Improving assessment impacts on decision-making
A framework of analysis

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Abstract

Health Impact Assessment has emerged as a means for public health agencies to influence public policy-makers to make 'healthy' decisions. At the same time, however, a lot of policy-makers question the value added of HIA. Similar, several public health experts in the Netherlands and abroad recognize the difficulties of influencing policy-makers to actually make policies health sensitive. A question prompts: how effective is HIA in raising health impact awareness among policy-makers?

To evaluate the effectiveness of HIA one needs to look beyond the product and procedure of HIA to the policy process as a whole of which the HIA was part. In the field of impact assessment, learning from experience through outcome evaluation has not been practised widely. Our paper will describe a theoretical framework for analysis of the impact of impact assessment on policy in general. The impact assessment analysis framework is based on concepts from the Knowledge Utilization studies (policy analysis), Science and Technology studies (boundary work) and organizational learning (communities of practice) and Knowledge Management literature (dynamic capacity). The basic question to be answered is how decision-makers utilize the information from research in general, and from an impact assessment in particular.

In our presentation we will apply this framework to the case of Dutch national housing policy. We have analysed documents from different archives and conducted interviews with several policy actors, stakeholders and HIA practitioners at both the strategic and the operational level. The preliminary results draw an astonishing picture of the link between HIA and the policy process in this case, which has both theoretical implications for analysing HIA effectiveness as well as practical implications for developing conditions for an effective HIA.

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[1] This paper is a product of a joint research project in the Netherlands on Health Impact Assessment (HIA), in which two perspectives are combined. An epidemiological research is aimed at developing instruments to quantify potential health impacts from policy. A policy research is aimed at designing instruments for process management of HIA to contribute to healthy decisions. The combination of both perspectives should gain insight into the relation between knowledge and policy-making. The project will result in a handbook for HIA and two dissertations on HIA by the end of 2006.

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Outline:

1. Introduction

The link between impact assessment (IA) and decision-making seems obvious. According to IA definitions, impact assessment of policy is aimed at making policies or projects environmentally friendly, safer, healthier, and more democratic. Yet, there are two issues that make this link less obvious. We limit our scope to Health Impact Assessment to describe both issues.

Health Impact Assessment (HIA)[2] is a relative young member in the family of policy impact assessments. In the past decade several HIA tools and methodologies have been discussed and designed, bodies of data compiled, and models and theories have been developed[3]. HIA is applied at the local, regional, and national level of policy-making. Nevertheless, HIA practitioners, whether scientists or health service officials, still debate about how impact assessment should be practised[4]. Is it a scientific assessment to inform policy-makers? Is it a

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[2] HIA is 'a combination of procedures, methods and tools by which a policy, program or project may be judged as to its potential impacts on the health of a population, and the distribution of those impacts within the population' (WHO, 1998). HIA is a means to assess potential impacts before the policy is decided upon, in order to minimize damaging impacts and optimise beneficial impacts from the proposed policy (Scott-Samuel, Birley, & Ardern, 2001).

[3] www.hiagateway.org; www.who.int/hia; www.hiadatabase.net

[4] (European Centre for Health Policy, 1999; Joffe & Mindell, 2002; Lock, 2000; Mcintyre & Petticrew, 1999; Minnesota Department of Health, 2001/2; Parry & Stevens, 2001; Putters, 1996; Scott-Samuel et al., 2001; Taylor & Quigley, 2002; Varela Put, Broeder, Penris, & Roscam Abbing, 2001)

political means to have citizens and stakeholders participate and become empowered? Or is it a policy management instrument that translates potential health impacts from policy into alternative policy interventions? In short: what do the underlying assumptions of HIA practitioners and commissioners tell us about their expectations of the output?

In addition, there is a growing need for evaluation and follow up. To begin with, the growing diversity in HIA tools and methodologies makes it hard to compare different kinds of HIA and their outcomes. Moreover policy-makers wonder about the extent to which HIA actually impacts on the policy and whether the time investment outweighs the benefits. Several public health experts in the Netherlands and abroad recognize the difficulties of influencing policy-makers to actually make policies health sensitive[5].

We can address both issues by evaluating past practices of impact assessment. In policy analysis literature, evaluation is defined as the appraisal of an observation of the substance (product), process and/or outcome/impact, by means of criteria from (in) formal goals and objectives, principles and/or standards. As a result, evaluation is both empirical and normative, as the observations are judged according to a chosen (or negotiated) standard. Therefore it is important to make these criteria explicit (Bressers & Hoogerwerf, 1995).

In this paper, we concentrate on a framework for analysis of HIA outcomes by reflecting on literature from three sources that address the relation between research and policy: the Knowledge Utilization studies, the more recent Science & Technology studies and Knowledge Management literature[6], developed in the past decade.

2. The relation between research and policy: a literature study

We will describe useful concepts from the Knowledge Utilization studies, the Science & Technology studies and the Organizational learning and Knowledge Management literature.

2.1 Knowledge Utilization studies: policy analysis

First we describe the origins of the field, then its concepts for analysis, and finally their application to (health) impact assessment and policy-making.

2.1.1 A brief history
A short history of the relation between research and policy helps us to understand how knowledge utilization became an issue. Until the 20th century science and policy were more or less separated worlds. World War I and II were periods of rapid technological innovation, helping governments to prepare and win the war. As a result, policy-makers felt very confident that the social sciences could as well support policy-making by providing insight into the conflicts of values between democracy, justice, prosperity and welfare (Hoppe, 2002). Researchers, as concept builders, would provide knowledge to policy-makers, the concept users. Thus, academic institutes were provided with virtually infinite resources and funds. In the sixties however, this confidence was shaken by setbacks in the 'War on Poverty' in the U.S., based on huge research programmes of

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[5] (Banken, 2001; M.P.M. Bekker, 2003; Den Broeder & Bekker, 2002; Putters, 1996; Putters & Van der Grinten, 1998)

[6] Although the concepts of information, research and knowledge differ, we use them interchangeably here because they are related in a way that allows a description of the policy – research link.

the social sciences, and of Keynesian economics. Research did not succeed in fulfilling the expectations of policy-makers. Government decision-makers increasingly recognized the bargaining and advocacy characteristics of policy-making, whereas social scientists still remained neutral. They continuously appealed to the systematic methodology and theory building by falsifying claims, while their prescriptions yielded very little policy response. Research funds were cut back and academic institutes increasingly needed to compete for resources. …In the mid seventies systematic research was started into the utilization of research by policy-makers and the relation between research and policy (Weiss, 1977).

2.1.2 Policy analysis of the research-policy link
Carol Weiss was one of the main initiators and contributors to this field by questioning the assumptions underlying the idea of 'speaking truth to power'. In many sub disciplines of science, this paradigm is still dominant today. These assumptions are: 'Improving the use of research in policy means improving quality of policy decisions. Social science research is not now well used by governments (theme of neglect). Government officials could make better use if modest reforms were made' (Weiss, 1977). The recommendations of this, what Weiss calls, 'conventional wisdom' comprise, first of all, making knowledge relevant by funding through contracts, hiring researchers from non-academic institutes and monitoring research in progress. Secondly, enhance the capacity for utilization through transfer of knowledge by middlemen, agents or brokers, and the use of ICT, increased personal contacts and training of officials in 'scientific language'.

Weiss explains these assumptions, mainly held by scientists, by referring to a general belief in rationality. In this view, social science provides both the theoretical directions and the empirical soundings to reach desired goals in a complex world. Yet, Weiss argues that these directions, which are revealed in the selection of topics, variables and in theory construction, are guided by value considerations on the part of the researcher. These values become visible in the modern issues Weiss discusses in her 1977 edited book. To begin with, social science motives have moved beyond rationality as the political beliefs of social scientists reveal a left liberal orientation in combination with the increased competition for grants, funds and dissemination beyond other researchers' footnotes.

Moreover there are 'congenital defects' in linking social science research to policy. First of all, research is not equally available within the trias politica system. Judges and members of Parliament, for instance, have much less access to research and information than policy-makers, if only because of limited funds. Secondly, policy-making is often based on 'minimal pain' (compromise) rather than 'abstract logic'. Thirdly, in some cases, research complicates policy-making rather than clarify the problem. Fourthly, as we mentioned before, science is not value free. Fifthly, policy decisions are hard to identify in a process, in which several actors make sub decisions at different times and places that accumulate into policy. Weiss suggests replacing the question 'how to influence policy-makers' by 'how do decisions come about?'

The invisibility of decisions is illustrated by a 1980 study among upper level decision-makers. Weiss observes that they state that they 'do not decide: they propose, plan, review, draft, confer, advise, revise, criticize, write and supervise'. She concludes: 'decisions without conscious deliberation are unlikely to draw upon research in conscious and formal ways. On the other hand, drawing upon the stock of knowledge that they have absorbed from social science research is highly compatible with the manner in which they conceptualise their jobs. What they do is conditioned by what they know. The integration of social science generalizations and concepts into their Weltanschauung can have pervasive- if ultimately immeasurable- effects'(Weiss & Bucuvalas, 1980). Policy then evolves as a result of knowledge creep, by which knowledge is confirmed and reconfirmed by accumulation of research, and decision accretion, by which sub decisions accumulate into policy (Weiss, 1980).

Empirical observations of utilization by policy-makers contradict the second assumption of the 'speaking truth to power' paradigm, that policy-makers do not use research. Weiss then moves to a reinterpretation of the concept knowledge utilization, from 'direct, instrumental use' to 'contribution to the policy arena'. This provides room for long-term conceptual utilization, called 'enlightenment' (Janowitz, 1970). She finally distinguishes between three models of research: as provider of facts to fill a knowledge gap, as provider of ideas for conceptual policy development, and of arguments as ammunition in the policy arena (Weiss, 1991).

In addition, Caplan reflects on the conditions for effective utilization, to be identified as organizational and institutional arrangements as well as individual skills. Furthermore, he states that long-term conceptual development of policy calls for activities that may be very different from those necessary for more routine fact finding, without specifying how (Caplan, 1980).

In summary, explanations for knowledge utilization are sought in the policy process and how research fits into it. Here, I will not go deeper into policy and policy analysis, but briefly summarize the concepts that I find helpful in analysing and evaluating the outcomes of HIA[7].

2.1.3 Policy analysis of (un)healthy decisions

Policy analysis is helpful in revealing the changes in substance and context during the policy process. Policy substance we can observe in the cognitive perceptions of the policy problem and preferences towards the policy solution of the actors and stakeholders involved. The policy context we can observe in the social (informal) and institutional (formal) rules that may provide opportunities as well as threats to people's behaviour. Changes can be observed in the interactions between the actors and stakeholders. HIA addresses at least two policy networks, in which stable relations are maintained within a group of interdependent actors and stakeholders: its own health prevention and promotion network and the network of the policy addressed in the HIA. Negotiations over the substance and procedure of the HIA take place in a (virtual) arena. Usually this arena is largely separated from the policy arena, in which other actors make policy choices, allowing a small overlap where interactions take place between HIA commissioners, researchers and policy-makers. If the policy-makers are not the same as the policy implementers there is a need to look at the implementation arena and its relation to the HIA. Utilization is defined broadly: whether the HIA has lead to cognitive change in perceptions and preferences (conceptual use), and/or to policy action (instrumental use); or to strategic action.

Policy analysis nevertheless fails to provide a complete picture of the conditions for effective utilization of HIA in policy. It provides a biased picture because it does not question nor analyse how the research has come about. This is actually a bit surprising because Weiss acknowledges that social science research is not value-free and has become politicised. An alternative research tradition, which does reflect on the assumptions underlying research, is that of the Science & Technology studies.

2.2 Science and Technology studies (STS): boundary work between research and policy

Here also, we describe the origins of the field, then its concepts for analysis, and finally their application to (health) impact assessment and policy-making.

2.2.1 A brief history

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[7] For a description of policy, policy process and policy analysis, see (M. P. M. Bekker, 2003a, 2003b; Bekker, Putters, & Van der Grinten, 2004)

The Science & Technology Studies are rooted in the nineteen sixties. Since then a sociology of the sciences has developed with inputs from different disciplines (history, philosophy, sociology, anthropology, economics, political and legal sciences) (Jasanoff, Markle, Petersen, & Pinch, 1995). In addition to the general disappointment about the limited impact of prescriptions on policy that brought about the Knowledge Utilization studies, the sociology of the sciences was initiated as a result of three parallel debates in society. First of all, there was a strong debate about research expenditures, which were growing very fast. 'Science is a cow that we do not yet know how to milk', the director of the newly established Science for Science Foundation remarked in London 1965. Policy makers needed arguments to *rationalise* science policy. It evolved in positivist, functionalist, science policy orientated research, with important contributions to bibliographic and citation studies. An example is the work of Merton.

Secondly, in Europe there was a debate on the principles of the education of scientists. The technocratic scientific culture was opposed to a society oriented humane culture (feelings and values). Society was in need of generalists instead of specialists, and in need of interdisciplinary collaboration. This debate was about *humanizing* science education. Thirdly, the seventies showed the Vietnam war, in which technological innovation resulted in inhumane practices, and the emergence of civil rights, feminist and environmental movements. These resulted in a call for *democratising* science and technology (Edge, 1995). As a result, a radical, relativistic Sociology of Scientific Knowledge (SSK) emerged in the seventies, drawing on Kuhn's Structure of Scientific Revolutions, which will be elaborated below. The SSK allowed for innovative research such as ethnographic studies of laboratory practice and discourse analysis within science etc.

Since then, the STS are characterized by a continuing tension over the relation between fact (technical approach out of rationalizing science policy) and value (critical approach out of humanizing science education). There is dispute over whether or not any scholarly 'picture' can claim to stand outside the policy arena and offer reliable guidance from a 'detached' stance. Thus, 'the critical perspective challenges the atmosphere of revealed and unambiguous truth that surrounds science, and thus draws fire not only from the politically committed but also from an influential body of active scientists, who denounce it (the critical perspective, MB) as a false picture, likely to decrease public confidence in scientific activities. On the other hand, many STS scholars argue that, unless this critical image of science is more widely diffused, any realistic appraisal of its role in society is doomed... We need a more detailed understanding not only of the topography of the public's image of science but also of how that image can be manipulated by those in whose interest it is to do so...'(Edge, 1995). There is hope, however, of cooperation between the two approaches. An example is the emergence of actor-network theories and the sociotechnical graphs to fill them out.

2.2.2 Sociology of Scientific Knowledge

The Sociology of Scientific Knowledge studies offers interesting concepts in addition to the policy analysis of the Knowledge Utilization studies. In order to understand the argumentation, we first describe its origins. Kuhn (1962, 1977) distinguishes between normal science and scientific revolutions, in which paradigm shifts take place. These shifts are the result of emerging questions within normal science that cannot be answered with the concepts of the dominant paradigm, leading to a scientific revolution, the outcome of which may be a new paradigm. It does not bring us any closer to 'the truth', but is merely another way of working. Therefore, Kuhn argues, a paradigm shift is based on sociological and psychological explanations rather than rational arguments, thus initiating a sociology of science (Bal, 1996).

This has been elaborated by the SSK into a constructivist perspective on social processes, as opposed to a positivist perspective. Key assumption is that (scientific) facts become social constructs that derive their robustness from the stable relations built in their context. The boundary between science and society (and policy) is lifted. At the same time, separate institutions, languages, cultures and perspectives have been created between science and policy as

specific domains. An example is the 'precautionary principle' as an argument for policy choice, which cannot be scientifically validated. It is useful '…when scientific uncertainty precludes a full assessment of the risk and when policy-makers consider that the chosen level of environmental protection of human, animal and plant health may be in jeopardy' (Harremoës et al., 2001).

Ezrahi has reflected upon the scientific perspectives on scientific advice to policy makers. He distinguishes between utopian and pragmatic forms of rationality in scientific advisory practices. Both 'share a common commitment to rationalisation of public policy by increasing the incorporation of scientific knowledge in the definition and treatment of problems about which policies are sought. They differ not so much in their aims as in their conceptions of how far these aims can be realised' (Ezrahi, 1980). Utopian scientists consider political considerations as irrational and unjustifiable, whereas pragmatist scientists consider those inherent in public policy processes. As a result, he argues that 'the degree of agreement or disagreement within the respective groups of scientists and policy makers is important in determining the roles and uses of scientific knowledge in public policy'(Ezrahi, 1980). Utopian expectations of policy rationalisation by scientific knowledge are only accomplished under rare conditions of scientific and political consensus. Therefore, 'the task of scientists and politicians is neither to substitute the one for the other, nor to subordinate one to the other. It is rather to find in each case the way to fuse knowledge and policy within the limits set by the political and moral requirements of legitimacy and feasibility and by the standards of scientific truth and rationality'(Ezrahi, 1980)[8].

How this fusion can be brought about is described by Gieryn's introduces the concept of 'boundary work': 'the attribution of selected characteristics to the institution of science (i.e. to its practitioners, methods, stock of knowledge, values and work organisation) for purposes of constructing a social boundary that distinguishes some intellectual activity as non-science'(Gieryn, 1983). Bal (1998) describes the significance of this concept: 'the difference that this attribution of boundaries makes for the status of knowledge claims is a result of the cognitive authority of science. Because of its claim on exclusive knowledge about reality, science has become an important source of legitimacy for policy'. Gieryn (1995) adds: 'boundary work occurs as people contend for, legitimate, or challenge the cognitive authority of science – and the credibility, prestige, power, and material resources that attend such a privileged position.' Hence, boundary work is value driven and political in itself. Bal (1998) qualifies this boundary work as a functional activity: for instance management of conflicts becomes easier if one can remove the conflict to the other domain in order to move towards consensus or compromise.

According to Jasanoff (1990), the context, in which knowledge is produced or used, influences the way in which boundary work takes place. She distinguishes between research science and regulatory science. Research science appeals to the requirements of the international scientific community, i.e. peer reviewed publications, as a necessary and sufficient condition for legitimacy. These requirements are the boundaries that distinguish science from non-science. Regulatory science on the other hand, is applied, policy relevant science, which appeals to scientific standards for its research procedure, but at the same time appeals to policy context characteristics as an additional source of output legitimacy. An explicit example is the work of scientific advisory councils to ministries or the government, such as the Dutch National Council for Public Health and Health Care (RVZ). These provide a national forum where empirical observations and normative considerations in research and in policy are exchanged. In regulatory research, the boundaries between research and policy are reinterpreted and therefore need to be explicitly coordinated.

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[8] Recently the utopian and pragmatic rationalism have been translated into a rationalist and a contingent repertoire of actors, thereby linking belief and action, by Bal (1998). The principles of scientific consensus and political consensus on a certain policy issue have been translated policy problem characteristics by Hisschemöller, Hoppe and Midden (1998).

This may be done by creating a virtual 'boundary zone' (Löwy, 1992), in which researchers and policy makers can work together while maintaining their own identities. Starting from a multi-interpretable research question, for instance, provides the opportunity to develop, in the course of the research project, a common interpretation. 'Boundary objects' help to create such a zone. Examples are environmental norms for acceptable policy interventions; the selection of research themes, of data, of research institutes, of uncertainty limits, overlap of staff in different committees, a public draft report on which stakeholders may comment, visiting the project initiator and discussing feasibility of interventions instead of interests, but also the many possible roles of the public authority in dealing with the research. Involved officials may be policy makers, support staff, experts, employers or inspector/supervisor. The more roles are involved in the research, the more we may expect commitment or even a sense of ownership.

In conclusion, Bal (1998) describes boundary work in the field of maximum acceptable exposure levels in environmental health policy as the translation of contingency (context) into a rationalist research 'package' (a stable pattern of research objects and methods). In other words, boundary work is negotiating a pragmatic research mandate that allows the researcher to incorporate policy dynamics. This package enables the research report, the advisory report and the policy decision to be based on up to date considerations and on normative assumptions known by all parties. According to Bal, we may distinguish between a discretionary strategy, in which the mandate is broad, and a regulative strategy, in which the mandate is very detailed and limited. Further research is needed to

The differences between how STS and Knowledge Utilization studies look at the relation between research and policy are clear. The KU studies consider them as separate worlds, and perform a policy analysis (of individual and institutional characteristics and dynamics) to explain knowledge utilization. The 'speaking truth to power' perspective is comparable to Ezrahi's utopian rationalism. Ezrahi recommends a pragmatic rationalism instead, recognizing the need to appeal to political legitimacy of scientific research in addition to scientific standards. Thus, STS consider policy and research to be subject to the same underlying mechanisms of human behaviour. As a result, individual and institutional explanations are sought in the negotiated boundaries between policy and regulative research, which are translated into coordination mechanisms through boundary work for an optimal research effect on policy.

2.2.3 Sociology of (Health) impact assessment

From the STS studies we recognize the technocratic and critical approaches in impact assessment. For Social Impact Assessment, Carley (1986) states that the political function is increasingly recognized over technical dominance. He describes its development between 1975 and 1983 'from pseudo-science' to an instrument for the 'planning process'. The former was characterized by an 'objectivist, structural/functional approach with an elitist, technical orientation of the expert researcher', while SIA as a planning instrument relates to a 'pluralist, reformist approach with a participatory mode'.

As for Health Impact Assessment, HIA has been developed in two scientific sub disciplines: risk analysis and environmental protection on the one hand, and social medicine and public health on the other (Birley, 2002) Risk analysis and environmental hygiene researchers reveal a technocratic orientation on 'facts' as they produce a quantified retrospective evidence base of mainly physical health determinants, and deduct predictions to reduce exposure to potentially damaging policy interventions. This is called 'tight scope HIA' (Kemm, 2001). Social medicine and public health researchers, on the other hand, additionally pay attention to socio-economic health determinants and lifestyle and aim for health promotion in addition to risk prevention. They reveal a technocratic approach in epidemiological research (tight scope HIA), as well as a critical orientation on 'values' in qualitative, participatory research. The latter is called 'broad scope HIA' (Kemm, 2001).

In the Netherlands, national policy HIAs for the most part have a technocratic orientation, and are mostly based on expert opinion and literature study. Exceptions are two HIAs based on quantitative modelling and simulation for predictions (on tobacco policy and on dental care insurance provisions). Two exceptions to the technocratic dominance are the HIA on National Housing policy and the very first HIA on the 'Ecotax'[9] and the impacts on the health of the handicapped and elderly. The HIA on National Housing policy considers the experienced opportunities for physical exercise, by secondary analysis of a 1998 survey database. The other three parts of this HIA are technically oriented towards traffic safety, social safety and accidents in and around the house. Only the HIA on the 'Ecotax' was more 'participative' by telephone interviews held with representants of the affected population. Finally, the local level tool 'HIA on Cities and Environment', which was especially developed for Dutch experimental policy on developmental and construction projects that will exceed environmental standards (Fast, 1996), is a technocratic procedure, which does however have citizens participate in a reference committee to the HIA (Bekker, 2003a).

One possible explanation for the Dutch dominance of the technocratic orientation may be that expert judgement in the Netherlands is still very much valued as opposed to i.e. the USA (Bal, 1996). As a result, there is less need for experts to build coalitions to be heard. Another explanation may be, that up till now there have not been many local project level HIAs in the Netherlands, which are less suitable for quantitative population-based research but particularly suitable for public participation. A third explanation might be that the Netherlands, in comparison with Anglo-Saxon countries, have a much less developed civil society and as a result, the public health tradition is much less community oriented with hardly any private initiatives. Health issues seem to be a less straightforward reason for Dutch citizens to demand participation in policy making than environmental or safety issues.

Another concept from the sociology of science has proven applicable to our research. The scientific consensus and political consensus on a certain policy issue have been translated into a technical rationality and a political-administrative rationality of policy problems (Hisschemöller, Groenewegen, Hoppe, & Midden, 1998), the degree of which provide conditions for HIA (Putters, 1996; Putters & Van der Grinten, 1998).

As for boundary work, we may consider the impact assessment as a separate research that needs boundary work or we may consider the impact assessment as a boundary object itself. We choose to initially analyse HIA as a separate research that needs boundary work in order to be able to prescribe the conditions for HIA as a boundary object itself.

The concepts of both policy analysis and boundary work are not very demarcated and would provide a broad picture of the research done and the policy involved. To analyse their relation more specifically, we may turn to organizational learning and knowledge management, as impact assessment is an organized effort to influence an organized policy making process.

2.3 Organizational learning and knowledge management

Here also, we describe the origins of the field, then its concepts for analysis, and finally their application to (health) impact assessment and policy-making.

2.3.1 A brief history
Knowledge Management is a rather technical approach aimed at creating ways of disseminating and leveraging knowledge in order to enhance organizational performance (Easterby-Smith &

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[9] Ecotax: extra taxes paid for energy saving

Lyles, 2003b). It has its origins in the descriptive fields of organizational knowledge, which is content oriented, and organizational learning, which is process oriented. While organizational learning has its roots in the nineteen sixties, knowledge management has only started to develop from the nineties. Both were expanding in periods of rapid business and/or technological innovations. Knowledge management 'starts with the neo-economic view of the strategic value of organizational knowledge and then uses familiar IT software such as databases and electronic conferencing to facilitate the acquisition, sharing, storage, retrieval and utilization of knowledge'(Easterby-Smith & Lyles, 2003a). Its underlying key concepts of organizational learning may add to our framework of analysis of HIA outcomes.

2.3.2 Organizational learning and knowledge
Sub disciplines that have fed into organizational learning are organizational psychology, sociology, economics, and information and communication technology. Basic ideas are that organizational learning takes place in social interactions, although the receiver does not copy the sender's ideas in the exact same format (Dewey). These ideas are explicit knowledge, which is distinct from tacit knowledge as personal, consciously or unconsciously unarticulated knowledge within an organization (Polyani). This may be an important feature of the internal (human) resources of the firm. By working together, individuals gain experience in a team performance and as a result, organizations know more than the sum of the knowledge of individuals within them (Penrose). Hayek has questioned the utilization of organizational knowledge in a way that contributes to good decisions for the organization or the society as a whole, recognizing that knowledge is situated (contextual) and therefore needs qualitative methods of research. Another important feature of organizational learning is double loop learning (Cyert and March, 1963), allowing organizations to translate the society's response to organizational output into new organizational rules or procedures (Easterby-Smith & Lyles, 2003a).

Key concepts are knowledge creation; stickiness; absorptive capacity; organizational capabilities and communities of practice. Knowledge evolution has traditionally been modelled as a process of variation, selection and retention. Nonaka & Takeuchi (1995) have refined this model into 'knowledge creation' as a conversion process. According to them, knowledge creation is a cyclical conversion between tacit and explicit knowledge, following four steps of conversion: socialization (sharing experiences, developing a common understanding); externalisation (using metaphors and analogy to understand the unknown by a known language); combination (of the models resulting from socialization and externalisation); and internalisation (learning by doing) (Nonaka & Takeuchi, 1995; Plaskoff, 2003).

The transfer of knowledge is often describes as 'sticky', characterized by 'hesitancy, stubbornness, awkwardness and unpleasantness'. Stickiness is a property of the transfer rather than of the knowledge involved. The causes of stickiness are therefore related to the substance as well as to its context (Szulanski & Cappetta, 2003). The 'absorptive capacity' of an organization might provide more insight into the stickiness of knowledge transfers. Cohen & Levinthal (1990) have defined absorptive capacity is 'the ability to recognize the value of new external knowledge, assimilate it and apply it to commercial ends'(Van den Bosch, Van Wijk, & Volberda, 2003). Antecedents of this capacity may be prior related knowledge and the intra or interorganizational communication structure.

Absorptive capacity may also provide an indication of the 'organizational dynamic capabilities', which are 'routinized activities directed to the development and adaptation of operated routines', forming in other words a deliberate learning strategy (Zollo & Winter, 2003). This can be done by tacit experience accumulation; knowledge articulation; and knowledge codification. Absorptive capacity and dynamic capabilities can be enhanced by creating Communities of Practice (CoPs).

CoPs are aimed at 'developing expanding circles of intersubjectivity, or common understanding about how to be a community, how to learn organizationally' (Plaskoff, 2003).

Recent research views CoPs as a tool for building a shared history in a community through stable membership. The idea of communities is very old (Weber, Tönnies, Dewey), its application as a business construct is new. CoPs identify the practice of its members and focus on their dominant work. Its members share a feeling of 'responsibility and a passion for practice'. CoPs are therefore distinct from organizational communities (departments) and work communities (project teams), which are aimed at accountability; and from learning communities, which focus on a supplementary skill, task or interest (Plaskoff, 2003).

CoPs might contribute to the absorptive capacity of an organization in that enhances the communication and distributive structure within and between organizations and mobilizes prior relevant knowledge through exchange between its members.

If we compare organizational learning and knowledge management to the sociology of science, we can identify the same technocratic and sociological approaches to the relation between research and policy. The concepts of knowledge creation and communities of practice depart from the same constructivist idea that most knowledge is tacit, equivalent to cultural patterns of behaviour. The concepts of stickiness, absorptive capacity and organizational capabilities on the other hand seem to be more related to a technocratic problem solving perspective.

2.3.3 Learning through Health Impact assessment

The organizational learning and knowledge management literature adds an interesting intra- and interorganizational perspective to our framework for analysis of HIA outcomes. HIA, as we described before, deals with at least two different organizational parts of government: the health authority as HIA commissioner and authority of the subjected policy. In the policy implementation arena even more organizations may become involved in learning about potential health impacts.

The knowledge creation model provides interesting concepts for HIA as it addresses the sociocultural context, in which the researchers, policy makers and otherwise involved need to socialize, learn the language and the unwritten rules for behaviour. In the words of Bal (1996), they would have to open their rationalist repertoire to the contingent repertoire to successfully transfer their knowledge. Stickiness of HIA output, secondly, is our central research problem. In addition, the concepts of absorptive capacity and organizational capabilities specify the institutional opportunities for adoption of HIA output. Communities of Practice, finally, provide an interesting concept for both observation and as a tool for prescription. Continuous meetings with representatives of several involved organizations, for instance, could be specifically aimed at integrating health considerations in daily practice rather than merely learning about health impacts from policy.

3. A framework for analysis

The framework consists of the following concepts:
1. *Knowledge Utilization studies*
- Policy network analysis: distinguish between an HIA arena, a policy/project arena, and a policy implementation arena, in which different combinations of actors and stakeholders are involved, who are interdependent for resources.
- Individual level concepts: <u>cognitive</u> problem perceptions and solution preferences in the policy/project process; competencies and capabilities

- Institutional level concepts: formal rules and procedures regarding dominant repertoire (ideas and beliefs on the subject); positions, rewards/sanctions; and accessibility of arenas/networks and association in interactions.
- Interactions among and between individuals and institutions in a sociocultural context

These concepts reveal four dimensions of decision-making (and knowledge utilization): they have cognitive, social, cultural and institutional elements. These concepts remain rather broad and need to be focussed at the research-policy link in more detail.

The instruments that policy analysis literature recommends to coordinate the link between research and policy are oriented at process management; make the research process fit the policy/project process. Tools are network management (maintenance); network constitution (pro-active inviting new actors into the network, changing the network compilation); developing health policy performance indicators, such as DALY's[10]; institutional representation in different arenas (De Bruijn, Ten Heuvelhof, & In 't Veld, 2002).

2. Science and Technology studies

Concepts: Technical and political-administrative rationality, boundary work, boundary objects, boundary zone, package, mandate. The boundaries are not in the model for analysis (page 14) but can be observed by the concepts of interactions, individual perceptions and preferences.

Instruments for coordination are for instance environmental standards for acceptable risks; but also selection of research institutes, research themes, data collection, and uncertainty limits; an advisory board: membership, objectives, procedures; a public draft report on which stakeholders may comment, or the complex roles of public officials in supporting the research. Officials may take the role of policy maker (HIA commissioner), supervisor or inspector, support staff, expert or employer. The more roles are involved in the research, the more we may expect commitment or even a sense of ownership.

The technical rationality is the extent to which there is scientific consensus on the knowledge that is available on a certain policy issue, which means that the risk of potential health impacts is known. The political-administrative rationality of a policy problem is the extent to which there is political consensus over the values within that policy. Thus, we assume that the conditions for healthy decisions vary with the extent to which there is certainty over the potential health risk and the extent to which there is consensus on the importance of (public) health as compared to other values concerning the policy. See Table 1.

Table 1. Classification of policy problems according to the technical and the political-
administrative rationality (Douglas & Wildavsky, 1982; Ezrahi, 1980; Hisschemöller et al., 1998; Hoppe, 2001; Putters & Van der Grinten, 1998)

Policy problems		*Technical rationality:* Consensus over knowledge?	
		Yes	No
Political-administrative rationality: Consensus over values?	Yes	1	2
	No	3	4

In the first category of policy problems, information on potential health impacts is available and the policy-makers agree that (public) health is an important value in the policy that should be

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[10] Disability Adjusted Life Years lost or gained with certain policy intervention.

protected. Here, the information is allowed to prescribe the solution to the policy problem (= also a health problem). An example is the maintenance of roads and highways.

In the second category, knowledge is not available, or there is no consensus among scientists on the available knowledge on potential health impacts, although the policy-makers agree that (public) health is an important value and should be protected. Policy-makers are intrinsically motivated to make healthy decisions, but they need more information about the best way to implement it.

The third category is characterized by conflicting values in the policy, even though information is available. Here, policy-makers acknowledge the information on potential health impacts, but put it aside as irrelevant to the proposed policy, because other values dominate.

The fourth category, both information and consensus are lacking. These problems in literature are called 'wicked', 'unstructured', 'untamed' or 'intractable' (Koppenjan & Klijn, forthcoming). Here, new information provided by a HIA might be used strategically or countered by another research. Research can be used to delay or block the policy process. Information is thus not capable of removing the controversial character of the problem. An example is a large infrastructural project that provides employment and financial gain, but affects lots of citizens and has many environmental impacts.

The technological and political-administrative rationality is not represented in the model of analysis on page 14, but is a leading principle in selecting the cases to be empirically analysed. The rational, structured problem is considered as a analytical perspective, to which three other cases will be sought.

3. Organizational learning and knowledge management
Concepts: data on the absorptive capacity and organizational capabilities (tacit experience accumulation; knowledge articulation; and knowledge codification) can be collected through the container concept of 'institutional rules and capacities'. The conditions for communities of practice can be observed by the concept of interactions.

These concepts result in the following framework of analysis:
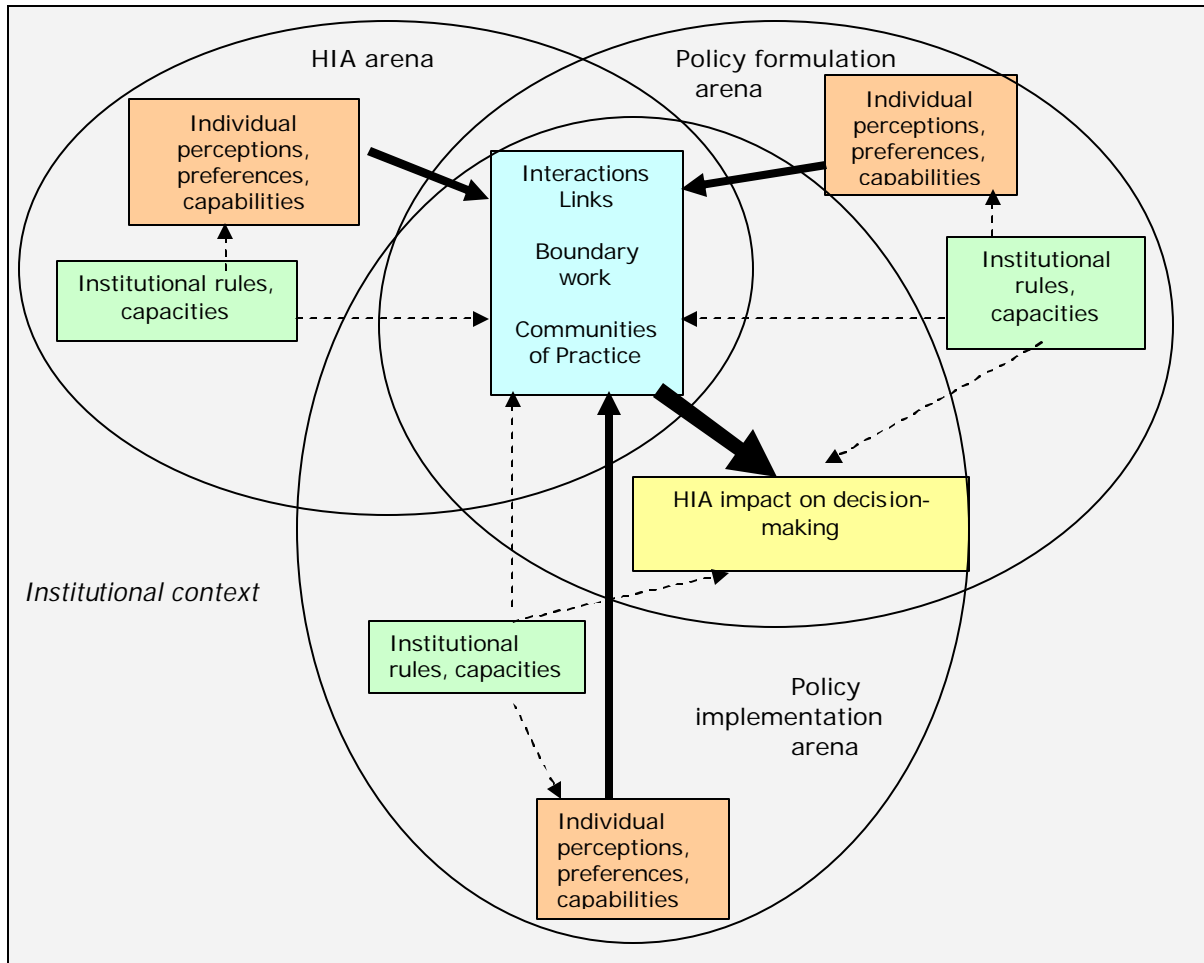
The black arrows represent the actions and interactions that bring about the HIA, and, separately, the policy. The impact of HIA on policy can only take place after a certain degree of interaction between the HIA arena and the other arenas have taken place. The institutional rules and capacities are not features of the arena but of the actors within the arena and their organizations. Each arena may thus comprise several and differing institutions. Their direct or indirect impact on the actors and their interactions are represented by the dotted arrows.

4. Topics for future research

With the impact assessment evolving from an information delivering instrument to a political instrument, the significance of knowledge, especially scientific knowledge, is put more and more into perspective with other sources of information, like community and traditional knowledge. Although we describe alternative sources of legitimacy for the (H)IA, such as public and stakeholder participation, I have not specifically addressed this

topic in this paper. Nevertheless, it needs more reflection in future research in order to explore all possible resources and conditions for healthy decisions. Pilots and empirical case studies should be aimed at analyzing whether, by actively mobilizing traditional and community resources, IA might become more effective in impacting on decision-making. In addition, the several instruments for guiding (H)IA into the policy process, mentioned in this paper, need to be analysed, tested if possible, to define their potential to enhance conditions for healthy decision-making. We will address these issues in our PhD project in the coming two years.

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