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A Step Beyond: Adding Behavior Analysis to the Discussion of Evolution, Natural Selection, and the Law

Katherine J. Kaminsky

Matthew W. Kirkhart

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A STEP BEYOND: ADDING BEHAVIOR ANALYSIS TO THE DISCUSSION OF EVOLUTION, NATURAL SELECTION, AND THE LAW

*Katherine J. Kaminsky & Matthew W. Kirkhart**

I. INTRODUCTION 947

II. THE NATURAL SELECTION OF BEHAVIOR 949

 A. *Introduction to Evolution and Behavior* 949

 B. *Selection of Behavior by Consequences* 951

 C. *The Contingency* 953

III. THE SOCIAL SELECTION OF BEHAVIOR AND THE IMPORTANCE OF COMMUNICATION 956

 A. *The Role of Social Selection of Behavior* 956

 B. *The Mechanism of Social Selection* 957

 C. *Social Selection of Communication* 958

IV. SOCIAL SELECTION OF COMMUNICATION AND THE REGULATION OF TERRORISM 960

 A. *Social Selection of Terrorist Activities* 960

 B. *The Regulation of Terrorism—A Step Beyond* 962

V. CONCLUSION 963

I. INTRODUCTION

Thinking beyond the usual parameters of legal theory is essential to the growth and success of the law, and as Professor Jones remarked, “law is fundamentally about regulating human behavior.”¹ It seems as though it would be impossible to endeavor to discuss the regulation of human behavior without having an understanding of the roots of the societal need for control and the core mechanisms of human behavior. However, that is

* Katherine Kaminsky is a graduate of the University of Florida, Levin College of Law and a former research editor of the Florida Law Review. She is an associate with the law firm of Kutak Rock in Omaha, Nebraska. Matthew Kirkhart received his Masters degree in Clinical Psychology from West Virginia University and his Ph.D. in Clinical Psychology from the University of North Carolina at Greensboro. He is a licensed psychologist and an assistant professor at Loyola College in Maryland in Baltimore, Maryland.

1. Owen D. Jones, Proprioception, Non-Law, and Biologic History, 53 FLA. L. REV. 831, 832 (2001).

what legal theorists inevitably attempt to do. Professor Jones has now opened the door for a thoughtful discussion and a new consideration of the elements that contribute to the regulation of human behavior that is the law.

Evolution and natural selection contribute much to an understanding of human behavior. The values that we hold and areas that we as a society select as important for regulation are certainly determined largely by our evolutionary history. As Professor Jones recognized, the intentional killing of a human being or nonconsensual intercourse are particularly heinous in most societies and are undoubtedly granted special attention in all societies due to their strong relationship to natural selection factors.² The evolutionary goal of procreation is negatively affected by actions that block the utilization of selection factors which would otherwise lead to procreation of a superior member of the species, such as nonconsensual intercourse. Similarly, survival of the species is put in jeopardy by actions that eliminate numbers of the species, such as the intentional killing of another.

However, Professor Jones's contribution to our understanding of the regulation of human behavior is unnecessarily limited in its application to the development of law in the present. While a reader has much to gain by appreciating why evolutionary selection created a brain that places value on human life, a discussion of evolution and human behavior has the potential to contribute far more to our understanding of the design and effectiveness of the law. Professor Jones suggests that knowledge about human behavior "may increase the effectiveness of law in pursuing pre-existing legal goals,"³ but it is difficult to see how that might occur with the only light of inquiry directed upon the distant past. The environment to regulate behavior exists in the present, and a greater understanding of human behavior in terms of Behavior Analysis (in contrast to behavioral biology) will provide a strong aid in recognizing avenues for enhancing the effectiveness of law and understanding the importance of law in today's society.

This Response will explore the relationship between evolution and the law with an eye on radical behavioral principles of reinforcement. Part II of this Response introduces the concept of the behavioral contingency and explains how its elements are relevant to the regulation of human behavior. In addition, Part II will discuss the role of evolution in the selection of behavior via reinforcer preference. This area of inquiry supports Professor Jones's emphasis on evolution as a means of understanding legal mechanisms because the law regulates behavior by associating behavior with socially meaningful consequences.

2. *Id.* at 862.

3. *Id.* at 835.

Part III of this Response narrows the scope of analysis to the area of social consequences and communication. As a result of selection, communication has developed as an inherently reinforcing class of behavior that is consequently very hardy and resistant to change. This general introduction is followed in Part IV by a particular example: terrorism. It is suggested that acts of terrorism may be reinforced by allowing the perpetrator or his cause to gain access to the media and, through this exposure, cause disruption to other social groups. Finally, strategies are derived from the behavioral analysis of terrorism that may be useful in regulating what is a very persistent and dangerous behavior.

This Response will conclude with a brief discussion of other behavioral analytic principles and their applicability to the regulation of human behavior by the law. In addition, the overall importance of allowing science and other areas of theory into our discussion of the law is emphasized.

II. THE NATURAL SELECTION OF BEHAVIOR

A. *Introduction to Evolution and Behavior*

The idea of the natural selection of species' characteristics has been a part of Western thought for over a century.⁴ Simply put, the genetic characteristics of individuals within a species will differ.⁵ The individuals in the species live within a particular environment, and some of those genetic characteristics may prolong or shorten their lifespan because of the particulars of the environment itself.⁶ Organisms that are "blessed" with the genetic characteristics that prolong survival tend to survive longer and reproduce at a greater rate than those who are not so blessed.⁷ Over several generations the genetic composition of the species changes; those genetic characteristics that were associated with reproductive success within that environment will be more common in the species than those characteristics which hinder reproductive success.⁸ The term "natural selection" has been used to describe this process because the natural environment, not the "willful" choice of the species members, determines what characteristics lead to reproductive success and are, thereby, passed on as the genetic composition of the species.⁹

4. HOWARD H. KENDLER, *HISTORICAL FOUNDATIONS OF MODERN PSYCHOLOGY* 83-85 (1987); W. SCOTT TERRY, *LEARNING AND MEMORY: BASIC PRINCIPLES, PROCESSES, AND PROCEDURES* 4 (2000).

5. KENDLER, *supra* note 4, at 84.

6. *Id.*

7. *Id.*

8. *Id.*

9. *Id.*

As an example, consider a species of moth whose wing color varies from dark black to gray to nearly white. For the sake of this example, assume that the primary way this species avoids predators is to stay motionless on a tree, thereby blending in, causing predators to fail to detect them. If this species of moth lives in a forest environment in which the trees have dark gray or black tree bark, it is highly likely that after several generations, the majority of the moths will be dark gray or black in color. The light gray and white moths would be more likely to have been eaten by predators sooner because of their lack of camouflage, and those moths would have less of an opportunity to reproduce and pass on their genes for coloration to future generations. Although all the moths are likely to be equal in their “desire” to survive, their desire for survival has minimal impact relative to the impact of their environment.¹⁰

Professor Jones addressed the idea of natural selection and evolution as it relates to the selection of brain structures and lawfulness as a characteristic of human biology.¹¹ The same principles of natural selection and evolution can be used to address not just genetic characteristics of a species, but the behavior of an individual.¹² Although it is obvious that a physical body is required to behave, and that one would be remiss in considering behavior without considering biology and genetics, a more specific appreciation of how the processes of natural selection apply directly to behavior is possible without appealing to “Behavioral Biology.” More importantly, applying the idea of natural selection to behavior directly, rather than using biology as a “middle-man” on the way to behavior (lawful or otherwise), may allow a more practical analysis of the law. After all, the focus of law is behavior,¹³ not biology, and if selection can be demonstrated to operate on behavior, then why not apply it there?

Jones correctly suggests that organisms of the same species likely have widely-shared behavioral predispositions that are biological in origin.¹⁴ He also indicates that what is of interest to the law is a situation in which an individual responds differently in different situations.¹⁵ This implies environmental selection of behavior itself, apart from environmental selection of genetic or biological predispositions for behavior. This level of analysis (focused on behavior itself) lies more solidly in the realm of psychology, specifically a subsection of psychology called “Behavior Analysis.”

10. In this case, the impact of the environment is exemplified by the way in which the color of the tree bark leads to the selection of color in the moths.

11. Jones, *supra* note 1, at 838.

12. B.F. Skinner, *Selection by Consequences*, in *THE SELECTION OF BEHAVIOR: THE OPERANT BEHAVIORISM OF B.F. SKINNER: COMMENTS AND CONSEQUENCES* 11-12 (A. Charles Catania & Stevan Harnad eds., 1988) [hereinafter *Selection by Consequences*].

13. See Jones, *supra* note 1, at 832.

14. *Id.* at 838.

15. *Id.* at 838-39.

B. *Selection of Behavior by Consequences*

The processes of natural selection can be thought of as occurring at different levels.¹⁶ The first level involves the selection of genetic characteristics, and accompanying behavioral predispositions, within an entire species over many generations.¹⁷ This level of selection is typically called “natural selection” and is often used to account for the consistent behavior of a species.¹⁸ For example, ducklings tend to follow large moving objects like their mother, a behavior called “imprinting.”¹⁹ Nearly all ducklings do this, and it is inferred that a natural selection process occurred over many generations such that those ducklings with the predisposition to engage in this behavior survived and reproduced at a greater rate than those ducklings that did not have this predisposition. Innate or instinctive behaviors such as imprinting are the result of the first level of natural selection processes, and these types of behavior are highly dependent on the presence of specific environmental stimuli (such as a moving mother duck). Therefore, these types of behaviors are relatively inflexible and not readily adaptable to changing environments. For example, ducklings have been known to follow any moving object, even a moving beer bottle, when that object is presented at the critical phase of development.²⁰ The rigid following of any moving object is not adaptive because it will not necessarily lead to the caretaking necessary for survival and may result in premature death for ducklings who have inadvertently wandered away and imprinted on an object other than their mother.

A second level of environmental selection, and one that is more applicable to law, is the selection of the behavior of an individual organism within the lifespan of that organism.²¹ Rather than focusing on the genetic or biological characteristics of an entire species, the behaviors of one individual are the focus of the selection processes. Simply put, the environment selects the behavior itself through the occurrence of relatively immediate consequences of the behavior.²² In this way it is possible to

16. *Selection by Consequences*, *supra* note 12, at 11-14.

17. *Id.* at 11-12.

18. *Id.* at 12

19. *Cf. id.* (Although the author concludes that imprinting may be due to a combination of selection procedures, for the purposes of this discussion it illustrates the point that behavior can be selected by the environment, and in some cases this selection results in behavior that is consistent across members of the same species.).

20. RICHARD W. MALOTT ET AL., *ELEMENTARY PRINCIPLES OF BEHAVIOR* 193-94 (4th ed. 2000).

21. JOSEPH J. PEAR, *THE SCIENCE OF LEARNING* 11-12 (2001) (stating that behavior that relies too greatly on natural selection principles can lead to poor adaptation, while behavior that is selected by its consequences is more likely to be adaptive).

22. *Selection by Consequences*, *supra* note 12, at 12; MALOTT ET AL., *supra* note 20, at 16-17; B.F. SKINNER, *SCIENCE AND HUMAN BEHAVIOR* 62-69 (1953) [hereinafter *SCIENCE AND HUMAN*

achieve a situation in which organisms of nearly identical genetic and neurological makeup respond in different ways to similar situations. Individual A may have a history of response X being selected in situation E, while Individual B may have a history of response Y being selected in situation E.²³

The selection by the environment of a particular behavior is typically referred to as "selection by consequences."²⁴ The analogy of selection by consequences to natural selection is fairly straightforward. Just as certain genetic characteristics will become more common in a species of organisms over several generations if those characteristics lead to greater survival, so too will certain behaviors become more common within the lifespan of a single organism if those behaviors lead to beneficial outcomes for the organism. For example, in a simple experimental situation a rat is placed in a cage with a lever that when depressed dispenses food. At the beginning of the experiment, the rat may engage in a variety of behaviors, including sniffing around the cage, grooming, standing erect, and pressing the lever, each with its own rate of occurrence. Assuming that the rat is hungry, and therefore a beneficial outcome would be access to food, over time the rat will engage in more lever pressing and less of the other behaviors mentioned. The environmental consequence (access to food) selected the behavior (lever pressing), just as the environment selected darker coloring for the moth species over other coloring in the earlier example of natural selection.²⁵ Although the behavior of consuming certain food items is likely the result of the first level of natural selection (rats who do not consume nutritious food do not live long enough to reproduce and pass on their behavioral predisposition to not consume nutritious food), it is unlikely that the rat has a behavioral predisposition to press levers resulting from natural selection processes. Instead, it is more likely that the occurrence of the behavior of pressing the lever is a result of the second level of natural selection: selection by consequences.

BEHAVIOR].

23. In long hand, Individual A has responded to E by doing X and has been reinforced for that behavior, making it more likely for Individual A to respond by doing X when presented with E again. In contrast, Individual B has responded to E (the exact same environmental situation) by doing Y and has been reinforced for that behavior, making it more likely for Individual B to respond by doing Y when presented with E again. As a result, two similar individuals, A and B, respond differently in the same situation.

24. A. Charles Catania, *Introduction*, in *THE SELECTION OF BEHAVIOR: THE OPERANT BEHAVIORISM OF B.F. SKINNER: COMMENTS AND CONSEQUENCES* 5 (A. Charles Catania & Stevan Harnard eds., 1988).

25. See *supra* Part II.A.

C. *The Contingency*

Because selection by consequences occurs within the lifetime of an individual organism, it is easier to observe and describe than the selection processes for genetic characteristics and behavioral predispositions of an entire species over multiple generations. Behavior Analysis has developed a specific language to describe the process of selection by consequences.

The most basic concept in the description of selection by consequences is the “contingency.” In its simplest form, a contingency involves a behavior and the consequence or outcome that follows the behavior.²⁶ The word “contingency” is used because the occurrence of the consequence is contingent upon the occurrence of the behavior.²⁷ Continuing with the example of the rat,²⁸ access to food is contingent upon pressing the lever. No other behavior by the rat results in access to food. Also, the term “contingency” is used because any future occurrences of pressing the lever are contingent upon a history of gaining access to food in the past by pressing the lever.²⁹ This is a very important point, because almost any current behavior is the result of the prior selection of the behavior by the consequences it produced in the past. In Behavior Analysis, this prior selection by consequences is referred to as a “learning history,” and current behavior is attributed in large part to this history.

As stated, the simplest form of a contingency is the behavior and the consequence that follows it. This is called a “two-term contingency” because there are two terms: behavior and its consequence.³⁰ In the example with the rat,³¹ the two-term contingency can be thought of as “lever press→food.” Contingencies can be further expanded to include the specifics of the environment within which the consequence operates, thereby leading to a more sophisticated and complete account of selection by consequences. These contingencies are called “three-term contingencies” because they include an additional term, the “stimulus,” or a description of the important environmental features present before the behavior occurs.³²

26. MALOTT ET AL., *supra* note 20, at 16-19.

27. *Id.* at 16-17.

28. *See supra* Part II.B.

29. *See* SCIENCE AND HUMAN BEHAVIOR, *supra* note 22, at 62-65. By “history” we are referring to the individual learning history of the rat. The exposure of the rat to situations wherein lever pressing resulted in food is the rat’s history of gaining food in the past for pressing the lever.

30. MURRAY SIDMAN, EQUIVALENCE RELATIONS AND BEHAVIOR: A RESEARCH STORY 329-30 (1994).

31. *See supra* Part II.B.

32. SIDMAN, *supra* note 30, at 331-32; SCIENCE AND HUMAN BEHAVIOR, *supra* note 22, at 107-08.

The previous example involving the rat³³ could be slightly modified to illustrate a three-term contingency. Suppose a light was installed in the cage with the lever. The hungry rat is again placed in the cage, and again a lever press will result in access to food. However, the lever press only results in access to food when the light is illuminated, a lever press will not result in access to food. In this situation not only will the rat, over time, engage in more lever pressing and less grooming, sniffing, etc., but also the rat will tend to press the lever only when the light is illuminated. The three-term contingency not only describes the process of selection by consequence, it also describes the context within which this selection occurs: “light on→lever press→food.” Note that the light is not doing the selecting in this example. The rat is not pressing the lever reflexively in the presence of the light. Access to food is still doing the selecting of the behavior; it is just doing so within the context of the presence of the illuminated light. Put another way, if we were to turn off the light and maintain access to food with a lever press, the rat would continue to press the lever. However, if we were to leave the light on and terminate access to food following a lever press, the rat would fairly quickly stop pressing the lever, even if the light remained illuminated.

Contingencies also are labeled according to their effects upon behavior.³⁴ For example, contingencies that lead to a strengthening of behavior over time are termed “reinforcement contingencies.”³⁵ Contingencies that lead to a weakening of behavior over time are termed “punishment contingencies.”³⁶ If the consequence involves the presentation of something that was not present before the behavior occurred, or was present to a lesser degree, the contingency is referred to as a “positive contingency.”³⁷ If a consequence involves the removal or reduction of something present before the behavior occurred, the contingency is referred to as a “negative contingency.”³⁸ These terms are typically combined together to describe a complete contingency. So, for example, when a contingency results in the presentation of something following a behavior that was not present before the behavior occurred (positive), which strengthens the behavior over time (reinforcement), that contingency is called a “positive reinforcement contingency.”

This terminology is often misunderstood and incorrectly represented by persons outside the field of Behavior Analysis. This is due primarily to the use of the words “positive” and “negative.” For contingencies, these words are not meant to convey a value judgment of the contingency.

33. See *supra* Part II.B.

34. MALOTT ET AL., *supra* note 20, at 18-19.

35. See SCIENCE AND HUMAN BEHAVIOR, *supra* note 22, at 93.

36. *Id.* ch. XII.

37. *Id.* at 73.

38. *Id.*

Instead they are meant to describe the before-and-after conditions relative to the consequence. If something is presented after a behavior that was not there before the behavior occurred, this is “positive” in the language of contingencies even if that something is judged to be “undesirable.” Similarly, the terms “reinforcement” and “punishment” are not value judgments, but instead are descriptions of the functional impact that the consequence has on behavior. For example, regardless of how desirable or undesirable an event is, if it strengthens behavior, the consequence is considered to be a “reinforcer.”

Reinforcers are also sometimes described as being “unlearned” or “learned.”³⁹ An unlearned or “unconditioned” reinforcer, for example, acts to select behavior without any experience or learning on the part of the organism.⁴⁰ As stated, food, water, and sex are examples of unconditioned reinforcers because an organism’s behavior is predisposed, through the natural selection processes, to be selected by these events. Those organisms whose behavior was reinforced by food, for example, were more likely to survive and procreate since their food-finding behavior would occur with increasing frequency. Escape from pain or physical injury are other examples of unconditioned reinforcers.

In contrast, learned or “conditioned” reinforcers only select behavior after they have been associated with unconditioned reinforcers.⁴¹ One clear example of a conditioned reinforcer is money. Only those individuals who have had the experience of exchanging money for food, water, shelter, safety or other unconditioned reinforcers will engage in behavior that is selected by money. There are a number of benefits to behavior selection using conditioned reinforcers.⁴² One of the most obvious benefits is that conditioned reinforcers are not as affected by motivational variations as are unconditioned reinforcers. For example, a behavior that is selected by food may only occur when food is needed or desired. In contrast, most conditioned reinforcers (like money) will select behavior regardless of the particular motivations of the individual at the moment. For example, a person will tend to act in a manner such that money is earned even if he is not hungry because money can be used to alleviate many conditions.

There are several innate behaviors shared by all humans.⁴³ Sucking, rooting for the breast, grasping, and possibly the development of language (spoken or otherwise) have all been identified as behavioral predispositions for humans that are the result of the first level of natural selection.⁴⁴ But what is of most interest to the law are not these “human

39. *Id.* at 72-81.

40. MALOTT ET AL., *supra* note 20, at 178.

41. *Id.* at 178-79.

42. SCIENCE AND HUMAN BEHAVIOR, *supra* note 22, at 77.

43. SAUL KASSIN, PSYCHOLOGY 277, 376-77 (3rd ed. 2001).

44. *See id.*

consistencies.” What are of interest are the variations in behavior, lawful and unlawful, that, like the rat’s lever pressing,⁴⁵ are more likely the result of selection by consequences. With the language of contingencies, it becomes possible to describe and understand these behaviors. In addition it becomes possible, once the contingencies are identified, to change the environment such that different consequences occur and, therefore, different behaviors are selected.

III. THE SOCIAL SELECTION OF BEHAVIOR AND THE IMPORTANCE OF COMMUNICATION

A. *The Role of Social Selection of Behavior*

One of the goals of most social groups is behavioral consistency. Ideally, trains run on time, people always drive at or beneath the speed limit, and the amount one pays for a sale item at a store is the same price found in the newspaper advertisement. According to Behavior Analysis, the path to stable behavior is the consistent application of the consequences that select the behavior. However, one of the difficulties with behavior that is selected by its consequence in the natural environment is that the behavior is only as stable and consistent as is the naturally occurring consequence that selects it. Any environmental inconsistency in the presentation of the consequence will lead to future inconsistencies in the behavior. One need only examine weather patterns to appreciate the inconsistency and unpredictability of “Mother Nature”—the natural environment. Although there are noteworthy exceptions to this inconsistency in the natural environment (e.g., touching fire always leads to pain), unpredictability in the natural environment is an all too common situation. If behaviors were selected only by events in the natural environment, then an organism would be somewhat limited in its ability to engage in stable and consistent behavior over an extended period of time.⁴⁶

Another difficulty with behavior that is selected by consequences in the natural environment is that behaviors selected by the natural environment may not be advantageous in a social environment. Simply put, what is beneficial for the individual may be harmful to the group. For example, the natural environment tends to select specific behaviors involved in obtaining food. However, some of these food-obtaining behaviors involve stealing food from other members of a social group. The stealing behavior may be in the best interest of the individual but not in the best interest of the group. Theft, and similar behaviors, disrupt the functioning of the

45. See *supra* Part II.B.

46. PEAR, *supra* note 21, at 13; *Selection by Consequences*, *supra* note 12, at 13-14.

social group and, in the long term, hurt the survival of the individual as well as the species, because survival of the individual is related to the survival of the social group.

For these situations, another level of selection has been recognized that tends to engender more behavior stability and selects behaviors that are beneficial for the social group as a whole. "Social selection," the next level of selection, involves the selection of behavior not by the natural environment, but by the social environment. Specifically, it involves the selection of behavior by consequences that are mediated by the behavior of others.

B. *The Mechanism of Social Selection*

"Other members of a species are one of the most stable features" of an organism's environment.⁴⁷ Therefore, one of the most effective selection mechanisms for behavior is the behavior of other members of the same species either as individuals or as a group, that is, "culture." Although the process is identical to selection by natural consequences, because the selection results from consequences in the social environment rather than the natural environment, this level of selection is called "social selection."

Many animals other than humans engage in behavior that is the result of social selection. For example, Vervet monkeys emit different vocalization warnings to their peers depending on the type of predator in the vicinity.⁴⁸ One call is emitted when a large, land-based predator, such as a leopard, is encountered. A different call is emitted in the presence of an airborne predator, such as a hawk, and another call is emitted when a snake is detected.⁴⁹ The monkeys engage in different behaviors in response to different calls. For example, the monkeys climb into the nearest tree in response to the "leopard call," dive into thick bushes in response to the "hawk call," and stand up on their hind legs and visually scan in response to the "snake call."⁵⁰ Although there is obvious survival value to the other monkeys for responding to the call in that they can better avoid the predator, there is also social selection of the behavior of making the call itself. Because the making of the call by one monkey allows the entire group to avoid a predator, it is beneficial to the group as a whole to reinforce the calling behavior of the individual monkey.⁵¹ In addition, the survival of the other monkeys in the group indirectly benefits the calling monkey by providing it with more opportunity to reproduce, obtain food,

47. *Selection by Consequences*, *supra* note 12, at 12-13.

48. DONALD R. GRIFFIN, *ANIMAL THINKING* 166 (1984).

49. *Id.*

50. *Id.*

51. Warning-call behavior might be reinforced by the social group by providing protection, comfort, or grooming to the calling monkey.

safety, etc., which is a further instance of social selection of the calling behavior.

It is more likely that these vocalizations are the result of social selection rather than natural selection or selection by consequences. The calls provide no benefit to the monkey who makes them if it is alone and not a member of a social group. The individual monkey who makes the call is equally likely to avoid the predator whether it makes the call or not. A human analogy to this would be stating aloud that you are in pain while you are alone. It is highly unlikely that this behavior would continue in the absence of others because there is no one present to help you alleviate your pain, so there is no "reason" to make the statement aloud. Said another way, there is no reinforcement of the audible "I'm in pain" statement because when alone, pain level is independent of whether the statement is made or not made. However, the "I'm in pain" statement could be reinforced when in the presence of others because another person, upon hearing your statement, may be able to do something to alleviate the pain (administer medication, give you a massage, provide physical therapy services, etc.). The three-term contingency for the social selection of this statement would be: "other person present → 'I'm in pain' → reduction in pain because of actions of the other person." Although while in pain you may engage in other behaviors that alleviate pain because of their consequences, such as shifting bodily positions or taking aspirin, these behaviors are the result of selection by consequences. These behaviors reduce pain because of their consequences, and you are as likely to engage in these behaviors whether another person is present or not. The communicative statement of being in pain, however, is the result of social selection because another member of the social group mediates the consequence that maintains the statement.

C. *Social Selection of Communication*

As can be seen, one particular type of behavior that is likely to be highly affected by social selection is communication.⁵² Although the ability to speak and use language is likely the result of natural selection processes,⁵³ what words are chosen and even whether or not we speak at any point in time is more likely to be the result of social selection processes.⁵⁴ As an analogy, consider bipedal walking. Humans have a long evolutionary history for the natural selection of bipedal movement such that the most common method for locomotion for humans is bipedal movement. However, the way that an individual walks, and when they run,

52. *Selection by Consequences*, *supra* note 12, at 13.

53. KASSIN, *supra* note 43, at 277.

54. *Selection by Consequences*, *supra* note 12, at 13; B.F. SKINNER, VERBAL BEHAVIOR 29 (1957) [hereinafter VERBAL BEHAVIOR].

walk, or jump, are dependent more on selection by consequences and/or social selection than natural selection.

There are several reasons why communication between members of the same species would be socially selected. Language allows an individual to be affected by events or objects that are not present at the moment. If you know the location of my lost keys, you can inform me of this information when requested to do so, even if we are not currently at the location of the keys. This characteristic of language, called "displacement," is very valuable to a social group, and the selection, or reinforcement, of talking about objects or events that are not currently present is therefore likely to be reinforced via social selection.⁵⁵ For example, in the film "Dances with Wolves,"⁵⁶ the Native Americans repeatedly asked the main caucasian character, played by Kevin Costner, if he had seen any buffalo.⁵⁷ When he finally did encounter buffalo and informed them of this, they responded with excitement and the further inclusion of him into their group.⁵⁸ The social selection of such vocalization was obvious, as was its value to the group.

Language also allows one to discuss events that are not obvious or available to others, such as past experiences, thoughts, emotions, and desires. This can have considerable value to both the individual and the social group because these types of statements provide information to others that they otherwise could not obtain. These statements also benefit the social group as a whole because the vocalizations typically have less of a disruptive effect on the group than other behaviors that provide the same information. As an example, Malott and his colleagues discussed the case of an autistic boy who responded with disruptive and socially unacceptable behavior when confronted with a task that was difficult for him.⁵⁹ Although his disruptive behavior certainly communicated to his therapist that he was frustrated and that he found the task difficult, his behavior was violent and tended to disturb others in the room with him.⁶⁰ His therapist then taught him to ask for help when confronted with a task that was frustrating and reinforced his request for help by helping him and thereby reducing his frustration.⁶¹ The social selection of his requesting help not only benefitted the boy, in that he got relief from his frustration, but it also benefitted the entire group, in that his socially disruptive behavior in response to frustration disappeared and was replaced with a verbal request, something far less disruptive to the group.

55. VERBAL BEHAVIOR, *supra* note 54, at 29.

56. DANCES WITH WOLVES (Orion Pictures 1990).

57. *Id.*

58. *Id.*

59. MALOTT ET AL., *supra* note 20, at 41-43.

60. *Id.* at 41-42.

61. *Id.* at 43.

IV. SOCIAL SELECTION OF COMMUNICATION AND THE REGULATION OF TERRORISM⁶²

A. *Social Selection of Terrorist Activities*

Like most behavior, terrorist acts are determined by many factors. Extreme political, ideological, and religious beliefs sometimes serve as a blueprint or motivator for terrorism. Even the terrorists' social group itself acts to reinforce terrorist behavior by its members. However, there are some social reactions by groups outside of the terrorist groups that may affect terrorist behavior. Bombings and attacks typically disrupt the social structure of the victim's group, a common goal for terrorists. Terrorism also can be viewed as a form of communication to the world at large, and the social groups outside of the terrorists' groups may inadvertently reinforce terrorism as a form of communication. Terrorism as communication and terrorism causing the disruption of the social fabric of the victims' group are two factors that may be effective in combating and understanding terrorism, and are also factors that can be influenced by individuals outside of the terrorists' social group.

Similar to the autistic child discussed above, terrorists' chosen form of communication is violent and disruptive to those around them. Suicide bombings and the burning of the homes of others are very powerful forms of communication. Modern media provides channels for strong reinforcement of terrorist behavior, as these communications are disseminated to huge groups of people who hear the terrorists' messages. The resilience of terrorist behavior therefore should not be surprising. One of the points of terrorism is communication, and communication in general is strongly reinforced by even the most peaceful of societies. Communication in the form of terrorism may be reinforced to an even greater extent in those subcultures that condone violence.

Terrorism has been suggested to exist almost purely as a form of communication, a symbolic act.⁶³ So important is communication to

62. On September 11, 2001, the United States of America was the target of several violent terrorist attacks. On that date, terrorism was transformed from a theoretical and abstract problem for the American homeland to a very tangible and horrific reality. This Response was written and submitted before the terrorist attacks occurred. The authors strongly wish to convey that any discussion of terrorism in a venue such as this cannot possibly capture the real impact of terrorism on the lives of individuals. Our academic discussion of terrorism here is not meant to trivialize the losses felt by the families and friends of the victims of the attacks of September 11th, or any other terrorist attacks.

63. D. Timothy White, *The Terrorist Threat to the American Presence Abroad*, THE CRITICAL INCIDENT ANALYSIS GROUP NEWSLETTER (Critical Incident Analysis Group, Charlottesville, Va.),

terrorism that Margaret Thatcher once likened publicity to oxygen for terrorists.⁶⁴ “Without attention, a terrorist act is a tree falling in the forest with no one to hear and it’s pointless.”⁶⁵ Terrorists use violent methods to communicate their beliefs to others. Those beliefs may be unavailable to the public unless they are communicated by the terrorists. In addition, the holding of extreme beliefs is often reinforced by the terrorists’ social group. As a result, terrorist activities are reinforced even more strongly; the communication-element is reinforced by society at large and the underlying belief is reinforced by the terrorists’ social group.

Terrorism is such a violent and absorbing form of communication that simple social reinforcement may not be enough to maintain it. Media exposure, providing an exponentially greater reinforcer, might be necessary for terrorism to persist. It has been suggested that terrorists often watch CNN to make sure that their message is being heard.⁶⁶ “That’s how [terrorists] can measure [their] success.”⁶⁷ Therefore, the three-term contingency for the terrorist act can be explained as “access to the public→terrorist act→publicity.” As in the above example of the pain statement,⁶⁸ without an environment that provides access to the public, terrorists’ acts are less likely to be reinforced. In the absence of an audience there is little benefit for the terrorist to commit the act.

Another social consequence that reinforces terrorist acts is the disruption of the social functioning of the group victimized by the terrorist attack. Social disruption weakens a social group by disrupting commerce, health services, and other social services. On an individual level, victims of terrorism are likely to experience a variety of psychological effects in response to the stress of the attack and may feel that their lives are no longer meaningful and their world no longer makes sense.⁶⁹ These consequences act to reinforce the terrorists’ behavior, given that one of the terrorists’ goals is the breaking down of the fabric of the target society.

Through our understanding of behavioral contingencies and social reinforcement, we can form a more complete understanding of terrorism and draw conclusions. For example, we may conclude that terrorist activities that gain media attention are more likely to be repeated or that

2000, available at http://faculty.virginia.edu/ciag/terr_media.html.

64. Raphael F. Perl, *Byliner: Terrorism, The Media, and the 21st Century*, at <http://www.usembassy-israel.org.il/publish/press/security/archive/1997/June/ds10619.htm> (June 18, 1997).

65. White, *supra* note 63.

66. *Id.*

67. *Id.*

68. See *supra* Part III.B.

69. Raymond B. Flannery, Jr., *Psychological Trauma and Posttraumatic Stress Disorder: A Review*, 1 INT’L J. EMERGENCY MENTAL HEALTH 135-40 (1999).

prior to the general availability of television, terrorism was less grand and news-worthy.⁷⁰

B. *The Regulation of Terrorism—A Step Beyond*

Professor Jones's level of analysis, an exploration of the role of evolutionary history in the establishment of the brain and certain social values, does not allow us to go any farther into the workings of the law. Once an understanding is gained of the importance of evolution for a particular problematic behavior, the analysis concludes with a prediction and a general insight into how society might be regulated to best control the behavioral state we are in. Professor Jones's focus on the past and evolutionary process ties the hands of the law in some respect since the current state of man is offered as static and unchangeable. The law can do nothing to intervene in evolution and alter the way people are, therefore Professor Jones's interventions must work to merely control those tendencies with which man must cope. With the addition of a discussion of behavioral principles and mechanisms, however, the analysis can continue to provide suggestions for making the law more effective in areas that have commonly been difficult, if not impossible, to address.

Recognition of the three-term contingency provides two areas in which intervention may be applied to terrorism. First, terrorism is unlikely where access to the public is not granted. Therefore, a system that makes it known that terrorist acts will not be publicized should result in a decrease in terrorism. If a media climate had existed a few years ago such that the Unibomber could never have gained access to a large audience for his "manifesto," he may not have engaged in terrorists acts. An act is unlikely

70. Professor Jones's evolutionary perspective allows for some exploration beyond the level of prediction, but the legal and social strategies that he suggests as a follow-up to his analysis are less focused than those derived from a Behavior Analytic system specifically designed to guide intervention. Owen D. Jones, *Evolutionary Analysis in Law: An Introduction and Application to Child Abuse*, 75 N.C. L. REV. 1117, 1134-36 (1997). In his article, *Evolutionary Analysis in Law: An Introduction and Application to Child Abuse*, Owen Jones ends his evolutionary analysis at this level. Professor Jones, for example, in *Evolutionary Analysis in Law: An Introduction and Application to Child Abuse*, first establishes that an understanding of the evolutionary importance of preserving the life of one's own progeny leads to a prediction that perpetrators of physical abuse would be more likely to abuse and possibly kill the offspring of others rather than their own. *Id.* at 1174-81. In fact, Professor Jones's prediction is borne out. It has been reported that in at least one jurisdiction ninety percent of "child abuse/murder cases involve defendants who were the mother's boyfriends or stepfathers of the victim." Vivian Wakefield & Diana Marrero, *Angry Boyfriends Often to Blame in Child Homicides*, GA. TIMES-UNION (Jacksonville, Fla.), July 19, 2001, at A1. However, Professor Jones's analysis concludes with a list of suggested social service and regulatory interventions that seem overly broad such as "reducing the number of children living with stepparents" or "establishing a stronger preference for the biological parent in child custody actions." Jones, *supra* at 1234-36. Professor Jones's suggestions that penalties be increased or that the legal standard for corporal punishment be more strict for non-related abusers are based more soundly in the Behavioral Analytic realm.

in an environment that cannot give rise to a desired consequence. In addition, the three-term contingency suggests that keeping media coverage to a minimum, or even eliminating media coverage, following a terrorist event will make terrorist acts less likely in the future.

Unfortunately, limits on the freedom of the media to report and on the freedom of the public "to know" run contrary to our social value system as enumerated by the Constitution.⁷¹ As a result, instituting such limits as a means of regulating terrorism is difficult, if not impossible. However, an understanding of the behavioral contingencies involved may allow policymakers to consider other avenues to reduce terrorism. In addition, the citizens of a country targeted by terrorists could be encouraged to function in their daily lives as normally as possible to reduce the perceived social disruption induced by the terrorists' actions, thereby removing one of the social reinforcers for the terrorist behavior. Although these actions cannot repair the damage caused by a terrorist attack, they may allow a group to affect the likelihood of future terrorist attacks.

V. CONCLUSION

By opening the door of legal theory to welcome other areas of inquiry, Professor Owen Jones has done the law a great service. An appreciation of evolutionary principles allows for a deeper understanding of the root of those social values that have guided the establishment of modern legal systems. In addition, Professor Jones's analysis leads to a greater understanding of the etiology of the actual behaviors that the law seeks to regulate. A consideration of Behavior Analysis adds to Professor Jones's work by providing a basis both for making predictions about patterns of legal systems and human behavior within those systems and for offering clues into ways of enhancing the law's effectiveness. Those who work to make the law more effective at modifying resilient behaviors could look to the behavioral contingency for ideas of how the law might best intervene. But this is only one example of how Behavior Analysis can contribute to an understanding and designing of the law. There are many others. For example, modeling, or the learning by one organism through observation of another operating under a particular contingency, offers a paradigm for understanding how punishment of one may act as a deterrent for another. A fuller exploration of the factors that enhance the effectiveness of modeling could be invaluable in the design of a more effective deterrence system of punishment for crime. Similarly, the concept of rule-governed behavior, or behavior in response to a description of a contingency (i.e. the "rule" or a "law"), rather than the actual contingency itself, has obvious implications for the application and

71. Raphael F. Perl, *Terrorism, the Media, and the Government: Perspectives, Trends, and Options for Policymakers*, at <http://www.fas.org/irp/crs-terror.htm> (Oct. 22, 1997).

effectiveness of the law. An appreciation of how the phrasing of a law or the relationship between the law and the actual contingency it describes would allow laws to be more effective, both in promoting desirable behavior and reducing undesirable behavior.

Now that Professor Jones has invited us to journey beyond the scope of our own libraries, a fuller exploration of many areas of inquiry can be broached. The law is certain to gain from this new adventure.