation between the structure characteristic of AVC in planning methods and their attributed effects. Altogether eleven key findings can be drawn from this detailed qualitative study. These findings will here be listed only; further explanation about individual findings can be drawn from Förster and Thierstein 2011 (Förster and Thierstein 2011).

1. The basic skills AVC create positive effects through complementarities and synergies (see figure 5)
2. The interplay of AVC fosters the interdependency network of planning methods' positive effects
3. The interplay of all three skills AVC within planning methods is particularly effective
4. Planning methods that are exclusively based on communicative skills are less effective
5. The interplay of different communicative events within planning methods fosters their positive effects
6. Face-to-face communication is more effective than medial communication
7. The higher the methods' degree of interaction the more effective are the methods

8. Analyses show higher effectiveness when closely linked to communication events
9. Complexity and complementarity of analytical methods fosters planning methods' effectiveness
10. The deliberate design of the process of interpretation and evaluation of analytical results increases effectiveness of planning methods
11. Making use of complementary visualisation techniques improves the positive effects within planning methods.

The analysis reveals clear correspondence between input of AVC and the effects of the methods applied. Despite a number of limitations of our meta-analysis and the study sample, AVC obviously affects the impact of planning methods on the goal achievement of the planning projects. We worked out structure characteristics of analysis, visualisation and communication as well as of their interplay that seem to play an important role for effectiveness of planning methods.

4. Discussion and conclusions

There are a number of important limitations within the meta-analysis: 1) the selection of scientific articles exclusively from peer-reviewed journals entails the bias of considered disciplines and case studies; 2) the meta-analysis focuses only on positive effects of planning methods, their unintentional side-effects are not analyzed; 3) the articles report on the positive effects of planning methods; however, the empirical basis of the authors' findings cannot be assessed; 4) the latter is especially critical when some articles report on effects of planning methods with low priority because the articles focus on other issues.

4.1. Expert workshop and interviews

In order to validate our findings from the meta-analysis we carried out an expert workshop in October 2011 as well as a series of expert interviews with planning practitioners from Munich. The aim was firstly to discuss individual findings from the meta-analysis; secondly to assess the conceptual foundations of our research project and thirdly to check the relevance of our approach and overarching hypothesis from planning research and practice. The participants in the expert workshop and expert interviews were chosen from academia as well as from planning practice from German-speaking countries; a number of planning practitioners from the Munich metropolitan region were included.

The content analysis of the group discussion in the expert workshop reveals four central perspectives on the intermediate results of our research project. These perspectives are based on clusters of arguments closely used together during the discussion. In each perspective the need for further research is indicated.

Specifying our understanding of planning and planning process

The presentation of the concept and intermediate results of our project evoked a lively debate about our underlying understanding of the notion and concept of planning. With Schönwandt's basic scheme for planning we introduced a broad understanding of planning that is not restricted to a particular application – concerning scale, topic area, time horizon or institutional context. Correspondingly, we used multi-faceted case studies in our meta-analysis. In the group discussion participants argued that this broad understanding was too vague and that we therefore cannot learn much from this variety of very different case studies. Some experts point to the great importance of the institutional context on spatial planning that restrains cross-case learning in our study sample. One participant argues that our level of abstraction with regard to spatial planning is too high and hence useless. Another contribution to the discussion favors a restriction of the research project to the comparison of similar and hence more comparable planning cases. A group of participants questions the separation of the three preparatory stages "Comprehension of the Situation", "Elaboration of Instructions", and " Communication of Behaviour" that involve the "Planning World" from the sections "Interventions", "Setting" and "Outcomes" of the "Life World". The contribution of professional planners should not be restricted to these three stages as outcome and impact of planning projects are substantially determined by its implementation in the “Life World”. The conception of our project deliberately distinguishes the thought process – i.e. the three preparatory stages – from the implementation process. There is still conceptual work to be done in order to specify our understanding of planning process in respect of the applications of the methods on the one hand and their outcome and impact on the other hand.

Deepening the understanding of AVC and examining the role of framing and conceptualising

A number of participants found it difficult to clearly understand the concept of the basic skills AVC. We use the three terms in a specialized sense. On the one hand, participants’ spontaneous reactions to the term visualisation expand the concept to mental images and symbols as well as to all kind of methods that appeal to the senses such as excursions, mobile workshops, literature or sounds. On the other hand, the definition of visualisation is regarded as too extensive as it includes very different kind of phenomena. A central point in the discussion on the basic skills relates to activities such as framing, conceiving or conceptualising. Participants and interviewees argue that the triad AVC should be expanded to these kinds of skills. This remark points to a conceptual problem which we still have to tackle. Firstly we consider AVC as basic skills in order to frame, conceive or to conceptualize alternative solutions. Of course, some additional competencies are needed, such as creative skills. Some of the articles in our study sample refer to collective creative techniques. On the other hand we conceive planning methods as closely linked to media or group communication. In this regard, we neglect those creative techniques that are related only to one person or an internal work group and do not directly address the recipients of the methods.

Elaborating a framework of AVC’s impact that also considers the time axis

The third view of the results of the first research module concerns the analyzed effects of the planning methods. One participant argues that with our database of scientific articles we have collected only impacts that the authors assume instead of factual impacts of planning methods. Zech refers to the fact that many planning practitioners with expertise in the evaluation of planning methods are not used to publishing in peer-reviewed journals. Hence our database is biased. This is certainly true and the interpretation of the results must take account of the logic and rules of scientific publication practice. In addition there is a conceptual problem when assessing the effects of planning methods from a literature review. Each author – at least implicitly – has a different understanding of output, outcome and impact of the methods that she describes. The question is, to what extent does our meta-analysis really capture the impact of planning methods? To clarify this question we need to further conceptualize the idea of the output, outcome, and impact of planning methods on the time axis and with regard to the basic scheme for planning.

Investigating the role of context for the success of planning methods

When further elaborating a concept of impact we also have to specify the role of the context of this impact. Despite the correlation between AVC interplay and the effects of planning methods as shown in figure 5, the meta-analysis cannot elaborate on cause-and-effect between the skills and their respective impact. All workshop participants clearly recognize the importance of the context within which planning methods are applied. The context includes the different stakeholders with respective background knowledge and concerns, organisational structures, financial and human resources, balances of power, legal framework, etc. In order to choose case studies for our second research module we still have to refine the idea of context. The context varies in each planning case and it is important to be aware of the dependent and the independent variables that influence the impact of AVC within spatial planning methods.

4.2. Conclusions

In our paper we presented the intermediate results of an ongoing research project. Based on a conceptual framework, we carried out a first empirical research module and validated the results in an expert discussion and expert interviews. Although significant need for further research is identified and important conceptual as well as empirical work still has to be done, we consider our approach and our preliminary results as highly relevant for current spatial planning research and practice.

The activity of spatial planning is often regarded as a black box. Beyond the single planning case there is little transferable knowledge on how to effectively design and apply planning methods. This kind of knowledge is most likely found with experienced practitioners. With its empirical orientation, the research project aims to learn systematically from current planning practice. A broad cross-case perspective has been applied in the literature review of the first empirical research module; the second research module will deepen its findings in three focused case studies based on the analysis of primary documents and in-depth interviews.

With the expected results we hope to stimulate the discussion on the financial, temporal and personal resources of planning methods as well as their legal framework. Furthermore, the consequences for planning education will be outlined.

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