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An Investigation of the Duplication of Game Purchases between Regular and Pathological Gamblers

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Abstract

The purpose of this study was to explore the duplication of game purchases in regular and pathological gambling. A clearer understanding of the differences between regular and pathological gambling can aid public policy makers to better regulate the industry and reduce gambling's negative social impacts. It may also help social marketers to devise more cost effective programs. Using the data collected by the Australian Productivity Commission, this study found that pathological gambling follows the Duplication of Purchase Law, which states that the dominant factor of purchase duplication between two brands is their market shares. Moreover, pathological gamblers were heavy gamblers who tend to gamble more intensively across multiple games compared to heavy regular gamblers.

Introduction

Once thought to be a shady business, gambling has become a legitimate industry in an increasing number of countries and country states. It is an activity involving the use of money to take risks in order to gain some value (Abbott and Volberg, 2000). In Australia, gambling industry accounts for an estimated 1.5 per cent of Gross Domestic Product, and employs over 100,000 people in more than 7,000 businesses (Productivity Commission, 1999). Based on major gambling studies around the globe, more than 90% of the people surveyed gambled at least once in their lifetime (Ministry of Public Safety and Solicitor General, 1994; Abbott and Volberg, 2000).

While legalizing gambling brought in much needed tax revenue for national and state governments, it also created social problems for modern communities. According to most major national surveys on gambling, problem gamblers accounts for around 1% to 6% of total gamblers (Shaffer, Hall and Bilt, 1997). Local communities are increasingly concerned with the expansion of gambling venues and the incidence of problem gambling. Social marketers around the world have since introduced numerous programs to educate the public about gambling and problem gambling.

Many gaps still remain in problem gambling research, hence limiting the cost effectiveness of social marketing. While many social marketing programs are effective in increasing problem gambling awareness (e.g. Vecsi and Montgomery, 2006), their impact on the incidence or prevalence of problem gambling has not been (and cannot be effectively) measured (Perese, Bellringer and Abbott, 2005). The duplication of game purchases (i.e. purchases across two or more games) is an area that has not been comprehensively explored by previous researchers and social marketers. Developed from empirical-based marketing theory and observed in many consumer brands, the Duplication of Purchase Law states that the dominant factor of purchase duplication between two brands (or games) is their market shares (or relative participation rates). A previous study conducted by Lam (2006) has proven the applicability of the law to the understanding of gambling participation. Lam (2006), however, did not explore game purchase duplications of pathological gamblers. This study was hence

undertaken to fill this gap. In brief, pathological gambling can be defined as a mental disorder associated with a continuous loss of control over the frequency and amount gambled despite adverse consequences to one's life (American Psychiatric Association, 1994). The results of this study can aid public policy makers to better manage gambling consumption and identify the behavioural differences (i.e. frequency and duplication of purchases) between heavy regular and pathological gamblers. In addition, this information will be relevant to social marketers to help them devise more cost effective public awareness programs on problem gambling.

Duplication of Purchase Law

When one considers consumers in aggregate, many markets are relatively stable and follow simple empirical '*marketing laws*' (Ehrenberg, 1959). It is common to find regularity in the consumer purchases (Ehrenberg, 1995; East, 1997). In a stable market and at any given period, a consumer can either buy only one brand or a number of brands (i.e. multi-brands). According to Ehrenberg (1988), the proportion of consumers who are loyal to one brand is related to its penetration rate. Hence, consumer loyalty is generally higher for high penetration (i.e. high market share) brands compared to low penetration brands.

According to Ehrenberg (1996), the Duplication of Purchase Law states that buyers of one brand will buy a second brand in proportion to the penetration of the second brand. Hence, the key factor for the purchase duplication between any two brands is the penetration of each brand (Uncles, Ehrenberg, and Hammond, 1995). Based on this duplication law, a brand in a market is expected to have many of its own buyers also purchasing from other large brands and only a few of its own buyers also purchasing from smaller brands (Sharp and Sharp, 1997). Furthermore, the percentage of buyers any two brands share (i.e. duplicated buyers) depends on their market shares rather than on their marketing related activities such as positioning (Ehrenberg, 1988).

The Duplication of Purchase Law has been proven to hold true in numerous occasions, mostly involving high purchase-frequency products. If so, can it be applied to study game purchases? While Lam (2006) investigated the purchase of games among regular gamblers, he did not examine pathological gamblers. In this study, the key research question is: Is the Duplication of Purchase Law applicable to the study of gaming purchases for pathological gamblers? If so, how do game duplications differ between regular and pathological gamblers? To answer these questions, the following hypothesis was formed:
H1 - Game purchases of pathological gamblers follow the Duplication of Purchase Law.

When compared to regular gamblers, one would expect pathological gamblers to gamble more heavily and across more games. Hence, the following hypothesis was also made:
H2 - Pathological gamblers have higher duplication of game purchases than regular gamblers.

Research Methodology

In an effort to enhance external validity, information collected from the Australian Productivity Commission survey was used. The Productivity Commission's National Gambling survey is the largest national survey on gambling behavior to be carried out in

Australia so far. It was actually undertaken in two phases. The first phase was implemented using a CATI approach, and sampled the 18+ years old adult population. The questionnaire included questions on demographics, purchasing amount and duration for a number of gambling products. There were more than 10,600 final respondents in the first survey but only 8,554 of them (81%) gambled within the last 12 months. Among these, 8,470 respondents provided valid information on purchase frequency for eight types of games – lotto, instant, electronic gaming machine, horse racing, keno, table game, sports betting, and bingo. Each respondent in the first survey was asked if they ever played each of the eight gambling products in the last 12 months. If so, the respondents were prompted to indicate the exact number of times (i.e. play/purchase frequency) in the last 12 months that they played for each particular game.

In the second phase, a selective follow-up interview approach was conducted. All respondents in the first interview who were classified as regular gamblers (i.e. those who participate in any of the gambling activities at least once a week) were included, as well as one out of four non-regular gamblers and one out of two non-gamblers (who were randomly selected. A final sample of 3,498 respondents was then obtained. This time, the questions asked were more comprehensive, and included respondents' perception of gambling and a pathological gambling test using South Oaks Gambling Screen (SOGS). SOGS is a commonly-used 20-item questionnaire designed to evaluate gambling disorders. Among all, 140 respondents could be classified as probable pathological gamblers according to SOGS.

In order to facilitate comparison, all 140 probable pathological gamblers were identified within the first sample of 8,470 respondents. These respondents were then categorized into light and heavy gamblers using a median split based on the total gambling purchase frequency (i.e. number of times per year). All 140 probable problem gamblers were found to be heavy gamblers. The final sample was categorized into light regular, heavy regular and pathological gamblers.

Data Analysis and Results

The analysis began by examining the participation and average purchase frequency for each of the three groups of gamblers (i.e. light regular, heavy regular and pathological) across the eight different games. Note that the average purchase frequency is defined as the number of purchases per year for each gambler. Table 2 shows the duplication table for the games.

Table 1: Participation Rates, Pathological Gambling Rates, Average Purchase Frequency per Buyer by Group

No. of Respondents and Participation Rate in Each Group	Lotto	Instant	EGM	Horse	Keno	Table Games	Sports	Bingo
Light Regular Gamblers (n = 4,237)	2,484 (59%)	2,083 (49%)	1,602 (38%)	971 (23%)	538 (13%)	335 (8%)	186 (4%)	148 (4%)
Heavy Regular Gamblers (n = 4,177)	3,849 (92%)	2,516 (60%)	2,117 (51%)	1,365 (33%)	1,015 (24%)	451 (11%)	372 (9%)	331 (8%)
Pathological Gamblers (n = 140)	108 (77%)	83 (59%)	123 (88%)	76 (54%)	64 (46%)	37 (26%)	31 (22%)	32 (23%)
Pathological Gambling Rate in Each Game (= no. of pathological gamblers divided by total sample per game)	1.7%	1.8%	3.3%	3.2%	4.1%	4.6%	6.5%	5.4%

Average Purchase Frequency per Buyer for Each Group	Lotto	Instant	EGM	Horse	Keno	Table Games	Sports	Bingo
Light Regular Gamblers	4.6	3.1	1.7	0.7	0.4	0.2	0.2	0.2
Heavy Regular Gamblers	51.9	17.4	9.8	7.6	3.7	0.7	2.2	2.6
Pathological Gamblers	33.4	19.0	65.1	39.6	18.9	5.2	4.6	8.6

With reference to Table 1, the percentage of pathological gamblers in each game ranged from 1.7% for Lotto to 6.5% for Sports betting. Except for Lotto and Instant, the participation rates for pathological gamblers for all games were much higher than for heavy gamblers. The same could be said for the average purchase frequencies for each game between heavy and pathological gamblers; the latter was much higher across all games except Lotto and Instant.

Next, the duplications of game purchases were calculated for the games. Table 2 shows the duplications. These results show that there were high levels of duplication in games played for all three groups of gamblers. For example, among those pathological gamblers who played Lotto, 65% also played Instant. Comparing the observed average duplication rate with the participation rate of the second game, high correlations ranging from 0.973 to 0.995 ($p<0.001$) were found for all groups. Hypothesis H1 is therefore supported - the Duplication of Purchase Law appeared to be applicable to the pathological gamblers. In aggregate, the duplication of purchase behavior of pathological gamblers tended to follow the participation rates.

A comparison between heavy regular and pathological gamblers showed higher purchase duplications (except for Lotto and Instant) for the pathological group. Hence, hypothesis H2 is also partially supported by this study – pathological gamblers tend to be multiple-game players and their duplications of game purchases were higher compared to light and heavy regular gamblers for all except Lotto and Instant.

Table 2: Duplication of Game Purchase

Light Regular Gamblers — *Who also gamble…*

	2nd game (y)							
Respondents who gamble… - 1st game (x)	Lotto	Instant	EGM	Horse	Keno	Table Games	Sports	Bingo
Lotto*	-	48%	32%	20%	11%	6%	3%	3%
Instant	58%	-	35%	20%	14%	7%	4%	4%
EGM	49%	46%	-	24%	21%	13%	5%	5%
Horse	52%	43%	39%	-	16%	13%	8%	4%
Keno	52%	53%	62%	28%	-	17%	6%	7%
Tables Games	47%	44%	62%	37%	27%	-	10%	6%
Sports	44%	44%	39%	42%	17%	18%	-	6%
Bingo	49%	53%	53%	24%	24%	13%	7%	-

Observed Average Duplication	50%	47%	46%	28%	19%	12%	6%	5%	Correlation
Participation Rate of 2nd Game (b_y)	59%	49%	38%	23%	13%	8%	4%	4%	0.973

Heavy Regular Gamblers

	2nd game (y)							
1st game (x)	Lotto	Instant	EGM	Horse	Keno	Table Games	Sports	Bingo
Lotto	-	61%	50%	32%	24%	10%	8%	8%
Instant	93%	-	55%	35%	29%	12%	9%	9%
EGM	91%	65%	-	39%	38%	17%	11%	11%
Horse	90%	64%	61%	-	37%	20%	15%	7%
Keno	90%	71%	80%	49%	-	19%	12%	13%
Tables Games	88%	66%	77%	59%	42%	-	25%	9%
Sports	82%	63%	60%	56%	32%	30%	-	7%
Bingo	87%	66%	75%	28%	41%	13%	8%	-

Observed Average Duplication	89%	65%	65%	43%	35%	17%	13%	9%	Correlation
Participation Rate of 2nd Game (b_y)	92%	60%	51%	33%	24%	11%	9%	8%	0.982

Pathological Gamblers

	2nd game (y)							
1st game (x)	Lotto	Instant	EGM	Horse	Keno	Table Games	Sports	Bingo
Lotto	-	65%	90%	55%	50%	27%	23%	24%
Instant	84%	-	95%	54%	49%	30%	23%	23%
EGM	79%	64%	-	50%	49%	29%	20%	25%
Horse	78%	59%	80%	-	51%	33%	30%	15%
Keno	84%	64%	94%	61%	-	31%	30%	25%
Tables Games	78%	68%	97%	68%	54%	-	32%	16%
Sports	81%	61%	81%	74%	61%	39%	-	7%
Bingo	81%	59%	97%	34%	50%	19%	6%	-

Observed Average Duplication	81%	63%	91%	57%	52%	30%	24%	19%	Correlation
Participation Rate of 2nd Game (b_y)	77%	59%	88%	54%	46%	26%	22%	23%	0.995
Percentage difference in observed average duplication between heavy & pathological gamblers	-9%	-3%	38%	33%	51%	74%	88%	113%	

* Example: For light gamblers, 48% of respondents who reportedly gambled lotto also gambled instant scatchies, 32% also gambled EGM, and 29% also gambled horse racing.

Discussions and Implications

The Duplication of Purchase Law states that purchase duplication between two brands or products is closely related to their penetration rates. The results of this study showed that game purchases of pathological gamblers obeyed the Duplication of Purchase Law, which was found to hold true in the consumption of many consumer products. Hence, hypothesis H1 is supported. Moreover, a number of pathological gamblers tended to be multiple game purchasers and their duplications were much higher than the heavy regular gamblers in all games except for Lotto and Instant. Hence, hypothesis H2 is partially supported. Some degree of variability between observed and theoretical results were found. These deviations from the theoretical '*norms*' may represent the extent to which there may be effective segmentation in the gambling market or may be simply due to sampling errors (Kau et al., 1998).

The results of this study would be useful to public policy makers by providing more insights to the purchase behavior of pathological gamblers as compared to heavy regular gamblers. These differences are important for clearer identification of pathological gamblers. The results of current study thus serve as important additional information that social marketers can used to more effectively identify and target their audience of pathological gamblers. The ability to separate the healthy from the pathological gamblers can potentially reduce marketing costs and strengthen marketing effectiveness. Social marketers should include results of current study in their programs to help the public to better identify problem gambling within their own community. That is, pathological gamblers are typically heavy gamblers who tend to gamble more across a number of games as compared to heavy regular gamblers. They also have a predictable purchase duplication related to the popularity (i.e. measured by market share) of each game in the marketplace.

In marketing, the Duplication of Purchase Law often acts as a useful benchmark to measure differences or similarities between brands (Sharp & Sharp, 1997). Some questions can be asked: Is there a tendency for pathological gamblers of game X to also gamble in game Y? If so, how strong is the tendency? In the same way as in the marketing of consumer products, duplication law may also be employed as a benchmark to monitor changes in gambling.

It is important to note that this study used a secondary dataset to support its hypotheses. The quality of survey and types of measures used to support the findings were, thus, not within the control of the researcher of this study. Hence, the use of secondary data may potentially limit the research scope and quality of this study.

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