



Motivation crowding by economic incentives in conservation policy: A review of the empirical evidence



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ARTICLE INFO

Available online 3 December 2014

Keywords:

Conservation
Payments for ecosystem services
Policy instruments
Economic incentives
Motivation crowding

ABSTRACT

The paper seeks to advance our understanding of the extent to which the use of economic incentives can undermine (“crowd out”) or reinforce (“crowd in”) people’s intrinsic motivations to engage in biodiversity and ecosystem conservation. We first synthesize and classify the psychological mechanisms behind motivation crowding effects. Then we conduct a systematic review of empirical studies that test for motivation crowding effects triggered by economic incentives to encourage nature conservation. Based on eighteen empirical studies, we identify evidence of motivation crowding out and, to a lesser extent, crowding in effects. Finally, we discuss the implications for environmental policy and research. We note that the limited comparability of results across studies, the lack of baseline information about pre-existing intrinsic motivations, and a complexity stemming from cultural and contextual heterogeneity appear to be the main challenges when it comes to establishing more conclusive evidence. We conclude that, as economic instruments for conservation are increasingly being used worldwide, it is crucial to assess existing intrinsic motivations and expected changes in people’s motivational structures prior to large-scale implementation. We call for caution with economic incentives in situations involving considerable uncertainty regarding the detrimental impacts on intrinsic motivation.

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1. Introduction

Economic incentives have increasingly gained prominence in environmental policy as a means to promote biodiversity and ecosystem services conservation¹ (Vatn, 2010; Pirard, 2012; WBCSD, 2011). While these developments are often regarded as an impetus for biodiversity conservation and an opportunity for “mainstreaming biodiversity” (TEEB, 2010), critics have started to voice doubts about their potential to halt biodiversity loss (McCauley, 2006; Redford and Adams, 2009; Child, 2009). One concern frequently raised is that economic incentives may “crowd out” intrinsic motivations, such as people’s moral commitment towards nature conservation (e.g. Luck et al., 2012). Thus the effectiveness of economic incentives in achieving biodiversity conservation remains contested, and some authors suggest that the changes they can induce in motivations may, under certain conditions, undermine long term conservation efforts (Kosoy and Corbera, 2010; Vatn, 2010; Gómez-Baggethun and Ruiz-Pérez, 2011; Muradian et al., 2013).

The crowding out hypothesis is often traced back to Titmuss’ (1971) argument that blood donors are motivated by moral concerns rather than money, and that monetary compensation for donating blood could lead to a decrease in supply (see also Mellström and Johannesson, 2008). Motivation crowding theory is based on the psychological notion of intrinsic vs. extrinsic motivation (Deci, 1971, 1975; Deci et al., 1999). Intrinsic motivation refers to doing an activity for the inherent satisfaction it brings, meaning that an individual is moved to act for the fun or challenge involved or else due to personal conviction. Extrinsic motivation, on the other hand, is given whenever an activity is done for its instrumental value, that is, in order to attain a separable outcome, be it of a material or monetary nature or related to perceived benefits of a non-material kind (Ryan and Deci, 2000). Contrary to a common assumption implicit in economic theory, motivation crowding suggests that the effects of extrinsic motivators such as monetary incentives do not necessarily complement intrinsic motivations (Bowles, 2008). Instead, they may undermine intrinsic motivations (“crowding out”) and in other circumstances reinforce them (“crowding in”).

It was Frey (1992, 1993, 1997) who first introduced the crowding out hypothesis to the economic literature, arguing that the effects described might also outweigh the stimulating effect of monetary incentives and so reduce a person’s propensity to engage in the desired activity. Since then, work in behavioural and experimental economics has discussed the crowding out effect in relation to a variety of contexts,

DOI of original article: <http://dx.doi.org/10.1016/j.ecolecon.2014.09.029>.

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¹ We treat “biodiversity” and “nature” as equivalent, and for the sake of brevity we often write “biodiversity conservation” instead of “biodiversity and ecosystem conservation”.

including people's motivations in the workplace (Frey, 1997; Gneezy and Rustichini, 2000b; Heyman and Ariely, 2004), communities' willingness to host a nuclear energy facility (Frey and Oberholzer-Gee, 1997), parents' efforts to arrive on time to pick up their children from day care (Gneezy and Rustichini, 2000a), and voluntary efforts to raise funds for humanitarian causes (Gneezy and Rustichini, 2000b). Bowles and Polonía-Reyes (2012) review some 50 experimental studies that demonstrate motivation crowding effects across many domains.

The relevance of the crowding out hypothesis in relation to environmental policy has frequently been mentioned (e.g. Frey, 1992, 1993; Frey and Oberholzer-Gee, 1997; Bowles, 2008), typically with respect to behaviours such as resource use (recycling, saving water), modes of mobility (driving slowly, using public transport or a bicycle as opposed to a car), and consumption decisions, including boycotts of environmentally harmful products (Gawel, 2000; Frey and Stutzer, 2008). For corporate behaviour, the hypothesis has been related to polluting the environment (Frey, 1992; Gawel, 2000). Although economic instruments for biodiversity conservation are increasingly being implemented worldwide, an understanding of their effects on motivational structures remains elusive. In 2010 Vatn described the motivational aspect of economic instruments such as payments for ecosystem services (PES) as “a very under-researched area” (Vatn, 2010, p. 1250). Over recent years, a growing number of studies have addressed motivation crowding arising from economic incentives implemented in a variety of contexts to encourage biodiversity conservation, including rewards for using traditional crop varieties in Bolivia and Peru (Narloch et al., 2012), a payment scheme for tree planting in Uganda (Fisher, 2012), and incentives for forest management and conservation in Mexico (García-Amado et al., 2013). Ultimately, understanding motivation crowding effects is of crucial relevance when it comes to appraising the overall efficacy of economic instruments – not least because motivational changes have been shown to be persistent (Gneezy and Rustichini, 2000a).

The aim of this paper is to advance our understanding of the extent to which economic instruments used in biodiversity conservation policy can lead to motivation crowding effects and under what conditions this occurs. To begin, we synthesize key findings in the economic literature regarding the psychological mechanisms through which economic incentives can lead to motivation crowding effects. We then review existing empirical research on motivation crowding arising from economic instruments used to encourage biodiversity and ecosystem conservation, before finally presenting and discussing the empirical evidence and the associated implications for environmental policy and research.

2. Methodology

Our review was conducted in two stages. The first stage consisted of a survey of the economic literature on motivation crowding in order to summarize the psychological mechanisms behind motivation crowding effects that have been identified as relevant for environmental behaviour. We classify the mechanisms according to whether they are expected to trigger crowding out or crowding in effects. The second stage consisted of a systematic review of peer reviewed articles with the aim of searching for evidence of motivation crowding effects. Specifically, we reviewed papers published up until 2013 that i) present an empirical study, ii) address economic instruments for biodiversity or ecosystem conservation, and iii) test for motivation crowding effects. We conducted a *title search* for articles in the ISI web of knowledge using the following combinations of keywords: ‘economic incentives and biodiversity’, ‘economic incentives and conservation’, ‘motivation, crowding, and biodiversity’, ‘motivation, crowding, and conservation’, ‘motivation, crowding, and environment’, and ‘motivation and crowding’, as well as a *topic search* for articles with the keywords ‘motivation, crowding, and biodiversity’, ‘motivation,

crowding, and conservation’ and ‘motivation, crowding, and environment’. We then conducted an equivalent online search through Google scholar, using the keyword combinations as above. Finally, we searched the reference lists of the previously identified studies for further relevant empirical work.

In the second stage of the review we began by characterizing the studies according to the environmental behaviours affected by economic incentives, the study populations, and the geographical locations where the studies were conducted. We then classified the types of intrinsic motivation mentioned in the articles. Following this, we analysed the studies according to the following criteria: i) type of economic incentive, ii) methods and data, iii) reported findings on motivation crowding effects, and iv) psychological mechanism behind motivation crowding effect.

Regarding the types of incentives, we follow Pannell's (2008) categorization of economic policy instruments, distinguishing between positive incentives that seek to encourage sustainable natural resource management and conservation activities (e.g. rewards, subsidies, payments for ecosystem services) and negative incentives that seek to limit harm to biodiversity or to prevent the over-use of natural resources (e.g. fines, taxes). Research indicates that positive and negative incentives may have distinct consequences in terms of motivation crowding if, for instance, positive incentives are perceived as supportive while negative ones are perceived as controlling (Frey and Stutzer, 2008; Volland, 2008).

Following the taxonomy created by Harrison and List (2004), the empirical methods used to test for motivation crowding effects are divided into framed field experiments, natural field experiments, and natural experiments. In framed field experiments, local people are invited to participate in interactive tasks, here typically representing a “social dilemma” situation where the environmental status of a common pool resource (CPR) or a public good (PG) is affected by individual decisions on resource extraction. In natural field experiments, a “real world” setting (such as the opportunity to participate in a community activity or a farmer's choice between different agricultural practices) is manipulated by introducing an economic incentive, and the people involved do not know that they are part of an experiment. Natural experiments investigate the effects of actual policy interventions involving economic incentives. Empirical data used to assess the effectiveness of incentives and motivation crowding effects are classified as behavioural data, where behaviours are observed in order to derive inferences regarding the status of and changes in motivations, and survey data, where inferences regarding motivations are derived from reported attitudes or statements on intentions to act.

Finally, evidence on motivation crowding is divided into either crowding out or crowding in effects. When available, we record the evidence for motivation crowding reported by the authors. Where authors do not explicitly refer to crowding effects, we checked whether the analyses included implicit indications for motivation crowding effects. We also report whether the results are statistically significant or only suggestive of an effect (e.g. from qualitative interview data). Finally, we report whether the studies relate their results to psychological mechanisms behind motivation crowding effect, based on the categories established in the first stage of our review, and how they do so.

3. Results

3.1. Psychological Mechanisms Underlying Motivation Crowding Effects

Table 1 categorizes and describes the different psychological mechanisms behind crowding out and crowding in effects that are mentioned in the literature as being relevant to environmental behaviour. Several papers propose typologies with sub-sets of the mechanisms and different terminologies (Gawel, 2001; Frey and

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