

# Analysis of Gambling Behavior

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Volume 2 | Issue 2

Article 3

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2008

## Commentary - Gambling, Shaping and Ratio Contingencies

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### Recommended Citation

Catania, A. Charles (2008) "Commentary - Gambling, Shaping and Ratio Contingencies," *Analysis of Gambling Behavior*. Vol. 2 : Iss. 2 , Article 3.

Available at: <https://repository.stcloudstate.edu/agb/vol2/iss2/3>

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## COMMENTARY

### GAMBLING, SHAPING AND RATIO CONTINGENCIES

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Fantino & Stolarz-Fantino rightly point out that pathological gambling often seems paradoxical, in the sense that the behavior persists despite powerful contingencies operating against it. They also argue that verbal behavior probably plays a major role in pathological gambling. I am strongly inclined to agree with them.

My guess is that the dependence of an individual's gambling on that individual's verbal behavior will depend not only on what is said but also on how the verbal behavior was established. To the extent that correspondences between verbal and nonverbal behavior matter, it probably makes a difference whether the gambler says, "I'm on a winning streak" or "I'd better quit while I'm ahead." Perhaps more important, it probably also makes a difference whether the gambler says it based on recent events in the current gambling environment or because someone else has just said it. Correspondences between verbal and nonverbal behavior are more likely when the verbal behavior has been shaped than when it has been established by instruction (e.g., Catania, Lowe, & Horne, 1990; e.g., Catania, Matthews, & Shimoff, 1982). It may therefore be worthwhile for experimental analyses of verbal behavior in gambling to address the sources of the verbal behavior as well as its topographies.

Fantino & Stolarz-Fantino make it clear that a crucial issue in the analysis of pathological gambling is the range of individual differ-

ences. The relevant histories are not easily accessible, so it is not surprising to look to properties of the organism, and for Fantino & Stolarz-Fantino a major candidate is in the relative steepness or shallowness of discount functions. Discount functions, however, are economical ways to describe patterns of behavior; they do not explain those patterns. Fantino & Stolarz-Fantino recognize this, but I am leery of accounts that appeal to something within the organism, even if the account might be regarded mainly as metaphorical (and I must acknowledge having occasionally indulged in such metaphors in my own writings).

The language of choice too easily leads to invented inner entities. If words such as *choice* and *decision* are followed, for example, by statements that an organism first chooses or decides and then makes a response based on that choice or decision, a way-station has been created that can distract us from environmental contingencies in their interactions with behavior (Skinner, 1950; 1963). Fantino & Stolarz-Fantino are reasonably careful, but I worry that some who approach the relevant behavior analytic literature from other perspectives may fall into such cognitive traps.

One consequence of such language may be a neglect of basic environmental contingencies. Fantino & Stolarz-Fantino are concerned with delays and other contingencies, but give scant attention to the literature on the effects of schedules of reinforcement (Ferster & Skinner, 1957). Random- or variable-ratio schedules capture the sorts of contingencies that operate in gambling, so it is appropriate

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to ask why the experimental analysis of behavior does not give them more attention. After all, these contingencies can engender enormous quantities of behavior, and conditioned reinforcers can vastly amplify their effects (Findley & Brady, 1965). These facts about behavior are presumably not lost on those who design the workings of casinos.

Perhaps a major reason for the neglect of such basic contingencies in our analyses of gambling behavior lies with the large variability in gambling behavior. If these contingencies are so powerful and so ubiquitous, how can it be that some become pathological gamblers whereas others seem immune to the lure of the wager? Would we expect such individual differences in the behavior of pigeons or rats or even chimpanzees?

But anyone who has worked with large ratios will tell you that you cannot just drop an organism into a chamber with appropriate contingencies arranged and expect lots of behavior. Instead, the behavior must be shaped. You start with relatively small ratios, and only gradually build them to the point where very long runs of responses as well as some very short ones are followed by reinforcers (I am taking it for granted here that the reader is familiar with the essential properties of random-ratio schedules).

Skinner recognized the necessity of shaping in establishing random-ratio performance in a satirical op-ed piece (Skinner, 1977) in which he proposed that taxation could be eliminated if lottery contingencies were stretched over successive terms of school, so that all adults would eventually become chronic gamblers (Skinner offered many clues that his piece was a take-off on Jonathan Swift's 1729 satire, "A modest proposal," but subsequent letters to the editor suggested that too many readers missed the joke).

The key may then lie in the variability of gambling contingencies. At issue are the effects on very large populations of individuals and not just on a very small number of labora-

tory subjects (furthermore, experiments in the laboratory have only sometimes used true random-ratio contingencies, as opposed to recycling sequences of ratios or other arrangements better suited to the technologies available in the early days of schedules research). Expose thousands or millions of individuals to ratio contingencies and it will be inevitable that some will have the bad luck (or good, depending on one's perspective) to lose so often in their early exposures to gambling contingencies that their gambling behavior remains weak over extended periods of time. It will similarly be inevitable that some at the other end of these probability distributions will start out with the good luck (or, conversely, the bad, depending on one's perspective) to win often in early gambling experiences, with the wins gradually tapering off only after having engendered a rate of gambling sufficiently high that it persists over long runs of losses (and so is labeled pathological by those without access to the relevant history).

As already mentioned, I strongly suspect that other variables (verbal behavior for one) may enter into pathological gambling, but we should exhaust the potential effects of environmental contingencies before we invest great effort on research that does not take those contingencies into account. Once we assess the likelihoods of different sorts of histories that can be created by various gambling contingencies, we may be able to make some predictions about the prevalence of pathological gambling to be expected in large populations, and we may also be able to study whether patterns of gambling behavior share properties with random-ratio behavior in the laboratory (e.g., break-and-run patterns of responding in extinction as a function of history).

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