

BEHAVIORISM AND PUBLIC POLICY: B. F. SKINNER'S VIEWS ON GAMBLING

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If the gambling establishment cannot persuade
a patron to turn over money with no return,
it may achieve the same effect by returning
part of the patron's money on a variable-ratio schedule.

-Skinner, *Science and Human Behavior*

ABSTRACT: The spread, regulation, and social side effects of gambling are major public policy issues. Although not presented systematically, extensive remarks about the nature of gambling appear in the works of B. F. Skinner. These are explicated in two broad categories: Skinner's explanation of gambling, and his argument(s) against gambling.

In America, gambling is becoming as ubiquitous as drinking and gunfire. Described as the private sector growth industry of the 1990s, the gambling enterprise, or "gaming" as the industry prefers to describe itself, promises to place a casino within easy driving distance from any populated point in the United States. Less than 25 years ago casino gambling and many other forms of legalized gambling were limited to a single state so isolated by its desert expanse that it was known only for the testing of atomic bombs, quick divorces, and 24-hour casinos. Today, the largest metropolis in the state of Nevada promises to grow to two million persons from its mere 250,000 of the mid-1970s. Casino-style gaming spread first to Atlantic City and then to boats on navigable rivers, to Native-American reservations, to any city or region that would solve with gaming whatever economic or social problem that exists locally.

In 1995 an estimated \$500 billion dollars were legally wagered in the United States, whether in casinos, at race tracks, sports rooms, or in state lotteries. This compares to less than \$20 billion put at risk 20 years earlier, and to the current annual personal expenditure of \$63.5 billion for higher education, \$47.2 billion for tobacco products, and \$23.4 billion for barber and beauty shop services. Only two states, Utah and Hawaii, have held out against the spread of gambling in the last two decades. A total of 24 states now have some form of casino gambling, and 37 have lotteries.

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The history of governmental attempts to control and regulate gambling, both in the states and abroad, are extensive and periodic (Collins, 1996). Following the enactment of the first of the state lotteries and the potential for a wave of additional legal gambling opportunities, the United States Congress established the Commission on a National Policy on Gambling in 1976. One of its most widely cited findings was the result of a contracted survey which determined that the national lifetime prevalence rate (the percentage of the population that at some point in their life would develop problems due to gambling) was less than one percent, with a substantially higher rate in Nevada (2.5%), where gambling opportunities were widely available. More recent analysis has updated these projections based on a meta-analysis of survey studies conducted during the past twenty years. Shaffer, Hall, and Bilt (1997) estimate that the lifetime prevalence of clinically significant consequences from gambling is 1.6 percent for adults in the United States, and that an additional 3.9 percent of adults have problems with gambling.

To address social consequences from the spread of gambling, the National Council on Problem Gambling was established in the late 1970s, and was the force behind the inclusion of pathological gambling as a mental disorder in the 1980 revision of the *Diagnostic and Statistical Manual of Mental Disorders* of the American Psychiatric Association. The Council also is the publisher of the *Journal of Gambling Studies* (formerly *Journal of Gambling Behavior*), and has a number of state affiliates. Many years earlier, in 1957, Gambler's Anonymous, a self-help group modeled after the 12-step program of Alcoholic's Anonymous, was begun.

In anticipation of renewed efforts to regulate and restrict gambling, the gaming industry founded the American Gaming Association (AGA) in June, 1995. It has the twin avowed purposes of advocating for, and educating about, gaming. The AGA began with 17 member companies, and has grown to more than 90.

Finally, in 1996, the nation was again poised to analyze gambling behavior. Congress returned to the question of gambling by establishing a nine member national panel, named the National Gambling Impact Study Commission, with members appointed by the President. The commission began its work in late 1997 by examining Native American casinos, pathological gambling, and the general growth and impact of the industry.

Discussions of gambling, whether about pathological or recreational, frequently cite B. F. Skinner's analysis. In fact, no other contemporary public policy issue provides such an isometric fit with the principles of behavior analysis as gambling: an easily counted repetitious behavior which is maintained by its consequences. The purpose of this paper is to review the observations of one of America's leading psychologists of the last half-century on gambling—a leisure activity which has emerged during that period as a principal pastime and industry, and which has, as a consequence, become a primary public policy problem at century's end. An earlier publication (Knapp, 1976) reviewed the evidence in support of an operant analysis of gambling behavior by examining the role of discriminative stimuli, response priming and reinforcer sampling, schedules of reinforcement, conditioned reinforcers, response cost, and variable magnitude of reinforcement. Another (Knapp & Lech, 1986) surveyed the literature that employs a functional perspective in treatment programs for pathological gamblers. The discussion in the present paper is limited to

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B. F. Skinner's own statements on gambling in order to understand his analysis and place it in the broader context of his work. Skinner's views remain the classic statement of radical behaviorism. It is worth our effort to understand his behavior analytic formulation of the critical public policy issue of gaming even though future developments in the conceptual, experimental, and applied analysis of behavior might require it to be modified (Rachlin, 1990). Following a brief overview of Skinner's position, his argument(s) against and his analysis of gambling are explicated.

Skinner's Earliest Statements on Gambling: Explanation

B. F. Skinner's first two works, *The Behavior of Organisms* (1938) and *Walden Two* (1948), contained no mention of gambling. It is in the general 1953 work, *Science and Human Behavior*, that the first discussions about gambling appear. In an early section of *Science and Human Behavior* Skinner presents what might be loosely termed "an explanation of gambling behavior," although his discussion arises in the context of contrasting the power of a fixed-ratio (FR) schedule of reinforcement (one in which a response is reinforced after a given number of responses) with a variable-ratio (VR) schedule of reinforcement (in which a response is reinforced after a variable number of responses around a given mean). Variable-ratio schedules, Skinner explains, are more "powerful" than fixed-ratio schedules in a variety of ways, the most important of which is the amount of behavior generated per reinforcer, and its persistence in the absence of reinforcement. Skinner uses gambling to illustrate the power of VR schedules. He writes, "the efficacy of such schedules in generating high rates has long been known to the proprietors of gambling establishments" (1953, p. 104). Thus, the first mention of gambling in Skinner's writings is to illustrate something more fundamental about his analysis of behavior rather than to explain gambling behavior per se; nevertheless, Skinner and many other radical behaviorists accept the VR schedule as an explanation of gambling.

Of course, it is not precisely true that gambling devices operate on a VR schedule of reinforcement, at least not as that schedule has come to be operationalized in operant laboratories. The traditional slot machine and other gambling devices have a constant probability of payoff for any given pull of the lever (or bet); this is not true for the VR schedule. In the VR schedule, the probability of payoff increases with each successive pull (response) since the last payoff. The distinction between a VR schedule and one with a constant probability of payoff is made by referring to the latter as a random ratio (RR) schedule of reinforcement. This distinction has practical importance because a VR slot machine would be a game of skill to the degree that the player may estimate where he or she is in a "run," if a variable number of coins is allowed to be played at each pull (or wager). The difference between RR and VR schedules has been noted by operant psychologists (Catania, 1968), and both schedules have been examined extensively for their effects on the behavior of lower organisms (Thompson & Grabowski, 1972). Only a few human studies of these schedules are available, however (see Hurlburt, Knapp, & Knowles, 1980). Skinner was obviously aware of the distinction, but commonly used the more general expression VR schedule, and that practice is followed here.

The analysis of gambling as an appreciation of the VR schedule of payoff constitutes Skinner's most important contribution to a discussion of gambling. In fact, most of his later observations follow from the nature of behavior when it is controlled by a VR schedule. For example, Skinner explains that a VR schedule can make an otherwise weak reinforcer very effective (Skinner, 1953, p. 396; 1971, p. 170).

Many pages go by in *Science and Human Behavior* before another discussion of gambling appears in the latter portion of a section of chapters devoted to the controlling agencies of a culture. The relevant chapter is one entitled, "Economic Control." Here Skinner proposes a definition of gambling as "a system of economic control in which the individual is induced to pay money in return for a reinforcement the value of which is too small to lead to exchange under other schedules" (1953, p. 397).

Why does Skinner take up a discussion of gambling in a relatively short chapter on economic control? Surely the topic, particularly at the time of his writing in the early 1950s, does not warrant such space based upon the total market influence of gambling which was then limited to horse tracks and the early Nevada casinos. Again, Skinner is using gambling behavior as a way to make a larger point—namely, that an "important factor contributing to the probability that an individual will turn over money, either for other money or for goods, is the schedule on which he is reinforced for doing so" (1953, p. 396). His discussion of gambling goes on for several pages, but it is clearly included to capture the larger point.

Thus, all of Skinner's early discussions of gambling occur because they are examples or illustrations of larger points of analysis. They are offered to demonstrate the power exerted by the schedule of the payoff (reinforcer) and the particular power of a schedule in which the payoff for responding occurs after an unpredictable and varied number of responses. Such a schedule, whether in a laboratory setting, as part of a gaming device, or as an aspect of the natural environment, leads the organism under its control to respond at high rates for relatively little reinforcement, and to persist in long periods of responding when no payoff is forthcoming.

Skinner's Second Observation Concerning Gambling: Argumentation

Skinner's earliest remarks on gambling may be described as "schedule" related. His second observation concerning gambling appeared only late in his works and, so far as can be determined, appeared only once. In 1980, selections from the extensive notebooks that Skinner had kept over the years were published (Skinner, 1980). In one note he records his objection to gambling as a form of leisure activity. His argument in this regard has been largely ignored by those interested in Skinner's views of gambling or in his views of morality, yet his opinion appears to be strongly held.

In *A Matter of Consequences*, the third volume of his autobiography, Skinner made these remarks in connection with gambling, the only mention I have found in the three volumes:

I was no stranger to variable-ratio schedules. . . . They had sustained my interest in literature, art, and music, and they explained my dedication to my laboratory and the

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desk at which I wrote papers and books. But I resented the gambling enterprises which used them to take money away from people. State lotteries angered me. Legislatures were afraid to raise taxes, but could turn to lotteries because people were said to be free to buy or not to buy tickets. (1983, p. 371)

This passage is one of the few places in any of Skinner's writings where he describes himself as angered by something.

More importantly, however, it moves Skinner from the realm of behavioral psychology to that of social criticism and policy. Skinner's analysis of gambling as behavior maintained by VR schedules of reinforcement and his argument for the inappropriateness of gambling as a leisure activity are not unrelated. In fact, the analysis of VR schedules and the behavior they induce is critical to his argument for rejecting gambling on "moral" grounds. His argument rests on the kind of behavior engendered by the schedule.

We have arrived at a point where, in a simple sense, we know Skinner's views on gambling. Therefore, the remainder of the paper fills in the details and sketches out the implications of his position. In doing so, it might be reasonable to begin with an extended discussion of VR schedules and their implications, since his objections to gambling are premised on his analysis of VR schedules. For the moment, however, I have elected to forgo these discussions and turn instead to his more interesting remarks on the detrimental consequences of gambling as a leisure activity.

The Basis of Skinner's Argument Against Gambling

In his works Skinner has repeatedly observed that the VR schedule of reinforcement is operative in a wide variety of activities, hence so are its effects. "The same variable ratio schedule affects," says Skinner, "those who explore, prospect, invent, conduct scientific research, and compose works of art, music, or literature . . ." (1974, p. 61). In *Beyond Freedom and Dignity* (1971) he wrote, "The same schedule explains the dedication of the hunter, fisherman, or collector. . ." (p. 171); and in *Notebooks* he mentions "hunting, fishing, research, exploration, and writing" (1974, p. 82). Skinner observes parenthetically that high rates of behavior in connection with these activities are often attributed to "dedication rather than compulsion or irrationality" (1974, p. 61). To this list of culturally valued activities, Skinner might have added such leisure pastimes as rock hunting and book collecting. For these and many other leisure activities involve a schedule of reinforcement that is variable and unpredictable in producing its "reward."

How does Skinner develop an argument based upon a VR schedule that is telling against gambling, but not against the many other valued activities maintained by VR scheduled reinforcement? One line of attack available to Skinner is the distinction between a contrived reinforcer and the natural reinforcing consequence of an activity or behavior. Painting, composing, and writing are often held to be reinforcing for their own sake. Thus, they differ from gambling, not with respect to the schedule of reinforcement which maintains them, but in the nature of the ends for which one engages in them. Psychologists and social critics often speak of intrinsic versus extrinsic rewards in this regard. Persons may gamble for play money at a "Monte Carlo Night," and children sometimes play poker for candies and convicts

for cigarettes. It is doubtful, however, that Las Vegas or Atlantic City could survive on the "intrinsic rewards" associated with slot machines, roulette wheels, and the tossing of dice. Skinner does not rest his argument on the value of "intrinsic" over "contrived" reinforcers, however, inasmuch as he has repeatedly defended the value of contrived reinforcers under certain circumstances (see especially Skinner, 1977a).

For Skinner, the important difference between gambling and other activities similarly maintained by VR schedules is not the nature of the ultimate reinforcer-many artists, composers, and writers work for a living; the telling difference lies "in the contrived contingencies of a gambling enterprise, [where] winning is not contingent on useful, let alone ultimately useful, behavior. "Gambling is wrong," says Skinner, "not because it ruins some people or is tabooed by a church, but because it commits a person to repetitious, stultifying behavior" (1980, p. 82). By Skinner's reckoning, patrons of Las Vegas and Atlantic City and other places where casinos reign are "rendered useless or ineffectual and made to appear stupid and ridiculous," the definition of stultifying. It is probably not embarrassment from such an appearance that Skinner wishes people to avoid, however, but rather activities that pass the time without changing the person. We may leave the pond with no fish, or the forest without any game, but in the latter instance we have exercised and in the former perhaps read a book, especially if the fish failed to "bait" us. Notice that Skinner's position is not merely addressed to persons who succumb to the "pathology" of compulsive gambling, but rather to those who rely upon gambling as a valued recreational activity relative to other activities.

Undoubtedly, some will see in Skinner's construction of gambling as a frivolous activity the specter of the prude and the puritan-the presence of the protestant ethic. In fact, in the note where Skinner recorded his views, he asks himself, "Am I being a nineteenth-century prude in objecting to gambling?"(1980, p. 81). It would seem that Skinner is claiming leisure activities must be productive activities. Is this so? No, at least not in the sense that a product must result from them. But Skinner's position seems to entail the notion that something about the person should be different, changed. The activity should leave the person with something more than lost time, as many VR scheduled activities do.

Another argument against gambling, at least against state sponsorship of gambling, may be derived from Skinner's analysis of behavior. From the Skinnerian perspective, gambling, to the degree that the game involves little or no skill, rests upon superstitious behavior-behavior maintained by adventitious pairing of response and reinforcement. One may pose this question: Should the state engage in activities that lead a goodly portion of its citizens to become increasingly superstitious?

Skinner explored the issue of state-created superstitious behavior in a set of remarks prompted by the initiation of the New Hampshire lottery (Skinner, 1977b). They serve to make a caricature of the states' role in promoting gambling by its citizens. He titled his views, "Freedom, at last, from the burden of taxation," and they appeared as a letter to the editor of the New York Times. They were a proposal for employing the school system to turn the populace into gamblers who willingly and voluntarily participate in lotteries which support the nation's defense, educational system, state and local governments, and federal social programs, thus making taxes

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unnecessary. The "virtue of voluntary action," as Skinner terms it, will support, "a society of free and happy people" (Skinner, 1977b, p. 29).

Skinner says his proposal is based on the realization that "people are not born gamblers. They become gamblers when exposed to certain sequences of lucky hits. Why should our schools not be used to expose everyone to such sequences," Skinner asks (1977b, p. 29). His plan calls for the use of the behavioral technology principles outlined in *Walden Two*. "In kindergarten the tickets will cost a penny and prizes will be of the order of a dollar, with the grand prize now and then of five dollars. The odds will be extremely favorable; at this stage the state will lose money, but of course the amounts involved will be trivial" (1977b, p. 29).

The ratio would be stretched across the grade levels with prizes of increasing value but with decreasing odds. By the time the students are seniors in high school "the grand prize will be awarded in a ceremony on state-wide television with an admired figure participating" (p. 29). After some years the "result will be a yearly crop of high school graduates who will continue to buy lottery tickets for the rest of their lives..." (p. 29).

Skinner's criticism here is directed at gambling only as a byproduct. He is instead after those who insisted that such behavior is "voluntary" or a reflection of "choice." For our purposes, however, it is the criticism of lotteries themselves that is relevant. To Skinner, and he is certainly not alone in this regard, lotteries are a method of taking money from the citizens without evoking complaints or countercontrol efforts. In such a view, lotteries are a kind of deception passed off on the citizens of the state who, to be sure, know that one cannot get something for nothing, at least not until now. The state as the promulgator of lotteries necessarily participates in a form of regressive taxation, promotion of superstition, and manipulation of contingencies (Lyons & Ghezzi, 1995), often in a manner that borders on deceptive advertising.

The VR Schedule of Reinforcement as an Explanation of Gambling

Skinner has defined gambling as "a system of economic control in which the individual is induced to pay money in return for a reinforcement the value of which is too small to lead to exchange under other schedules" (1953, p. 397). As he suggests, "if a man cannot sell a car to one man for \$3,000, he may still sell it to 3,000 men for \$1 if the culture has provided the necessary history of variable-ratio reinforcement when its members have 'taken chances'" (p. 397). Elsewhere Skinner puts it more simply, "a gambling enterprise pays people for giving it money--that is, it pays them when they make bets. But it pays on a kind of schedule which sustains betting even though, in the long run, the amount paid is less than the amount wagered" (1971, p. 33).

Skinner recognizes many of the traditional variables analyzed in determining the probability of a person placing a bet (for example, see Skinner, 1953, p. 396). An appreciation of his unique contribution requires one to understand that the long term outcome, the net gain, is not relevant in explaining the moment-to-moment responding of someone under the control of a VR schedule. This is because the momentary effect of the consequences, not their total summed across time, controls

the behavior of the subject. Immediate consequences control behavior. Long-term outcomes are likely to be effective only when they are mediated in some way so that contact is made with the behavior as it occurs. Most discussions of pathological gambling are in terms of long-term outcomes. "The long-term net gain or loss," according to Skinner, "is almost irrelevant in accounting for the effectiveness of this schedule" (1953, p. 104). Or as he puts it in *About Behaviorism*, "the ultimate loss (the 'negative utility') does not offset the effect of the schedule" (1974, p. 56), which, as the reader may recall, is to produce extremely high and persistent rates of behavior--doing something very often for very little return.

The ratio in a VR schedule can be "stretched." When Skinner speaks of "stretching" the VR schedule, he is referring to the laboratory technique of slowly and gradually increasing the mean value of the ratio, from a starting point at which a steady rate of responding by the organism is maintained, until ratios are reached at which energy expended by the laboratory organism is greater than energy obtained from the food reinforcer. In games of chance, "at first the mean ratio may be favorable to the bettor; he 'wins.' But the ratio can be stretched," Skinner suggests, "in such a way that he continues to play even when he begins to lose. The stretching may be accidental (an early run of good luck which grows steadily worse may create a dedicated gambler), or the ratio may be deliberately stretched by someone who controls the odds" (1971, p. 33).

In *Science and Human Behavior* Skinner observes, "A mean ratio can be reached at which reinforcements occur so rarely that the pigeon or rat spends more energy in operating the device than he receives from the reinforcement with food, while the human subject steadily loses money" (1953, p. 397). Earlier he had commented, "A pigeon may respond as rapidly as five times per second and maintain this rate for many hours" (p. 104). Skinner observes that the con man or "the professional gambler leads his victim on by building a favorable history of reinforcement He begins with a low mean ratio under which reinforcement occurs so frequently that the victim wins. The mean ratio is then increased, either slowly or rapidly depending upon how long the gambler plans to work with a particular victim" (1953, p. 397).

The monetary reinforcers delivered by the VR schedule are the critical consequence in maintaining the gamblers' behavior, but they are not the only relevant consequences. There are "auxiliary" or "conditioned" reinforcers associated with each kind of gambling device or game (Skinner, 1953, p. 104, 397). The observation is a familiar one that Skinner has made in several places. In *Science and Human Behavior* he notes, "'almost hitting the jackpot' increases the probability that the individual will play the machine, although this reinforcer costs the owner of the device nothing" (1953, p. 397). In *About Behaviorism* he adds, "the slot machine, the horse race, the Bingo game--all permit the player to come close without actually winning" (1974, p. 235). In his *Notebooks* Skinner calls attention to the fact that the experience of almost hitting the jackpot, or having a "near miss" must be mildly punishing. "An emotional component is clear . . . if one loses at the very end of a contest--the effect is felt as disappointment, a letdown from the elevation of impending reinforcement. But the net effect must be reinforcing, or the designers of gambling systems are wrong" (1980, p. 235). The only way Skinner has to account

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for individual differences in gambling behavior among people--variations in attraction to gambling and varying degrees of persistence at it--is by reference to their individual history of reinforcement (1953, p. 396; 1974, p. 60-61). For many persons Skinner's analysis is weak at this point, for individual histories of reinforcement are often difficult to obtain, but at least they have the virtue of being the kind of thing one might obtain objectively.

Explanations of Gambling Rejected by Skinner

Skinner briefly reviews the explanations of gambling that he finds vacuous. For example, excitement as a motive for gambling is rejected because the "excitement" that the gambler experiences is seen as a "collateral" byproduct of the VR schedule. **Nor** do gamblers play to win, dominate, or master, for as Skinner notes, they seldom do. Nor do gamblers play to punish themselves; the loss of money may be a consequence of gambling, but it does not follow that such losses are reinforcing. The point is made clear when one realizes it is not the consequences at the end of play that are relevant to maintaining play, but the immediate effect of the schedule on the behavior of the gambler.

Nor is Skinner impressed with a "rule" analysis of gambling. He does allow for the possibility of rule-governed behavior, and certainly some accounts of gambling have attempted to formulate the behavior of the gambler in terms of a set of rules (rational or irrational) that the gambler is following. However, in Skinner's view "the behavior of the gambler is either not calculated or calculated from erroneous data, such as the maturity of the chance" (Skinner, 1980, p. 63).

Why cannot rational and intelligent people stop gambling by simply citing a rule to themselves, such as, "Stop gambling if you don't want to lose"? As Skinner explains, rules come to control behavior only when they themselves are maintained by consequences, thus such a rule "will have an effect only if (like all rules) there are special contingencies to maintain the rule-governed behavior" (1974, p. 330). Skinner discusses this issue in a note entitled, "Those who gamble punish themselves," in which he poses the question, why do they then continue to gamble in the presence of the "growing aversive stimuli"? (i.e., losses) (1980, p. 330). Gamblers Anonymous is one effort to provide a set of special contingencies for maintaining the rule, "I don't gamble."

The final comments by Skinner on gambling appear in *Enjoy Old Age*, a book of behavioral suggestions for later life, in a chapter entitled "Having A Good Day." "Many old people," he and Margaret Vaughn write, "turn to gambling for a touch of excitement"--excitement produced by the "unpredictability of the results" (1983, p. 102). There is a caution, however, since "gambling adds to the enjoyment of life . . . only if you stay within your means, placing only the bets you can afford to lose." The rough odds of several types of games are then reviewed and again it is explained that "people do not gamble because they win," but "because of the unpredictability of the results" (p. 102). There is no suggestion, other than financial loss, of the potential consequences of gambling. The last several paragraphs, however, lead the reader in other directions--watching sports and soap opera on television and reading good literature--all of which also involve unpredictable schedules of reinforcement.

Summary and Comment

From Skinner's perspective the most fundamental feature of gambling is not the form of the game, a ball rolling around a wheel, cards turned over on a table top, brightly colored reels spinning inside a machine, but how the consequences of the game are scheduled. Change the schedule, and the game loses much of its power to attract and hold players. Other activities may involve similar schedules, which by their nature produce high rates of behavior and resistance to long periods without reinforcement. But many of the other activities maintained by a variable-ratio schedule result in a changed person and a benefit for the culture---perhaps a new discovery, book, work of art, or merely a fish for dinner. Gambling as recreation is deficient not from failing to fill the time, nor from substituting distraction for uncomfortable feelings of whatever origin, but for leaving us as we were--sans our financial losses. Some readers may be inclined to decontextualize Skinner's opposition to gambling as merely a reflection of the protestant ethic (Bjork, 1993; Smith, 1996) which formed many of his early experiences, rather than as a formulation that necessarily follows from a behavior analysis of gambling. Undoubtedly, no adequate and complete analysis of gambling from a behavior analytic perspective is currently available (but see Rachlin, 1990). However, the limited purpose here was to sketch Skinner's own contributions, brief as they were, and to show something of their interdependency on his functional analysis of behavior and of the intensity with which he held his opinions on gambling. There are, to be sure, occasions when he seems to entertain the possible utility of gambling as a recreational activity or as an incentive within a larger motivational system (1980, p. 299). But in the final analysis, he "resented the gambling enterprises . . . used to take money away from people" (1983, p. 371).

Each fall the new editions of introductory psychology textbooks arrive. Recently, I surveyed 10 textbooks. In the section that described VR schedules, six of them included photographs of people playing slot machines, three discussed slot machines as an illustration of variable-ratio schedules, only one made no mention of gambling in explaining schedules of reinforcement. Whatever the ultimate value of Skinner's analysis of gambling may be, he appears to have forever reserved a place in introductory psychology textbooks for pictures of people playing slot machines (a now nearly antiquated form of play, replaced by video poker machines). For this the owners of Las Vegas and Atlantic City casinos may be grateful. On the other hand, the pictures are most often in the section of the text that describes simple animal learning--perhaps in this we find the lasting legacy of Skinner's views on gambling.

REFERENCES

- Bjork, D. W. (1993). *B. F. Skinner: A life*. Basic Books: New York.
- Cantania, A. C. (1968). (Ed.). *Contemporary research in operant behavior*. Glenview, IL: Scott, Foresman, 1968.
- Collins, A. F. (1996). The pathological gambler and the government of gambling. *History of the Human Science*, 9, 69-100. <http://dx.doi.org/10.1177/095269519600900304>

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- Hurlburt, R. T., Knapp, T. I., & Knowles, S. H. (1980). Simulated slot-machine play with concurrent variable ratio and random ratio schedules of reinforcement. *Psychological Reports*, 47, 635-639. <http://dx.doi.org/10.2466/pr0.1980.47.2.635>
- Knapp, T. I. (1976). A functional analysis of gambling behavior. In W. R. Edington (Ed.), *Gambling and society* (pp. 276-294). Springfield, IL: Charles C. Thomas.
- Knapp, T. J. & Lech, B. (1987). Pathological gambling: A review with recommendations. *Advances in Behaviour Research and Therapy*, 9, 21-49. [http://dx.doi.org/10.1016/0146-6402\(87\)90006-3](http://dx.doi.org/10.1016/0146-6402(87)90006-3)
- Lyons, C. A. & Ghezzi, P. M. (1995). Wagering on a large scale: Relationships between public gambling and game manipulations in two state lotteries. *Journal of Applied Behavior Analysis*, 28, 127-137. <http://dx.doi.org/10.1901/jaba.1995.28-127>
- Rachlin, H. (1990). Why do people gamble and keep gambling despite heavy losses? *Psychological Science*, 1, 294-297. <http://dx.doi.org/10.1111/j.1467-9280.1990.tb00220.x>
- Shaffer, H. J., Hall, M. N., & Bilt, J. V. (1997). *Estimating the prevalence of disordered gambling behavior in the United States and Canada: A Meta-analysis*. Boston: Fellows of Harvard College.
- Skinner, B. F. (1938). *Behavior of organisms: An experimental analysis*. New York: Appleton-Century-Crofts.
- Skinner, B. F. (1953). *Science and human behavior*. New York: Macmillan.
- Skinner, B. F. (1971). *Beyond freedom and dignity*. New York: Bantam/Vintage.
- Skinner, B. F. (1974). *About behaviorism*. New York: Knopf.
- Skinner, B. F. (1977a). The contrived reinforcer. *The Behavior Analyst*, 5, 3 - 8.
- Skinner, B. F. (1977b, July 26). Freedom, at last, from the burden of taxation. *New York Times*, p. 29.
- Skinner, B. F. (1980). *Notebooks* (edited with an introduction by Robert Epstein). Englewood Cliffs, NJ: Prentice-Hall, Inc.
- Skinner, B. F. (1983). *A matter of consequences*. New York: Knopf.
- Skinner, B. F. & Vaughn, M. (1983). *Enjoy old age*. New York: Norton.
- Smith, L. D. (1996). Situating B. F. Skinner and behaviorism in American culture. In L. D. Smith & W. R. Woodward (Eds.), *B. F. Skinner and behaviorism in American culture* (pp. 294-315). Cranbury, N. J.: Associated University Presses.
- Thompson, T., & Grabowski, I. G. (1972). *Reinforcement schedules and multioperant analysis*. New York: Appleton-Century-Crofts.