

The Evolution of the Theoretical Foundations of Punctuated Equilibrium Theory in Public Policy

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Abstract

Punctuated equilibrium theory in public policy replicated from biological punctuated equilibrium theory has concluded that public policies alternate between stasis and punctuation. However, recent research on Pacific Northwest forest policy, U.S. state tobacco policy, and U.S. federal auto efficiency policy have found no punctuations despite an attempt to do so. What is the efficacy of using biological punctuated equilibrium theory to also explain punctuated equilibrium in public policy? Significant differences exist between biological and public policy punctuated equilibrium theory including time frames for change, what constitutes outside disturbances of equilibrium, venues of punctuated equilibrium, levels of analysis for change, and patterns of change. Most policy research on punctuation has focused on the “tone” of media coverage related to change. Some recent studies concluding no punctuation occurred have focused on government action or inaction. Proving strong inference in scientific research requires a clear and viable syllogism linked to appropriate methodology. Both of these crucial elements are now in question in punctuated equilibrium research in public policy.

KEY WORDS: environment, health and medicine, media, pollution, transportation, urban studies

Introduction

In his seminal 1964 article on conducting scientific experiments, Professor John Platt described the foundation and necessity of obtaining a strong inference in scientific investigations (Platt, 1964). Creating a strong causal inference in scientific research includes devising a clear hypothesis or hypotheses, conducting rigorous scientific experimentation that can falsify one or more hypotheses, and then recycling the procedure (Platt, 1964). Crucial to this whole interrelated process of scientific inquiry is crafting a rigorous and clear syllogism (Lukasiewicz, 1987; Platt, 1964). Affirming the importance of a crisp and clear syllogism when conducting scientific research Professor Platt wrote:

Steps 1 (devising alternative hypotheses) and 2 (devising a crucial experiment) require intellectual inventions, which must be cleverly chosen so that hypothesis, experiment, outcome, and exclusion will be related to a rigorous syllogism; and the question of how to generate such inventions is one which has been extensively discussed elsewhere. (Platt, 1964)

Syllogisms ordinarily contain major and minor premises linked to a general conclusion (Aristotle, 1989; Lukasiewicz, 1987; Platt, 1964). In a proper syllogism, both the major and minor premises have one term in common with the conclusion of the syllogism (Aristotle, 1989; Lukasiewicz, 1987; Platt, 1964). The major premise is a predicate or assertion linked to the conclusion (Aristotle, 1989; Lukasiewicz, 1987; Platt, 1964). The minor premise contains the subject of the conclusion (Aristotle, 1989; Lukasiewicz, 1987; Platt, 1964).

In 2009, Baumgartner and Jones in describing the overall conceptual framework of their punctuated equilibrium theory in public policy directly and explicitly described the syllogism of their theory in the following manner:

We have adopted the terminology of punctuated equilibrium because it evokes the images of stability interrupted by major alterations to a system. However, systems may be stable without necessarily being in equilibrium, so we do not wish to assert that all periods of stability are signs of equilibrium; they could simply be due to lack of outside disturbances. The term punctuated equilibrium was proposed by paleontologists Niles Eldredge and Stephen Jay Gould to describe gaps in the evolutionary record. (Baumgartner & Jones, 2009)

Here, the conclusion of the syllogism is that punctuated equilibrium in public policy occurs as a result of major alterations to the policy system. The major premise linked to the conclusion is that punctuated equilibrium includes periods of stability that are quickly changed by major alterations to the policy system. The minor premise also linked to the conclusion is that a pattern of punctuated equilibrium due to an exogenous shock occurs in evolutionary biology and public policy (Aristotle, 1989; Lukasiewicz, 1987; Platt, 1964).

In recent years, a number of scholars have concluded, and thus confirmed the major and minor premises linked to the public policy-punctuated equilibrium syllogism, that there has been a punctuation of policy equilibrium in various policy monopolies in the U.S. such as nuclear power or tobacco that has resulted in significant policy changes (Baumgartner & Jones, 1993, 2009; Breunig & Koski, 2006; Jones, Sulkin, & Larsen, 2003; Repetto, 2006; True, Jones, & Baumgartner, 1999; Wood, 2006a, 2006b; Worsham, 1998). Punctuated equilibrium in public policy has been specifically defined as long-term and relatively incremental policy change followed by an exogenous shock to a policy monopoly resulting in a tipping point oriented toward sharp and explosive policy change (Baumgartner & Jones, 1993, 2009; Breunig & Koski, 2006; Jones et al., 2003; Repetto, 2006; True et al., 1999; Wood, 2006a, 2006b; Worsham, 1998). Policy patterns after positive feedback resulting in punctuation of equilibrium are then followed by a new pattern of long-term and relatively incremental policy change (Baumgartner & Jones, 1993, 2009; Breunig & Koski, 2006; Jones et al., 2003; Repetto, 2006; True et al., 1999; Wood, 2006a, 2006b; Worsham, 1998). Significant factors contributing to the resistance of punctuated equilibrium in the form of negative feedback have been identified as: policy entrepreneurs, courts and rule of law, policy monopolies, bounded and not comprehensive rationality, lack of acceptance of new policy ideas tied to a public policy, and the fragmented U.S. political system in which only select political jurisdictions may adopt significantly new legislation (Baumgartner & Jones, 1993, 2009; Breunig & Koski, 2006; Jones et al., 2003; Repetto, 2006; True et al., 1999; Wood, 2006a, 2006b; Worsham, 1998).

By contrast, scholars of punctuated equilibrium in evolutionary biology argue that punctuated biological evolution occurs due to genetic drift resulting in species change particularly in isolated and peripheral species populations (Eldredge, 1979, 1985, 1989a, 1989b; Eldredge & Gould, 1972; Gould, 1982a, 1982b, 1984, 1989, 1997a, 1997b, 2002; Gould & Eldredge, 1977; Mayr, 1954; Stanley, 1979). Such punctuated evolutionary biological change, which is not sharp and dramatic (as is postulated in punctuated equilibrium theory in public policy) and occurs over thousands of years, is nonetheless quicker than gradual biological evolutionary change (Eldredge, 1979, 1985, 1989a, 1989b; Eldredge & Gould, 1972; Gould, 1982a, 1982b, 1984, 1989, 1997a, 1997b, 2002; Gould & Eldredge, 1977). Factors

inhibiting punctuated equilibrium in evolutionary biology unlike the primarily political and social factors inhibiting punctuated equilibrium in public policy include lack of genetic variability in a population and stable environmental conditions (Eldredge, 1979, 1985, 1989a, 1989b; Eldredge & Gould, 1972; Gould, 1982a, 1982b, 1984, 1989, 1997a, 1997b, 2002; Gould & Eldredge, 1977).

Yet, what if a substantial outside alteration occurs as was the case in recent findings for Pacific Northwest forestry policy, U.S. state tobacco policy, or U.S. auto efficiency policy and there is still no punctuation (Cashore & Howlett, 2007; Givel, 2008; Perl & Dunn, 2007)? This raises a question as to the efficacy of utilizing the major and minor premises linked to the conclusion of the public policy-punctuated equilibrium syllogism as borrowed from evolutionary biology. This article will analyze and trace the soundness of the current punctuated equilibrium syllogism in public policy. Strong inference in science is an interlinked approach between a clearly stated syllogism and a rigorous methodological approach proving all or part of any aspect of a syllogism. Because recent research on Pacific Northwest forestry policy, U.S. state tobacco policy, or U.S. auto efficiency policy has found that the public policy-punctuated equilibrium syllogism is not valid, this article will also analyze the general methodological approaches utilized to measure public policy-punctuated equilibria.

Punctuated Equilibrium Research in Public Policy

The major syllogistic premise of punctuated equilibrium in public policy is that there is long-term and relatively incremental policy change followed by an exogenous shock to a policy monopoly resulting in a tipping point oriented toward sharp and explosive policy change (Baumgartner & Jones, 1993, 2009; Breunig & Koski, 2006; Jones et al., 2003; Repetto, 2006; True et al., 1999; Wood, 2006a, 2006b; Worsham, 1998). Policy patterns after positive feedback resulting in punctuation of equilibrium are then followed by a new pattern of long-term and relatively incremental policy change (Baumgartner & Jones, 1993, 2009; Breunig & Koski, 2006; Jones et al., 2003; Repetto, 2006; True et al., 1999; Wood, 2006a, 2006b; Worsham, 1998).

Significant factors contributing to the resistance of punctuated equilibrium in the form of negative feedback have been identified as: policy entrepreneurs, courts and rule of law, policy monopolies, bounded and not comprehensive rationality, lack of acceptance of new policy ideas tied to a public policy, and the fragmented U.S. political system in which only select political jurisdictions may adopt significantly new legislation (Baumgartner & Jones, 1993, 2009; Breunig & Koski, 2006; Jones et al., 2003; Repetto, 2006; True et al., 1999; Wood, 2006a, 2006b; Worsham, 1998).

Years later, in 1993 and reiterated in 2009, political scientists Frank Baumgartner and Bryan Jones, borrowing Gould and Eldredge's early scientific findings of punctuated equilibria (but not their later refined version of punctuated equilibrium), argued that the rate of change in public policy usually occurs slowly and gradually (Baumgartner & Jones, 2009). However, occasionally, Baumgartner and Jones argued, public policy change can also occur "sharply," "explosively," and in a "short period" due to an outside disturbance (such as a trigger event) followed

again by slow gradual policy change (Baumgartner, 2006; Baumgartner & Jones, 2009). In 2006, Baumgartner further clarified the definition of punctuated equilibrium in public policy as follows:

In any case, our use of the PE [Punctuated Equilibrium] paradigm meant that we wanted to explain what we termed positive-feedback processes (things that can create rapid self-reinforcing changes, destabilizing and explosive growth, for example) as well as negative-feedback processes (also self-correcting, or homeostatic processes leading to steady equilibrium-type behaviors over time) (Repetto, 2006).

They cited rapid and dramatic changes in policy for nuclear power, pesticides, urban affairs, federal but not state tobacco control, public budgeting, election results, substance abuse, and auto safety to bolster their claim that their punctuated equilibrium syllogism is a robust approach to describe policy change (Baumgartner & Jones, 2009; Jones et al., 2003). In addition, in 2009, Baumgartner and Jones further proposed that punctuated equilibrium can occur through “disruptive dynamics” that can include interactions between political parties, interest groups, elected officials, and legislative committees (Baumgartner & Jones, 2009). Punctuated equilibrium policy theorists have noted that sharp policy change can also occur due to disruptive events caused by crises, elected officials, legislative committees, wars, new technologies and scientific changes, radical economic change, and reformist mobilizations by interest groups and coalitions opposed to policy monopolies (Repetto, 2006).

Crucial to understanding how powerful forces oppose continual punctuated equilibrium is the role of policy monopolies (Givel, 2006). Policy monopolies or powerful and influential groups or coalitions in a policy subsystem can hinder the ability of outside groups to actually engage in significant decision making and policy change (Givel, 2006). Power in this manuscript means the ability of one or more parties to compel one or more other parties to engage in certain actions, even against their will (Bachrach & Baratz, 1962).

In further understanding the role of policy monopolies in countering interest group mobilization by less powerful groups, punctuated equilibrium theorists also focus on the maintenance of the balance of power (or not) between opposing groups or advocacy coalitions including policy monopolies (Baumgartner & Jones, 2009; Givel, 2008). This continual conflict between these opposing groups or coalitions can result in policies that are usually and primarily in equilibrium or occasionally moving to substantial disequilibrium due to a punctuation of equilibrium (Baumgartner & Jones, 2009; Givel, 2008).

Powerful policy monopolies can use their resources to employ lobbyists, policy specialists, lawyers, and public relations specialists; fund campaign contributions, gifts, honoraria, and entertainment events for public officials; and utilize third party front groups (Givel & Glantz, 2001). They also build political alliances with other powerful groups to stymie sharp policy changes and challenges by outside groups (Breunig & Koski, 2006; Givel & Glantz, 2001). In addition to the influence of powerful policy monopolies, a myriad of single district U.S. governmental political jurisdictions including between and amongst the federal government, states, and local governments strongly hinders widespread and sweeping political changes simultaneously in numerous political jurisdictions. This significantly favors the political status quo (Repetto, 2006).

Another important factor that hinders punctuations of equilibrium is the role of the courts, judicial review, and precedent in often overruling more significantly reformist and radical policies such as significant changes in property rights (Repetto, 2006). Thus, in addition to policy entrepreneurs, bounded rationality, and resistance to new policy ideas, the power of influential groups in the policy process, a conservative judicial orientation, and fragmented political jurisdictions between and amongst levels of government can also counter attempted punctuations of a policy equilibrium. Research by political scientist Jeffrey Worsham also clarified the public policy-punctuated equilibrium syllogism by noting that in a particular policy niche a dominant policy monopoly can consist of competing factions or a new policy coalition can challenge the dominant policy monopoly (Worsham, 1998).

In 2009, Baumgartner and Jones in a reaffirmation of their basic syllogistic premise of punctuated equilibrium in public policy argued:

If every researcher found major punctuations, then we would lose confidence in the ability of the theory [punctuated equilibrium syllogism] to distinguish large changes from more modest changes in the case material. We have not argued that punctuations are everywhere; we have argued that policies alternate between stability and punctuation. (Baumgartner & Jones, 2009)

Nonetheless, in recent years various researchers in many policy niches such as nuclear energy (Baumgartner & Jones, 2009), pesticides (Baumgartner & Jones, 2009), substance abuse (Baumgartner & Jones, 2009), urban affairs (Baumgartner & Jones, 2009), federal but not state tobacco control policy (Baumgartner & Jones, 2009; Wood 2006b), auto safety (Baumgartner & Jones, 2009), environmental protection (Baumgartner, 2006; Repetto, 2006), forestry policy (Wood, 2006a), public budgeting (Breunig & Koski, 2006; Jones & Breunig, 2007; Jones et al., 2003; Jordan, 2003; Ryu, 2009), civil defense (Mortensen, 2007), alcohol prohibition and repeal (Schrader, 2007), social security (True, 1999), and election results (Jones et al., 2003) *have* discovered punctuated equilibrium occurring. These research findings, in essence, affirm all aspects, including the major and minor premises linked to the conclusion, of the public policy-punctuated equilibrium syllogism.

In addition, the primary and general methodological approach to reach these research conclusions has been examining and analyzing the “tone” including the frequency of media coverage (Baumgartner, 2006; Baumgartner & Jones, 2009; Jones et al., 2003). This has included examining the reporting of news stories on various issues by such media outlets as the *New York Times* and *Congressional Research Quarterly* (Jones et al., 2003).

Recent research in some policy niches including Pacific Northwest forest policy, U.S. state tobacco policy, and U.S. auto efficiency policy that utilized a methodological focus on public policy outputs rather than tone as a basis of analysis have concluded that attempts to induce a major alteration to the policy equilibrium have not been successful (Cashore & Howlett, 2007; Givel, 2008; Perl & Dunn, 2007). Public policy outputs for this manuscript are defined as government actions or inactions with respect to laws, regulations, and funding for a particular issue. Public policy outputs are commonly reflected in executive branch actions or orders, judicial decisions, and legislation.

A 2007 article by Perl and Dunn documented that despite an attempt at punctuating U.S. corporate average fuel economy criteria, a political impasse developed from 1981 to 2005 (Perl & Dunn, 2007). In a 2007 article by Cashore and Howlett on forest policy in the U.S. Pacific Northwest, the authors found from 1976 to 2005 a generally limited impact with no punctuations in policy by environmentalists with respect to controlling the harvesting of timber, protecting old growth forests, and preserving ecosystems (Cashore & Howlett, 2007).

Another study in 2008 in the area of U.S. state tobacco policy has also found, despite a vigorous attempt from 1990 to 2006 by health advocates, sympathetic politicians, litigators, and regulatory agencies, punctuation of equilibrium in nine key state anti-tobacco policy areas did not occur (Givel, 2008). The nine key indicators of state tobacco control policy outputs that were examined included: state clean indoor air laws for government, private workplaces, restaurants, and hospitals; higher tobacco taxes; state preemption of stronger local clean indoor air and youth access ordinances; Centers for Disease Control and Prevention (CDC) minimum state spending levels for tobacco control programs; and state tobacco licensing requirements (Givel, 2008).

State anti-tobacco policy patterns for this period indicated that the number of states enacting: tobacco license legislation was linear and increasing, minimum CDC spending for state anti-tobacco programs was linear and constant, higher tobacco taxes was oscillating and increasing, and preempting stronger local youth access and clean indoor air laws was exponential and constant (Givel, 2008). Also, the number of states enacting state clean indoor air laws for government, private workplaces, restaurants, and hospitals was exponential with no bound (Givel, 2008). In none of these key state anti-tobacco policy areas did a dramatic and sharp punctuated policy change occur with a vast majority of states enacting anti-tobacco legislation in a short period.

Summary

A crucial difference between the large number of studies that have upheld punctuated equilibrium in public policy and those that have not has been the methodological focus of these studies. When the methodological focus has been on tone the research has often concluded that punctuated equilibrium occurred in sync with the major and minor premises of the conclusion of the public policy-punctuated equilibrium syllogism espoused by Baumgartner and Jones. When the methodological focus has been on policy outputs or what government does or does not do, the research has concluded that punctuated equilibrium did not occur contradicting Baumgartner and Jones's public policy-punctuated equilibrium syllogism.

Punctuated Equilibrium Research in Biology

The impetus for punctuated equilibrium theory in evolutionary biology occurred in 1954 when Ernst Mayr theorized that biological evolution does not occur gradually (Mayr, 1954). Rather, rapid biological evolution occurred through mutation, recombination, and natural selection in peripherally isolated populations (Mayr, 1954). In

order for evolution to occur isolated populations required genetic variability (Mayr, 1954).

In 1972, paleontologists Stephen J. Gould and Niles Eldredge argued in their famous essay in *Models of Paleobiology* that biological evolutionary change was not always “slow and steady” or gradual as was maintained by Charles Darwin in 1859 (Darwin, 1859). Darwin argued in his 1859 book *On the Origin of Species* that some individuals in a species are better able to survive in a specific environment due to a variation in their genetic traits, which is passed on to their offspring (Darwin, 1859). He based this new and revolutionary theory on the observed behavior of various isolated species such as the finches and tortoises on the Galapagos Islands and human selection of breeds of domesticated animals (Darwin, 1859). As variations in genetic composition in a population accumulated over time they slowly evolved into a new species (Darwin, 1859).

By contrast, like Mayr’s argument in 1954, Gould and Eldredge argued from fossil evidence of the rise-and-fall of snail populations that often after long periods of incremental changes new species evolved quickly in “small, peripherally isolated” populations due to a sharp environmental change (Eldredge, 1979, 1985, 1989a, 1989b; Eldredge & Gould, 1972; Gould, 1982a, 1982b, 1984, 1997a, 1997b; Gould & Eldredge, 1977). This occurred through macro-evolutionary processes including phylogenetic drift, speciation, and species selection (Eldredge, 1989b; Stanley, 1979). Gould and Eldredge analyzed the fossil records of the 300,000-year evolution of a pulmonate snail *Poecilozonites bermudensis* and discovered that there was a distinct difference of color banding for the western and eastern varieties in the Bermudian Pleistocene (Eldredge, 1989a, 1989b). Both of the varieties went extinct very suddenly and were quickly replaced by *Pb. bermudensis*, which had originally developed in the St. George’s Island area (Eldredge, 1989a, 1989b). They called this alternative tempo of biological evolutionary change punctuated equilibria (Eldredge, 1989a, 1989b).

Nevertheless, after scientific critique and debates, Gould and Eldredge refined their original argument that punctuated equilibrium was the norm in biological evolution (Eldredge, 1989a, 1989b; Gould & Eldredge, 1977; Gould 1997a, 1997b, 2002). They argued that paleobiology had long been dominated by advocates of phyletic gradualism (Eldredge, 1989a, 1989b; Gould, 1989). They also argued that punctuated equilibrium theory is not a theory of saltational or instant species change but based on slow change over thousands of years but faster than the slower species change that evolutionary gradualists argued occurred (Dawkins, 1996; Eldredge, 1989b; Gould, 1989). Gould also disputed the notion that evolution was a uniform process, instead calling for “evolutionary pluralism” where gradualism and punctuated equilibrium both occurred (Gould, 1989; Gould & Eldredge, 1977). Gould and Eldredge refined their original theory in 1977 arguing:

We never claimed either that gradualism could not occur in theory, or did not occur in fact. Nature is far too varied and complex for such absolutes; Captain Corcoran’s “hardly ever” is the strongest statement that a natural historian can hope to make. Issues like this are decided by relative frequency. (Gould & Eldredge, 1977)

Gould also argued in 1989:

This general movement in thought (evolutionary pluralism) has several bases including the popularity of structuralist thinking in philosophy (particularly Foucault) the widespread recognition of uniformity and gradualism as a historical bias and (we would like to think) the empirical adequacy of punctuational change in a pluralistic world of many styles. (Gould, 1989)

In essence, in a revision of their original 1972 thesis on the uniformity of punctuated equilibrium, Gould and Eldredge refined their original view that punctuated equilibrium was the only or exclusive explanation of how species change occurred (Eldredge, 1989a, 1989b; Gould 1989, 1997a, 1997b, 2002; Gould & Eldredge, 1977).

Conceptual Differences between Punctuated Equilibrium in Biology and Public Policy

Table 1 compares punctuated equilibrium theory used in evolutionary biology and public policy. Included in the comparison are the bases of punctuated equilibrium change, the time frame for change, what constitutes outside disturbance to a current equilibrium, the venues in which punctuated equilibrium occur, the levels of analysis for the change, and the patterns of policy change. The comparison indicates that punctuated equilibrium in public policy as postulated by Baumgartner and Jones is incongruent with respect to the validity of the minor premise linked to the conclusion of their syllogism.

Biological punctuated change according to Gould and Eldredge is based on macro-evolutionary genetic factors and environmental factors. Policy change

Table 1. Comparison of the primary theoretical characteristics of punctuated equilibrium in public policy* and biology

	Public policy	Biology
Bases for change	Disturbance and disruption of equilibrium of policy monopolies	Macro phylogenetic drift, speciation, species selection
Time frame of change	Saltational or very short term defined as dramatic and explosive	Over thousands of years but quicker than gradual change; not saltational
Outside disturbances that punctuate equilibrium	Interest groups, political parties, elected officials, legislative committees, crises, wars, new technologies, scientific changes, radical economic change, and reformist mobilizations	Genetic variability in geographically isolated populations adapting to new environmental conditions
Factors resisting change	Political entrepreneurs, courts and rule of law, policy monopolies, bounded rationality, acceptance of new policy ideas tied to a public policy, fragmented political system	Lack of genetic variability in a population and stable environmental conditions
Venues for change	Various governmental jurisdictions	Geographical and ecological venues
Levels of analysis	Between and amongst levels of government	Genetics and higher levels of organisms
Patterns of change	According to Baumgartner and Jones, if measured by tone and political communications, alternates between stability and punctuation; according to other recent research, if measured by policy outputs, pluralistic policy output patterns occur with no change, limited change, and punctuated change	Evolutionary pluralism where gradual and punctuated change both occur

*Baumgartner and Jones (2009).

according to Baumgartner and Jones is based on a variety of outside and often-complex disturbances that punctuate established policy monopolies. Punctuated equilibrium theory as posited by Baumgartner and Jones tends to be saltational or near saltational with “explosive” and “dramatic” policy changes. Punctuated equilibrium as defined by Gould and Eldredge is not saltational, but slow change, that is, faster than gradual evolutionary change. Factors resisting punctuated change are also quite different with a lack of genetic variability and stable environments causing evolutionary biological stasis and various institutional factors, policy entrepreneurs, bounded rationality and policy monopolies thwarting punctuated equilibrium in public policy. The venues for punctuated equilibrium are also dissimilar with biological punctuated change occurring in various geographical and ecological niches while punctuated change in public policy occurring in between and amongst governmental jurisdictions.

Perhaps the most significant difference is that Baumgartner and Jones currently rely on an early conceptualization of Gould and Eldredge’s theory of punctuated equilibrium. Gould and Eldredge’s early view of punctuated equilibrium was subsequently revised and replaced with evolutionary pluralism. Evolutionary pluralism is the notion that evolutionary change in biology can be gradual or punctuated but not saltational.

Summary

The minor premise linked to the conclusion of the syllogism used by Baumgartner and Jones to explain punctuated equilibrium in public policy is not in sync with punctuated equilibrium as currently used in evolutionary biology. Nor is the public policy-punctuated equilibrium syllogism in sync with recent research findings in U.S. state tobacco policy, U.S. Northwest forestry policy, and U.S. auto efficiency policy that concluded that punctuation of equilibrium did not occur despite concerted attempts to alter public policy. Tied to the issue of the inconsistent syllogism used by Baumgartner and Jones in punctuated equilibrium theory is the equally crucial issue and as of yet unanswered question of why different methodological approaches now used by scholars to measure punctuated equilibrium in public policy come to distinctly different conclusions on the viability of the public policy-punctuated equilibrium syllogism.

Paradigm Change

As Thomas Kuhn argued, a paradigm (such as the punctuated equilibrium syllogism in public policy) is an accepted model or pattern (Kuhn, 1996). Paradigms are based on accepted scientific research and facts, can predict and most importantly are able to resolve “residual ambiguities” (Kuhn, 1996). Ideally, a new scientific theory will develop when a significant anomaly is discovered but this often occurs with substantial resistance (Kuhn, 1996). A paradigm that is in “crisis” is often reconstructed with new and usually simplified axioms (Kuhn, 1996). The new paradigm normally solves the problems of the old paradigm (Kuhn, 1996).

The basis in science to ascertain if an old paradigm is in crisis is through scientific research engaged in “strong inference” that disproves all or parts of the old

paradigm such as now has occurred in recent research finding no punctuations despite a concerted effort to alter public policy. In this manner, scientific theory and knowledge advances by testing null hypotheses (Platt, 1964).

Discussion

The current findings of Pacific Northwest forest policy, U.S. state tobacco policy, and U.S. federal auto efficiency standards of no punctuation with a widespread disturbance to the system is an anomaly to Baumgartner and Jones' central theoretical syllogism of punctuation due to exogenous shocks to a policy system. If an effort to create a more congruent public policy-punctuated equilibrium syllogism related to the current paradigm of punctuated equilibrium change in evolutionary biology were to occur, the minor premise linked to the conclusion of the revised syllogism would include a pluralistic model that accounts for attempts at punctuation leading to no change or non-punctuated change as recent policy research has concluded as well as the possibility of punctuated change. This is also in line with Gould and Eldredge's revised interpretation of evolutionary pluralism being the basis of evolutionary biological change.

Scientific researchers in the normal course of scientific discovery and work are free, of course, to utilize any testable scientific syllogism (or metaphor that can be expressed as a syllogism) that they deem proper such as punctuated equilibrium in evolutionary biology being related to public policy. At the same time, it is crucial in the interest of scientific precision in terms of linking a syllogism to testable methodology to label their preferred scientific syllogism based on a precise description of the current science upholding or not all or parts of the preferred syllogism (or metaphor). In the case of public policy-punctuated equilibrium theory, this should be oriented toward Gould and Eldredge's actual definition of punctuated equilibrium, which they described as evolutionary pluralism. Due to the current policy research findings that punctuation did not occur despite major efforts to alter a current equilibrium, this warrants a revised description of the current public policy-punctuated equilibrium syllogism. This revised description would include a name change other than *punctuated equilibrium* to better describe the new public policy syllogism. Punctuated equilibrium theory in public policy does not fully describe the complex nature of policy changes despite exogenous shocks or attempted alteration of a policy niche that may or may not result in punctuated policy change.

Diverse policy output pluralism and patterns in a socially complex and realistic manner has already been shown in U.S. state tobacco control policy (Givel, 2008). Uniformity between stasis and punctuated change is not necessarily the rule or basis of public policy change. Reformist policy output change may not be punctuated or saltational or near saltational even when there is an attempt at punctuation. A first step in describing the new syllogism would be to take note that policy output change may not occur due to powerful interests asserting their influence as was the case in U.S. state tobacco policy (Givel, 2008). Sometimes dominant corporate interests win despite an attempted punctuation, suggesting, in these cases, a policy monopoly based on corporate hegemony and dominance in a policy niche. Public policy

theory change needs to account for this as well as the complexity and diversity of punctuated and non-punctuated policy output changes and lack of change that can occur.

In addition, tied to using strong inference in testing the major and minor premises of the conclusion of the syllogism is the adequacy of using a methodological approach based on tone. This measurement approach does not directly predict and explain what government does or does not do. Using tone as a central focus is a measurement of the *policy process* but it does not directly measure the end and ongoing results of the policy process or policy outputs. Moreover, no justification, so far, has been provided in the scholarly literature as to why examining what government does or does not do is an inadequate approach to measure policy output change as it actually impacts society and the natural environment.

Ultimately, the minor premise to the conclusion of the current public policy-punctuated equilibrium syllogism is faulty, the strong inference methodological approach based on causality using tone to measure punctuations is open to serious question, and the viability of explaining policy change based solely on short-term systematic reactions to attempts to punctuate a policy sub-system is tenuous. Without a resolution of these significant issues, the current public policy-punctuated equilibrium syllogism contains significant anomalies. If these anomalies cannot be resolved as Kuhn recognized, then the next step is rethinking the old public policy-punctuated equilibrium syllogism as a means to advance scientific inquiry and predictability in public policy.

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References

- Aristotle. (1989). *Prior analytics*. R. Smith (Ed.). Indianapolis, IN: Hackett.
- Bachrach, P., & Baratz, M. (1962). The two faces of power. *American Political Science Review*, 56, 947–952.
- Baumgartner, F. (2006). Punctuated equilibrium theory and environmental policy. In R. Repetto (Ed.), *Punctuated equilibrium and the dynamics of U.S. environmental policy* (pp. 24–46). New Haven: Yale University Press.
- Baumgartner, F., & Jones, B. (1993). *Agendas and instability in American politics*. Chicago: The University of Chicago Press.
- Baumgartner, F., & Jones, B. (2009). *Agendas and instability in American politics* (2nd ed.). Chicago: The University of Chicago Press.
- Breunig, C., & Koski, C. (2006). Punctuated equilibria and budgets in American states. *Policy Studies Journal*, 34(3), 363–380.
- Cashore, B., & Howlett, M. (2007). Punctuating which equilibrium? Understanding thermostatic policy dynamics in pacific northwest forestry. *American Journal of Political Science*, 51(3), 532–551.
- Darwin, C. (1859). *On the origin of species by means of natural selection or the preservation of favored races in the struggle for life*. London: John Murray, Albemarle Street.
- Dawkins, R. (1996). *The blind watchmaker*. New York: W.W. Norton & Company.
- Eldredge, N. (1979). Alternative approaches to evolutionary theory. In J. Schwartz & H. B. Rollins (Eds.), *Models and methodologies in evolutionary theory* (pp. 7–19). Pittsburgh, PA: Bulletin of the Carnegie Museum of Natural History.

- Eldredge, N. (1985). *The unfinished synthesis: Biological hierarchies and modern evolutionary thought*. New York: Oxford University Press.
- Eldredge, N. (1989a). *Macro-evolutionary processes: Species, niches, and adaptive peaks*. New York: McGraw-Hill.
- Eldredge, N. (1989b). Punctuated equilibria, rates of change, and large-scale entities in evolutionary systems. In A. Solnit & S. Peterson (Eds.), *The Dynamics of Evolution*. Ithaca, NY: Cornell University Press.
- Eldredge, N., & Gould, S. (1972). Punctuated equilibria: An alternative to phyletic gradualism. In T. J. M. Schopf (Ed.), *Models in paleobiology* (pp. 82–115). San Francisco: Cooper and Co.
- Givel, M. (2006). Punctuated equilibrium in limbo: The tobacco lobby and U.S. state policymaking from 1990 to 2003. *Policy Studies Journal*, 34(3), 405–418.
- Givel, M. (2008). Assessing material and symbolic variations in punctuated equilibrium and public policy output patterns. *Review of Policy Research*, 25(6), 547–561.
- Givel, M., & Glantz, S. (2001). Tobacco lobby political influence on U.S. state legislatures in the 1990s. *Tobacco Control*, 10, 124–134.
- Gould, S. (1982a). Darwinism and the expansion of evolutionary theory. *Science*, 216, 380–387.
- Gould, S. (1982b). The meaning of punctuated equilibrium and its role in validating a hierarchical approach to macroevolution. In R. Milkman (Ed.), *Perspectives on evolution* (pp. 83–104). Sunderland, Massachusetts: Sinauer.
- Gould, S. (1984). Toward the vindication of punctuational change. In W. A. Berggren & J. A. V. Couvering (Eds.), *Catastrophes and earth history* (pp. 9–34). Princeton: Princeton University Press.
- Gould, S. (1989). Punctuated equilibrium in fact and theory. In A. Solnit & S. Peterson (Eds.), *The dynamics of evolution* (pp. 54–84). Ithaca, NY: Cornell University Press.
- Gould, S. (1997a). Darwinian fundamentalism. *The New York Review of Books*, 12, 34–37.
- Gould, S. (1997b). Evolution: The pleasures of pluralism. *The New York Review of Books*, 26, 47–52.
- Gould, S. (2002). *The structure of evolutionary theory*. Cambridge, MA: Harvard University Press.
- Gould, S., & Eldredge, N. (1977). Punctuated equilibrium: The tempo and mode of evolution reconsidered. *Paleobiology*, 3, 115–151.
- Jones, B., & Breunig, C. (2007). Noah and Joseph effects in government budgets: Analyzing long term memory. *Policy Studies Journal*, 35(3), 329–349.
- Jones, B. D., Sulkin, T., & Larsen, H. A. (2003). Policy punctuations in American political institutions. *American Political Science Review*, 97(1), 151–169.
- Jordan, M. (2003). Punctuations and agendas: A new look at local government budget expenditures. *Journal of Policy Analysis and Management*, 22(3), 345–360.
- Kuhn, T. (1996). *The structure of scientific revolutions* (3rd ed.). Chicago: University of Chicago Press.
- Lukasiewicz, J. (1987). *Aristotle's syllogistic logic from the standpoint of modern formal logic*. New York: Garland Publishers.
- Mayr, E. (1954). Change of genetic environment and evolution. In A. C. Hardy & E. B. Ford (Eds.), *Evolution as a process* (pp. 157–180). London: Allen & Unwin.
- Mortensen, P. (2007). Stability and change in public policy: A longitudinal study of comparative subsystem dynamics. *Policy Studies Journal*, 35(3), 373–395.
- Perl, A., & Dunn, J. A. (2007). Reframing auto fuel efficiency policy: Punctuating a North American policy equilibrium. *Transport Reviews*, 27, 1–35.
- Platt, J. (1964). Strong inference. *Science*, 146(3642), 347–353.
- Repetto, R. (2006). Introduction. In R. Repetto (Ed.), *Punctuated equilibrium and the dynamics of U.S. environmental policy* (pp. 1–23). New Haven: Yale University Press.
- Ryu, J. (2009). Exploring the factors for budget stability and punctuations: A preliminary analysis of state government sub-functional expenditures. *Policy Studies Journal*, 37(3), 457–474.
- Schrad, M. (2007). Constitutional blemishes: American alcohol prohibition and repeal as policy punctuation. *Policy Studies Journal*, 35(3), 437–463.
- Stanley, S. (1979). *Macroevolution: Patterns and process*. San Francisco: W.H. Freeman.
- True, J. (1999). Attention, inertia, and equity in the Social Security program. *Journal of Public Administration Research and Theory: Journal of-PART*, 9(4), 571–596.
- True, J. L., Jones, B., & Baumgartner, F. (1999). Punctuated equilibrium theory: Explaining stability and change in American policymaking. In P. Sabatier (Ed.), *Theories of the policy process* (pp. 155–188). Denver, CO: Westview Press.
- Wood, R. S. (2006a). The dynamics of incrementalism: Subsystems, politics, and public lands. *Policy Studies Journal*, 34(1), 1–16.
- Wood, R. S. (2006b). Tobacco's tipping point: The master settlement agreement as a focusing event. *Policy Studies Journal*, 34(3), 419–436.
- Worsham, J. (1998). Wavering equilibriums: Subsystem dynamics and agenda control. *American Politics Quarterly*, 26(4), 485–512.

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