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Patching vs Packaging in Policy Formulation: Assessing Policy Portfolio Design

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Abstract: Thinking about policy mixes is at the forefront of current research work in the policy sciences and raises many significant questions with respect to policy tools and instruments, processes of policy formulation, and the evolution of tool choices over time. Not least among these is how to assess the potential for multiple policy tools to achieve policy goals in an efficient and effective way. Previous conceptual work on policy mixes has highlighted evaluative criteria such as "consistency" (the ability of multiple policy tools to reinforce rather than undermine each other in the pursuit of individual policy goals), "coherence" (or the ability of multiple policy goals to co-exist with each other in a logical fashion), and "congruence" (or the ability of multiple goals and instruments to work together in a uni-directional or mutually supportive fashion) as important design principles and measures of optimality in policy mixes. And previous empirical work on the evolution of existing policy mixes has highlighted how these three criteria are often lacking in mixes which have evolved over time as well as those which have otherwise been consciously designed. This article revisits this early design work in order to more clearly assess the reasons why many existing policy mixes are sub-optimal and the consequences this has for thinking about policy formulation processes and the practices of policy design.

Keywords: planning; policy design; policy instruments; policy layering; policy mixes; policy portfolios

1. Introduction: Policy Portfolios and Policy Design

Policy design is an activity which unfolds in the policy process as policy actors deliberate and interact over the construction of both the means or mechanisms through which policy goals are given effect and the goals of policy themselves. It is "the effort to more or less

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systematically develop efficient and effective policies through the application of knowledge about policy means gained from experience, and reason, to the development and adoption of courses of action that are likely to succeed in attaining their desired goals or aims" [1-3]. But public policies are comprised of complex arrangements of policy goals and policy means which can be packaged in a more, or a less, systematic fashion. Why this is the case and how thinking about policy design can be advanced and made more systematic is the subject of this article.

Like 'planning', policy design theory has its roots in the 'rational' tradition of policy studies, one aimed at improving policy outcomes through the application of policy-relevant knowledge to the crafting of alternative possible courses of action intended to address specific policy problems [4-12]. But it extends beyond this to the consideration of the practices, frames of understanding, and lesson-drawing abilities of policy formulators or "designers" in adapting design principles to the particular contexts that call for policy responses [2,13].

Assessing policy designs and the extent to which policy-making can be considered to embody an intentional design logic begins with the recognition that in many circumstances, policy decisions will be more highly contingent and 'irrational' than in others [14]. That is, there is no doubt that in many cases policy-making is driven by situational logics and opportunism rather than careful deliberation and assessment [15-19].

This high level of contingency has led some critics and observers to suggest that policies cannot be 'designed' at all, at least in the sense that a house or a piece of furniture can be the product of conscious and systematic design fashioned and put into place by one or more 'designers'. But those who have written about policy design disagree with this assessment. Recognizing the dialectic existing between principle and context they distinguish the formulation process from the actual design of a policy itself [20]. In much the same way as the development of an architectural plan can be distinguished from its engineering or construction manifestations, optimal policy designs in this sense can be thought of in a 'meta' or abstract sense as 'ideal types', that is, as configurations of elements which can reasonably be expected, if adopted with due attention given to specific contextual settings and needs, to have a higher probability of delivering a specific outcome than some other configuration. Whether or not this potential is actually realized in practice is another matter and the subject of separate, although clearly related, investigation and inquiry.

This article explores this meta-orientation to the study of policy designs. Bracketing the actual process of policy formulation which may or may not provide auspicious conditions for a 'design orientation', it first revisits several 'first principles' for policy portfolio design found in the policy design literature and addresses the nature of the evaluative criteria used to distinguish 'good' from 'poor' design. Returning to the ground of actual policy-making, it then moves on to consider issues such as the 'degrees of freedom' or room to manouevre which designers have in developing and implementing their designs and the ideas of 'maximizing complementarity' and 'goodness of fit' with existing governance arrangements with which contemporary design theory is grappling. Finally it develops the notion that two distinct and very different types of design processes have been incorrectly juxtaposed in the literature—"policy patching" and "policy packaging." It suggests the former is more likely to be found in practice than the latter and should be the subject of further research in this area of policy and design studies. The article shows how the early design literature has been refined to incorporate some of the shortcomings identified by subsequent empirical research, and now approaches formulation and design issues fully taking into account restrictions on the abilities of designers to accomplish their designs in practice while offering realistic guidance on how these may be overcome.

2. Policy Design, Policy Portfolios and *Ex-Ante* Assessment

Policy makers typically consider several policy alternatives, some of which, or parts of which, may ultimately be implemented in the attempt to achieve desired outcomes. These are alternative options for how government action can be brought to bear to resolve some identified problem or attain some goal and their articulation and consideration forms the basis of processes of policy formulation.

It is important to note that in this conception policy design is thus both a 'verb'—in the sense of characterizing one manner in which a policy formulation process can unfold in creating a policy configuration sensitive to the constraints of time and place—and also a 'noun'—in the sense of being an actual product or artifact that can be compared to others [21].

Policy design as a verb involves some process of coordinating disparate actors working in a given spatio-temporal context towards agreement on the content of designs-as-noun. These processes of policy design or formulation are interesting and complex and subjects of inquiry in their own right but, as noted above, can be separated, at least in the abstract, from the 'design-as-noun' itself. Again, to use an architectural metaphor, this is true in much the same way as craftsmanship and skill in construction are significant factors involved in realizing a building vision but can be considered separately from the vision itself; which can be assessed not only against its concrete realization but also against aesthetic and other criteria for assessing 'good' from 'poor' designs [21-24].

But what is it that is 'designed' in policy design? In all but the very simplest contexts, policy alternatives are options for government action comprised of different sets of policy means—that is policy tools and their

calibrations—bundled together into packages of measures which are expected by their designers to be capable of attaining specific kinds of policy outcomes [25-28]. "Policy designs" in this sense refer to how specific types of policy tools or instruments are bundled or combined in a principled manner into policy 'portfolios' or 'mixes' in an effort to attain policy goals.

Analyzing policy design in the context of such policy portfolios raises a series of questions about how exactly the superiority of the design of one mix over another can be assessed *ex-ante*. A design perspective in general assumes that not all designs are equal nor is one design just as good as any other, and a subject of much interest to students of policy designs, therefore, is the nature of the evaluative criteria which can be used to identify "better" or more 'intelligent' designs and distinguish them from 'poor' designs, and from 'non-designs'.

Various design principles have been articulated at various points in the history of studies of policy formulation and policy tool choice with this end in mind. And the merits and demerits of some of these efforts are set out below. As shall be discussed, rules or maxims have been proposed both about how many tools and goals there should be in a bundle and about how tools should be combined in order to stand the best chance of attaining these goals [29]. The former is a subject which received some attention as early as the 1950s and resulted in the development of several principles of policy design which emphasized aesthetics of simplicity and elegance. The latter issue received some attention in the 1970s and 1980s as scholars emphasized a need to avoid unreflexive preferences for the use of highly coercive tools on the part of governments and instead urged sequenced designs which began slowly with the use of the least 'interventionist' tools possible before 'moving up' to the use of more coercive designs only if and so far as less coercive ones proved unable to accomplish stated goals.

While these areas were the subjects of most early thinking about policy mixes, more recent design thinking has begun to address a second series of questions related to the larger issues of how and to what extent tools must not only be related logically or evidentially to each other but must also must match their policy environments in order to be both practically feasible as well as theoretically elegant. That is, designs have come to be seen as involving the need to go beyond just a logical or theoretical match of policy elements to goals but also must involve a match between the social construction and ecological adaptation of policy [30], or between 'principle' and 'context' [31]. This is in much the same way as architectural designs can either ignore or reflect and incorporate their geo-physical settings with most designers advocating the latter course as generating more pleasing and effective results.

This more recent thinking about the nature of policy mixes and their design has raised several new issues for policy design thinking which add an additional layer of complexity to earlier analyses and principles. Older concepts such as consistency', 'coherence', and 'congruence' which set out the goals towards which complex designs should aspire have now been joined by other considerations such as those concerning what level or 'degrees of freedom' designers have in moving towards new designs or building on old ones. Such considerations often promote 'policy experiments' or trial runs and pilot projects which may or may not be scaled up into full-blown programmes depending on their outcomes as a means to determine policy fit to practice [32,33] and have led to suggestions for more resilient or adaptable designs which retain adequate 'flexibility' or adaptive elements to allow them to be adjusted to changing circumstances once in place [33,34].

These studies take very seriously the need to 'match' design to both spatial and temporal contexts that were lacking in earlier studies. To this end they have developed a new set of maxims to replace those earlier ones often found faulty or limited when applied to policy-making practice. These include injunctions such as those urging flexibility cited above as well as those urging policy formulators to "maximize complementary effects" in their choice of tools and goals. They also include precepts related to the need to better match policy designs and policy designing or formulation activities, such as considerations of how to assess the goodness of fit between policy elements and their environments in the effort to match policy designs with governance contexts. These existing and new design principles and maxims are discussed in more detail below.

3. Older Design Maxims and Their Problems

Contemporary thinking about policy formulation and policy designing is firmly rooted in an older literature on policy design which over the course of the 1950s to 1990s developed several maxims or heuristics expected to be used to head off common errors or sources of failure in policy-making. These included the promotion of parsimonious tool use in policy mixes, the injunction to begin with less coercive tools and only move towards increased coercion of policy targets as necessary, and the adoption of the above-mentioned notions of coherence, consistency and congruence as criteria for assessing the level of optimality of the arrangement of elements in a policy mix. Although a good start, as noted below only limited empirical evidence supported the accuracy and utility of these principles, which tended to underestimate the difficulties involved in formulating and implementing complex policy mixes. As these faults were recognized, new efforts to think about more complex policy designs have led to a new generation of design thinking in this area and the articulation of a new set of principles and practices expected to result in superior designs; that is, ones more likely to reach their targets and achieve their goals [35-38].

3.1. Parsimonious Tool Use

The first and oldest maxim in the policy design literature is the injunction to observe parsimony in tool selection. An oft-cited rule in this area, for example, was first put forward by Jan Tinbergen in 1952 [29], to the effect that the "optimal ratio of the number of tools to targets" in a policy should be 1:1 [39]. That is, that the number of policy tools in any mix should roughly match the number of goals or objectives set for a policy.

This may appear to be a reasonable rule-of-thumb, for which Tinbergen provided some logical justification in his discussion of the information and administrative costs associated with the employment of redundant tools in the area of economic policy-making. In his work, for example, Tinbergen analyzed what he termed the 'normal' case in which one goal was matched with one target in a simple situation in which one instrument could fully address its task and accomplish the goal set out for it. Most observers, however, including Tinbergen, were well aware that in practice combinations of tools are typically used to address single and especially multiple policy goals, not a single instrument addressing a single goal. In such circumstances, as Tinbergen [29] noted "it goes without saying that complicated systems of economic policy (for example) will almost invariably be a mixture of instruments" (p. 71). As a result he himself argued "a priori there is no guarantee that the number of targets (goals) always equals the number of instruments" (p. 37).

Such admonitions and caveats about design complexity, unfortunately, were usually neglected in studies ostensibly based on Tinbergen's work, with many erstwhile designers attempting to force complex situations into the more simple mould required for Tinbergen's rule to apply [39]. More contemporary thinking about policy design, however, begins not with single instrument choices at specific moments in time *de novo*, but rather with considerations of designing mixes of tools which specifically take into account the spatio-temporal complexities missing in earlier design studies [25,26]. Thus they move well 'beyond the Tinbergen Rule' in the effort to inform modern design contexts and practice in a meaningful way.

3.2. Moving Up the Scale of Coercion in Sequential Instrument Choices

A second principle of policy design found in the older literature on the subject was not only the injunction to be parsimonious in the number of instruments chosen at a specific point in time in order to attain a goal, but also to be sparing in their use dynamically or sequentially over time. In the mid-1970s and early 1980s, for example, Bruce Doern, Richard Phidd, Seymour Wilson and others published a series of articles and monographs that placed policy instruments on a single continuum based on the 'degree of government coercion'

each instrument choice entailed [30-44]. They argued that choices of tools, or policy designs, should only 'move up the spectrum' of coercion as needed so that the 'proper' sequencing of tool types in a policy mix would be from minimum levels of coercion towards maximum ones [45]. Assuming that all instruments were more or less technically "substitutable" or could perform any task—although not necessarily as easily or at the same cost—it was argued that in a liberal democratic society, governments, often for both ideological and pragmatic reasons, would prefer to, and should, use the least coercive instruments available and would only employ more coercive ones as far as was necessary in order to overcome societal resistance to attaining their goals. As Doern and Wilson ([45], p. 339) put it:

"(...) politicians have a strong tendency to respond to policy issues, (any issue) by moving successively from the least coercive governing instrument to the most coercive. Thus they tend to respond first in the least coercive fashion by creating a study, or by creating a new or re-organized unit of government, or merely by uttering a broad statement of intent. The next least coercive governing instrument would be to use a distributive spending approach in which the resources could be handed out to constituencies in such a way that the least attention is given as to which taxpayers' pockets the resources are being drawn from. At the more coercive end of the continuum of governing instruments would be a larger redistributive programme, in which resources would be more visibly extracted from the more advantaged classes and redistributed to the less advantaged classes. Also at the more coercive end of the governing continuum would be direct regulation in which the sanctions or threat of sanctions would have to be directly applied."

This rationale for instrument choice clearly took policy context into account in making design decisions and moved design discussions such as Tinbergen's forward in that respect. That is, Doern and his colleagues work was based on an appreciation of the ideological preferences of liberal-democratic societies for limited state activity and on the difficulties this posed for governments in the exercise of their preferences due to the relative "strength" or ability of societal actors to resist government efforts to shape their behaviour.

This formulation has many advantages as a design principle. It is not uni-dimensional, although it might appear so on first reading, because it does take into account several political and contextual variables and assumes instrument choices are multi-level, with finer calibrations of instruments emerging after initial broad selections of tools have been made [46]. Preferring "self-regulation", for example, governments might first attempt to influence overall target group performance

through exhortation and education efforts and then add instruments to this mix only as required in order to compel recalcitrant societal actors to abide by their wishes, eventually culminating, if necessary, in regulation or the public provision of goods and services.

This maxim was based on both observations of the actual design practices followed by many governments which were used to develop and inform a set of principles informing 'proper' or appropriate overall tool preferences. However, as Woodside [47] argued, it was lacking in several ways. As he put it:

"Experience suggest that governments do not always seek to avoid coercive solutions, but indeed, may at times seem to revel in taking a hard line from the start. While there are undoubtedly many reasons for these heavy handed responses, surely some of the most important ones include the constituency or group at which the policy is aimed, the circumstances in which the problem has appeared, and the nature of the problem involved" ([47], p. 786).

Hence although suggestive, this second design principle also needed nuance and revision. These and other similar concerns led to further efforts in the 1990s to deal with the complexities of policy design, especially in the context of mixes or bundles of tools.

3.3. Coherence, Consistency and Congruence as Measures of Design Integration and Criteria of Superior Design

These early efforts from the 1970s and 1980s to articulate fundamental policy design principles were overtaken in the 1990s by work which focused on the need to articulate a set of general principles which would more clearly inform the selection of the various parts of a mix or portfolio, bracketing for a moment the issue of formulation processes and policy outcomes. Here it was noted that policies are composed of several elements: distinguishing between abstract or theoretical/conceptual goals, specific programme content or objectives, and operational settings or calibrations [48-50]—for example, as set out in Table 1. The central criteria which the design literature developed for dealing with how these multiple parts of a policy *should* be related was the notion of '*integration*' or the idea that goals and means within mixes should not work at cross-purposes but mutually reinforce each other [51-53].

That is, moving beyond Tinbergen's rule, it was argued that some correspondence across elements was required if policy goals were to be successfully matched with policy means [49,51]. And it was argued that a relatively small number of criteria could be identified to help assess the extent to which existing or future mix elements were integrated [54].

Previous work on policy design had identified one such evaluative criteria in the notion of "*consistency*" or the ability of multiple policy tools to reinforce rather than undermine each other in the pursuit of policy goals. A second such criteria related to goals rather than means. Here the idea of "*coherence*" or the ability of multiple policy goals to co-exist with each other and with instrument norms in a logical fashion was developed. Finally the idea of "*congruence*" or the ability of goals and instruments to work together in a uni-directional or mutually supportive fashion rounded out these three integrative dimensions proposed for a superior policy design [55].

Table 1. Components of a policy mix.

		Policy Content		
		High Level Abstraction	Programme Level Operationalization	Specific On-the-Ground Measures
Policy Focus	Policy Ends or Aims	**Goals** What General Types of Ideas Govern Policy Development? (e.g. environmental protection, economic development)	**Objectives** What Does Policy Formally Aim to Address? (e.g. saving wilderness or species habitat, increasing harvesting levels to create processing jobs)	**Settings** What are the Specific On-the-ground Requirements of Policy (e.g. considerations about the optimal size of designated stream-bed riparian zones, or sustainable levels of harvesting)
	Policy Means or Tools	**Instrument Logic** What General Norms Guide Implementation Preferences? (e.g. preferences for the use of coercive instruments, or moral suasion)	**Mechanisms** What Specific Types of Instruments are Utilized? (e.g. the use of different tools such as tax incentives, or public enterprises)	**Calibrations** What are the Specific Ways in Which the Instrument is used? (e.g. designations of higher levels of subsidies, the use of mandatory vs. voluntary regulatory guidelines or standards)

Source: modified from [50].

The development of such criteria was a significant advance over the earlier works mentioned above and moved policy design thinking well beyond other frameworks developed around the same time which purported only to develop a series of 'hints' for policy-makers to follow in promoting better designs [56,57].

However, while clear enough in theory, these works raised to the forefront the need to, like Doern and his colleagues had done, re-integrate thinking about policy 'design-as-noun' with 'design-as-verb' or policy formulation [58,59]. This was because empirical work on the evolution of long-term policies or 'institutions' highlighted how these three criteria were often only weakly represented in existing mixes, especially those which have evolved over a long period of time [60,61]. That is, empirical research into policy designs in practice revealed considerable gaps between the coherency, consistency and congruence of actual policy mixes compared to their theoretical specification and highlighted the need to consider the *temporal* evolution of tool portfolios, much as Doern and his colleagues had done several decades earlier [62].

4. Modern Principles of Policy Design: Complementary Effects, Goodness of Fit and Degrees of Freedom

Recent design thinking has built on this basis in earlier studies and has underlined the importance of considering both the full range of policy instruments when designing a mix—rather than assuming that a choice must be made between only a few alternatives such as regulation versus market tools [63]—as well as ensuring that a proposed mix is compatible with existing governance arrangements [64]. Towards this end, several new principles have emerged in the current design literature. These include "maximizing complementary effects" and "goodness of it", or attempting to ensure a good fit between policies elements and between those elements and their governance context.

4.1. Maximizing Complementary Effects

A major issue and insight driving contemporary design studies concerns the fact that not all of the tools potentially involved and invoked in a policy mix are inherently complementary [65-67] in the sense that they may evoke contradictory responses from policy targets [68-73] and thus fail to achieve their goals. At the same time, of course, some combinations may also be more virtuous in the sense of providing a mutually reinforcing or supplementing arrangement [74]. Similarly, some other arrangements may be unnecessarily duplicative while in others some level of redundancy may be advantageous in ensuring that a stated goal will be achieved [75,76].

Grabosky [66] and others worked on these issues throughout the mid-to-late 1990s, noting that some tools necessarily counteract each other—for example,

using command and control regulation while also attempting voluntary compliance—and thus those combinations should be avoided in 'smart' policy designs. Hou and Brewer [74] similarly worked on the other side of this design coin, noting that other tools complemented or supplemented each other—for example, using command and control regulation to prevent certain behaviour deemed undesirable and financial incentives to promote more desired activities at the same time—and thus those combinations should be encouraged.

A key principle of current policy design thinking, therefore, is to try to maximize supplementary effects while minimizing counterproductive ones. "Smarter" designs are thus said to involve the conscious creation of policy packages which take these precepts into account in their formulation or packaging [64,65,77,78].

4.2. Goodness of Fit: The Need for Designs to Match Governance Mode and Policy

Contemporary design thinking also highlights the need for designs to respond not only to such general theoretical design principles but also to the particular, context-dependent features of the policy sector involved [26]. In this sense, "goodness of fit" between the policy mix and its governance context is a concern and can be seen to occur at several different levels.

That is, at one level design choices emerge from and must generally be congruent with the governance modes or styles practiced in particular jurisdictions and sectors. This is because different orientations towards state activity involved in policy mixes require specific capabilities on the part of state and societal actors which may only be forthcoming if the mix matches the governance context. Policy designs, it is argued, thus must take into account the actual resources available to a governmental or non-governmental actor in carrying out their appointed roles in policy implementation [79]. Thus, for example, planning and 'steering' involve direct co-ordination of key actors by governments, requiring a high level of government policy capacity to identify and utilize specific policy tools capable of successful moving policy targets in a required direction [80,81].

Work on 'policy styles' [82-84] in the 1980s and 1990s identified a number of common patterns and motifs in governance arrangements in specific sectors and jurisdictions which contemporary design theory argues designs in different jurisdictions should reflect [26,79,85]. While many permutations and combinations of possible governance arrangements exist, recent policy and administrative studies have focused on four basic or 'ideal' types found in many jurisdictions and sectors in liberal democratic states. These are the legal, corporate, market and network governance forms (see Table 2). Government actions through legal and network governance, for example, can change many aspects of policy behaviour but do so indirectly through

the alteration of the relationships existing between different kinds of social actors [86,87]. This is unlike corporate and market governance which involves more overt state direction. Each mode has a different focus, form of control, aim and preferred service delivery mechanism and procedural policy orientation which policy designs should incorporate and approximate if they are to be feasible.

This relationship between governance style or context and the policy instruments and goals contained in a policy mix is a significant one for studies of policy design. Since the exact processes by which policy decisions are taken vary greatly by jurisdiction and sector and reflect differences between and within different forms of government—from military regimes to liberal democracies—as well as the particular configuration of issues, actors and problems found in particular areas or sectors of activity—such as health, education, energy and transportation, social policy and many others [88,89]—the existence of a relatively small number of overarching governance modes allows for the matching of design and context in an easily understandable and applicable fashion.

Table 2. Modes of governance.

Mode of Governance	Central Focus of Governance Activity	Form of State Control of Governance Relationships	Overall Governance Aim	Prime Service Delivery Mechanism	Key Procedural Tool for Policy Implementation
Legal Governance	Legality—Promotion of law and order in social relationships	Legislation, Law and Rules	Legitimacy—Voluntary Compliance	Rights—Property, Civil, Human	Courts and Litigation
Corporate Governance	Management—of Major Organized Social Actors	Plans	Controlled and Balanced Rates of Socio-economic Development	Targets—Operational Objectives	Specialized and Privileged Advisory Committees
Market Governance	Competition—Promotion of Small and Medium sized Enterprises	Contracts and Regulations	Resource/Cost Efficiency and Control	Prices—Controlling for Externalities, Supply and Demand	Regulatory Boards, Tribunals and Commissions
Network Governance	Relationships—Promotion of Inter-actor organizational Activity	Collaboration	Co-Optation of Dissent and Self-Organization of Social Actors	Networks of Governmental, and Non-Governmental Organizations	Subsides and Expenditures on Network Brokerage Activities

Source: modified from [90,91].

4.3. Degrees of Freedom

A third key concept which has emerged in contemporary design thinking around this same issue is that of 'degrees of freedom' or the consideration of the relative ease or difficulty with which policy-makers can alter the status quo. That is, if *any* combination of tools was possible in any circumstance then decision-makers could be thought of as having unlimited 'degrees of freedom' in their design choices. Empirical studies of large scale institutional changes, however, have noted this kind of freedom in combining design elements is quite rare. For example, this can occur in situations of what Thelen [92] terms 'replacement' or 'exhaustion' when older tool elements have been swept aside or abandoned and a new mix is designed or adopted *de novo*. As Thelen noted, however, most existing mixes or portfolios have rather emerged from a gradual historical process in which a policy mix has slowly built up over time through processes of incremental change or successive reformulation. As Christensen et al. [93] have argued, a key design issue is thus the leeway policy designers have in developing new designs given the pre-existence of historical arrangements of policy elements. This has added a siginificant temporal dimension to policy design studies which early generations of thinking either ignored or downplayed.

That is, in addition to the requirements of "goodness of fit" with prevailing governance modes there are also constraints imposed by existing trajectories of policy development. As Christensen et al. [93] note, "these factors place constraints on and create opportunities for purposeful choice, deliberate instrumental actions and intentional efforts taken by political and administrative leaders to launch administrative reforms through administrative design" (p. 158).

How much room for manouevre designers have to be creative [94] or, to put it another way, to what degree they are 'context bound' in thus time and space [26] is a subject of much current interest in contemporary

design studies. From the historical neo-institutionalist literature cited above it is well understood that complex policy mixes, like institutions, can emerge through several distinct processes or historical trajectories [92, 95-97]. These trajectories—'layering', 'drift', and 'conversion'—differ from 'replacement' and 'exhaustion' in terms of the challenges that they raise for each generation of designers attempting to integrate policy elements in effective, complementary, or 'smart' mixes with coherent goals, consistent means, and congruency of goals and instruments. *Layering* is a process whereby new elements are simply added to an existing regime without abandoning previous ones, typically leading to both incoherence amongst the goals and inconsistency with respect to the instruments and settings used. *Drift* occurs when the elements of a policy mix are deliberately maintained while the policy environment changes. The impact of the policy mix is thus likely to change and this is the result that the designer wants to achieve [98]. *Conversion* involves holding most of the elements of the policy mix constant while redeploying the mix to serve new goals [99]. While consistency may remain largely intact, conversion poses significant risks of incongruence between the old instrument elements and the new goals that have been introduced.

Replacement is thus not the only, or even necessarily the only desirable, historical context for policy design; it simply imposes the smallest number of constraints on successful design. Except in the case of completely new policy areas or old ones facing the kind of total overhaul envisaged in periods of policy punctuations, however, policy designers, are typically faced with a situation in which an already existing policy mix is already in place and cannot be easily discarded [100,101].

These existing arrangements have commonly emerged or evolved over relatively long periods of time through rounds of previous decisions, and even if they had a clear logic and plan at the outset they may no longer do so [102]. Designers' freedom is thus hemmed in on two sides. First, existing mixes often have accumulated varying degrees of political support from those who benefit from them, ruling out complete replacement [103-105]. In such cases where key instruments in the mix are defended by powerful "instrument constituencies", layering can be an appropriate response since these interests may have no objection to the addition of new instruments provided only that "their" instrument is not touched. Conversion, on the other hand, may be indicated where these instrument constituencies can be persuaded that their favoured instruments may actually be strengthened by the addition of new goals that bring in new political support for the existing mix. Drift can also be the favourite strategy of political interests who are not strong enough to destroy a policy mix whose goals they dislike but, by blocking necessary change, may succeed in reducing or even transforming its impact to something more palatable to them [106].

5. Policy Packaging and Policy Patching as Design Methods

This last point raises another area of interest in current design studies, that of the basic mode or style of policy-making best suited to realizing policy designs. An important insight in this regard is that designers can recognize and manipulate the relationships involved in processes such as layering, drift and conversion, just as they can those related to replacement and exhaustion [107].

Hacker, for example, has argued that layering, in many ways the simplest way of changing a policy mix, is a process that can ultimately induce conversion. This is because, as new instruments and goals are added into the mix without abandoning the previous ones, new possibilities for relating goals to instruments open up [108]. Drift, on the other hand, may be deliberately used to engineer a crisis in which replacement becomes a real possibility as the impact of a policy mix diverges ever more obviously from that intended by its original designers, shedding political support along the way. Layering may have a similar outcome while employing the opposite political mechanism when a new instrument, originally a minor part of the policy mix, gradually assumes prominence, perhaps as the result of setting or calibration changes, and attracts defectors from other instrument constituencies [109]. In such situations designers can attempt to *patch* or restructure existing policy elements rather than propose alternatives *de novo* in a new *package* of measures [59,110].

Although there is a strong tradition in the design literature to restrict discussions of design to situations characterized by processes of replacement and exhaustion there is ample existing evidence showing that many existing policy regimes or mixes have instead developed through processes of policy layering, or repeated bouts of policy conversion or policy drift, in which new tools and objectives have often been piled on top of older ones, creating a palimpsest-like mixture of inconsistent and incoherent policy elements [111]. And sweeping it all away and starting again with custom made policy designs capable of meeting contemporary policy challenges may seem to be the obvious solution. Policy *packaging* of this kind, which deliberately seeks to exploit synergistic relationships between multiple policy instruments, was definitely the explicit or implied preference in most earlier efforts to promote enhanced policy integration and coherence in designs across different policy domains [51-53].

However, recognizing that layering, conversion and drift can also be 'intentionally' designed—much in the same way as software designers issue 'patches' for their operating systems and programmes in order to correct flaws or allow them to adapt to changing circumstances—is a critical insight into design processes with which contemporary design studies is beginning to grapple. Distinguishing between policy packaging and

policy patching as two methods of attaining the same goal—the heightened coherence, consistency and congruence of complementary policy elements coupled with a better fit between tools and their context—is a needed step towards moving beyond older principles of parsimony and the inexorable use of less coercive tools towards enhancing the ability of policy formulators to deal with policy problems which demand complex governmental responses [112].

6. Conclusion: Policy Design and the Feasibility of Policy Alternatives

The purpose and expectations of policy design efforts have always been clear [113,114]. Design is an activity conducted by a number of policy actors in the hope of improving policy-making and policy outcomes through the accurate anticipation of the consequences of government actions and the articulation of specific courses of action to be followed. This is to be accomplished by improving assessments of both the theoretical effectiveness as well as the feasibility of policy alternatives [115-118].

Each "policy" however is a complex 'regime' or arrangement of ends and means-related goals, objectives, instruments and calibrations which exist in a specific governance setting and which change over time. Central concerns in the design of policies are thus related to answering questions about how these mixes are constructed, which methods yield superior results and what is the likely result of their (re)design. Understanding these aspects of policy formulation and design and synthesizing knowledge about them into a small number of precepts which policy formulators can follow in their work has always been at the forefront of policy design work.

However these considerations must take into account the fact that 'policies' are typically 'bundles' or 'portfolios' of policy tools arranged in policy mixes and that such bundles are typically the outcome of distinctive processes of policy change, in which elements are added and subtracted from the mix over time. Early work on policy design did not always take this to heart and clarifying the principles enunciated and articulated by early policy design proponents and applying them to policy mixes, and distinguishing between intentional and unintentional process of policy change in the development of such bundles has been a central feature of contemporary policy design study and efforts to move policy design processes and understanding forward.

While policy designs can and should be considered in the abstract, understanding how policy change processes create and modify mixes is critical to evaluating the chance of success for any particular policy mix to attain its goals once put into practice. Adding the notion of policy 'patching' to considerations of intelligent design, for example, better connects design considerations to practice than do many earlier discussion firmly centered in the 'planning' orientation. These often rely upon ideas about the ease or need for wholesale policy replacement which do not exist in practice.

Contemporary design discussions centered on the articulation of design principles such as "goodness of fit" in policy formulation, governance and steering, and the 'degrees of freedom' which formulators or designers have in carrying out their work both over space and over time help to complement and advance earlier notions such as parsimony and the gradual ratcheting of coercion, and the need for coherence, consistency and congruence in designs which were a major feature of earlier eras of thinking about design issues.

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