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Payments for ecosystem services: durable habits, dubious nudges, and doubtful efficacy

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Abstract: Payments for ecosystem services (PES) have become a popular approach to bring about improved environmental behaviors. When such programs are launched in developing countries, an additional benefit is that they are said to improve incomes for the poor. In this paper, we argue that PES schemes are *not* 'market-based'. Indeed, they are not even 'market-like'. The incentive properties said to be present in such programs are of doubtful efficacy. We suggest that PES schemes are instances of a new class of transaction – the *inducing transaction* – whose purpose is to make certain resource users the instruments of the desires of others. We relate the success of PES schemes to Veblenian 'habituation' and Peircean 'habit breaking and habit taking' to suggest that PES schemes face a daunting challenge if they are to bring about durable behavioral changes.

1. Introduction

The modern state with its complex policy architecture offers a number of opportunities for novel transactions that remain under-theorized. A popular example of such transactions – payments for ecosystem services (PES) – is advanced as a market solution to serious environmental degradation. Despite its recent popularity, too little theoretical attention has been devoted to the presumptions and problems of such programs.

The pertinence of this necessary exegesis arises from the fact that environmental policy has long been understood as a dichotomized arena in which there are either command-and-control policies, or there are market-based policies through which the government seeks to alter individual behaviors that are harmful to the environment. For instance, so-called command-and-control approaches entail governments setting limits on a class of pollutants (or nature-related actions) and then monitoring firms to make sure the limits have been followed. Alternatively, market-based approaches seek to establish certain

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performance standards and then to let firms find the most efficient means to achieve those mandated standards. Tradable pollution permits are a common example of such market-based policies. Here, governments set the desired level of pollution – or the desired level of ambient environmental quality – and then firms are able to trade pollution permits so that a given level of reduction in pollutants is achieved at the lowest possible cost.

Of course each of these approaches is less pure than their label implies. The notion of command-and-control raises the specter of Soviet-like inspectors spying on firms, and the notion of market-based suggests that there is a widespread market at work in which anyone can buy and sell pollution opportunities. Despite these flawed images, the categories and their labels remain durable and serve as a common metaphor in environmental policy circles. As for the specific class of transactions under discussion here:

> Payment for ecosystem services (PES) is an approach to environmental management that uses cash payments or other compensation to encourage ecosystem conservation and restoration. We define PES to include direct payments from ecosystem service beneficiaries to land stewards, as well as indirect payments earned through eco-certified production. . . . PES is implemented through contingent agreements between land stewards and ecosystem service beneficiaries such as private businesses, communities, and society as a whole . . . As markets and compensation schemes for ecosystem services are established, low-income land stewards stand to benefit from the increased value placed on the services that these lands provide. (Milder *et al.*, 2010: 4)

Notice here a common feature of many of these programs – they seem to promise the best of both worlds. Voluntary incentives, instead of coercive regulations, will eliminate unwanted environmental behaviors, and this new income flow in exchange for new benign environmental practices will augment rural incomes (Ferraro, 2001, 2008, 2011; Ferraro and Kiss, 2002; Arriagada *et al.*, 2012). Here, it seems, is a true 'double dividend'. According to Milder *et al.*, there are four varieties of PES schemes:

1. Public sector buyers: These buyers seek to protect the public good of ecosystem services on behalf of their constituencies. They include local, regional, and national governments, as well as quasi-public agencies such as the World Bank;
2. Private sector buyers under regulatory obligation: These buyers are mandated to offset their environmental impacts by laws such as wetland mitigation requirements or greenhouse gas emissions trading schemes;
3. Private sector buyers acting voluntarily: These buyers may purchase ecosystem services to support their business operations, to maintain a 'green' brand image, or to adhere to principles of corporate social responsibility. This category also includes philanthropic buyers such as conservation non-governmental organizations (NGOs) and individual consumers;

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4. Consumers of eco-certified products: These buyers participate in ecosystem service markets by paying a premium for products produced in more environmentally benign ways, such as shade-grown coffee that conserves biodiversity. Although the form of payment is less direct than in the other three categories, this market segment is important for low-income land stewards and is therefore included in our analysis.

We shall focus attention on the first and third examples – programs in which 'buyers' (including those from non-governmental organizations) approach individuals or groups in rural communities, often but not exclusively in the developing world, with the explicit purpose of bringing about improved environmental behaviors. When a deal has been consummated, buyers will have obtained the *expectation* of improved environmental stewardship from 'sellers', and those sellers – whose environmental behaviors are thus expected to change – will have secured a new income stream that is presumed to compensate them for their new forbearance toward local habitats. In the US and parts of Europe, landowners are paid to remove land from agricultural production so as to create conservation reserves and natural habitat conducive to wildlife. In the developing world, rural residents are paid *not* to cut forests or to kill valorized wildlife. Or, they may be paid to undertake certain desired activities (i.e., erosion control).

Our primary purpose here is to analyze this particular institutional innovation with the intent of demonstrating that, contrary to popular perceptions, PES programs are *not* examples of a market transaction. They are not market-like or even marked-based. This clarification is necessary because the political appeal of such schemes rests on the argument that, by being market-based, they are free of the so-called command-and-control approach that is common to environmental policy. Once it is clear that classic PES programs are not examples of market-based transactions, we can then focus attention on identifying the explicit nature of this new class of transactions.

A second goal here is to suggest that these schemes represent a new class of transaction unrecognized by classical institutional economists such as John R. Commons who gave us *bargaining transactions*, *managerial transactions*, and *rationing transactions* (Bromley, 2006; Commons, 1931; Ramstad, 1990, 1996). We will suggest that PES schemes are best understood as *inducing transactions*.

Finally, we will suggest that advocates of PES programs have failed to account for the profound significance of habits in everyday life. We will develop this argument with reference to Veblenian 'habituation' and to the 'habit taking and habit breaking' of Charles Sanders Peirce.

2. Payments for ecosystem services

While PES programs vary, the general pattern entails a voluntary transaction where a well-defined ecosystem service (or a land-use likely to secure that service) is 'purchased' by a (minimum of one) *buyer* from a (minimum of one)

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provider – hereafter called a *seller* (Shelley, 2011; Wunder, 2005). The usual practice is that a specific habitat of particular environmental significance – sometimes called an environmental hotspot – will have been identified by national or international environmental organizations and then a decision will have been taken to employ a PES scheme rather than try to convince national and/or local governments to undertake a new regulatory program. Often a PES program is necessitated by the fact that some governments are unwilling to take decisive action. Or, perhaps governments will indeed launch some regulatory program but then be unwilling (or unable) to carry out the necessary implementation and enforcement. We see that PES schemes might be the favored institutional innovation simply because of the absence of other options. Examples of PES schemes would be initiatives to reduce indiscriminant timber harvesting, to prevent overgrazing of fragile hillsides, or to modify other habituated practices.[1] The negotiated arrangements must be assumed to offer sufficient economic incentives to locals so that their new forbearance toward nature is optimally remunerated.

We stress *optimally remunerated* as a reminder that any claims for the advantageous market-based properties of PES programs must rest upon the presumption that buyers of improved environmental behaviors (and expected outcomes) will pay no more than is exactly required on the part of sellers in order to get them (sellers) to comply with the necessary behavioral changes desired by the buyer. If this condition is not met, then buyers are necessarily overpaying for the new behaviors. Under such circumstances, the conditions for an efficient market are violated and PES schemes cannot be advanced as an ideal solution compared with other policy approaches. In recognition of this challenge, a common practice for securing efficiency in PES transactions is to introduce competitive tendering. In such programs, the buyer issues a call for certain practices on the part of local resource users and then accepts the most cost-effective offers.

Notice that PES programs entail a suite of operational rules, a mechanism of local governance, as well as implementation and enforcement agreements. The voluntary nature of PES programs means that there will always be the necessity for negotiation and bargaining between buyers and potential sellers of improved environmental outcomes. It is quite common that there will be just one buyer seeking negotiations with a large number of potential sellers of improved environmental practices and outcomes. Indeed the most common practice is that a number rural land owners (or users) in a particular location will be offered compensation by a buyer to alter their land-use practices. Arrangements are launched when a buyer decides the specific ecosystem services to be protected and then various sellers in a local setting are asked to make their offers concerning

1 Such schemes also replace possible co-management arrangements in which a non-governmental organization joins with local individuals in altering traditional environmental behaviors.

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how much compensation would be required in order to comply with the desired flow of specific ecosystem services. In some instances, with knowledge of local arrangements, the buyer will initiate the process by making an initial offer thought sufficient to induce changes in traditional practices. The purpose is to draw individual agents into a new – and often abstract – game with other agents. Sometimes potential sellers may be bidding against other possible local interests in an effort to secure the new payments. While the opponent is not necessarily known, some interaction between the agents is inevitably underway through bargaining. A key claim for PES schemes is that they promote the protection of ecosystem services, rural development, and individual freedoms. By implication, this would mean that PES programs and the transactions therein are instituted in a special way. More specifically, the implication is that such programs re-constitute individuals in their interactions with nature. Is this claim credible? We now turn to that issue.

3. PES as a new instituted game

Efforts to understand the nature of the PES transaction bring us to the institutionalism of John R. Commons. In his work, Commons started with the transaction as the central unit of analysis – a move that has been developed most prominently, and to good effect, by Oliver Williamson (2002, 2005). In contrast to what Commons regarded as the dubious hedonism of neo-classical economics – a consumer and a commodity that is giving of utility – Commons insisted that the central focus in economics must be the *negotiational psychology* that surrounds individual transactions. In particular, Commons was interested in the coming together of two 'human wills in action' – each looking to the future – with the intent of using the transaction as an instrument of newly attained advantage (Bromley, 2006; Ramstad, 1990, 1996). That is, after all, why individuals engage in transacting: each hopes to gain something.

Commons distinguished three classes of transactions: (1) the bargaining transaction; (2) the managerial transaction; and (3) the rationing transaction.[2] The bargaining transaction is the standard one most studied in economics. In the bargaining transaction, both parties – buyer and seller – are legal equals. By this is meant that each participant enjoys similar and reciprocated rights and duties in the eyes of the law (Commons, 1990, 1995). In the bargaining transaction, negotiational psychology concerns both persuasion and coercion. Persuasion is obvious, but the element of coercion is often overlooked. However, the hungry mother whose children cannot eat unless she works is not entirely free to resist

2 The managerial transaction concerns the *creation* of wealth, while the bargaining transaction concerns the *transfer* of wealth among participating entities. The rationing transaction, of limited interest here, concerns the reapportionment of social and economic opportunities. This is what occurs in parliaments (legislatures) and courts (Bromley, 2006).

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entering into a bargaining transaction. Or she does so at some considerable cost. If there is a large 'reserve army of unemployed' then the buyer of labor stands in a considerable advantage compared to the many sellers of labor services. While the legal position of both parties is equal, their respective economic positions certainly vary.

Unlike bargaining transactions of everyday markets, managerial transactions occur inside of firms where the negotiational psychology concerns command and obedience. In managerial transactions, one party to the transaction is in a position of legal superiority, while the other party is a legal inferior. For instance, a firm can always refuse to hire an aspiring worker, and can dismiss one it finds unsuited. Workers cannot force a firm to hire them, nor – with some limited exceptions – may workers dispute a dismissal. Here the negotiational psychology is one of pleading and argument.

While first impressions may suggest that PES schemes represent a simple bargaining transaction, this would be a mistake. All bargaining transactions are embedded in – and function because of – an elaborate legal architecture that circumscribes these specific transactions. All bargaining (as well as managerial) transactions have the explicit force of the law behind them. With PES schemes the legal nature of the transaction is clouded by the fact that international environmental organizations, as buyers, may have a tenuous place in the legal scaffolding of the various countries in which they seek to purchase enhanced environmental outcomes. A second difficulty in transactions concerning ecosystem services concerns the ambiguous nature of the object of the transaction. Ecosystem services are not standard discrete commodities such as a carton of milk or a camera, and this fundamental difference can render established legal remedies quite problematic. The environmental transaction under discussion here is not always easily recognizable and clearly distinguishable from the natural environment for which it holds serious implications (Vatn, 2005; Vatn and Bromley, 1994).

In the standard bargaining transaction, there is explicit *exchange* of one known thing for another known thing – a commodity on one hand, and credible currency on the other. A buyer and seller come together and either agree or fail to agree on this specific exchange. We know that for such transactions to result in meaningful information – prices and quantities – there must be many potential buyers and many potential sellers.[3] We also know that information must be easily (cheaply) accessible and available to all participants, and that transaction costs must be low. These necessary conditions of *efficiency in exchange* are rarely present in the PES transaction.

3 We usually put this in terms of the conditions for market exchange to comport with the necessary efficiency conditions. But the real point is that the resulting information from a market transaction – prices and quantities – will then carry normative significance. That is, the resulting prices are 'correct' and if the prices are correct then the objects exchanged in those markets are consumed in the 'correct' quantities.

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It seems, on closer inspection, that PES schemes are *not* similar to bargaining transactions. Perhaps they resemble managerial transactions? However, this cannot be the case since managerial transactions take place *inside of* an existing authority structure – a firm or a government agency. In PES schemes, the buying entity holds no compelling legal obligations over the sellers of improved ecosystem services beyond terminating payments if performance is unacceptable.

We conclude that the PES transaction is sufficiently different from both the bargaining transaction and the managerial transaction that further conceptual clarification is called for. What sort of transaction is it?

4. PES as an inducing transaction

A proper understanding of the essential nature of the *inducing transaction* requires that we be very clear about its purpose. The animating purpose of the PES is not to make both participants better off. While that is the claimed *result* of such transactions, it is necessary to recall that such transactions arise for one reason and one reason only – to bring about a change in the environmental *behaviors* of potential sellers. The central intent of the transaction is to cause individuals to break existing production and consumption habits and to take new ones. At issue is the desire to overcome limiting factors on the side of both buyer and sellers. For the buyer, the limiting factor is a newly valorized environmental asset. For potential sellers the limiting factor is income. The task of the buyer is to identify essential constraints that keep individuals from protecting important natural values and then design the program accordingly. There can be no transaction if buyers are unable to modify the habituated behaviors of potential sellers. And there can be no transaction if potential sellers are not inclined toward changing their habituated behaviors.

Habits occupy contested terrain in economics. Veblen wrote that:

> The economic life history of the individual is a cumulative process of adaptation of means to ends that cumulatively change as the process goes on, both the agent and his environment being at any point the outcome of the past process. His methods of life today are enforced upon him by his habits of life carried over from yesterday and by the circumstances left as the mechanical residue of the life of yesterday. (Veblen, 1898: 74–75)

This emphasis on habits also emerges in the writings of both John R. Commons and Charles Sanders Peirce – the latter not an economist, but a logician (and founder of pragmatism) who situated *habit breaking* and *habit taking* at the center of his theory of human action (Commons, 1990; Deacon, 2012; Hulswit, 2002; Peirce, 1934; Reynolds, 2002). Denying the prominence of habits in human behavior requires the assumption that individuals have great quantities of time available for calculating and optimizing across a large number of margins as they go about their daily tasks. This presumption is difficult to defend (Hodgson,

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1998, 2004; Simon, 1987). Human behavior is deeply habituated – and for good reasons – on the basis of long experience with what seems to work (Quellette and Wood, 1998). Only when confronted by startling doubt and surprise do individuals stop and reassess what they are doing – and why they are doing it (Bromley, 2006). This matter of deep habituation is fundamental to any supposition that scattered individuals out in remote areas can be easily dislodged by PES schemes from a lifetime – perhaps of several generations of predecessors – of habituated behaviors with respect to their natural surroundings.

To Peirce, habits are potentials (see also Hodgson, 1997). Peirce's 'habit' is a general term referring to regularities of behavior arising in both physical and organic contexts. Habits are possibly actualized modes of behavior and action, and that actualization depends on embodied but contingent conditions and purposes, i.e. *constraints*. In other words, 'The concept of constraint is, in effect, a complementary concept to order, habit, and organization, because it determines a similarity of class by exclusion ... Constraints are what is not there but could have been, irrespective of whether this is registered by any act of observation' (Deacon, 2012: 191–192).

The fact that those of us from the outside have now decided to valorize particular segments of some compelling physical surroundings does not imply that locals will easily abandon their settled patterns of interaction with, and necessary dependence on, that particular natural environment. Much of the literature on PES schemes stresses the pro-poor dimension of many of these programs, and this serves to buttress the program's appeal among the general population. However, in more affluent settings the logic suggests substantial local participation to ensure the willingness to overcome resistance and to engage in more adaptive habits in changing social–ecological settings (Folke, 2006; Sagoff, 2011).

We might usefully think of PES schemes as a game to be played with the objects of the buyer's interest. From that specific perspective, the point of playing the game is to create new *durable* habits among a specific population – and the purpose of bringing new habits is to alter behaviors that are now environmentally destructive. Habit breaking and habit taking can be understood as operating along a continuum.[4] Habit formation implies a cycle of a cue, a routine, and a reward:

> First there is a *cue*, a trigger that tells your brain to go into automatic mode and which habit to use. Then there is the *routine*, which can be physical or mental or emotional. Finally, there is a *reward*, which helps your brain figure out if this particular loop is worth remembering for the future. (Duhigg, 2012: 19) (emphasis in original)

4 Habit breaking and habit taking operate on a continuum from chaos to order – from chance to habit. See Spinks (1991). Or, from the irritating doubt through inquiry to a precarious stage of fixed belief, habit (Peirce, 1934).

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But this view is too mechanical for Dewey who insisted that 'a habit is impossible without setting up a mechanism of action, physiologically engrained, which operates "spontaneously", "automatically", whenever the cue is given' (1988: 70). He writes:

> The essence of habit is an acquired disposition to *ways* or modes of response, not to particular acts except as, under special conditions, these express a way of behaving. Habit means special sensitiveness or accessibility to certain classes of stimuli, standing predilections and aversions, rather than bare recurrence of specific acts. It means will. (ibid.: 42)

Dewey's introduction of 'will' is central to our model of habit breaking and habit taking. A payment can be considered a cue for certain new behaviors, and increased monetary well-being is the reward gained from the trade. But of course in an efficient constellation of transactions between buyers and sellers, the end result must be that some (the 'marginal') sellers of new environmental behaviors are necessarily indifferent between their old behaviors in the *absence* of payments, and their new behaviors *with* payments.[5] If this condition is not met, buyers are paying too much for the new behaviors. The central point, if PES schemes are to earn the sobriquet of a market (or a market-like) transaction, is that for most sellers, the payment will represent exact compensation for the presumed sacrifice of abandoning old behaviors in exchange for new environmentally benign behaviors.

We insist, following Commons, that a habit is a reflection of both the 'human *will* in action' and the specific *environment* in which that will has been shaped. Notice that this tends to make habits contingent. Habits are jointly enacted into experience by customary transactions of the actors and particular environmental features. The environment comprises the contingent circumstances in which the will, particular actions, and agency are constituted. Dewey writes: 'Habits incorporate an environment within themselves. They are adjustments *of* the environment, not merely *to* it' (1988: 38) (emphasis in original). In other words, 'We are the habit' (ibid.: 24). This view is coincident with distributed and embodied theories of mind and problem solving (Clark, 1997; Hutchins, 1996). Emerging from organic transactions between an organism and its environment, habit is both a repetitive routine and an artistic potential.

Consider the PES scheme in this light. Those who come into local communities with the hope of bringing about new environmental behaviors (new habits) need policy instruments suited to specific circumstances, particular qualities, and varying degrees of habituation. Dispensable – mechanistic – habits call for different types of interventions than when buyers are confronted by deeply embedded habits. These latter require a more complex set of alterations in the customary environment. Both the agent *and* the decision environment must be

5 There will be some producers' surplus spread among infra-marginal sellers.

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changed. PES schemes acquire much of their political appeal in virtue of relying on incentives to break old habits and constitute daring new ones.

However, this process of habit breaking and habit taking is more difficult than is generally imagined among advocates of PES schemes. Those who promote PES schemes pay insufficient attention to habits as the observable mirror of beliefs – as volitional emanations – rather than as mere automatic (mechanical) unreflective reactions.

Consider the distinction between the concepts of facilitation and inducement. There are a number of habituated actions that individuals might willingly jettison if only they could overcome a hurdle or barrier of some sort. Consider the family that is dependent on an old automobile that requires frequent repairs, and that delivers abysmal gas mileage. Such cars entail high operating costs that often strap poor families. Such cars are also said to be major sources of greenhouse gas emissions. Policies offering economic incentives to get such cars off the road for energy and climate reasons – so-called 'cash for clunkers' programs – offer cash incentives to trade in such cars in order to acquire a more fuel-efficient (and more reliable) mode of transportation. The driver wins – aggregate fuel efficiency edges up for a large number of such trades, and greenhouse gas emissions fall per mile driven. In fact, it seems there are a number of winners. The key winner of course is the individual whose habituated behavior (driving the clunker) is altered through an economic incentive. Notice that the driver of the improved car has no reason to revert to her former habit (driving the bad car).

But of course many habits are not so easily abandoned – and it is here that the inducing transaction enters. The purpose of the inducing transaction is to bring about specific behavioral changes when the individual agent has no interest in altering those existing behaviors. There is nothing in it for her. The PES scheme is an example of just such an inducing transaction. And this brings us to the temporal fragility of PES programs.

It is reasonable to assume that agents embedded in newly valorized ecosystems are currently acting in accord with their best understanding of their options and prospects. They can be considered rational maximizers in the context of the constraints and opportunity sets open to them. Why else would they be doing what they are doing if they did not think it was the best (the optimal) course of action? Their actions are not random or mechanical but rather are informed by their *beliefs* about the choices they face. As Peirce would have it, 'Logic is the art of reasoning ... Reasoning is the process by which we attain a belief which we regard as the result of previous knowledge ... A *Belief* is a state of mind and the nature of a habit, of which the person is aware' (Peirce, 1998: 11–12) (emphasis in original).

Not all habits are beliefs, but all beliefs are habits. And so the rational agent whose behavior is the subject of extreme interest by potential buyers is expected to change that very behavior without undergoing the bothersome process of acquiring new beliefs. The offer of payments is presumed to be sufficient to the

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task. However, payments can only be sufficient – inter-temporally durable – if those payments are accompanied by, indeed *preceded by*, new beliefs. If money is merely a cue, then – as above – there *might* emerge new temporary behaviors that some commentators wish to call new 'habits'. But money is not, and cannot be, the reason for new beliefs – though money may be enough to bring forth new mechanical habits. That is, PES schemes may indeed change some habits, but money on offer cannot possibly change existing beliefs in the absence of good reasons for abandoning those beliefs. Payment is merely the necessary and momentarily sufficient reason to change behavior without the inconvenience of actually changing beliefs. Indeed, once the payment stops, those new temporary behaviors are generally the first casualty. When the cue is gone, the response also goes.

5. Inducing new reasonable habits

> ... pragmatism is, ... a theory of situated creativity. (Joas, 1996: 133)

The popularity of PES schemes, especially in the poor countries of the developing world, introduces three additional considerations that remain undertheorized. These are changing realms of power, a necessary emphasis on purpose in the human condition, and the fundamental creativity of human action.

Inducements and power

Once new habits are taken, we see a new inhibition of the will, as well as modification of the decision environment where doubt and surprise animated the quest for new beliefs, where new beliefs eventually became fixed, and where appropriate actions were then taken. In those settings where customs and culture change in ways necessary to support the adoption and continuity of new behaviors, the new purposes promoted by PES *may* prevail. But the conditions under which that promising result will be realized are stringent in the extreme.

Habits will only change when the inner or outer environment changes. As Hodgson and Knudson (2012) insist, habit breaking and habit formation can be facilitated by purposive or accidental cultural and environmental cues. In the limiting case – that is, in 'small' instances – 'nudges are approaches that influence decisions while preserving the freedom of choice' (Sunstein, 2013: 38). Thinking with nudges offers a way to look beyond the standard models of information, regulation, and compensation. Such thinking also allows us to focus on improved ways to re-design, perhaps only slightly, choice and action architectures that may have large potential effects on outcomes. It remains an open question, however, whether or not small nudges can be sufficient for many environmental problems. It is true that PES schemes are, in one minor sense, nudges. But there is a deeper element at work. Much of the recent interest in nudges is that they help individuals make better decisions *for themselves*. Individuals are said to become 'better maximizers'. In contrast, PES schemes are not motivated by an interest in

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how the affected individuals will feel about the new choices they make. Rather, the central purpose of PES schemes is to induce those individuals to alter their behaviors for the sake of others – potential buyers – who hold an abiding interest in new environmental behaviors.

Here it is an interest group (with money) from outside the local environment that seeks to make local individuals (sellers) into instruments of their own (the buyers') desires (MacIntyre, 1984). The way to effect this expropriation of the will of others is to make it worth their while to become agents of the buyer's intentions. The buyers of new ecosystem services are 'internalizing the other' so that they (potential sellers of new environmental behaviors) become a form of disembodied 'hired labor' working for those from the outside. The PES scheme brings them to 'do to nature' what outsiders (buyers) are unable to do for themselves (because the outsiders are not there, and because they could not manage to do it very well even if they were there). Notice that buyers are therefore able to exercise some degree of power (control) over sellers. Sellers become agents of (for) the buyers of ecosystem services.

The inducing transaction identifies and overcomes certain constraints in the working environment in order to fit the policy purpose to the exact alternative courses of action open to sellers. The essential challenge is to design an alternative behavioral setting for the seller, and then to design appropriate incentives that will make particular new choices seem ideal (be irresistible) to the seller. In one sense, the ideal inducing transaction must overcome two issues in the mind of potential sellers. First is the need to make it worth the seller's time to modify long-established – habituated – behaviors. Second is the need to mask the fact that the buyer has made the seller an instrument of the former's desires. Sellers cannot be left with the impression that others are exerting power over their lives and livelihoods. This obviously requires an arrangement that fits the new policy purpose – desired behavioral changes – with the underlying needs and commitments of sellers. This problem concerns affecting and changing the customary (cultural) environment in which sellers necessarily operate. In practice this necessitates new cultural cues for participants in the PES game.

Finally, notice that as a particular PES program gets launched, and the institutional environment and various deontic relations change, the administrative environment of the buyer will also change. This means that the organizational routines of the buyer will necessarily be transformed. The task of the buyer is to control the limiting factors, and to put up appropriate constraints and incentives. The task of the seller is to exercise liberties in his/her negotiation within the new opportunity space. Both participants *can* and *may* alter their newly instituted behaviors as they interact and adjust their long- and short-term interests.

In PES games, the breaking of old habits, and the taking of new repertoires of action, is an activity confined to potential sellers. The buyer only designs and launches the instrument, a new potential constraint, in the environment. The rest is left to the seller. Indeed, a hopeful agent-based design of societal

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arrangements can often work better than *a priori* prohibitions, commands, and obligations (Ferraro and Kiss, 2002; Ormerod, 1998). Also, the elimination of perverse incentives seems to work better when the sellers themselves work out what seems better to do. They gradually manage to arrive at Peircean settled belief (Bromley, 2006).

Inducements and purpose

A concern for purpose brings us back to the essence of the PES game – durable changes in habituated behaviors. It is here that incentive sustainability becomes a serious challenge. The problem remains the same – financial inducements are unlikely to be sufficient, either in magnitude or in duration, to instill durable long-run behavioral changes. Habit breaking can be easier than habit taking. This difficulty arises because the settings and circumstances of individual – indeed of a group of – resource users are always in the process of becoming. This means that it is not possible to design optimal incentive-compatible remuneration schedules running into the future because neither party (buyers or sellers) knows precisely what the future will bring. This problem was identified by G. L. S. Shackle who wrote:

> Outcomes of *available* actions are not ascertained but created. We are not speaking ... of the objective recorded outcomes of actions which have been performed. Those actions are not 'available'. An action which can still be chosen or rejected *has no objective outcome*. The only kind of outcome which it can have exists in the imagination of the decision-maker. (Shackle, 1961: 143)

The important aspect of PES schemes is, in fact, the creation of what Kronman calls a *relational contract* which provides the institutional scaffolding for continual re-contracting over price and associated behaviors. Unfortunately, transactions costs – the costs of gaining necessary information, of writing new contracts, and of monitoring and enforcement – may quickly dissipate possible gains from trade (Kronman, 1985). We see this in the recent quite dramatic fluctuations in the price of grains driven by the emerging bio-fuels market. Land previously set aside in conservation reserves, in wildlife areas, and land devoted to forage crops began quickly to be converted back to grain production (which is highly erosive). In this extreme case, the issue seems to be less about renegotiation than breach.

This reminds us that the primary challenge in PES schemes is the normative emphasis on new purpose-making. Current habits must be broken and new habits taken up. In other words, it is expected (and hoped) that sellers will start to see their old needs differently. This is how PES programs mimic economic liberty: fine-grained institutional mechanisms and constraints are established and put into force. This implies that the buyer must not only specify the rules of the new game, but must also become a player in a game as new local mechanisms

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of power are established and implemented. Inducing policies entail the early definition of what is attainable and possible to achieve. What are individuals willing and capable of doing and being?

The prospects of program renewal may suggest that irreversible actions – harvesting old growth timber, destroying a fragile aquatic ecosystem – may be sufficient to hold agent's attention and lock in new habits. Notice as well that *adverse self-selection* may dampen strong motives to revert to earlier behavior. Adverse self-selection arises because PES programs are voluntary and therefore participants can be expected to enroll their least-profitable activities (cultivating marginal land, idiosyncratic timber harvesting) in the program (Ferraro, 2008). This means that behaviors on such lands would have been quite unlikely to change even in the *absence* of a PES scheme. For example, in Costa Rica's PES program, 71% of forest-protection contracts were applied to lands with limited or no agricultural potential (Hartshorn *et al*., 2005). Local farmers were paid to avoid environmentally harmful land uses when, in fact, they had no intention of converting those lands to agriculture. A similar selective rationale can be found in more affluent places, such as Finland (Juutinen *et al*., 2008). Since the opportunity cost of enrolling such lands in the program is low, it is unlikely that much behavior change actually occurred.

In reality, there are individuals who already have a pro-environment attitude and they have decided to leave certain – perhaps unproductive – pieces of land unutilized because they already exhibit certain aesthetic or natural values. With the introduction of a PES scheme this 'admirable' habit may, to the obvious surprise of buyers of improved ecosystem services, change. One much-cited example of such surprise is a *crowding-out effect*.[6] There is also an opposite moral change in a customary environment. The *crowding-in* effect means that the agents first participate in creating a new norm, and then conform and entrain that norm.[7] This happened in SW Finland when the PES program known as Natural Values' Trading was introduced in 2003–2007. The key to the crowding-in effect was that the program enabled new mental habits concerning forest biodiversity *protection as an economic activity*. Hence the PES program strengthened the moral commitment to safeguard biodiversity. The purpose became a part of the renewed culture of forestry. Land-owners, as sellers of natural values, considered it important that they had real-life contacts with the buyer as they discussed and agreed upon the terms of the trade. A few years earlier, the same region (SW

6 This is related to an institutional change in blood donation systems. The introduction of financial payments actually *reduced* the total amount of blood received. A moral action became commoditized. Payments corrupted the moral order of blood 'donations' (Dedeurwaerdere, 2005). But notice, however, that if the actual payment is not cash but, for instance, a health service (worth money) the crowding-out effect does not exists to the same extent (Lacetera *et al*., 2013). The purpose of blood donation is to support life and health. If the purpose of the donation scheme is the same, then it is considered more acceptable. It operates as a nudge.

7 See Vatn (2005) for a discussion of environmental crowding-in.

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Finland) had experienced strong grassroots resistance to a biodiversity protection scheme known as the Natura 2000 Reserve Network (Hiedanpää, 2002). After an active networking and advocacy process, this PES program was launched and has become exceptional in its local innovation. It has now extended its key principles up to the national biodiversity policy of Finland (Hiedanpää and Bromley, 2012).

The creativity of action

Throughout, we have alluded to the fact that habituated behavior cannot be comprehensively disentangled from the environment that brought those behaviors to the point where they appeared normal, natural, right. Just as Dewey maintained that we are the habits we display, it seems plausible to suggest that the natural environment within which individuals (potential sellers of new ecosystem services) are embedded necessarily becomes an expression of those who are so embedded. The local environment *becomes* the individual who creates and manages it. And that individual in turn is nothing but a reflection of the local environment that has been created through her actions. With this in mind, it is now clear that PES schemes cannot simply change individuals in their interaction with nature. Rather, such schemes require that the new desired environment be understood as a force that reconstitutes those individuals who depend upon it. The hoped-for environment necessarily re-fashions – reconstitutes – the individual.

Recall that the very animating idea that brings environmental organizations to focus their efforts on localized environmental hotspots arises because of emerging evidence that those local environments are *already* undergoing some degree of stress and transformation. If secure preservation of those ecological settings and circumstances were not in doubt then it is most unlikely that outside agents would feel the need to act (and to spend money) in order to alter individual behaviors at the local level. Indeed, PES schemes arise precisely because of an emerging conflict between two imagined outcomes in the future. One outcome is the imagined (predicted) denouement of the current human–environment game, while the other imagined (predicted) outcome reflects the more desirable future thought possible by the behavioral changes that launch and justify PES schemes. Pragmatism understands this situation – and the unwanted environmental trajectory if nothing is done – as an instance of the 'world rebounding back on us' (Joas, 1996: 128).

The essential point here is that individuals out on the ground – potential sellers – must also have noticed what external environmental organizations have come to fear. Erosion is harming crop yields and filling streams with sediment, certain plant and animal species are increasingly rare, etc. Joas writes:

> The typical pragmatist schema anchors doubt in action, which is conceived in terms of a model of periodically recurring phases ... all perceptions of the world and all action in the world is anchored in an unreflected belief in

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> self-evident given facts and successful habits. However, this belief, and the routines of action based upon it, are repeatedly shattered; what had previously been a habitual, apparently automatic procedure of action is interrupted. The world reveals itself to have shattered our unreflected expectations; our habitual actions meet with resistance from the world and rebound back on us. (Joas, 1996: 128)

When that unreflected action, that habituated behavior, is increasingly resisted by a reacting and uncooperative world, the emerging process is one of *creative reconstruction* of both the agent and the resistant environment. If a new 'equilibrium' can be reached then the agent and the local environment move forward together in a newly reconstituted interaction. If the evolving local environment continues to yield certain desired benefits in the eyes of local users – bounteous harvests, adequate fish and wildlife, sufficient forest products – the new equilibrium settles down. On the contrary, if the natural environment reveals itself to becoming increasingly uncooperative then the human agent in this game will begin to reconsider.

We have seen this process at work in the early days of European settlement in the United States. The arrivistes brought with them an understanding of how to interact with nature, and yet when that understanding – that habituation – led to ill-suited human action, nature struck back with a vengeance. Crop failure, drought, pests, early frosts, and rainy summers brought hardship and many settlers gradually decamped to new places. Perhaps digging for gold in California, or silver in Nevada, is better than trying to raise wheat in North Dakota? A variant of this has been proposed by the anthropologist Calvin Martin in his 'The War Between Indians and Animals' (Martin, 1978). Martin's thesis is that the human–environment game of the sub-Arctic Micmac Indians went wrong when Indians retaliated against their fur-bearing benefactors who were interpreted as allies in the human–nature game. As we know, Europeans had introduced new diseases that began to take a toll on Indian survival prospects. As Indian mortality increased the shamans lost their ability to explain the world and the idea gradually took hold that this increased human mortality arose because animals were retaliating against the Indians for their excessive harvests. The point here is that human action is always caught in this tension between unreflected human choices and much-needed acts of creativity (Joas, 1996: 129).

This brings us to Peircean secondness – the 'brute actions' of local agents as they encounter and modify the local environment. But of course they are not immune to the reactions of that local environment back on them, and in the course of mediating between action–reaction we then see Peircean thirdness – habit taking. In an important sense, local individuals and groups are interacting and creating meanings with the natural world in which we imagine them to be the only force. PES schemes become a new component of this on-going semiotic process. It takes social–ecological creativity and practical experiments to modify, cue (or nudge) ecological and cultural environments such that the expected

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benefits of PES schemes might become permanent. Only in this way will new habits of local individuals, routines of the organizations, and customs of the local communities be sustained.

6. Closing observations

PES schemes seek to get close to individual decision makers and the world they inhabit, modify, and ultimately recapitulate. *Inducing transactions*, lying at the core of these PES programs, are here introduced as a fourth class of transactions that enrich the tri-partite scheme of John R. Commons. Inducing transactions work at the volitional core of what it means to be a rational agent. In seeking to change the behavior of individuals, inducing transaction end up changing the very environment that gave rise to the human behaviors now thought to be in need of modification. The agents of interest are nothing but the acquired habits of their local environment, and that local environment is nothing but an efflorescence of a mélange of individual habits. The policy problem is that old habits are hard to break. More seriously, new habits are harder to take.

Programs for paying individuals to provide ecosystem services bring together two distinct epistemic communities. Those in the position of buyer seek to convince local resource users to stop imposing harm on parts of the natural system in which they (the users) are embedded. These local individuals are primarily concerned with survival under difficult circumstances. They now, quite by accident, find themselves embedded in an ecosystem that holds enormous symbolic – perhaps ceremonial is the correct Veblenian term – value for those (buyers) from far-away places. Buyers have a tendency to find nature more compelling than local people, while local resource users (potential sellers) find that securing a livelihood is more compelling than protecting specific attributes of nature that has been recently valorized by others. We see that both parties to such transactions bring different ontological and epistemic presumptions to any possible transaction. For buyers, the guiding purpose is to protect nature. For sellers, nature is not for protecting but for providing resource – and livelihood – flows. It is not often that PES schemes linking ecosystem services and rural livelihoods can bring these two epistemic communities closer together. It can happen, but there are many difficulties to be overcome (Arriagada *et al*., 2012).

Before that can happen however, one final caveat is in order. Often, the degradation of nature is not plausibly traceable to flawed incentives faced by individuals embedded in particular ecosystems. Rather, the explanation lies elsewhere. An obvious example comes from the long-running concern with degradation associated with common property regimes. Starting with Garrett Hardin's mis-named allegory of the commons, the standard narrative blamed resource degradation on the allegedly 'flawed' property regimes out in the villages and hillsides of the developing world. This simple account is flawed (Bromley, 1991; Larson and Bromley, 1990). The standard solution was that the commons

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must be privatized so that market forces would save it from destruction. It was claimed that only private property rights would solve deforestation, rectify degraded rangelands, protect wildlife, restore desultory wetlands, protect endangered species, create incentives for investment in agricultural productivity, and rectify much else that afflicts the developing world. In the extreme, writers such as Hernando De Soto insisted that one defeats poverty by formalizing land titles (2000). The empirical support for such claims is non-existent (Bromley, 2009; Chang, 2011; see also Kerekes and Williamson, 2008).

In fact, there are plausible reasons to believe that resource degradation is often caused by flawed economic circumstances well beyond the village of much interest in such schemes. After all, if the economic climate in a country is so seriously defective in terms of creating plausible livelihood strategies, then more profound work at that level may create opportunities that would preclude currently destructive environmental practices among the poor and dispossessed. This puts an extra burden on inducing transactions as they seek to bring about beneficial habit breaking and habit taking. The achieved changes might just be irrelevant to the larger problem. Indeed, there are plausible trajectories of resource degradation even under the very best conditions of individual behavior on the part of those embedded in poor habitats. With a few reasonable assumptions about flawed markets for agricultural inputs and agricultural produce, it is possible to set in motion a constellation of behaviors out on the ground that will generate resource degradation despite the very best intentions of local resource users. Degradation is the result of economic processes that have nothing to do with the motives of the poor embedded in a particular ecosystem. Rather, environmental degradation is the result of market failures situated between the rural village and the urban market. This means that efforts focused on the behavior of individuals situated in ecosystems of compelling interest to environmental organization may have no discernible effect on behaviors with respect to nature (Bromley, 2008). If individual motives and desires are not implicated in destructive behaviors then rewards for different (better?) motives and desires are seriously misplaced.

To put the matter another way, constructive or destructive environmental behaviors very often arise because of a flawed economic environment within which rural households are situated. Individuals are often powerless to modify their behavior even with the promise of particular rewards for doing so. The system is stacked against them. In such circumstances, deforestation has little to do with flawed property rights, with relative prices, with the construction of roads, or indeed with all of the usual suspects. Deforestation happens because national governments have their reasons for making sure that it happens (Bromley, 2006; Hiedanpää *et al*., 2011). After all, governments can earn much-needed foreign exchange, and they can relieve landlessness by moving poor farmers to recently cleared forested areas. We see that the standard prescriptions for stopping deforestation arise from flawed diagnoses. If the wrong diagnosis

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is made, the medicine cannot possibly do good work. Diabolically speaking, the devil is always in the details.

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