

# **The WAGER Vol. 9(20) - The Telltale Heart: Gambling, Expectancy, and Heart Rate**

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Smarty Jones ran to victory in the Kentucky Derby on May 1st and again in the Preakness Stakes last weekend, accompanied by a frenzy of human emotion. According to the Associated Press, "At the Derby, the excitement almost seemed too much for the 78-year-old Chapman [Smarty Jones' owner, who suffers from a lung ailment], who had to take a series of deep breaths to calm himself after his horse's victory" (Associated Press, 2004). Does the emotional fervor inspired by these races arise strictly from admiration for the livestock involved or might the millions of dollars wagered be a factor?

Much gambling research has focused on the cognitive processes that might affect gamblers' decision-making (e.g., WAGERS 5(42), 6(29), and 9(5)); new research, however, is providing insight into the physiological processes that take place when people gamble, and the relationship of these processes to gambling expectations and behavior. For example, research has suggested that level of physical arousal might be related to frequency and duration of gambling sessions (e.g., Griffiths, 1990, 1995). This week, the WAGER highlights a recent study by Ladouceur and his colleagues (2003) that expanded on this line of research by examining the relationship between the anticipation of monetary gain and arousal (i.e., heart rates) in video lottery terminal (VLT) players.

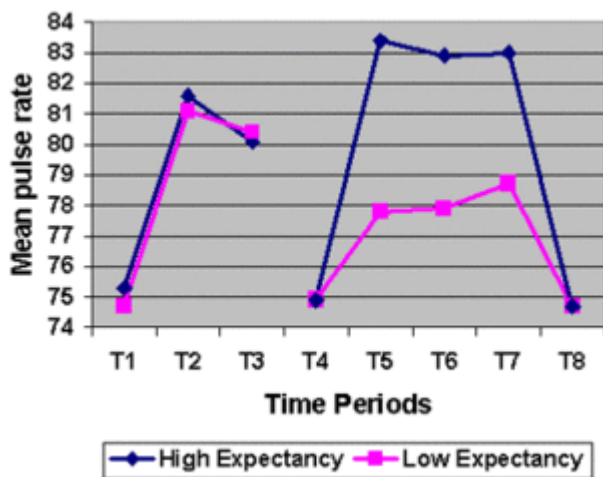
Ladouceur et al. recruited 34 (16 female) occasional (i.e., less than once per month) and regular (i.e., at least once per month) video lottery terminal (VLT) players through newspaper advertisements and fliers posted at Laval University in Québec. All participants were over age 18 (mean = 42.9, SD = 18.0) and were non-pathological gamblers according to the South Oaks Gambling Screen (SOGS, Lesieur & Blume, 1987). All subjects received \$10 for participating in the study, which involved playing a series of games on a "Swinging Bells" VLT1. The authors randomly assigned subjects to two experimental groups (9 men and 8 women each): high winning expectations or low winning expectations. Participants in the high winning expectations group were told that they could win up to an additional

\$40 by playing the VLT; subjects in the low winning expectations group believed they could only accumulate “credits” (i.e., no monetary gain) with a win.

The authors hypothesized that the high winning expectation group would experience elevated levels of arousal compared to the low winning expectation group. To test this hypothesis, investigators monitored subjects’ heart rate by electrocardiograph (EKG) while participants played the VLT. Each group started at rest (T1), then listened to instructions (T2) and familiarized themselves with the VLT machines by playing 50 games set at a 92% return (T3). After the first 50 games, subjects rested for one minute (T4), and investigators informed subjects that the machines would now yield a 200% payout (T5) and gave group-specific information about winnings (i.e., up to \$40 cash, or valueless “credits,” depending on group) (T5). Subjects had time to contemplate potential winnings (T6) and then played an additional 50 games (at the 200% payout; T7), and had one more period of rest (T8) (see Figure 1).

Controlling for players’ prior VLT experience and baseline pulse rate, Ladouceur et al. used an analysis of covariance (ANCOVA) to show that participants in the high expectancy group were significantly more likely to have an increased heart rate than those in the low expectancy group when informed of potential winnings (i.e., T5;  $F = 9.81, p < .01$ ), anticipating playing the last 50 games (i.e., T6;  $F = 8.63, p < .01$ ) and playing the last 50 games (i.e., T7;  $F = 4.48, p < .05$ ). Although Ladouceur et al. do not discuss this pattern in detail, Figure 1 also shows that both groups exhibit increased heart rate in response to the first set of instructions (i.e., T2); only during the second trial (i.e., the second set of instructions) does the low expectancy group fail to exhibit a strong increase.

**Figure 1. Mean pulse rate by time period (Ladouceur et al., 2003)**



There are several methodological limitations to this study. For example, the total study sample (N=34) is small and might not be representative of either the general population or the general gambling population; this likely precludes application of the current results to the wider gambling population. Further, these findings might not apply to the relationship between winning expectancies and arousal in pathological gamblers (i.e., individuals scoring 5 or greater on the SOGS), since problem and probable pathological gamblers were excluded from the study. Finally, and perhaps most importantly, the authors presented subjects with an unusual and perhaps unrealistic gambling condition (i.e., 200% payout and no possibility of loss). Subjects' responses, then, might represent anticipated monetary gain rather than gambling-related monetary gain and loss.

Despite these concerns, these results suggest that instead of the conventional wisdom that people gamble primarily for the excitement of the game (i.e., the action) the expectancy of monetary gain might be an important factor increasing arousal among VLT bettors in particular and gamblers in general. The patterns exhibited in this study (i.e., the change in reaction between T1-T3 and T4-T6 for the two groups) indicate that the relationship between winning expectancy and arousal might be most important in the continuation of gambling behavior once a game has lost its novelty. With further research, this finding could provide support for a model of gambling that includes defined relationships between expectancy, physiological arousal and gambling behaviors (e.g., frequency, duration). Is Smarty Jones getting excited about the Belmont? Perhaps, but it's more likely that Roy Chapman (Smarty's owner) is.

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## Notes

1 The “Swinging Bells” VLT machine displays nine symbols arranged in a 3×3 matrix. Players register a “win” by attaining three identical symbols in a row, either vertically, horizontally, or diagonally.

## References

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