

Policy Experiments and Learning

Mid-term recommendations for design of experiments
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1 Introduction

This PhD research project is one of several projects within the Governance of Adaptation theme of the Dutch government's Knowledge for Climate programme. The Governance of Adaptation consortium focuses, in part, on analysing existing governance strategies and how they can be improved so they are resilient, legitimate, and effective against the long term effects of climate change. Policy experimentation is identified as a strategy to improve adaptation governance, due to its potential to connect new ideas to existing policy systems (Termeer et al, 2011). Experimenting with policy is also a key element of governance in the adaptive (co) management field, due to its potential to foster learning and flexibility in the policy process (Armitage et al, 2008).

This report is the result of an extensive literature review on policy experiments and its recommendations highlight points where experimental design may intersect with learning outcomes. Learning is considered a vital element of environmental governance (Diduck, 2010) and is the central concept of the PhD project. Using a learning perspective, I can trace evidence of knowledge acquisition, norm consideration, and trust building among participants; as well as how the results of a policy experiment influence the policy decision making process. The aim of the PhD project is to investigate the relationship between policy experiments and learning and identify prescriptions as to what design choices (the independent variable) should be made to foster particular learning outcomes (the dependent variable). For instance, what design choices enhance the relational aspects of learning? What design choices increase cognitive learning, i.e. knowledge acquisition, and are they the same as design processes that foster normative learning, i.e. consideration of goals and values? How should a policy experiment be designed so it maintains influence and relevance?

This report introduces the reader to the outline of the PhD project, its relevance to the policy process, the research framework, and makes some recommendations (to be empirically tested) about how certain design choices facilitate particular learning outcomes; for instance, choices about who participates, what information is generated and shared, and how power is distributed. The overall aim of the report is to enlighten policy makers on the usefulness of policy experiments and garner feedback on whether the project has potential to be relevant to a practitioner's toolbox of best practices.

2 Policy Experiments

2.1 Definition of a policy experiment

Policy experimentation is a method of evaluating a policy innovation, *ex ante*; that is, determining its prospective effects before it is fully adopted. It allows policy makers to better understand the effects of a policy intervention before making a final decision on whether to implement it. This sort of policy “evidence” contributes robust scientific results to the policy making process that are sorely needed in times where environmental concerns create intractable, uncertain and complex policy issues.

The perceived benefit of conducting policy experiments is debated in the academic literature from a theoretical perspective (it is particularly supported in adaptive governance), but there is little empirical investigation done into their effects, despite their widespread use in different policy sectors in the Netherlands and abroad. They are also broadly defined, from quasi-field experiments with randomisation and control groups to pilot projects with an experimental nature. Despite the broad set of characteristics in the literature, I propose the following definition of a “policy experiment”:

1. *It attempts to test a policy innovation in a field setting, whether an innovation in technology, concept, or governance process. Testing ranges from explicit findings of cause and effect to establishing a baseline for monitoring effects in a contextualized setting;*
2. *To do so, it provides a “protected space” away from the status quo by temporarily changing the institutional context;*
3. *It requires the involvement of participants and varies according to who participates, to what degree, and for what purpose; and*
4. *It generates policy evidence so it has a connection with government policy (whether directly as a policy intervention or indirectly as a tool to develop innovations that impact policy) and seeks to influence it.*

2.1.1 Criticisms

Interestingly, policy experimentation has generated a lot of scepticism in academic literature. Relying on evidence of a policy’s effects *ex ante* might seem like a fail-safe option to better policy making, but policy experiments are not considered appropriate for many reasons (a good summary can be found in Sanderson, 2002; Greenberg et al 2003). For instance, policy experiments attempt to traverse the policy and scientific worlds. Science offers up reliable evidence, but policy- in order to make a good political decision-might have other considerations that take precedence. Moreover, politics likes certainty and to conduct an experiment means a decision maker is not certain of their policies. An experiment may need considerable resources that a policy maker cannot justify spending on a policy that may fail. Admitting they do not have the answer could be political suicide (never-mind the flipside: spending money on a failed policy without seeing whether it will work, or not taking action at all). The ethical impacts of experimenting with policy cannot go unnoticed when citizens are subject to policy changes that could disadvantage them. More prosaic criticisms include the mismatch in temporal length- policy issues can pop on and fall off the policy agenda at

speed but a policy experiment can take a lot longer and risk losing relevance, and methodological design is questioned: is the evidence indicative of the actual effects of a policy on the social and natural worlds? Can results be generalized from the context of the experiment to a wider application?

Despite these criticisms, policy experimentation still claims a key role in achieving adaptive governance of social-ecological systems and this may be due to its conceptual link to learning. Experiments and learning are often discussed in-tandem; for example, adaptive management experiments allow for “learning-by-doing” (Lee, 1999) and social policy experiments provide the evidential basis for learning how to improve policy action (Sanderson, 2009). Experimentation is considered a “key mechanism” and can quicken the pace of learning (Armitage et al 2008) and experiments function as a boundary object where participants can learn with and from each other (Huitema et al 2009). Learning is a broad and diffuse topic that needs to be defined in its own right, which is the intention of the following section.

3 Learning

3.1 The relevance of learning

Learning can be defined as being essentially about change – the process by which knowledge, skills, and attitudes are acquired (Muro and Jeffrey, 2012). The management of our social-ecological systems is complex and uncertain and learning is considered a perspective that helps us address those challenges. Learning can achieve a lot: governance that facilitates learning fosters relationships and trust, reconciles diverse views and interests, resolves conflict, develops shared understandings, encourages monitoring and reflection, and enables decision making in uncertain situations (Diduck, 2010). For this project, it is hoped that a focus on learning will encourage an experimental design that overcomes the criticisms listed above; for example, close the science-policy gap by having scientists and policy makers work together on experiments, generate useful contextual information so even if an experiment does not produce the hoped-for results it still has influence over the policy process, include citizens in the process to minimise ethical concerns, and maintain relevance by acknowledging changing values.

Theoretically, learning is measured and understood in many different ways. This PhD project conceptualises learning as three learning effects measured as: cognitive, normative, and relational learning, which are described and defined as the following:

3.1.1 Cognitive learning

A cognitive learning process results in “the acquisition of new, or the improved structuring of existing, knowledge” (Haug et al 2010). It refers to the learning of factual knowledge that is generated by carrying out the experiment and also the knowledge participants share with one another. Therefore, not only it is important that an experiment generates high levels of information that the participants learn, the design of the experiment must incorporate mechanisms to ensure high levels of cognitive learning between the participants.

When experiments are designed for learning in particular, for instance “learning by doing” experiments in adaptive management (Lee, 1999), cognitive learning is what they have in mind. An experiment aims to test something and generate knowledge; however, just because an experiment generates knowledge does not necessarily mean it produces high levels of cognitive learning. For instance, cognitive learning relies on a clear presentation of results and if the person communicating the results is not comprehensible then low levels of cognitive learning may occur (particularly on technical issues that not all participants are familiar with).

3.1.2 Normative learning

Haug et al (2010) define it as “changes in the viewpoints, norms and values of participants”. This could occur in light of new knowledge- a cognitive influence; or due to deliberation or persuasion from another participant- a relational influence (Haug et al 2010). Normative learning can be measured as a convergence of views of participants (Huitema et al, 2010; Muro and Jeffrey, 2012), which develops into a common interest shared by the group.

3.1.3 Relational learning

Relational learning refers to the collaborative effects of learning; like an improved ability to cooperate, increase in trust, and a better understanding of the mindsets and frames of other participants (Haug et al, 2010; Huitema et al, 2009). It follows from Webler's class of learning as "moral development" which includes being able to take on other participants' perspectives and learning how to cooperate with others (Webler et al 1995).

An experiment that fosters the relational learning process may produce evidence of participants sharing and understanding each others' frames of particular issues; for instance how each participant views the policy issue, the reasons for the experiment, how they define the experiment in terms of success, etc. Recognition of different frames can improve trust relations and create room for better cooperation (Mostert et al 2007).

4 Research

The PhD project is an attempt to close a significant gap in the literature, because although it is assumed that conducting a policy experiment will allow us to learn something, there are issues to be explored; for instance, what characteristics a policy experiment has, how its design features influence learning outcomes, and whether particular design choices and enhanced learning actually improve decision making.

This report focuses on answering the middle question: how an experiment's design features influence certain learning outcomes. To answer the question I draw on Ostrom's Institutional Analysis and Development framework (Ostrom, 2005). I use this framework for two reasons. One, it provides a particularly succinct group of institutional design options that relate quite coincidentally to the learning literature. Two, analysing policy experiments in their stark institutional arrangements makes them comparable despite their outward differences (as noted earlier, experiments can be used to test different policy problems in different domains but as long as they meet the definition set above, they can be analysed as a policy experiment).

Through Ostrom's framework of rules, I have identified seven "design considerations" that are relevant to conducting a policy experiment and in the following section these are discussed in detail. In order to make sense of how diverse the choices can be for each consideration (Ostrom's rule typology can produce indefinite institutional configurations) I have developed a set of *Ideal Types* as a heuristic device. The three types are the *technocratic ideal type*, which resembles a positivist, technocratic view of science, the *boundary ideal type*, which resembles the participatory, post-normal view of science, and the *advocacy ideal type*, which acts as a stealth advocate of predefined interests hidden by the process of experimentation. These ideal types are similar to those developed by Pielke in his analysis of the role of scientists in policy making (Pielke Jr., 2007). The ideal types stem from a review of the literature and attempt to illustrate how diverse choices can be for each design consideration and how they could relate to learning. None of the ideal types exist in reality but are idealized versions of what I might find empirically.

4.1 Findings

There are seven identified design considerations that potentially have an impact on the learning outcomes described earlier. These relate to participation (actor participation, available positions, and accessibility); information (information transmission, source of knowledge, type of knowledge), and the distribution of power. The following section introduces each design consideration, its theoretical aspects, and explores what design choices are made in relation to the technocratic, boundary, and advocacy ideal types of policy experiments.

4.1.1 Actor participation

Actor participation refers to the type of actor involved in the policy experiment and whether access is extended to include not only science and the state, but also economic and civil actors. According to Renn and Schweizer (2009), these are the four central actors for governance in a modern society and they each make particular contributions: economic interests contribute an efficient use of resources; state interests provide political legitimacy; civil actors contribute their values and preferences and improve social acceptability; and science provides reliable knowledge

for effective regulation. Not all policy experiments will include these actors; however, the learning literature is heavily in favour of including a range of actors in the process. There are three main reasons: one, to increase the amount and type of knowledge. Scientific knowledge is not the only relevant knowledge to policy making- non-scientific, contextual, local knowledge also provides great benefit (Folke et al, 2005) and including non-state, non-expert actors can tap into the creativity in society (Huitema et al, 2009). Two, diverse participation ensures the legitimacy of the process. Ignoring affected parties can lead to a blocked, frustrated process and policy choices that are not supported by those affected, which limits trust and understanding among participants (Webler, 1995). The third reason for diversity in participation is to widen the range of perspectives shared. Involving outsiders will allow for a wider, more varied range of perspectives to be included and challenged, which can improve the understanding of the experimental impacts (Hoogma et al, 2002).

However, there are warnings against too much diversity in participation. Too many actors can affect an experiment's ability to function because of a lack of effective coordination and intimacy (Heggens et al (2012); Mosert et al (2007)). Furthermore, a group that contains conflicting values and objectives may result in fundamental clashes of frames, which leads to inter-group anxiety or political deadlock (van Buuren and Loorbach, 2009; van Eeten, 1999).

When applying the above to the ideal types, an experiment that resembles the technocratic ideal type has limited participation and those involved contribute their technical, scientific expertise. They are invited into the process to generate technical knowledge as demanded, and funded, by the policy side. In contrast, the boundary and advocacy ideal types broaden their participant base to include non-experts and non-state actors. This is because the use of an experiment is considered more than just for generating scientific knowledge, it is also conducted to generate acceptance of a policy innovation and to gather different knowledge and perspectives.

4.1.2 Available positions

The positions available to participants in a policy experiment include that of initiator, financier, and in some cases facilitator and steering body.

The initiator position is generally filled by one participant and since policy experiments have a public good aspect traditionally the state fills this role, but with modern governance processes this is not always the case. For instance, the hotspot groups designated by the Dutch government to develop regional policy strategies can initiate experiments to test their ideas. However, most policy experiments have one initiator who takes control or decides when and where to distribute control.

The facilitator position is expected to play an important role in policy experiments by ensuring the process is fair. For instance, the use of a facilitator can mean the initiator does not have to defend its interests while facilitating the experiment (Mostert et al, 2007). A neutral facilitator can moderate the sharing of information among participants to ensure everyone contributes (van de Kerkhof and Wiczorek, 2005) and enforcing protocol. Those with personal qualities that build trust among participants are seen as particularly valuable in fostering learning (Mostert et al, 2007).

Due to their broader participant base, boundary and advocacy experiments tend to employ facilitators and project managers to manage the increased complexity and coordination issues. Funding may stem solely from the initiator or from contributions by various participants.

4.1.3 Accessibility

Access to the policy process can be narrow- where only those with a “stake” in the outcomes are invited to participate, or broad- when the intention is to engage with the wider public (Reed, 2008). The initiator of a policy experiment determines how open or closed the process is by either inviting participants to join or by opening the decision up to actors who decide for themselves. Participants are restricted differently in their eligibility to join; a technocratic experiment is strictly “invite only” but a boundary experiment allows actors to make their own judgement on whether they are affected by the proposed experiment. An advocacy experiment minimises the likelihood of drawing in subversive perspectives by either being invitation only or limited to those who feel they have something to gain.

4.1.4 Information Transmission

A forth design consideration is how information is transmitted. The transmission of information occurs through the interaction and communication of participants (Newig and Pahl-Wostl, 2010) and is an important factor for ensuring an experiment maintains a) its flexibility and b) transparency between participants. In relation to the first point, a main purpose of the experiment is to generate new information and this information must be shared in order for participants to feed back into the design to improve the experiment (Holling, 1978). Therefore, low information transmission can substantially decrease an experiment’s capacity to be adaptive and respond to intended and unintended information. Regarding transparency, not sharing information can lead to breakdown in the relationships between participants. McLain and Lee (1996) describe problems that developed during an experiment where the monitoring work was carried out by scientists who failed to share results with less dominant participants, assuming them unimportant, but who then mounted a “formidable protest” against proposed plans.

The frequency and distribution of information transmission varies between types. Information transmission is not secretive in a technocratic experiment but it tends to shift in a linear direction from the expert to the policy maker, with information moving between participants only if it’s relevant. Boundary experiments encourage regular information transmission between everyone so all participants are privy to the generated knowledge and the experiment’s adaptive capacity is maintained. An advocacy experiment may restrict the distribution of certain results due to their commercial sensitivity or their being politically unpopular, and not all participants are privy to all knowledge.

4.1.5 Source of knowledge generated by experiment

As an intervention to test the effects of a policy in a real-world setting, an experiment relevant to governance of the socio-ecological system will interact with both the social and natural environment. The experiment is expected to generate reliable scientific information about the effects on the natural system and may also be monitored for generalisable effects on the social system. However, experiments vary on how they interact with the social system, in particular whether they draw context relevant information from it. Renn et al (1995) argue that traditional decision making is insufficient because it relies on scientific, systematic observations and general theories and ignores “local and anecdotal knowledge of the people most familiar with the problem”. However, anecdotal information is unreliable compared to scientific information and being subjective means no generalisable claims can be made from it,

but scholars do argue that its benefits outweigh its costs. For example, Dryzek (1987:189) notes that there is an “unspoken assumption that greater and more widespread knowledge enhances rationality in the policy process”, while Reed (2008) states that context knowledge about the impacts of a policy experiment can provide a more comprehensive understanding of socio-ecological systems (Reed, 2008), which would arguably produce more relevant and effective policy decisions.

Although it may be considered overly simplistic, this division into scientific and local sources of knowledge is how most studies classify knowledge systems (Grey et al, 2012). Scientific knowledge generates information via systematic means and uses predefined principles and processes to generate new, de-contextualised, and widely transferable information (the “know-why” information), and local knowledge reflects non-expert or localised information, tacit, informal, and context dependent (the “know-how” information) (Grey et al, 2012; Reed, 2008). However, this division does not extend directly to the type of stakeholders, as non-expert stakeholders might contribute scientific knowledge about the intervention and it is possible that all stakeholders hold local and scientific knowledge simultaneously (Grey et al 2012).

The ideal types divide along knowledge sources. A technocratic experiment is institutionally designed to ignore local knowledge since it only includes experts as participants. In this variant, the strength of the experiment is in the reliability of its evidence for policy making in the scientific sense but it cannot provide policy contextual information, which may compromise its relevance (Millo and Lezaun 2006). For a boundary experiment the focus is broadened. It is conducted to not only to test effects but also to seek legitimacy by gaining acceptance with those who are affected by its outcomes, which it does in part by garnering and valuing knowledge from the non-expert participants. If local knowledge is valued and considered in the process then interventions will be better accepted (Renn et al, 1995). An advocacy experiment has a similar design and gathers both scientific and local forms of knowledge, however the knowledge is used to support and advocate for a particular interest and not necessarily to build a legitimate and acceptable solution.

4.1.6 Type of knowledge

There are two types of knowledge that a policy experiment may generate based on its design- instrumental, technical forms of knowledge and norm-reflective, deliberative forms of knowledge (norms include values, objectives, and goals). Drawing from the policy appraisal and policy evaluation literatures (e.g. Majone, 1989; Fischer, 1995; Owens et al, 2004), it is apparent that this distinction pinpoints a debate over the role of norms in the policy process. According to Fischer, a technocratic view of policy making separates fact from value by a division of labour: scientists find fact and politicians tussle over values, so in the context of experimenting, the objectives of a policy are decided by policy experts and the experiments tests whether these objectives are met in reality (Fischer, 1995). However, another view is presented by Majone (1989:24) who argues that actually, values are not fixed, or determined only prior to an evaluation process, but rather they constantly develop as a function of the policy making process they allegedly guide. A policy experiment is but one part of the policy development process and maybe norm consideration does not always have a role within this implementation function; however, when one is referring to policy that addresses a “wicked problem”, norm consideration may be an essential element of the policy experiment. For instance, it has been suggested that modern environmental problems (e.g. climate change) have a “wicked” nature about them, making them highly complex and essentially unsolvable by scientific means (Rittel and Webber

1973). In this case, not only are facts uncertain and in dispute, but clear values are not apparent either. Problem complexity can only be really addressed by questioning norms (Petersen et al, 2011) and policy experiments may be, for these complex policy problems, the ideal space to explore differences in relevant perspectives.

Norm deliberation in an experiment provides an opportunity for participants to voice their points of view and challenge existing assumptions, which can then contribute to the building of a shared understanding of the multiple perspectives involved (Majone, 1989). McLain and Lee (1996) found that when participants were given the opportunity to voice their objectives it gave the participants a forum to discuss conflicting norms. This deliberation may result in the development of a common purpose, or collective interest, which had not been unearthed before the experiment. Aiming for a convergence of participant perspectives is contentious in the literature (for example, issues such as time, resource costs, and fundamental frame clashes are highlighted by van Eeten, 1999 and Owens et al, 2004) and frame reflection and consensus on agreed issues may be more appropriate (Voss and Bourneman, 2010). It must be pointed out; however, that the most essential common interest is the ecological interest, which tops all others because no interest can be met without it (Dryzek, 1987).

When applying this discussion to the ideal types, for both the technocratic and advocacy experiment types do not create opportunities for participants to reflect and share perspectives and challenge assumptions. In a technocratic experiment policy makers determine values and objectives prior to the policy experiment, which are then tested by the experiment. A similar situation is echoed in the advocacy experiment; the initiator(s) predetermine the goals they want to achieve and implement the experiment in order to meet those goals. The objectives of both sorts of experiment are fixed and there is no opportunity for amendment. If the policy intervention is uncontroversial then this may not be an issue, but if you have actors affected by the outcomes and no venue for them to challenge the assumptions made by the initiators, the experiment risks delay and failure (Hoogma et al, 2002; McLain and Lee, 1996). In contrast, a boundary experiment makes room for both technical and norm-reflective types of knowledge because it acknowledges the need to establish a common interest among participants. By creating the opportunity for challenging assumptions it builds a shared understanding and a common interest is more likely to emerge, culminating in legitimate and acceptable policy outcomes that meet the expectations of all participants.

4.1.7 Distribution of power

The depth of participation in a policy experiment is indicated by how power is distributed among participants. There are three node points in an experiment where power is concentrated and decisions are made. These are: “problem definition and design”, “implementation and monitoring”, and “evaluation and report” decision nodes. Participants have varying degrees of influence at each decision node, from being merely informed, to having input into the final decision, to having decision making power (based on Arnstein’s ladder of citizen participation- Arnstein, 1969). Reed demonstrates that for participation to be meaningful, participants need to a) have power to influence decisions, and b) be brought into the process as early as possible. Further, if trust and cooperation is to be built, power needs to be spread between participants, as power sharing improves relationships. Moreover, studies in public participation have found that enhancing the role of stakeholders by enlarging their contribution improved trust and cooperation among participants between each other and in the process as a whole (e.g. Mostert et al, 2007; Huitema et al, 2010).

Power distribution is most even in boundary experiments. Participants all get a say in the final decision at each decision node, from design to evaluation. For advocacy experiments authority distribution is restricted, with power being retained by an elite steering group that drives their own interest. The elite steering group is made up of the initiator and dominant interests that may or may not be experts. Other participants have influence over implementation and evaluation nodes but no decision power. The problem definition and design stage is completely controlled by the initiator. Finally, a technocratic experiment has the most concentrated power, with the initiator making all final decisions. Expert participants have input and influence over the implementation and evaluating stages but no decision power.

4.2 Recommendations

From this review of seven main institutional design considerations for policy experiments, I derive five tentative recommendations that link the design choices to learning outcomes:

1. Taking into account the points raised above about participation and how it relates to the different sources of knowledge (scientific and local) I hypothesise that-

In a policy experiment, the range of knowledge and perspectives will be wider with more diverse participation, which will heighten cognitive and normative learning. However, there is an optimum range of participation that, if breached, will counter the increased learning effects.

2. When considering the impact of various levels of information transmission and types of knowledge (technical and norm-reflective), I hypothesise that-

In a policy experiment, cognitive learning is enhanced when information is communicated broadly and regularly with transparency; and in a policy experiment, normative learning is possible if participants' perspectives are shared and challenged and participants are able to influence design throughout the experiment.

3. As enhanced trust is considered a cornerstone of learning (Mostert et al, 2007) and the literature states that trust and understanding emerge through building strong relationships, which comes from significant communication and interaction among participants (Head, 2008) I hypothesise that-

In a policy experiment, trust is improved by allowing participants control over the process, regular interaction, and the use of an independent facilitator.

4. Finally, on a meta-level, the three ideal types lead to different learning outcomes, I hypothesise that-

The Ideal Types create different learning effects. A technocratic experiment produces mainly cognitive learning and minor relational learning. A boundary experiment produces cognitive, normative and relational learning. An advocacy experiment produces cognitive learning and negative relational learning.

5 Conclusion

This report is a result of an extensive literature review on learning and develops suggestions of how the design of a policy experiment can increase particular learning outcomes. It defines a policy experiment as a test of a policy innovation in a temporary field setting that has the intention of influencing policy making. Three learning outcomes are relevant to this study: knowledge acquisition (cognitive learning), changes in norms (normative learning), and an increase in trust and understanding (relational learning) and seven design characteristics are described that relate to these three learning types according to the literature.

The seven identified design characteristics are particular institutional design choices that initiators of policy experiments make when setting up and conducting an experiment and can be grouped according to participation, information, and power. Choices on participation include those made for who participates, what positions they hold, and how accessible the experiment is to actors. Experiments can be designed so they have narrow, limited participation with few positions, or so they are broad with a diverse participation and open accessibility. Diverse participation is expected to have a positive effect on learning outcomes but too diverse and problems with coordination and frame clashes may actually inhibit learning. The second group, information, covers how information is distributed and who it is shared with, as well as potential sources of knowledge in an experiment and type of knowledge generated. Experiments that distribute information broadly and regularly are expected to enhance learning, and knowledge acquisition increases in experiments with a variety of knowledge sources (i.e. both expert and non-scientific sources). An experiment designed to generate both instrumental and norm-reflective forms of knowledge will increase the chances of relational and normative learning because challenging and sharing perspectives may allow a common interest to develop and a heightened understanding of participants' frames. Finally, the design choices that share power have an influence over learning, with the more influence participants have over the experimental process, the more trust and understanding that develops.

Now the relevant institutional design considerations are theoretically identified, the next phase of the research is the empirical analysis of policy experiments in the Netherlands, to see whether these recommendations hold water in reality.

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