Exploring the Buying Behaviour of "Good" and "Bad" Gambling Products

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ABSTRACT

Betting on Electronic Gaming Machines (EGMs, slots, fruit machines, pokies) is portrayed as being a highly addictive form of entertainment, and is often cited as having the highest rate of "problem gambling" among its users. The Australian State Governments are pursuing strategies to restrict EGM access on land-based facilities while the Federal Government has imposed a ban on EGM games for online use by most of those living in Australia. Lottery products, on the other hand, are viewed as "low risk forms of gambling" that have been allowed online. However, both Lotto and EGM play fit a normal pattern of repeat purchase (the NBD) found in many repeat consumer and business goods. An empirical analysis of data on Australians' gambling shows that most forms of gambling (Bingo, wagering) actually have a higher proportion of "problem gamblers" among their players than EGMs, and that the high co-morbidity of problem gambling with other problems questions the validity of present perceptions about the addictive labeling of EGMs.

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**Introduction**

In countries where it is allowed, gambling has long been a popular product category. In the US and Australia, more people report personally purchasing a gambling product than any other consumer product (Simmons, 1997; Roy Morgan, 2000). The most recent Australian Government survey on gambling found that 80% of Australians reported they had gambled in the last 12 months. About 60% of these gamblers had purchased a Lotto game and 44% had bought instant scratch tickets (Productivity

Commission, 1999). Poker ("Pokies") and other electronic gaming machines (EGM's) have the next highest penetration of reported play with 36% of the gambling population that gambled in the past year.

Australia has had legal EGM play in most states for over 10 years, and is alleged to have the largest number of EGMs in the world. On a per capita basis, Australia has about five times more EGMs than the US. Although the share of the Australian population playing Lotto far exceeds that of EGMs, Lotto products account for only 11% of the total gambling revenue in Australia. On the other hand, the 36% of the Australian population that played EGMs generated 52% of total gambling revenue (Productivity Commission, 1999), or five times more than lottery products. In addition, a relatively small proportion of EGM players accounts for most of the revenue. But is this unusual behaviour?

Although EGM play doesn't have the highest penetration of either the population or of "problem gamblers" (Bingo and wagering are much higher), it has been labeled the "distilled essence of gambling" or "crack cocaine of gambling" (National Gambling Impact Study Commission, 1999), with much political pressure focused on limiting its expansion in land-based venues and barring it from an online presence. This study provides an empirically based examination of Australians' reported play of EGMs, and compares it to other "acceptable" forms of gambling and non-gambling products. The comparison portrays a more objective evaluation of EGM play and challenges the leading perspective used to explain its buyers' behaviour.

## The Nature of Gambler Decision-Making

Most of the literature on gambler decision-making portrays a cognitive based, information processing individual who occasionally (about 1 to 3% of gamblers) exhibits compulsive behaviour . These compulsive gamblers are usually called "problem" or "pathological" gamblers because of the financial, legal and social costs associated with their level of gambling (Collins and Lepsley, 2003). This cognitive orientation has been specifically applied to both Lotto (Rogers, 1998; Miyazaki, Brumbaugh and Sprott, 2001) and EGM play (Griffiths, 1994).

The leading cognitive based paradigm for evaluating normal and problem gambling behaviour is Fishbein and Ajzen's (1975) Theory of Reasoned Action (TRA). This theory attempts to

identify the cognitively based precursors of gambling behaviour. Both East (1997) and Rogers (1998) have discussed the measures required to test the TRA model for Lotto gambling.

Oh and Hsu (2001) tested the TRA with a longitudinal design using a sample of regular gamblers from the State of Iowa in the USA. Information about the respondents' past and intended gambling behaviour was also requested. Although attitude was found to directly affect behavioural intention, it had no link to future gambling behaviour. Past behaviour was found to directly affect both the respondents' behavioural intention and future behaviour. Past behaviour was found to be twice as strong as behavioural intention on actual behaviour.

The finding that past behaviour has a stronger influence than attitudinal constructs on future behaviour is similar to the findings of Norman et al. (2000) in regard to physical exercise. Gambling is a frequently repeated behaviour much like physical exercise.

Another view of consumer gambling behaviour involves the concept of habit. Although there are numerous views of the role of habit, it is generally accepted that habits are behavioural tendencies that will re-occur in the context of a stable environment. Habitual behaviours have been studied in brand loyalty (Alba and Hutchinson, 1988), consumption disorders (O'Guinn and Fabe, 1989) and activities with rituals (Rook, 1985). In a meta-analysis of many studies that compared the effects of cognitions and habit on everyday behaviour, Ouellette and Wood (1998) found that habit provided a better explanation and prediction of frequent activities (those done daily or weekly). Therefore, the cognitive based view may not be the best paradigm to understand a frequently repeated behaviour like gambling.

## Patterns of EGM Purchasing

The November 1999 Productivity Commission report on "Australia's Gambling Industry" notes the disproportionate amount of game purchase from a small number of players. However, the tendency for a few buyers to account for a large proportion of sales is a well known and accepted phenomenon in marketing and is often referred to as the "80-20 rule of thumb". It was first recognised in the early 1950s with the consistent syndicated tracking of self-reported purchase of fast moving

consumer package goods. The "80-20 rule of thumb" or "phenomena of buyer concentration" (Anschutz, 1997) means that eighty percent of the purchases are accounted for by twenty percent of the buyers. In actual use, the proportion purchasing and amounts they account for varies based on the brand's penetration of use in the population and the average frequency of its purchase by buyers over time (East, 1997). The exposure of services such as retailers (Wrigley and Dunn, 1984) and exposure to TV media (Barwise and Ehrenberg, 1988) have been found to conform to a particular pattern. The phenomenon where a small number of purchasers make most of the product's purchases appears quite normal in repeat purchase consumer goods and services (Ehrenberg, 1988; East, 1997). The pattern reflects a Negative Binomial Distribution (NBD), and deviations from this pattern are so infrequent that the NBD pattern has been referred to as a Law of Marketing (Bass, 1995), and is often used as a baseline measure for assessing the efficacy of marketing activity (Ehrenberg et al., 2004).

Just as pre-post deviations from the expected pattern of sales can measure marketing activity, deviations from an expected distribution may also offer a means to establish where buying behaviour is abnormal. For example, if the proportion of heavy gamblers (buyers) for a gaming category like EGM's was larger than expected, compared to other products, then this may be an indicator of pathological purchase behaviour in a market of users (Mizerski, Mizerski and Miller, 2000).

Early work by Ehrenberg (1959) has developed into a paradigm that applies probabilistic laws to observed or reported strings of purchases. This area is often referred to as the study of Stochastic Preference. This class of models (Brocklett, Goldsen and Panjer, 1996) has generated broad acceptance among Marketing Science scholars (e.g., Ehrenberg, 1995; Morrison and Schmittlein, 1988; Wagner and Taudes, 1987) modeling repetitive choices, and has been successfully applied to a wide range of Consumer (e.g., petrol, detergents, instant coffee) and Business (e.g., aviation fuel) goods and services (e.g., retailers). The specific stochastic model, Negative Binomial Distribution (NBD), is recognised as the leading stochastic model for the prediction and explanation of sales for frequently purchased consumer products (East, 1997).

## Applications of Stochastic Preference Models to Gambling

The major assumptions of the NBD (Morrison and Schmittlein, 1988; Wagner and Taudes, 1987) are that it is best used in product categories that have a single use or benefit, have a stable market (approximately the same number of new purchases as purchasers who drop out of the market), and have an average repurchase frequency (among purchasers) of more than once a year (East, 1997). These criteria are consistent with the typical environment of frequently purchased consumer products in the mature stage of their product life cycle. These situations are also typical of gambling, yet models of Stochastic Preference have had very limited application to this category.

Only a few games offered by one US State Lottery have been investigated for NBD patterns (Mizerski, Mizerski and Miller, 2000; Mizerski and Mizerski, 2001). More recently, Mizerski, Miller and Mizerski (2001) reported on the purchasing of six number lotto, three number "Cash 3" and instant or "scratchies". The data came from nine quarterly surveys of sampled Florida residents. The surveys were cross-sectional in that a different sample of respondents was chosen for each survey.

The three games experienced different levels of participation/penetration, frequency of purchase and demographic profile of buyers. This finding suggests the games may be different categories to gamblers. However, all three had a distribution of use, and amount of use by group, that fit the NBD predicted distributions. In essence, the gamblers reported a pattern of buying like frequently purchased consumer product categories, and exhibited the pattern within three months of the game's introduction. Recent research by Jolley (2003) showed that the NBD pattern was evident within a few sessions of playing an online EGM. Therefore, games of gambling appear to reach maturity quickly.

An additional finding that is consistent with frequently purchased consumer products was that there were no significant ($p > .05$) differences between the demographic and psychographic profiles of light and heavy users of the Lotto game. However, there were differences between players (users) of different games (three number and scratchies) and between users and non-users of a specific game. This is quite different from the findings in earlier studies (McConkey and Warren, 1987; Toneatto et al., 1997) that

failed to test for habitual responses. This phenomenon of similarities in users' demographics is often seen as another indicator of the NBD "fit" of the data (Mizerski and Mizerski, 2001; Mizerski, Miller and Mizerski, 2001).

## The NBD as Habit

Habit is generally viewed as previous behaviour under certain circumstances (Ouellette and Wood, 1998). A number of researchers in marketing have stated that the NBD pattern in market behaviour is evidence of a habitual response (East, 1997; Mizerski and Mizerski, 2001). Jolley (2003) tested the strength of habit against cognitive based measures of customer satisfaction and planned behaviour in online EGM betting and found that only habit predicted revenue generating betting behaviour. Habit was also the strongest predictor of a gambler's retention.

## Applying the NBD to EGM Purchase

It may be argued that the reason the lotto game purchase conformed to the normal pattern of habit expected by the NBD is that there is little evidence of problem gambling and addiction with Lotteries (Productivity Commission, 1999, p. 6.52). On the other hand, it is charged that EGM players have the highest share of "people with problems who favour that game" at 9.27% (Productivity Commission, 1999, p.6.54), with the news media reporting ample anecdotal evidence of "addictive" behaviour caused by EGM play (Ellicott, 2001). These perceptions are a strong argument in the move to restrict access to EGM games.

In an attempt to see if EGM play fits the habit/stochastic paradigm, data from the largest study of Australians' gambling will be analysed to see if they fit the NBD pattern. The proportion of problem gamblers by game type will also be compared.

## Method

Of the total sample (n=10,632) of Australians' responses collected by the Productivity Commission (1999 Report appendices), only those who had reported gambling in the last 12 months were used for further analyses. Using those who have shown a willingness to gamble (reported they gambled at least once in last year) provided a sample (n=8554) of the potential EGM purchasing population. Of this number (n=3088), 36.1% had reported playing an EGM for money in the last 12 months.

## Results

EGM players make up 36.1% of this "gambling" population and reported "playing Poker machines or gaming machines" an average of 15.04 times in the last 12 months. Using the categorisation of no play (non-players), 1 to 5 (light players) and 6+ (heavy players) playing occasions used in previous gambling studies (Mizerski and Mizerski, 2001; Mizerski, Miller and Mizerski, 2001) the reported and NBD generated distributions for EGM play are shown in Table 1. The NBD predicted distributions were generated through the use of East's (1997) software. The data suggest that approximately 19.7% of the population (who have gambled in the last 12 months) account for 91.2% of all EGM gambling. But is this disproportionate purchase behaviour, often reported as evidence of EGM danger, different from what one would expect from any often repeated purchase or behaviour with the penetration and average frequency of activity reported?

## Table 1. NBD vs Reported Distribution of EGM Play

| Proportion of the population | Reported | NBD expected |
|---|---|---|
| Non-players | 55.1% | 55.1% |
| Light players | 25.2% | 21.4% |
| Heavy players | 19.7% | 23.5% |
| Proportion of Sales | | |
| Non-players | 0% | 0% |
| Light players | 8.8% | 7.3% |
| Heavy players | 91.2% | 92.7% |

To test that proposition, the reported and NBD expected distributions (proportion of players and proportion of sales by player group) were compared using a chi-square statistic (Morrison and Schmittlein, 1988). There were no significant differences (p<.05) in either comparison, so the NBD provides a very good "fit" to this data. Analyses that used other levels for heavy use (e.g., 10 gambling occasions) also showed no significant differences from the expected NBD proportions. In other words, the NBD is fairly robust on the breakdown used for user category. The Lotto game data from the Productivity Commission Survey (1999) also fit the NBD using the same sample of respondents. Therefore, both EGM and Lotto game play were not significantly different from the behaviour of consumers of other product categories.

**Comparing Problem Play of Games**

The Productivity Commission Report (1999) uses several methods to evaluate the extent of potential problem gambling by game. As noted earlier, the overall penetration of Lotto in the population, whether adjusted for potential gamblers or not, is approximately 60%, while EGM play is 36.1% (see Table 2). The penetration of other games in the population of gamblers, and the penetration of "problem gamblers" among that game's players is also reported in Table 2. The Productivity Commission defined "problem gambling" as a score of 5 or more on the Southern Oaks Gambling Screen (SOGS). Two measures that the Productivity Commission used are shown on the far right side of Table 2. The first, the "Problem with favourite game" is a measure that attempts to allocate unique blame for problem gambling. This is the statistic most often used to support the argument that EGMs are inherently the most dangerous in terms of their potential to generate "problem gambling." However, both the SOGS measure and the method to establish unique cause are of questionable validity (e.g., Gambino, 1997).

**Table 2. Indicants of Possible Problem Gambling**

| Game | All Gamblers | Problem Gamblers* | Countinuous Adoption Rate | Problem With Favourite Game |
|---|---|---|---|---|
| Lotto | 60.6% | 5.6% | 48.5% | 0.28% |
| Scratch | 44.0% | 5.8% | 14.5% | 0.56% |
| EGM | 36.1% | 8.9% | 11.06% | 9.27% |
| Racing | 22.7% | 8.3% | 14.2% | 5.23% |
| Keno | 15.2% | 9.6% | __ | __ |
| Casino | 7.7% | 11.1% | __ | 3.59% |
| Sports | 5.5% | 11.0% | 2.42% | __ |
| Bingo | 4.8% | 12.0% | __ | __ |

* Problem gambling = 5+ on SOGS measure of problem gambling

The SOGS measure has been extensively criticised as providing a misleading and inaccurate gauge of problem gambling (e.g., Dickerson, 1997), and is acknowledged to be a poor indicator by the Productivity Commission in their report. Nonetheless, the Productivity Commission used a slightly modified version of this measure, along with a question asking the respondent, "On what

gambling activity have you spent the most money in the last 12 months?" This latter response was used to totally attribute the cause of problem gambling. This approach has several problems. First, the ability of the respondent to accurately attribute their "favourite" game was poor with many respondents incorrectly assigning where they spend most of their money. Second, there is a high co-morbidity or co-occurrence with other game play, and with other compulsive behaviours (e.g., drugs, sex), so that cause and effect are not identifiable (Walker, Milton & Anjoul, 2000) or are non-recursive. For example, Miller and Marquass (2001) analysed Australian Gold Coast clients of counseling services who reported problems with gambling. They found very high levels of reported co-morbidity with problem gambling (see Table 3). Cause and effect cannot be determined but attributing sole blame to one game is not supported.

Table 3. Co-Morbidity with Problem Gambling

| Financial Problems | 81% |
|---|---|
| Interpersonal | 78% |
| Intrapersonal | 82% |
| Family | 49% |
| Physical | 32% |
| Substance | 24% |
| Employment | 49% |
| Leisure | 45% |
| Legal | 28% |

Source: Miller and Marquass (2001)

Finally, the measure of the continuous adoption rate is the ratio of the percentage of people who gamble in a particular form of gambling on a weekly basis to the percentage of people who gamble on this format (over the last 12 months). This is purported to "indicate the extent to which people are potentially exposed to risk when playing a particular form of gambling." When looking at the rates in Table 2, one should remember that online EGMs are banned for Australians. Lottery games, racing and sports wagering were allowed to migrate online for Australians' access.

Compared to reported EGM play, the Lotto and scratch games have a much higher overall penetration and continuous adoption rate (4.4 times higher). This is dismissed by the Productivity Commission because they feel the Lottery products are a "low risk form of gambling" (Vol. 1, p. 6.53). Racing and sport

wagering show an equal or higher percentage of "problem gamblers" compared to EGM play, while the continuous adoption rate for racing is higher or allegedly more dangerous.

## Summary and Conclusions

Using the Productivity Commission's 1999 survey data, the analyses showed that self-reported EGM play fit the NBD model. This suggests that the pattern of EGM play is similar to other forms of gambling such as Lotto and instant or "scratchie" games. This expected (for the penetration and frequency of activity) pattern is also similar to that seen in frequently purchased consumer package goods and services. The disproportionate distribution of users accounting for most of the sales appears quite normal and expected.

Comparing reported EGM play to other games that are judged to be less of a problem by the Productivity Commission (Lotto, racing, wagering) shows EGM play to have proportionally fewer problem gamblers and thus be less of a threat than portrayed in many analyses. Finally, the assertion that EGM access will increase problem gambling vis-a-vis other games is not necessarily correct. There is a negative relationship of a game's penetration of use in a population with their proportion of problem gamblers. The more popular the game, the fewer (proportionately) problem gamblers of the game.

That does not mean that EGM play does not have its expected share of players that bet at compulsive levels. Those problem gamblers generate large psychological, social and financial costs for their families, employers, society and themselves (Productivity Commission, 1999). Nonetheless, all product categories may have a proportion of players, buyers or users that can't participate without lapsing into compulsive and problem use. Unfortunately, gambling extracts a particularly heavy toll on compulsive use.

These findings also support earlier research (e.g., Mizerski and Mizerski, 2001) that found habit may play a larger role than cognitive based processing in future behaviour. There are opposing views to this proposition (e.g., Ajzen, 2002), but a strong effect of habit in gambling would have major implications for consumers. Although some research has suggested gambling behaviour is driven by the misconceptions of the likelihood of winning (e.g., Miyazaki et al., 2001), that may happen only in the

initial stages of game play. It may be that once habituation develops, there is very little cognitive control over continuing the activity. That doesn't mean that thinking doesn't take place. It just means that the consumers' thinking appears to have little affect on their participation.

**Notes**

1. "Compulsive", rather than "addictive", behaviour is normally the term used when discussing gambling. Many researchers believe that gambling does not fit the medical model of addiction (Productivity Commission 1999, p.14.42).

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