

Crime as Pollution? Theoretical, Definitional and Policy Concerns with Conceptualizing Crime as Pollution

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Abstract Recently, criminologists have advocated understanding “crime as pollution” to argue for market based crime control policy initiatives that mirror pollution control policy initiatives. That argument assumes that pollution control policies are effective social control mechanisms. This article explores definitional, conceptual, methodological, theoretical, and policy concerns which arise from the “crime as pollution” concept. While the “crime as pollution” position has sparked interesting policy discussions in criminology, we suggest that viewing crime as pollution is inconsistent with the scientific definitions and measurement of pollution. Moreover, environmental market based social control responses have generated significant environmental justice concerns the crime as pollution model overlooks and hence is likely to replicate. Rather

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than crime as pollution, criminologists would be better served by further exploration of established criminological literature, including green criminology, which depicts pollution as crime and produces policies for the amelioration of pollution related victimization.

Keywords Crime · Pollution · “Crime as pollution” · Pollution as crime · Crime policy · Green criminology

Building on prior research (Farrell & Roman, 2006), discussions published in *Criminology & Public Policy* (Eck & Eck, 2012; Nagin, 2012) suggest employing the concept “crime as pollution” (CAP) as the basis for promoting market-based social control responses to street crime that replicate environmental regulations. This article examines previously unexplored concerns with the “crime as pollution” concept, and urges a much more cautious attitude toward this concept (for existing criticism see, Mazerolle and Ransley, 2012). We examine four major concerns with the CAP concept: that it (1) is inconsistent with the scientific definition of pollution and ignores that literature; (2) reverses the link made between pollution and crime in medical, epidemiological and criminological literatures; (3) is inconsistent with green criminological analysis or the pollution as crime view, and (4) ignores the social control biases associated with environmental social control. Of particular concern is that the CAP concept seeks to promote market-based controls that exhibit race, class and ethnic biases when applied as environmental policies, and hence, may reproduce those biases in CAP responses to street crime. This is a serious policy concern that requires additional consideration.

We begin this article with a short introduction to the CAP concept as described in prior works. Next, we identify and briefly describe the above listed major concerns with the CAP concept, in turn. We proceed by discussing the geographic assumptions made by the CAP concept, followed by definitional issues raised with the CAP concept. Then, we describe environmental justice and neurotoxicity/behavioral concerns that we believe are overlooked in the CAP concept, followed by a section discussing non-stationary point source pollution and end-of-pipe social control. Next we call into question additional assumptions implied by the CAP concept, including the utility of environmental market-based social control, crime as pollution versus pollution as crime, and market models of pollution as crime control. Finally, we provide a few concluding remarks summarizing the theoretical and policy concerns raised throughout the manuscript.

The Crime as Pollution Concept

The CAP concept is an extension of place-based policing (Nagin, 2012). The CAP concept argues that place based policing can be facilitated by replicating market-based environmental social control policies to eliminate crime hotspots (Eck and Eck, 2012). In this view, responsibility for social control would be shifted from policing agencies to those who produce criminal opportunities that may generate crime (Farrell and Roman, 2006), on the suggestion that this approach would be similar to the way in which

pollution is controlled. In the CAP literature, it is suggested that crime is a form of pollution and can be controlled in the same way as pollution.

In general terms, the CAP approach may be of interest to criminologists as it exhibits a disciplinary concern with street crime and its control. In the present work, we look beyond this traditional criminological concern, and draw attention to the theoretical and empirical deficiencies in CAP proposals that limit its policy applications. This includes paying attention to the scientific definition of pollution, and whether it is in the first place appropriate to conceptualize crime as pollution.

A second concern is that CAP arguments accept that market-based environmental controls work, and fails to adequately review the literature on the effectiveness of environmental social control. We suggest that market-based environmental social control *does not* work as advertised, and leaves much to be desired.

Third, CAP arguments ignore empirical studies that indicate market-based models produce significant levels of environmental injustice. In other words, not only are market-based environmental controls ineffective and inefficient, they also generate other serious social problems such as the unequal distribution of justice and racial and class biases related to the distribution and control of pollution.

Finally, the CAP argument also ignores the now well-established idea that pollution is crime, and the literature on this subject both within and outside of criminology. On this point, the CAP argument reverses the more common association between pollution and crime, and fails to address how such a concept fits within the extant literature on pollution and pollution as crime. Details of this discussion appear below.

Before proceeding, however, it is important to establish that CAP arguments ignore the treatment of pollution issues in literatures both inside and outside of criminology. As a discipline, criminology has long ignored the study of green/environmental crimes. While other disciplines have paid significant attention to environmental issues since the 1950s, it was only in the last two decades that the concept of green crime was described (Beirne & South, 2007; Frank & Lynch, 1992; Long et al., 2012; Lynch, 1990; Lynch & Stretesky, 2007; Stretesky, Long, & Lynch 2013; White & Heckenberg, 2014) and expanded (Agnew, 2012; Lynch & Stretesky, 2003, 2014; Zilney, McGurrin, & Zahran, 2006) in the criminological literature. Nowhere in developing the concept of CAP is there reference to this literature, or how these two literatures may be oppositional in nature. One would imagine that in proposing a new concept such as CAP, that some effort to address prior criminological literature on pollution issues would be consulted.

Crime, Hotspots, Pollution and Geography Assumptions

In exploring the CAP idea, Eck and Eck (2012) suggest that on the surface, crime hotspots appear similar to pollution hotspots empirically – that is, within *urban areas* crime hotspots and pollution hotspots overlap. That geographic similarity is employed to suggest that hotspot location parameters related to both street crime and pollution can be employed to generate market-based street crime social control responses that replicate the social control of pollution. In addition to overlooking whether environmental market social control works, and their potential to generate race, ethnic and class biases, the CAP argument fails to adequately assess its claim that crime is like pollution geographically. The literature on this issue suggests otherwise.

While pollution and crime share some geographic similarities *in urban locations*, there is little connection between pollution and crime on a broader geographic scale. Unlike crime, significant forms and volumes of ecological destruction/pollution occur in rural areas (Brisman, McClanahan, & South, 2014; Opsal & Shelley, 2014). These forms of ecological destruction and pollution includes activities related to: deforestation, mining, and other raw material extraction processes (Meng et al., 2009; Nraigu, 1990; Reece, 2007), non-point source agricultural pollution including pesticides and fertilizer runoff (Corsolini, Covaci, Ademollo, Focardi, and Schepens 2006; Jacques, Gibbs, Rivers, & Dobson, 2012; Kim, Ichihashi, Saeki, Atrashkevich, Tanabe, and Tatsukawa 1996; Mallin & Cahoon, 2003), farm animal waste (Edwards & Ladd, 2000; Nicole, 2013), and a host of other environmental pollution problem related to waterways, oceans, wetlands and tidal areas, rainforests, tropical and semi-tropical forests, grasslands, and other relevant ecological units of analysis (Lynch and Stretesky, 2014). While rural areas can have high concentrations of environmental pollution and destruction, they lack high concentrations of street crime meaning that street crime and pollution do not always co-exist. Thus, the initial assumption that crime and pollution are similar in their distribution is questionable outside of urban areas.

The CAP concept also suggests that the main form of urban pollution stems from “stationary sources” or what environmental researchers call “point source pollution” (PSP). To be sure, PSP, as Eck and Eck (2012) recognize, produce significant pollution. Yet, PSP is not confined to urban locations, and may not be the single most serious form of pollution in urban areas. Significant examples of rural PSP occur from mining and fossil fuel extraction sites. These sites are, in their present form, stationary, but are mobile in the long run and shift as old resources are depleted and new resources are located for exploitation. That is to say, rural PSP have limited life spans (are temporary in nature), and have a degree of mobility that urban PSP does not have. This conceptualization of temporary PSP can also be extended to other mobile environmentally destructive practices such as logging and mining, which produce several forms of air, land and water pollution while inhibiting the ecosystem’s ability to absorb pollution. Another contemporary example of this form of ecologically destructive mobility is seen in the extraction of natural gas through hydrofracturing.

In contrast to the CAP argument, nonpoint source pollution (NPSP) is a significant form of pollution within urban areas. As early as 1985, it was well recognized that urban NPSP was responsible for significant volumes of urban pollution – and for many pollutants, NPSP accounted for more than one-half of urban pollution (Brisman, 2002a; Harrington, Krupnick and Peskin, 1985). This includes NPSP water pollution from sewer systems (Lee and Bang, 2000) and roadways (Deletic and Orr, 2005). These pollutants include several harmful pollutants generated by motor vehicles (e.g., Thurston, Ito and Lall, 2011), and have been found to be unevenly distributed across urban neighborhoods (Chakraborty, 2009). These important NPSP are controlled through potentially different solutions than PSP (Shortle and Horan, 2001), and indicate that the focus of CAP policies on market-based solutions overlooks significant portions of the pollution distribution and abatement literatures.

Defining Pollution

A significant concern with the CAP argument is that it endeavors to equate crime with pollution without examining the way in which pollution is defined, especially in the scientific literature. The CAP definition of crime as pollution is inconsistent with the definition of pollution found in scientific literature. Since criminologists often define their field as interdisciplinary, work from other disciplines should be relevant to assessing the CAP concept.

With respect to toxicological sciences, for example, the term “pollution” has a very specific, objective scientific meaning that can be detached from law (Harrison, 2006; Spellman, 1999), unlike the concept of crime. That independent, objective measurement of pollution assesses the composition of emissions against environmental background data or health and behavioral effect data to determine whether an emission is indeed a pollutant (Lynch and Stretesky, 2011). In contrast, criminology does not propose an independent, objective measure of crime that exists outside of crime’s social construction in law (Waters, 2010; Lynch & Michalowski, 2006; Quinney, 1970; for relevant discussions see also, Markowitz and Rosner, 2000, 2003, 2012; Rosner and Markowitz, 1985). As a result, crime and pollution are defined by different standards and cannot be so easily equated.

In scientific terms, pollution is defined as the presence of chemicals in the environment at a concentration above their normal background level (Harrison, 2006: 39; Porteous, 2008:43), or in reference to harms suffered by living organisms caused by exposure to pollutants (Kumar, 2008; for criminological discussion see, Lynch and Stretesky, 2011, 2014).¹ While pollution is defined relative to scientific criteria in the scientific literature, environmental law and policy definitions of pollution varies widely across legal statutes (Spellman, 1999:3). For example, the Clean Water Act [33 U.S. Code §1251] (2002) defines pollution as:

“dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water.”

A more general definition found in the Clean Air Act (1990) [42 U.S. Code § 7401], which defines air pollutant as:

“any physical, chemical, biological, radioactive . . . substance or matter which is emitted into or otherwise enters the ambient air. Such term includes any precursors to the formation of any air pollutant, to the extent the Administrator has identified such precursor or precursors for the particular purpose for which the term ‘air pollutant’ is used.”

¹ The scientific literature on pollution also distinguishes pollution in general from toxic pollution. Toxic pollution is defined as a concentration of pollution significant enough to produced negative health, behavioral, or negative ecosystem disruption (Spellman, 1999). Thus, it is possible for pollution to exist in a form that causes no immediate threat of harm, a situation that occurs when an emission is above its natural background level but below the concentration at which that substance produces harm, or when the pollutant does not cause harm because there is no exposure (Lynch and Stretesky, 2011). Crime cannot be described in this way. By its very definition, crime is always harmful and is defined by the very fact that it produces harm.

The point here is that legally, pollution is defined as crime, and that the CAP concept fails to address the ways in which that concept fits with established scientific or socially constructed definitions of pollution. For crime to be pollution, issues such as the background level of crime must be precisely defined to ascertain when the level of crime exceeds its “natural” state – a concern that occupied, for example, Durkheim (1895). Theoretically, from a more rigorous market-policy position, CAP would only draw attention when it exceeded its background level. Specifically, this means that an established standard that identifies the background rate of crime must be set to determine when CAP policies ought to be engaged. Given, for example, the long term decline in crime in the US, the period where crime exceeded its background level may have passed, perhaps indicating that CAP policies are no longer relevant to the control of crime. Since, at this point, these questions have not been explored empirically in the CAP argument – which is an important aspect of establishing that crime exceeds actionable background levels with respect to instituting market-based social control – the CAP proposal does not meet efforts to establish that crime meets any pollutant-related scientific criteria.

Environmental Justice and Behavior Issues

A major concern with the CAP concept relates to examining the intersection of class, race, and ethnicity with the social control of pollution, an issue widely examined in the environmental justice literature. In that literature, a core concern is that environmental social control actions – law, policy, enforcement actions and even the distribution of pollution itself – are affected by neighborhood race, ethnic and class characteristics (Brisman, 2002b; Brulle & Pellow, 2006; Bullard, 2000; Hipp & Lakon, 2010; Pastor, Sadd, & Hipp, 2001). That literature suggests that environmental social control responses have been unequal, and disadvantage neighborhoods with higher concentrations of minorities or the poor. Given the existence of these biases in the application of market-based environmental social control responses, criminologists must specify how such injustices would be prevented by CAP policy responses.

Over the past three decades, medical research has explored the connection between pollution and crime, viewing pollution exposure as generating biological effects that may produce crime (Carpenter & Nevin, 2010; Denno, 1990; Dietrich, Ris, Succop, Berger, and Bornschein 2001; Fergusson, Boden, & Horwood, 2008; Masters, Hone, & Doshi, 1998; Mohai, Kweon, Lee, and Ard 2011; Needleman, McFarland, Ness, Fienberg, and Tobin 2002; Pastor, Sadd, & Morello-Frosch, 2004; Pihl & Ervin, 1990; Stretesky & Lynch, 2001; Wright, Dietrich, Ris, Hornung, Wessel, Lanphear et al. 2008). Logically speaking, pollution is among the antecedents of crime, and that as an antecedent of crime, pollution is unevenly distributed. This is an important issue in relation to the CAP concept and its suggestion that crime can be controlled by market-based policy on two fronts. First, as medical and criminological literature suggests, the crime control policy that ought to draw attention here is controlling pollution as a mechanism for controlling street crime. Second, controlling pollution has important justice dimensions, and controlling pollution can also have beneficial social justice implications especially for minorities and the poor that are unaddressed in the CAP approach. Of relevance here is the observation that the production of and

exposure to pollution is a form of criminal victimization that harms nature, human and nonhuman species, as well as ecosystem components (Beirne, 1999; Halsey & White, 1998; Kramer & Michalowski, 2012; Lynch & Stretesky, 2001; Ruggiero & South, 2010). This later view of “pollution as crime” addresses important crime and justice concerns that the CAP concept neglects.

Various literatures suggest the need to address the etiological and victimization dimensions of pollution, the geography of pollution and the structural sources of pollution in relation to the geography of crime, victimization, and environmental justice (Lynch, 2004, 2013). That understanding of pollution as a precursor to crime and victimization is also a central component of environmental justice research which, as noted, has established an association between pollution and the production of environmental injustice for low income and minority communities, and includes empirical and theoretical attention to these issues in the criminological literature as well (e.g., Burns and Lynch, 2004; Lynch and Stretesky, 2012, 2013; Lynch, Stretesky and Burns, 2004a, 2004b; Stretesky and Lynch, 2002, 2011).

To be sure, the fact that pollution has a spatial distribution in urban areas and that pollution precedes crime and victimization means that crime hotspots and pollution hotspots may overlap as noted in CAP approaches. That overlap occurs because of the primary importance of the geographic location of pollution emissions within urban areas. CAP assumptions, however, take this association as an indication that pollution control policies might apply to crime, when the more significant issue is that pollution control, if effective, could reduce victimization from street crime and green pollution crimes, reduce injustice and, in cost terms, net a larger pay-back than CAP approaches would stimulate.

As noted, it is widely recognized that pollution generates social injustices that have adverse effects on minorities and the poor. The CAP approach ignores this important observation, and instead endeavors to replicate market-based environmental social control policies that have historically facilitated environmental injustice. This is no small point, and stands as the most significant criticism of the CAP approach. How social and environmental justice issues would be addressed by CAP models has been overlooked, and thus replicating market-based environmental social control remains a significant concern in relation to the negative effects such approaches may generate with respect to the distribution of justice in society. To be sure, since there is evidence that pollution is unevenly distributed by race and class, and that pollution is one of the covariates of crime, CAP policies will likewise be unevenly distributed, perhaps producing additional social injustice tied to the production of unnecessary social controls that are distributed based on the geography of race, ethnicity and class. Extant green criminological literature (Brisman, 2008; Lynch, 1990; Stretesky & Knight, 2013; South, 1998; White, 2007) also describes how environmental social control exhibits class, race and ethnic biases. The concern here is that crime and pollution coexist in urban environments in ways that criminologists have not fully addressed (Lynch, 2004).

Issues of Concern: Non-Stationary Pollution and End-of-Pipe Social Control

Another important consideration is that while some pollution sites are stationary, pollution itself is not stationary, a point widely referenced in the scientific literature

(Colbeck, 2009: 310). Once created, pollution is non-stationary and difficult or impossible to control once emitted into the environment without first making an effort to control emissions on site. One response to this problem is the creation of “end-of-pipe” technologies that target pollution production sources, making it *appear* that areas rather than behaviors are regulated. There is significant criticism of end-of-pipe social control (Schnaiberg, 1980; Stretesky et al. 2013) that must also be considered. Of particular relevance is that end-of-pipe controls ignore the impact production decisions have on the generation of pollution, and that they therefore fail to address the *causes of pollution*. Rather, these market solutions are remedial, and will be less effective than strategies that target production decisions that cause pollution (Bennett, 2011). With respect to the CAP argument, this observation should also raise questions about whether market-based street crime controls would be efficient in the long run since, like environmental end-of-pipe responses, they fail to address the causes of the detrimental behavior. Crime, in other words, is similar to pollution to the extent that it is an end-of-pipe product. Whether that similarity means crime can be controlled by end-of-pipe social control styled policies, however, must also be interpreted in relation to the general effectiveness of environmental end-of-pipe social control policy.

Criticisms of Environmental Market-Based Social Control

The CAP argument overlooks criticisms of market-based environmental social control responses, some of which appear in the criminological literature. Of particular concern in those critiques is the very nature of the free market, the way it operates, and assumptions made about policies that flow from and buttress the free market (e.g., see, Burns, Lynch, & Stretesky, 2008; Walters, 2010; Walters & Martin, 2013). In short, the kinds of market-based policies used to control environmental pollution have been well criticized as ineffective, and as a result, some question should be raised about the potential effectiveness of those strategies as crime control responses. Prior studies, for example, suggest that state environmental market mechanisms only reduce offending when high levels of enforcement are also present (Harrington, 2013). The Environmental Protection Agency’s (EPA) own data suggests that market-based controls are ineffective. For example, EPA data shows that only 12 % of firms that report pollution data under the Toxic Release Inventory (TRI) also employ market-based source reduction policies to counter the production of pollution. Moreover, analyses of other EPA market-based models of social control such as self-policing find that approach to be ineffective (Stretesky, 2006; Stretesky and Lynch, 2009).

Existing CAP proposals overlook the structural and political context of market-based models of social control. At the federal level, environmental market models emerged incrementally and were heavily influenced by political and economic interests. Unlike the control of street crime where state, local, and federal agencies have relatively distinct responsibilities, controlling pollution takes place in a diffuse system of responsibility, where both state and federal agencies influence policies and enforcement decisions (Atlas, 2007; Mintz, 1995, 2005). For example, while the EPA produces national Clean Air Act (CAA) standards, the permitting and monitoring of CAA facilities may fall under state authority. State agencies engaged in differential enforcement of the CAA offer their own interpretation of federal rules, or may be

hostile to federal regulatory standards, while regulated firms fight regulators in court and form associations to lobby against regulatory stringency. Inconsistent resource allocations toward these efforts across states also impact the regulatory process. The result is a non-uniform system of crime control affected by lobbying and extensive political pressure. CAP models have not addressed how a similar situation would be avoided.

Environmental regulation relies heavily on self-reported violations, which one could argue would be the way crime hotspot establishments might be monitored under a market-based model of crime control (Stretesky, 2006). This self-report monitoring system has been widely criticized, and the problem such a system presents is evident in the self-reporting of accidental air pollution or “upset events” by facilities in environmental hotspots. Existing rules allow facilities to routinely report certain types of pollution as accidents, avoiding permit violations and punishment (Ozmy and Jarrell, 2011). Similar problems are likely to emerge in efforts to regulate crime hotspot locations and the reporting of crime.

Importantly, market-based regulations are often the exception rather than the norm in regulating environmental crime. Most environmental regulation since the 1970s has focused on a “command-and-control” approach that emphasizes deterrence to reduce pollution (Burns et al., 2008; Fiorino, 2005; Yandle, 1989). Market-based mechanisms, voluntary compliance, and reporting concepts were given more weight politically when agencies failed to adequately police or punish chronic offenders (Collins, 2010; Coequet, Wiles, & Campbell, 1999). Studies suggest that these voluntary market mechanisms only promote compliance among firms already in compliance with environmental regulations (Anderson and Lohof, 1997; Stretesky and Lynch, 2009). Market-based mechanisms only work if followed-up by stringent oversight mechanisms to reduce incentives for bad behavior, which is rarely accomplished (Burns, et al., 2008). Moreover, at the implementation level, few resources have been devoted to criminal enforcement of market-based programs, and the US EPA only employed 186 criminal investigators for the entire country (Ozmy and Jarrell 2011). While some studies suggest monetary penalties induce environmental law compliance (Gray and Shimshack, 2011; Magat and Viscusi 1990; Shimshack and Ward 2005, 2008), Simpson et al. (2007) find little long-term deterrent effect from these measures. Even if crime hotspots were permitted to allow “X” volume of crime and were allowed to employ flexible market strategies to help reduce crime, they would still require vigilant monitoring by law enforcement to insure firms abide by those agreements. This assumes firms would fully self-report crimes and that sufficient surveillance resources would be allocated, a condition that is lacking in our current system of environmental enforcement (Stretesky and Lynch, 2009). Environmental market-based regulators are so understaffed that they must rely on firms to self-report their crimes, which has lead regulators to adopt pollution abatement technologies as alternatives to enforcement. Large firms can absorb the costs of these market-based control mechanisms while smaller firms cannot (Yeager, 1987), a situation that might apply to market-based control of street crime, forcing small establishments out of business or to seek ways around market compliance efforts.

As Friedrichs (2010:343) notes, despite efforts to revise the control of environmental crime, these crimes remain widespread, while rules are inconsistently enforced and prosecuted, and lack sufficient sanctions. To be sure, conceptualizing crime as pollution and creating an enforcement regime around such an idea would shift how we prosecute

and pursue crimes, but the question, as noted above, is whether such a strategy would be effective, an issue the crime as pollution argument overlooks. Such an approach might be effective *if* a large regulatory apparatus were created at considerable cost.

Can crime be controlled by market-based solutions? Answering this question involves addressing market-based control assumptions. In the environmental arena, market-based solutions are employed because production and pollution are connected to each other theoretically in market-economic model assumptions that form the basis of market-based social control responses to environmental pollution. Moreover, in this economic view, there is a specific assumption that the market can correct its own deficiencies, and thus that the form of social control that emerges is necessarily market-based (Burns, et al., 2008). In the market model of social control, the market is seen as needing only some external (perhaps minimal) guidance to remedy the problem of pollution, and the resulting strategies of control are not necessarily seen as invasive nor extensive.

These assumptions are questionable with respect to street crime and its causes. With respect to street crime, it could be argued that “the market” produces crime because of market deficiencies. In some views, these market outcomes may include the unequal distribution of income and resources. In other words, market deficiencies create locations where resource deficiencies are concentrated and generate street crime. If correct, then street crime cannot be effectively controlled by end-of-pipe street crime policies since those policies fail to change the nature of the market and its crime producing tendencies. In other words, since the problem is market-based, market restructuring cannot be achieved simply by targeting street crime locations since such a policy does not alter the nature of the market place itself (e.g., the market will continue to produce new sources of crime and new crime locations even if some locations are targeted for social control). As a result, a market solution to crime will always be reactive and in constant need of revision. In this sense, a market solution to street crime is highly tentative, and significant resources would be required to constantly reassess the crime market and adjust market-based policy interventions.

There is considerable disagreement as to whether market solutions to pollution are effective. For example, despite the use of market-based control strategies, there is still a significant environmental pollution problem in the US. Toxic Release Inventory (TRI) data, for instance, indicates that US corporations report emitting more than 23.5 *billion* pounds of toxic waste annually, a figure that fluctuates not with social control efforts over time, but with the level of economic production in the US (Lynch and Stretesky, 2014). By the late 1990s, despite decades of market-based pollution control, reported TRI emissions had reached more 33 billion pounds per year, about a 10 % increase over 1990. The declines in pollution evident from 2000 to 2009 can be associated with a global economic recession, and not enhanced market-based control. Moreover, from 2009 to 2012, reported pollution emissions in the US have increased nearly 16 % as the economy recovered, again indicating that pollution is not well controlled by market-based social control policy.

Crime as Pollution, or Pollution as Crime?

As noted, the CAP concept is inconsistent with the scientific definition of pollution. That concept is also inconsistent with two decades of research on pollution as crime

framed by green criminology, and with respect to environmental law and policy, which also promotes the idea of pollution as crime (Burns, et al., 2008). Unfortunately, pollution is a serious contemporary problem, one that rarely attracts criminological attention while it has garnered significant attention in biology, physics, chemistry, ecological studies and increasingly in political and public policy debates. Thus, the CAP concept is useful to the extent that it stimulates criminological interest in concepts such as pollution. The limitation of the CAP concept in this regard, however, is that it draws attention to street crime rather than the more significant problem of ecological pollution and destruction produced by corporations (Stretesky et al. 2013; Lynch and Stretesky, 2014) – that is, pollution as crime.

Further, the effort to define crime as pollution is inconsistent with medical and epidemiology research on the role pollution plays in changing human behavior including crime (Carpenter & Nevin, 2010; Denno, 1990; Dietrich et al., 2001; Fergusson, et al., 2008; Masters, et al., 1998; Mohai et al., 2011; Needleman et al., 2002; Pastor, et al., 2004; Pihl & Ervin, 1990; Stretesky & Lynch, 2001; Wright et al., 2008). In that literature, crime may be an outcome of pollution, but it has not been conceptualized as pollution.

The CAP concept is poorly developed to the extent that it has not addressed the more widely recognized issue of pollution as crime. Since 1990 or for nearly a quarter of a century, green criminology (Lynch, 1990) has promoted the study of pollution as crime. Given the existence of this now established literature, one would expect an effort to introduce a new pollution concept (CAP) would address its fit with established criminological literature and address the pollution as crime approach. The pollution as crime view indicates that pollution is a serious crime with a diverse array of harmful consequences that criminologists ought to address. Empirically, it has been estimated that victimization associated with pollution far exceeds victimization from street crime (Lynch, 2013; Lynch and Stretesky, 2014; Jarrell, Lynch and Stretesky, 2013). How the CAP concept fits this extant literature has not been addressed. In contrast, the issue of why pollution ought to be treated as crime and as a concern in the study of criminal behavior and social justice is now well established, and has been addressed in literatures outside of criminology as well.

Market Models of Pollution as Crime Control?

Above it was noted that the CAP argument ignores the many diverse and specific market-based social controls incorporated into environmental social control, and overlooks whether these diverse strategies have relevance to controlling crime. Equally important to implementing these policy approaches is whether such responses would be defined as acceptable by policy makers and the general public.

For example, many market-based pollution control measures are incentive based (Burns, et al., 2008), and are uniquely different than traditional crime control approaches (Stretesky, 2006). To stimulate compliance with environmental regulations, social controls offer offending corporations monetary incentives such as tax rebates, grants and subsidies to remedy conditions that produce pollution (Burns, et al., 2008). As CAP suggests, it might be possible to imitate these kinds of policies in efforts to control crime. The costs of such programs, however, are likely to be prohibitive and rejected by policy makers and the general public on those grounds.

In the US, one of the major market models for controlling pollution are pollution permit systems (Burns, et al., 2008). The permit approach is based on determining how much pollution exists in a pollution zone, and then issuing pollution permits to companies in those zones. Companies holding permits can then pollute up to their assigned level. Financial incentives for reducing pollution are included in this model. When companies pollute less than their permit allows, they can bank those pollution reductions as pollution credits for future use, or sell those pollution credits to others for their use, potentially undermining social control objectives. Creating a similar market model for street crime would be a difficult task, and would also include market control mechanisms that appear contradictory to the purpose of criminal law. For example, a similar crime control model would issue a permit to a location for the number of violation that would be allowed to be committed on its property before law acted. If such acts were not committed, the location would be able to bank or sell its unused crime allocation to another site. To be sure, such a method for controlling crime might make many uneasy, but the real problem is determining the initial permit condition – how many crimes will a location be allotted? And what is the procedure for making that determination? Moreover, as noted in the environmental literature, such an approach creates an incentive for businesses to underreport emissions (DeMarchi and Hamilton, 2006), and might impact the utility of such models for the control of street crime.

Environmental market controls are also promoted by self-policing or self-reporting of polluting behavior (Friesen & Gangadharan, 2013; Stretesky, 2006). Compliance incentives offer companies incentives to comply that limit their liability for pollution, and/or lead to reduced offense charges. Despite the criticisms of that approach (Stretesky, 2006), such an approach also appears irrelevant to street crime since establishments are not charged with creating conditions that generate crime, and cannot be charged with crimes in the first place. Exactly how such a model would work with respect to street crime control remains questionable.

Despite assertions in the CAP model, it is difficult to imagine using the above examples of environmental market-based approaches to control street crime. In the first approach, as CAP suggests, the government would fund crime reduction projects by individual business establishments. Doing so, however, would require significant government financial support and intervention to achieve compliance. This approach also means that the kinds of specific projects local businesses should employ must be identified, and would require extensive government intervention into the operation of local businesses that may not attract public support. While one could imagine numerous social control policies that could be promoted under a market policy (e.g., installing metal detectors in bars, hiring security firms and personnel), the costs of such policies to small, local business is likely prohibitive, and expands social control so dramatically as to limit many of the freedoms people (particularly small business owners) expect in a market economy.

Could the government replicate market environmental social control by handing out “crime vouchers” indicating the number of crimes each location could produce without being held accountable for violating the law? This would be a significant undertaking given the number of small businesses in the US. According to the Small Business Association, there are currently 23 million small businesses in the US, and permitting and tracking violations at all those businesses would be a daunting task. As a comparison, the US EPA regulates approximately 21,087 businesses under the Toxic Release

Inventory reporting system, the market model on which this crime control strategy would be based, meaning that a market-based street crime control policy of this nature would be charged with policing 1,150 times the number of establishments the EPA monitors under the TRI. Likely, the budget for this purpose would be enormous. The EPA spends considerable sums on its enforcement and compliance program (\$625 million for 2014), and for related enforcement policy initiatives and market-social control programs (e.g., \$175 million for improvement to air quality control, \$1.1 billion for Clean Water Act compliance, and an additional \$817 million for the Safe Drinking Water Act). A budget that is potentially a thousand times this size would run into the trillions for controlling street crime with market-based strategies.

Another important point to consider is that there is a significant difference between using a market-based model to control pollution and to control street crimes at the locations they occur. In the first place, companies that produce pollution play an obvious role in generating a social problem. Moreover, the behavior of the facility where the pollution is produced is a direct result of conscious production decisions made at that facility. In contrast, when crime occurs at a location, the occurrence of that crime may not have been directly produced by the conscious decisions of the owner of the establishment. In that sense, holding business owners accountable for the crimes committed on their property may not be justifiable.

Conclusion

Pollution is a serious behavior that involves emitting harmful substances into the environment. Criminology pays little attention to these serious harms. These behaviors of the powerful have serious consequences, and criminologists have done little to address policies for the control of environmental victimization from pollution. Instead of calling attention to the role the pollution crimes of the powerful play in producing public health victimization, and instead of building on efforts that have drawn attention to pollution as crime and the problems of corporate crime, the CAP proposal employs the concept of pollution to instead draw attention to street crime and how it might possibly be controlled by market-based crimes control models. As we have argued throughout this discussion, the effort to do so is based on overlooking important theoretical and empirical literatures produced both within and outside of criminology that addresses relevant issues including: pollution as crime, the definition of pollution, the extent of victimization associated with pollution, the effectiveness of market-based environmental social control and the fact that market-based environmental social control produces environmental injustice.

These criticisms imply that the CAP concept is not only weak, but continues a long criminological tradition that fails to take pollution as a serious criminological concern. Our discussion also suggests that the CAP argument confuses crime and pollution through its failure to refer to relevant literatures both within and outside of criminology, and that such a limited view of pollution concepts and literature should also be criticized given the supposed interdisciplinary nature of criminology.

Instead of confusing crime with pollution, criminologists should, as green criminology has long urged, pay greater attention to pollution as crime and to the serious forms of violent victimization polluting behaviors produce for human and nonhuman species,

the ecosystem and its component parts, and investigate crime control policies useful for the reduction of these forms of victimization. In this view, the CAP argument can be seen as detrimental to efforts to promote criminological studies of the polluting behaviors of corporations and the broad range of harms and victimization those behaviors produce. As noted above, the CAP concept has limited conceptual validity with respect to the definition of pollution, and little empirical validity with respect to the contention that market-based social control has effectively controlled crime, limited victimization, and addressed issues of environmental injustice.

Crime is certainly a harmful act. But so, too is polluting. Equating two behaviors with one another because they are harms ignores the differences between these behaviors, and as a result, confuses the appropriate analysis of those behaviors and overlooks differences in the volume of victimization each of these harms generates. But, of equal importance here is the issue of public policy, and CAP public policy initiatives for street crime may be misleading by proposing that replicating market-based environmental social control will help eliminate crime. As research indicates, environment social control is largely ineffective and has not been a panacea for environmental crime. The historical record of pollution emissions in the US indicates that market-based controls have had minimal effects. At the same time, empirical studies also indicate that market-based environmental social control has generated inequities in responses to environmental crime, and should be questioned as an appropriate policy on those grounds as well. As we have noted, there is evidence that regardless of the form of environmental social control, problems such as pollution ebb and flow or contract and expand along with market conditions and economic growth, and have not been sufficiently controlled by environmental social control policies. Understanding that this is the case requires that criminologists pay closer attention to the empirical literature on this point developed both within and outside of criminology.

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