Gambling Participation and Problem Gambling Severity in a Stratified Random Survey: Findings from the Second Social and Economic Impact Study of Gambling in Tasmania.

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Demographic characteristics associated with gambling participation and problem gambling severity were investigated in a stratified random surveyin Tasmania, Australia. Computer-assisted telephone interviews were conducted in March 2011 resulting ina representative sample of 4,303 Tasmanian residents aged 18 years or older. Overall, 64.8% of Tasmanian adults reported participating in some form of gambling in the previous 12 months. The most common forms of gambling were lotteries (46.5%), keno (24.3%), instant scratch tickets (24.3%), and electronic gaming machines (20.5%). Gambling severity rates were estimated at non-gambling (34.8%), non-problem gambling (57.4%), low risk gambling (5.3%), moderate risk (1.8%), and problem gambling (0.7%). Compared to Tasmanian gamblers as a whole significantly higher annual participation rates were reported by couples with no children, those in full time paid employment, and people who did not complete secondary school. Compared to Tasmanian

gamblers as a whole significantly higher gambling frequencies were reported by males, people aged 65 or older, and people who were on pensions or were unable to work. Compared to Tasmanian gamblers as a whole significantly higher gambling expenditure was reported by males. The highest average expenditure was for horse and greyhound racing ($AUD 1,556), double the next highest gambling activity electronic gaming machines ($AUD 767). Compared to Tasmanian gamblers as a whole problem gamblers were significantly younger, in paid employment, reported lower incomes, and were born in Australia. Although gambling participation rates appear to be falling, problem gambling severity rates remain stable. These changes appear to reflect a maturing gambling market and the need for population specific harm minimisation strategies.

KEY WORDS: demographics, problem gambling, socio-economic, severity, prevalence, PGSI, Tasmania

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INTRODUCTION

During the 1990's,problem gambling prevalence rates rose dramatically in Australia(Productivity Commission, 1999). This was particularly noticeable in the state of Tasmania where the standardized problem gambling severity rate rose from 1.3% in 1994 to6.4%in 1996, the highest rate for any state in Australia for over 10 years(Williams, Volberg, and Stevens 2012). Over the same period, the overall rate of past year gambling participation in Tasmania rose from 72% to 89% (Williams et al., 2012). These increases in gambling severity and participation coincided with the rapid expansion of the gambling industry in which the availability of Electronic Gaming Machines (EGMs)dramatically increased (Productivity Commission, 2010). However, beginning in the late 1990's, problem gambling prevalence and gambling participation rates appear to have declined(Williamset al., 2012). This paperdiscusses these changes in the Tasmanian gambling environment from 1994 to 2008 and provides new data from the second Social and Economic Impact Study of Gambling in Tasmania (2011).

Tasmanian Gambling Surveys 1994-2008

The first Tasmanian gambling prevalence study was described as a baseline study to investigate the extent and impact of gambling with particular reference to problem gambling (Dickerson, Walker, and Baron, 1994). Participants (1,220 adults 18+ years or older) were selected based on local area, age, and gender to reflect the Tasmanian population. Dickerson et al. reported a 72% past year gambling participation rate and a South Oaks Gambling Screen (SOGS; Lesieur and Blume, 1987) probable pathological gambling prevalence rate (5+ item endorsement) of 0.9% (revised estimate from total sample; Dickerson and Maddern, 1997).Regular gamblers (SOGS score>3) were most often male (75%),aged 30-34 years

(18.8%), equally likely to be single or partnered (50.0%), secondary school educated (87.5%), workingfull time (37.5%), with an annual income in the range $AUD50,001 - $AUD60,000 (12.5%), employed asdirector/partner or in skilledemployment (12.5%), and ofnon-aboriginal status (93.8%).

The second Tasmanian gambling prevalence study was designed to update the baseline study(Dickerson and Maddern, 1997). In this study,1,211 adults (18+ years) were selected using a simple random stratified survey based on age, gender, and locality (city/country)to reflect the Tasmanian population according to the then most recent Australian Bureau of Statistics (ABS) data.The findings revealed an 89% past year gambling participation rate and a SOGS probable pathological gambling prevalence rate (5+ item endorsement) of2.9%. Males, persons aged 18-24 years, and students were found to be at a higher risk of gamblingrelated problems than the overall average of Tasmanian gamblers.

The third Tasmanian gambling prevalence study was conducted in 2000 (Roy Morgan Research, 2001)[1]. In this study, 1,223 adults (18+ years) were selected using a simple random surveyfrom the then latest version of the electronic white pages. Quotas based on age, gender, and locality were used to achieve a representative sample where the data were weighted to reflect ABS population estimates.Roy Morgan Research reported an 82% past year gambling participation rate and a SOGS probable pathological gambling rate (5+ item endorsement) of0.90%. Males, respondents aged 35-49 years, full-time workers, those performing household duties, and thosereporting anincome of less than $AUD50,000 had higher proportions than the sample average for probable pathological gambling.

[1] Although the Productivity Commission reported on a national gambling study in 1999 they did not report demographic data based on a prevalence survey for Tasmania. Consequently, the 1999 national prevalence study is excluded from this analysis.

The fourth Tasmanian gambling prevalence study was conducted in 2005(Roy Morgan Research, 2006). In this study,6,048 adults (18+ years) were selected by a random surveyfrom the then latest version of the electronic white pages. Roy Morgan Research reported that the sample data wereselected based on age times sex quotas, and were weighted on age, sex, area, and household size to reflect ABS population estimates. The findings of this study revealed an 85% past year gambling participation rate,a SOGS (5+ item endorsement) probable pathologicalgambling rate of 1.41%, and a Problem Gambling Severity Index (PGSI; Ferris and Wynne, 2001) problem gambling rate (8+ item endorsement) of0.73%. Roy Morgan Research reportedmales, respondents aged 18-24 years, part-time workers, and respondents with incomes of $AUD20,000-$AUD25,000 were significantly more likely than the sample average for being an “at-risk” or “problem gambler” (i.e., probable pathological gamblers).

The fifth Tasmanian gambling prevalence study, conducted in 2007, wasdesigned to provide up-to-date figures and insights into the changes in the attitudes and behaviour of Tasmanian adults since the 2005 study (South Australian Centre for Economic Studies, 2008). In this study,4,051 adults (18+ years) were randomly selected from the then most recent version of the electronic white pages. Quotas were set for the four major statistical districts of Tasmania and alsofor the 18-24 age groupbased onABS census data. Responses were weighted on household size, age, gender,and the probability of a respondent being selected to reflect ABS census data. The findings revealed a gambling participation rate of 71.7% and a problem gambling (PGSI 8+ item endorsement) prevalence rate of 0.54%. Males, respondents aged 18-29 years, those living in a household size of four adults, those living in greater Hobart, and those living with other relatives were significantly more likely than the overall sample to be moderate risk or problem gamblers.

In summary, gambling participation rates haverisen then fallen over the 1994-2008 period, as have problem gambling prevalence rates. Males have consistently been found to be at a higher risk for problem gambling, while those aged 18-24 years have frequently reported higher than average problem gambling rates. There appears to be some evidence for full-time work status and lower income correlating with problem gambling status although these results seem to fluctuate from survey to survey. However, identifying trends across surveys is somewhat problematic as there are a number of complicating issues, for example; regular changes in the instruments used to measure problem gambling severity, relatively low problem gambling severity base rates,and high standard errors for some prevalence estimates.

Industry Developments

The composition of the gambling industry also changed during the1990-91 to 2008-2009period (Australian Bureau of Statistics, 2011). In 1990-91, gamblingexpenditure was mostlycomprised of money spent on race wagering, lotteries, and casinos. The introduction of EGMs into hotels and clubs in 1996-1997 appears to have generated new expenditure rather than absorbing expenditure from other activities asrevenue from other gambling activities remained stable or increasedduring this period(Australasian Gaming Council, 2012). For example, expenditure on keno has remained relatively steady since its introduction in 1997-1998 while expenditure on race wagering increased after 2004-2005.

Gambling Expenditure Trends 1984 - 2010

Gambling turnover in Tasmania also reflects the rise and fall of gambling participation and problem gambling prevalence estimates. Tasmanian total gambling turnover increased from

$AUD 305 million in 1984-85 to a high of $AUD 2,556 million in 2004-2005, but has since fallen to $AUD 849 million in 2009-2010 (Government Statistician, 2012). Moreover, the rate of real national gambling expenditure has slowed - spending has only increased approximately $AUD 2 billion since 1998-99 compared to an approximate increase of $AUD 10 billion in the previous 10 years, while gambling as a percentage of household consumption has fallen from 3.9% in 1999 to 3.1% in 2008-09 (Productivity Commission, 2010). These changes in Tasmanian and Australian gambling expenditure suggest that the rapid expansion of gambling in Australia is over. This is characteristic of a maturing market where weakening demand and slowing growth results in reduced real expenditure (Productivity Commission, 2010).

Tasmanian Government's HarmMinimisation Measures

In response to thegaming industry rapidly expanding during the late 1990's and early 2000's, the Tasmanian state government introduced several harm minimisation and public health measures to mitigate the potential harms occurring from the increased numbers of gambling venues, gambling activities, and EGMs(Allen Consulting Group, Problem Gambling Research and Treatment Centre and & Social Research Centre, 2011). Some highlights were banning minors from gaming venues, the introduction of the Tasmanian Gambling Exclusion Scheme, restrictions on advertising, creation of smoke-free areas in enclosed public places including gambling venues, limitsto 24 hour gaming, staff training in responsible gambling, on-site problem gambling assistance, and restrictions on the service of alcohol in gaming areas (Risley, 2003;Australasian Gaming Council, 2012).

The Current Study

Although it seems that the gambling market in Tasmania is maturing, questions remain. Has successive harm minimisation and public health measures aimed at protecting gamblers (e.g., Tasmania's 2001 smoking ban in venues) and an apparent maturing market impacted on recent gambling participation and problem gambling rates? Further, what is the current demographic profile of problem gamblers, and are they different from the gambling population as a whole?

This paperexamines these issues by providing a detailed analysis of the demographic characteristics of a stratified random survey of the 2011 Tasmanian population. It draws mainly upon the prevalence data presented in volume 2 (gambling survey) of the second Social and Economic Impact Study of Gambling in Tasmania (Allen Consulting Group et al., 2011).

METHOD

Procedure

Data collection consistedof a Computer Assisted Telephone Interview (CATI)survey of 4,303 respondents residing in Tasmania, Australia. A random sample wasselected from a stratified frame of eight representative Tasmanian Local Government Areas based on the Socio-Economic Indexes for Areas (SEIFA) using the Index of Relative Socio-Economic Disadvantage(Australian Bureau of Statistics, 2006a), and a random rest of state sample. The survey wasconducted between 7 February and 3 March 2011.The questionnaire was based on previous state and nationalgambling prevalencesurveys(Productivity Commission, 1999;South Australian Centre for Economic Studies, 2008;National Centre for Social Research, 2010). The studywas managed by the Allen Consulting Group (ACG) in partnership with the Problem

Gambling Research and Treatment Centre (PGRTC) and the Social Research Centre (SRC). The analysis wasapproved by the University of Melbourne's Melbourne Graduate School of Education Ethics Committee (submission #'s 1135477.1/1135477.2).

*Pilot Testing:*Piloting of the original questionnaire occurred from 20th to 23rd January 2011. Concerns regarding respondent burden resulted in a reduction in the length of the questionnaire (the average survey duration of the final survey was approximately 16 minutes).

Stratification: Eight Tasmanian Local Government Areas (LGAs) were selected based on SEIFA scores (1=most disadvantaged, 29=least disadvantaged), EGMdensities (LGAs with comparable rates of EGMs per person and LGAs with different rates of EGMs per person), and SRC's experience of the likelihood of contacting households using random digit dialling. The rest of the state sample was selected from Tasmanian regions outside the target LGAs. Table 1 shows the eight target LGAs.The LGAs above the mid-line are the 'low' SEIFA LGAs (i.e., more disadvantaged) and those below the mid-line are the 'comparison' SEIFA LGAs. Each LGA comprised the lower of 400 contacts or 10% of contacted households.

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Sample Generation:The target LGA numbers were randomly chosen from SRC's proprietary land-line data-base. Thesenumbers were then used as a 'seed' where the last two digits were removed and two randomly generated digits were added to create a new ten digit contact number. These numbers were then 'washed' against known electronic business listings to remove non-residential numbers. The rest of state sample was randomly selected from a Sampleworx database of telephone exchanges containing working digit dial telephone numbers from regionsoutside the target LGAs.

Respondent Selection: Household residents aged 18 years or over were eligible for the study. Where more than one adult was resident in a household, the "*next birthday*" method, (i.e., the adult who was closest to their next birthday), was used to select a household member for the interview. Substitution ofthe selected respondent was only permittedwhen the respondent was unavailable for the duration of the survey.

*Call Procedures:*Up to six calls were made to establish contact. Contact attempts were spread over weekdays (late afternoon to early evening; 4:00 to 6:00 pm), late evenings (6:00 to 8:00 pm), and weekends (10:00 am to 5:00 pm). No calls were made outside these times except by appointment.

Measures

Participants were assessed across a variety of gambling and psychological measures. However, to better focus this analysis,this paper reports only gambling behaviour (participation, frequency, and expenditure), demographic information (age, gender, household structure, occupational status, annual income, country of birth, cultural group, and highest level of education), and problem gambling severity. Problem gambling severity was measured using the nine-item PGSI (Ferris and Wynne, 2001). Although some Australian state prevalence surveys have implemented the PGSI using modified scoring protocols, this study employed the standard scoring of the PGSI, as recommended by Jackson, Hynne, Dowling, Tomnay, and Thomas (2010). In this study, the PGSI was administered to the whole sample. Respondents indicated how often each item applied to them inthe last 12 months on a four-point scale: (0) never, (1) sometimes, (2) most of thetime, and (3) almost always. Scores range from 0 to 27, where higher scores indicatehigher problem severity. Scores on the PGSI can be used to classify individuals

asnon-gamblers/non-problem gamblers (score of 0), low risk gamblers (scores of 1 or 2), moderaterisk gamblers (scores between 3 and 7), or problem gamblers (scores of 8 orhigher).The PGSI has been adopted as the preferred measurement tool for population-level gambling research in Australia (Neale, Delfrabbro, and O'Neil, 2005). Psychometric studies of the PGSI has found it to have good internalconsistency, test-retest reliability, criterion validity,item variability, concurrent validity, and a unitary dimensional structure(Ferris and Wynne, 2001;Wenzel,McMillen, Marshall, and Ahmed, 2004).

Data Analysis

Data Weighting: Two variables were created to weight responses based on household structure (number of adults in a household) and selected demographics (age and gender) for the target LGAs and the rest of state sampleto the appropriate Tasmanian populations(Australian Bureau of Statistics, 2006b).

Analysis Plan: The analytical plan was designed to reflect the stratified random samplingapproach used in the data collection.Consequently, the Complex Samples SPSS (version 19.0) add-on modulewas employed to accurately reflect the stratification of the sample.

Data Management: The raw data was checked for completeness and accuracy.Consequently, two outliers that exerted extreme influence with questionable validity were removed from the expenditure analyses.

*Analytical Techniques:*Individual demographic variables were statistically compared with Tasmanian gamblers as a whole on participation, frequency and expenditureindices and also across gambling severities. The multivariate analyses were conducted using the base SPSS program using unweighted data as the complex sample module has no multivariate capability.

Demographic factors were entered into the hierarchical model at step 1 while participation factors were entered at step 2. Effect sizes were calculated for all statistically significant differences. Although parametric effect sizes were calculated on weighted data the non-parametric median analyses were conducted on unweighted datausing Microsoft Excel as SPSS was found to make inaccurate non-parametric calculations and does not produce weighted data as output.The minimum statistical significance cut-off point was set at $p<.05$, although some analyses also report $p<.01$.

*Suppression Rules:*Suppression rules were developed by the analytical team to eliminate the reporting of data with questionable accuracy. These were: 1) Point estimates were required to have at least 10 data points, and2) Standard errorswere also required to be less than 50% of their point estimate.All other estimates were suppressed where 'np' was inserted in the appropriate cell. Estimates with standard errors of 30-50% were flagged with an '†' indicating these estimates have high relative standard errors (RSEs).

Merged Categories: Attempting to provide as much data as possible, response categories were merged if the variable or category was of high importance (e.g., problem gambling severity). This followed a three-step hierarchy, stopping when the analysis found reportable results: 1) merging non-gambling response categories (e.g., country of birth), 2) merging non-problem and low-risk categories, and 3) merging moderate and problem gambling categories.

RESULTS

LGA/SEIFA Analyses

Table 2 displays the participation percentages across gambling activitiesin the low and comparison LGAs and the rest of state for the previous 12 months.

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There were no significant differences in gambling participation between low SEIFA LGAs as a group and the comparison LGAs or the rest of state. However, significant differences were found between the low SEIFA LGAs and the rest of state for participation onEGMs and instant scratch tickets ($p<.05$).

Gambling Participation, Frequency and Expenditure

Table 3 shows the average and median scores for gambling participation, gambling frequency (for those who engaged in these activities), and gambling expenditure (for those who engaged in these activities)by gambling activity.

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Table 3 shows that 64.8% of the sample participated in any gambling activity in the previous 12 months. In the previous 12 months, the average gambling frequency on any activity was 45.99 sessions while the average gambling expenditure was $AUD1,044 and the median gambling expenditure was $AUD 182.The most common gambling activity by a sizable margin was lotteries (46.5%), with the next most common activities beinginstant scratch tickets (24.3%), keno (24.3%), and EGMs (20.5%). Horse or greyhound races wasan activity that was engaged in

with much greater frequency (43.03 sessions) than lotteries (26.51 sessions), the next most frequent activity.The highest average expenditure was on horse and greyhound races ($AUD 1,556) and the second highest was on EGMs ($AUD 767). The highest median expenditures were on bingo ($AUD 150) andlotteries ($AUD 125),while gamblers on the horse or greyhound races reported a relatively lower amount($AUD 60).

Table 4 shows the means and standard errors across separate demographic categories. Asterisksand filled circles indicate statistically significant differences between individual response categories fordemographic variables and the average for all Tasmanian gamblers on the three indices of gambling behaviour (participation, frequency, and expenditure).

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Table 4 shows significantly higher annual gambling participation by couples with no children, those working full-time, and people who attended but did not complete secondary school ($p<.05$). Significantly lower annual gamblingparticipation was reported by people aged 65 or over, students, retired persons, people born outside of Australia,and those with postgraduate qualifications ($p<.05$). Significantly higher annual gambling frequency was reported by males, people aged 65 years or older, and people who were unable to work or were on a pension ($p<.05$). Significantly lower annual gambling frequency was reported by females, people aged 18-24 years ($p<.05$), couples with children still at home ($p<.01$), single people with children stillliving at home ($p<.05$), people living in group or shared households($p<.05$), people who primarily engage in household duties ($p<.05$), students($p<.001$), people who report annual personal incomes of between $AUD80,000 and $AUD129,999($p<.05$), and people with a tertiary

education/undergraduate degree (p<.05). Significantly higher annual average gambling expenditure was reported by males (p<.05). Significantly lower annual average expenditure was reported by females (p<.05), people aged 18-24 years (p<.001) and 35-44 years (p<.001), single people with children still living at home (p<.05), people livingwithin group or shared households (p<.05), people who primarily engage in household duties (p<.001), students(p<.001), andpeople with primary school education (p<.05*).* Significantly higher annual median gambling expenditure than the median for all gamblers was reported by males, people aged between 45-54 and 55-64, couples with children not living at home, people who had started but not completed secondary school, and those with trade certificates(p<.05). Significantly lower annual median expenditure was reported by females, people aged 18-24, 25-34, and 35-44, couples with children not at home, people reporting primarily household duties, those unable to work, and people reporting tertiary or postgraduate qualifications (p<.05).'Small' or lowerparametric effect sizes(d<.50; Cohen, 1977;1988)were found for all significant differences reportedfor participation, frequency, and expenditure indices. 'Small' or lowernon-parametric effect sizes(Φ<.30; Cohen 1977; 1988)were reported for annual median gambling expenditure for all significant differences except for students ('Large'; Φ=.56).

Problem Gambling Prevalence

Problem gambling severity (average and standard error) percentages for the Tasmanian population wereestimated asnon-gamblers (34.8%, 1.1), non-problem gamblers (57.4%, 1.2),low-risk gamblers (5.3%, 0.6), moderate risk gamblers (1.8%, 0.4), and problem gamblers(0.7%, 0.2).Table 5 shows the breakdown of gambling severityclassifications by demographic categories.Table 5 indicates higher gambling severities were associated with

youngerage ($p<.05$), paid employment ($p<.001$), lower personal incomes ($p<.05$), and being born in Australia ($p<.001$).

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Prediction of Gambling Severity

Socio-demographic factors: A two-step hierarchical regression was employed to examine the prediction of problem gambling severity by socio-demographic factors (gender, age, dependentchildren in the household, living with a partner, in paidemployment, annual personal income, country of birth, cultural identity, andeducation). The top panel in table 6 shows that socio-demographic characteristics (step 1) significantly predicted problem gambling severity ($p<.001$). Specifically, problem gambling severitywas significantly predicted by younger age ($p<.001$), no dependent children in thehousehold ($p<.001$), and when secondary school was not completed ($p<.05$). However, Step 1 factors only predicted less than 1% of the variance (as calculated by a linear correlation between socio-demographic factors and gambling severity).

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Gambling Activity: The bottom panel in table 6 shows that after taking the influence ofsocio-demographic characteristics into account, participation in gambling activities(step 2) explained a significant additional proportion of variance in problem gamblingseverity ($p<.01$). Specifically, problem gambling severity was significantlypredicted by participation in EGM gambling ($p<.01$), keno ($p<.01$), sportingevents ($p<.01$), horse/greyhound racing ($p<.05$), other

(gambling) events (p<.001), and instant scratch tickets(p<.05).Age and dependent children in the household also remained significant (p<.01). The addition of Step 2 factors increased the variance explained to 6.2%, an increase over step 1 by 5.3% of variance explained.

DISCUSSION

The recent decline in gambling participation in Tasmania continues in the current study, where 64.8% of the population in 2011 reported gambling on any activity in the past 12 months compared to 71.7% in 2008 (South Australian Centre for Economic Studies, 2008). Further, the participation rate for the most commonly endorsed activity gambling activity (lotteries) was 46.5%in 2011 compared to 51.3% in 2008 (South Australian Centre for Economic Studies, 2008).

However, estimating an accurate change in gambling frequency is difficult to determine between Tasmanian surveys.While the 2011 survey reported the average number of sessions, the 2008 study only reported average session length(South Australian Centre for Economic Studies, 2008). Further, the 2000 and2005 Tasmanian surveys did not report average total frequencies for each activity but reported the percentage of gamblers who gambled once or more per week, 1-3 times a month, and less than once a month(Roy Morgan Research, 2006). Further re-analyses of these earlier gambling surveys is required to standardise these reports before any meaningful comparisons with the current survey is possible.

Comparing gambling expenditure was also somewhat problematic. The 2011 survey reported the average expenditure for each activity but the 2008 survey reported only EGM expenditure. Further, as the 2008 survey reported expenditure across intervals (up to $5, $6-$10,

$11-$20, etc.) andno total was reported, where expenditure was split between hotels/clubs and casinos,only a rough estimate (approximately $6-$20) can be made for the average expenditure in 2008(South Australian Centre for Economic Studies, 2008). However, comparisons are more easily made between the 2011, and the 2005 and 2000 studies. The 2005 and 2000 studies reported on the average weekly expenditure on each activity. Converting the average amount spent per week into a yearly average expenditure amount, the expenditure on the highest two activities (EGMs, horse and greyhound races) found thatEGM expenditurein 2011 ($AUD767) was higher compared toEGM expenditure in 2005 ($AUD576) and 2000 ($AUD698) but lower in 2011 for horse and greyhound races ($AUD1,556) compared to the 2005 ($AUD4,635) and 2000 ($AUD2,082) surveys(Roy Morgan Research, 2006).

Similarly, comparing the 2011 expenditure between average and median amounts found dramatically different absolute amounts. These analyses also produced strikingly different orders of highest to lowest expenditures. For example, lotteries in 2011produced the highest average expenditure amount ($AUD1,556) but the equal second lowest median amount ($AUD60). This disparity suggests a significant degree of skew in the expenditure data and possibly a new avenue for further research. Moreover, these differences seem to add further weight to previous findings about the difficulties of working with expenditure analyses (Blaszczynski, Ladouceur, Goulet, and Savard, 2006), and the need for better analytical approaches.

Predictors of Problem Gambling

The obtained rate of problem gambling severity was found to be 0.7% in 2011, an increase from the 0.54% rate reported in 2008. Higher problem gambling severities were found in the current study were related to younger age and paid employment. Further,younger age, no

dependent children in the household, and secondary school not completed predictedproblem gambling in the first step in the hierarchical analysis. When gambling activity participation was included in the second step of the hierarchical analysis, participation on EGMs, keno, sporting events, other events, horse/greyhound racing, and instant scratch tickets were also predictive of problem gambling severity.

The consistent reportin previous Tasmanian and other recent state prevalence surveys of males being more likely to be problem gamblers was not found in the current study(Roy Morgan Research, 2006;South Australian Centre for Economic Studies, 2008;Department of Justice, 2009;Davidson and Rodgers, 2010;Department of Justice and Attorney-General, 2012;Ogilvy Illumination: Strategic Communication Research, 2012;Social Research Centre, 2013). This result fits with recent research from many jurisdictions that suggests female problem gambling rates are rapidly increasing, especially for younger females (Dowling, 2013). Although males were more likely to gamble more often and spend more money than the Tasmanian population in the current study,the demographic variables that were predictive in earlier studies that were replicated in the current study were younger age andpaid employment. This recent development requires that the research and public health communities give greater attention to these issues to better understand and address their possible causes.

Higher rates of problem gambling by youngeradults havealso been reported in previousTasmanian studies(Office for Problem Gambling, 2006;Roy Morgan Research, 2006;South Australian Centre for Economic Studies, 2008) and other recent Australian state prevalence surveys (Davidson and Rodgers, 2010;Department of Justice and Attorney-General, 2012;Ogilvy Illumination: Strategic Communication Research, 2012). Similar results have been found in national surveys. For example, Purdie, Matters, Hillman, Murphy, Ozolins, and

Millwood (2011)conducted a national study of young people and gambling in Australia and found 5.8% of 18-24 year old gamblers were classified as past year problem gamblers, a much higher rate than the 0.7% rate for the Tasmanian sample as a whole in the current survey.Possible reasons for the greater incidence of problematic gambling in young people may be due to adolescents experiencing more extreme emotional states than adults (for a brief review see Silvers et al., 2012), and the association between the likelihood of developing gambling problems and the belief that gambling is a way to regulate emotions(Gupta and Derevensky, 2001).Similar emotion regulation issues for adolescents have been implicated for a range of risky behaviours (Williams, Brown, Palmer, Liddell, Kemp, and Olivieri 2006;Steinberg, 2008).

Public Health Issues

The trend of declining participation and the apparent stabilisation of problem gambling severity rates suggest these two measures of gambling behaviour, although related to each other, appear to be following separate trajectories. Gambling participation rates appear to be following theexposure-adaptation hypothesis: increases of gambling opportunities resulted in more opportunities to gamble and subsequently greater gambling participation,followed by adaptation to these opportunities resulting in a fall of gambling participation(LaPlante and Shaffer, 2007). However, although problem gambling rates have also risen and fallen over the same period,recently these ratesappear to have stabilised. One possible explanation might be that harm minimisation and public health strategies implemented in Tasmania may have limited effectiveness for reducing problem gambling prevalence rates. For example, McMillen and Pitt (2005), in a review of harm minimisation measures in the Australian Capital Territory,found that problem gamblers perceived the introduction of a $AUD10 maximum bet on EGMs, a

mandatory three-hour shutdown of gaming machines each day, and a restriction on cash payment of winningsto be ineffective. However, recreational gamblers believed all three measures were effective at reducing gambling-related harm.

Further, there are other caveats. The fall in participation appears to be moderated by the density of specific gambling activities. Compared to the comparison LGAs, the low SEIFA LGAs had a higher density ofEGMs per adult (Allen Consulting Group et al., 2011). Although there were no significant overallgambling participation differences between low SEIFA LGAs and other regions (comparison, rest of state), low SEIFA LGAs reported significantly higher participation rates than the rest of state sampleon EGMs and instant scratch tickets. Further, low SEIFA LGAs reported higher expenditure and moderate/problem gambling prevalence rates than the comparison LGAs (Allen Consulting Group et al., 2011). These results support future Tasmanian public health approaches to assess the likely impact of introducing new gambling opportunities into socially disadvantaged communities.

Additionally, the recent increase in the advertising of sports betting in Australia (Hing, Vitartes and Lamont, 2013)co-incidences with an increase in sports betting participation rates, the only gambling activity reporting an increase in participation rates between the 2011 and 2007 surveys (Allen Consulting Group et al., 2011). This is a new area of concern and should also be a target for appropriate public health and harm minimisation strategies.

Study Strengths and Issues

Although the current study has some significant strengths, including robust sampling methodology, regional stratification, and multiple measures of gambling behaviour, it also highlights a number of difficulties relating to conducting long term comparative research in this

area, namely the lack of consistency in the surveying methodology and assessment of problem gambling severity. Over the past 14 years,several research organisations have tried different methods for selecting respondents, screening for eligibility, weighting responses, and measuring problem gambling severity. These changes make estimations and comparisons difficult across time and very likely under or overestimatethe 'true' participation and severity rates. Despite recent efforts to standardise problem gambling prevalence measures (Williams et al., 2012), the implementation of non-standard prevalence measures continue to make temporal and inter-jurisdictional comparisons difficult (Jackson et al., 2010). Consequently, assessing gambling severity will continue to be an issue until a single and validated methodology is consistently implementedwithin Tasmania and other jurisdictions.

Conclusion

This study confirms the recent trend of declining gambling participation in Tasmania,and confirms that younger people appear to be more at risk than the general gambling population for problem gambling. It also shows that the problem gambling rate appears to have stabilised.Further, the equality in problem gambling rates between genders needs to be further investigated to determine what might be the issues that are driving up female problem gambling rates. The implication from this researchis the needformore targeted public health strategies aimed at specific communities and groups, in particular; poorer communities, younger people,female gamblers, sports bettors, and problem gamblers.

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Table 1. Tasmanian LGAs

LGA	SEIFA Rank	Persons Aged 18+	People per EGM	Total Interviews
Brighton	1	9548	159	400
Break O'Day	3	4738	105	342
Glenorchy	8	33302	123	400
Devonport	9	18213	79	400
Circular Head	17	5777	116	301
Launceston	19	47680	127	400
Sorell	22	8944	163	401
Clarence	26	37945	230	400

Table 2. Average (Standard Error) Participation Percentage in each Gambling Activity by Low and Comparison SEIFA LGAs

	SEIFA LGAs		Rest of State
	Low[a]	**Comparison[b]**	
Gambling Activity			
Electronic gaming machines	28.3(2.4)*	21.3(1.8)	18.1(1.5)
Horse or greyhound races	16.4(1.6)	14.6(1.3)	14.3(1.4)
Instant scratch tickets	31.2(2.4)*	23.9(1.9)	22.7(1.6)
Lotteries	47.1(2.2)	45.8(2.0)	46.6(1.8)
Keno	29.8(2.0)	26.3(2.0)	21.9(1.5)
Casino table games	5.9(1.2)	7.6(1.2)	5.1(0.9)
Bingo	3.6(0.9)	2.8(0.9)†	0.9(0.3)†
Sporting or other events	3.8(0.7)	4.1(0.9)	4.3(0.8)
Informal private games	5.1(2.1)†	2.8(0.7)	2.9(0.7)
Total	32.9(3.0)	28.5(1.9)	29.1(2.9)

Notes:
† = 30% < RSE <50%
* $p<0.05$
[a] = Brighton, Break O'Day, Glenorchy, Devonport
[b] = Circular Head, Launceston, Sorell, Clarence

Table 3. Average (Standard Error) and Median (Lower, Upper Quartile) Scores for Gambling by Activity in the Previous 12 Months

	Participation[%]	**Frequency[#]**	**Expenditure[$]**	
			Average	**Median(weighted)**
Gambling Activity				
Electronic Gaming Machines	20.5(1.1)	12.21(1.4)	767(140)	100(30, 300)
Horse or Greyhound Races	14.7(0.9)	43.03(7.51)	1,556(266)	60(20, 600)
Instant Scratch Tickets	24.3(1.1)	12.66(0.96)	82(9)	24(10, 60)
Lotteries	46.5(1.2)	26.51(1.03)	367(26)	125(40, 416)
Keno	24.3(1.1)	16.50(1.48)	255(34)	50(20, 125)
Casino Table Games	5.9(0.6)	5.01(0.69)	387(93)	100(50, 280)
Bingo	1.8(0.3)	21.30(3.70)	383(89)	150(23, 444)
Sporting or other Events	4.2(0.5)	22.28(9.70)†	306(66)	60(20, 300)
Informal Private Games	3.2(0.6)	10.38(2.57)	193(49)	60(25, 200)
Other	0.4(0.1)	np	np	np
Total	64.8(1.1)	45.99(2.75)	1,044(102)	182(49, 624)

Notes:
[%] = Percentage reporting each activity
[#] = Average frequency of total gambling sessions
[$] = Australian Dollars
† = 30% < RSE <50%
np = Data suppressed

Table 4. Average (and Standard Error) and Median (Lower and Upper Quartile) scores for Demographic Characteristics for Gambling Participation, Frequency, and Expenditure

	Participation[%]	**Frequency**[#]	**Expenditure**[$]	
Comparison			Average	Median(unweighted)
Tasmanian adults as a whole	64.8(1.1)	45.99(2.75)	1,044(102)	251.1(60, 780)
Gender				
Male	65.4(1.4)	55.42(4.41)*	1,432(157)*	313.5(78, 922.5)•
Female	64.2(1.8)	37.05(3.27)**	676(131)**	175.5(40.75, 552)•
Age				
18-24	61.9(4.5)	29.10(5.38)**	577(125)**	120 (40, 435)•
25-34	74.0(3.8)	43.11(8.99)	1,127(296)	130 (44, 550)•
35-44	68.1(2.8)	37.76(6.62)	605(116)**	154(50, 529)•
45-54	64.3(2.4)	47.18(3.58)	1,213(212)	312(96.25, 797.5)•
55-64	65.7(2.1)	60.62(8.98)	1,594(424)	336(70, 951)•
65+	55.9(1.7)*	53.88(3.52)*	1,071(152)	280.5(60, 780)
Household Structure				
Couple with no children	74.9(3.3)*	51.28(12.39)	1,054(288)	275(70, 809)
Couple with children still at home	66.4(2.0)	35.69(3.11)**	927(142)	192(50, 636)•

Couple with children not living at home	64.2(1.9)	62.87(8.72)	1,255(295)	323(79.5, 900)•
Single person household (no children)	62.6(2.9)	54.99(4.89)	1,351(260)	260(48.25, 872)
Single with children still at home	65.7(4.2)	28.93(5.00)**	509(162)**†	147(40, 477)•
Single with children not living at home	58.9(3.0)	60.78(14.37)	1,329(578)†	260(70, 678.5)
Group or shared household	61.4(6.9)	30.34(6.51)*	596(223)*†	220(80, 596.5)
Occupational status				
In paid employment full time	71.4(1.7)*	44.92(3.85)	1,135(153)	275(70, 809)
In paid employment part time/casual	68.0(2.9)	47.62(9.48)	1,022(310)†	200(60, 636)
Primarily household duties	64.1(6.2)	33.30(4.90)*	447(89)**	176(56, 461)•
Student	49.2(6.7)*	19.09(6.03)**†	341(141)**†	70(27.5, 182)•
Retired	58.0(1.7)*	52.94(3.94)	1,083(187)	260(60, 747.5)
Looking for work	57.7(7.9)	36.04(8.56)	np	120(30, 620)
Unable to work/pension	56.2(4.6)	69.12(8.91)**	1,577(460)	416(118.75, 1103)•

Annual personal income before tax				
Less than $25,000	61.3(2.0)	45.07(4.97)	851(183)	216(60, 639)
$25,000 to $39,999	69.4(2.5)	46.97(7.61)	1,038(209)	276(60, 894)
$40,000 to $64,999	68.0(2.6)	49.45(6.73)	967(193)	300(80, 780)
$65,000 to $79,999	68.4(3.5)	50.85(7.52)	1,568(496)	250(70.75, 877)
$80,000 to $129,999	65.2(4.3)	34.74(4.23)**	943(187)	245(48, 716)
$130,000 or more	61.8(6.8)	48.93(20.66)†	np	208(76.5, 736)
Country of birth				
Australia	67.1(1.2)	45.89(2.98)	1,061(110)	260(60, 780)
Other	48.0(3.1)*	46.96(5.02)	876(224)	230(60, 657)
Cultural group				
Australian	65.4(1.2)	46.17(2.95)	1,030(105)	250(60, 766)
Other	60.3(4.5)	44.86(6.79)	1,327(471)†	268(84, 788)
Highest level of education				

Primary school only	54.0(6.7)	57.13(8.68)	744(138)*	282(60, 1043)
Secondary school: not completed	72.3(1.9)*	52.57(3.43)	1,332(176)	354(84, 1018)•
Secondary school: completed year 12	64.0(2.8)	50.49(7.61)	917(235)	280(78, 801)
Trade qualifications	68.0(2.9)	56.77(6.21)	1,184(210)	314(85, 894)•
Tertiary education	65.0(2.2)	30.49(5.11)**	772(225)	130(36, 429)•
Postgraduate qualification	46.1(3.6)*	46.81(16.19)†	1,061(424)	150(40, 468)•

Notes:
% = Percentage reporting each activity
# = Average frequency
$ = Australian Dollars
† = 30% < RSE <50%
np = Data suppressed
* $p<0.05$
** $p<0.01$
• $p<0.05$

Table 5. Average (Standard Error) Percentages for Demographic Characteristics by PGSI category

		PGSI category				
Demographic Characteristic	**Factor**	**Non-gambling**	**Non-problem**	**Low-risk**	**Moderate**	**Problem**
Gender	Male	47.2(1.9)	47.3(1.6)	55.3(6.0)	64.1(11.8)	73.4(10.8)
	Female	52.8(1.9)	52.7(1.6)	44.7(6.0)	35.9(11.8)†	26.6(10.8)†
Age	18-44*	39.8(2.1)	46.4(1.7)	55.3(5.5)	53.7(9.8)	69.6(11.3)
	45+	60.2(2.1)	53.6(1.7)	44.7(5.5)	46.3(9.8)	30.4(11.3)†
Cohabitation with partner	Living with partner	52.5(2.0)	57.8(1.7)	45.9(5.8)	57.8(11.2)	61.8(13.6)
	Not living with partner	47.5(2.0)	42.2(1.7)	54.1(5.8)	42.2(11.2)	38.2(13.6)†
Occupational status	In paid employment**	50.7(2.0)	64.1(1.5)	64.1(5.1)	67.2(8.3)	71.1(10.8)
	Not in paid employment	49.3(2.0)	35.9(1.5)	35.9(5.1)	32.8(8.3)	28.9(10.8)†
					Moderate risk/problem gambling	
Dependent children	Dependent children	44.2(2.0)	45.5(1.7)	48.5(6.1)	43.2(9.0)	
	No dependent children	55.8(2.0)	54.5(1.7)	51.5(6.1)	56.8(9.0)	

Personal income	Less than $64,999*	80.9(1.6)	77.9(1.4)	87.9(3.0)	87.7(3.8)
	$65,000 or more	19.1(1.6)	22.1(1.4)	12.1(3.0)	12.3(3.8)†
Country of birth	Australia**	82.5(1.4)	90.6(0.8)	95.1(1.6)	90.0(3.4)
	Other	17.5(1.4)	9.4(0.8)	4.9(1.6)†	10.0(3.4)†
Highest education	Secondary school or lower	41.1(2.0)	46.6(1.6)	50.7(6.1)	50.2(8.7)
	Additional qualifications	58.9(2.0)	53.4(1.6)	49.3(6.1)	49.8(8.7)

Notes:
† = 30% < RSE <50%
* $p<0.05$
** $p<0.01$

Table 6. Problem Gambling Participation: Multivariate Analyses

Step	Factors	Coefficient (SE)	β
1: **Demographic factors**			
	(Constant)	.674(.183)**	-
	Gender	-.062(.046)	-.025
	Age	-.007(.002)**	-.089
	Dependent children in household	.168(.052)**	.066
	Living with partner	.023(.048)	.0009
	Currently in paid employment	.000(.051)	.000
	Annual income	-.085(.057)	-.028
	Country of birth	-.010(.063)	-.003
	Australian as cultural identity	-.044(.081)	-.009
	Secondary school completed	-.105(.043)*	-.043
R^2 = .009, df = 9,3529			
2: **Gambling participation**			
	(Constant)	2.504(.474)	-
	Gender	-.065(.045)	-.026
	Age	-.004(.002)**	-.059
	Dependent children in household	.119(.051)*	.047
	Living with partner	.044(.047)	.017
	Currently in paid employment	.047(.050)	.019
	Annual income	-.073(.056)	-.024
	Country of birth	.077(.061)	.021
	Australian as cultural identity	-.063(.079)	-.013

	Secondary school completed	-.029(.042)	-.012
	Played EGMs	-.392(.058)**	-.127
	Bet on horse or greyhounds	-.131(.061)*	-.038
	Purchased instant scratch tickets	-.105(.051)*	-.036
	Played the lottery	-.042(.043)	-.017
	Bet on Keno	-.259(.054)**	-.092
	Bet on Casino table games	.061(.109)	.010
	Played Bingo	.068(.150)	-.008
	Bet on other events	-.446(.116)**	-.066
	Bet on informal games	.052(.144)	.006
Adj R^2 = .062, ΔR^2 = .053,			
df = 18, 3520			

Notes:
* $p<0.05$
** $p<0.01$
R^2 = Amount of variation in the dependent variable the model (this analysis) explains
df = Degrees of Freedom (the number of independent scores)
ΔR^2 = Difference in R2 betweenstep 1 and 2
Constant = constant amount at each step
Coefficient = Unstandardised coefficients of predictor variables
SE = Standard Error
β =Standardised coefficients of predictor variables

References

Allen Consulting Group, Problem Gambling Research and Treatment Centre, and the Social Research Centre (2011). *Social and Economic Impact Study of Gambling in Tasmania: Vols 1-3,*Hobart, TAS. The Tasmanian Government Department of Treasury and Finance.

Australasian Gaming Council (2012). *Database on Australia's Gambling Industries 09/10*. Melbourne, VIC Author.

Australian Bureau of Statistics (2006a). *Census of Population and Housing: Socio-Economic Indexes for Areas*. Canberra, ACT. Author.

Australian Bureau of Statistics (2006b). *Population by Age and Sex, Australia*. Canberra, ACT. Author.

Australian Bureau of Statistics (2011). *Consumer Price Index*, Canberra, ACT. Author.

Blaszczynski, A., Ladouceur, R., Goulet, A., & Savard, C. (2006). How Much Do You Spend Gambling? Ambiguities in Questionnaire Items Assessing Expenditure. *International Gambling Studies, 6*, 123-128.

Cohen, J. (1977). *Statistical Power Analysis for the Behavioral Sciences*. New York, NY. Academic Press.

Cohen, J. (1988). *Statistical Power Analysis for the Behavioural Sciences.* Hillsdale, NJ, Lawrence Erlbaum Associates.

Davidson, T. and B. Rodgers (2010). *2009 Survey of The Nature and Extent of Gambling, and Problem Gambling, in the Australian Capital Territory*. Canberra, ACT. Australian National University.

Department of Justice (2009). *Problem Gambling from a Public Health Perspective: A Study of Gambling in Victoria*. Melbourne, VIC.Author.

Department of Justice and Attorney-General (2012). *Queensland Household Gambling Survey 2011-2012*. Brisbane, QLD. Author.

Dickerson, M., and R. Maddern (1997). *The extent and impact of gambling in tasmania with particular reference to problem gambling: A follow up to the baseline study conducted in 1994. The extent and impact of Gambling in Tasmania 1996.* Sydney, NSW. Australian Institute for Gambling Research.

Dickerson, M., Walker, M., & Baron, E. (1994). *A Baseline Study of the Extent and Impact of Gambling Tasmania with particular reference to Problem gambling*.Sydney, NSW. Australian Institute for Gambling Research.

Dowling, N. A. (2013). The Cognitive-Behavioral Treatment of Female Problem Gambling. *The Wiley-Blackwell Handbook for Disordered Gambling*. David C. S. Richard, Alex A. Blaszczynski and L. L. Nower (Eds.). John Wiley & Sons Ltd.

Ferris, J., and Wynne, H. (2001). *The Canadian Problem Gambling Index: Final Repor*t. Ottawa, ON. Canadian Centre on Substance Abuse.

Government Statistician (2012). *Australian Gambling Statistics*. Brisbane, QLD. Queensland Treasury and Trade.

Gupta, R. and J. Derevensky (2001). *An examination of the differential coping styles of adolescents with gambling problems.*Toronto, ON. Ministry of Health and Long-Term Care.

Hing, N., Vitartas, P., & Lamont, M. J. (2013). Gambling Sponsorship of Sport: An Exploratory Study of Links with Gambling Attitudes and Intentions. *International Gambling Studies, 13*, 281-301.

Jackson, A. C., Hynne, H., Dowling, N. A., Tomnay, J. E., & Thomas, S. A. (2010). Using the CPGI to Determine Problem Gambling Prevalence in Australia: Measurement Issues. *International Journal of Mental Health and Addiction,8*, 570-582.

LaPlante, D. S. & Shaffer, H. J. (2007). Understanding the Influence of Gambling Opportunities: Expanding Exposure Models to Include Adaptation. *American Journal of Orthopsychiatry,77*, 616-623.

Lesieur, H. R.,& Blume, S. B. (1987). The South Oaks Gambling Screen (SOGS): A New Instrument for the Identification of Pathological Gamblers. *The American Journal of Psychiatry,144*, 1184-1188.

McMillen, J.,& Pitt, S. (2005). *Review of the ACT Government's Harm Minisation Measures.* Canberra, ACT. Centre for Gambling Research, Australian National University.

National Centre for Social Research (2010). *British Gambling Prevalence Survey*. Brimingham, West Midlands. The Gambling Commission.

Neale, P., Delfabbro, P., & O'Neil, M. (2005). *Problem Gambling and Harm: A National Definition.*Adeliade, SA. Gambling Research Australia.

Office for Problem Gambling (2006). *Gambling Prevalence in South Australia: October to December 2005*. Adeliade, SA. Population Research and Outcome Studies Unit.

Ogilvy Illumination: Strategic Communication Research (2012). *Prevalence of Gambling and Problem Gambling in New South Wales*. Sydney, VIC. NSW Office of Liquor, Gaming and Racing.

Productivity Commission (1999). *Australia's Gambling Indutsries. Report No. 10*.Canberra, VIC. Author.

Productivity Commission (2010). *Gambling. Report No. 50*. Canberra, VIC. Author.

Purdie, N., Matters, G., Hillman, K., Murphy, M., Ozolins, C., & Millwood, P. (2011). *Gambling and Young People in Australia*. Melbourne, VIC. Australian Council for Educational Research Ltd.

Risley, K. (2003). *Report on Smoke-Free Policies in Australia*.Melbourne, VIC. World Health Organisation.

Roy Morgan Research (2001). *The Third Study into the Extent and Impact of Gambling in Tasmania with Particular Reference to Problem Gambling: Follow Up to the Baseline Studies Conducted in 1994 and 1996*.Hobart, TAS. Department of Health and Human Services.

Roy Morgan Research (2006). *The Fourth Study into the Extent and Impact of Gambling in Tasmania with Particular Reference to Problem Gambling: Follow Up to the Studies Conducted in 1994, 1996 and 2000*. Hobart, TAS. Department of Health and Human Services.

Silvers, J. A., McRae, K., Gabrieli, J. D. E., Gross, J. L., Remy, K. A., & Ochsner, K. N. (2012). Age-Related Differences in Emotional Reactivity, Regulation, and Rejection Sensitivity in Adolescence. *Emotion. 12,* 1235-1247.

Social Research Centre (2013). *Gambling Prevalence in South Australia*. Melbourne, VIC. Office for Problem Gambling, South Australia Department for Communities and Social Inclusion.

South Australian Centre for Economic Studies (2008). *Social and Economic Impact Study into Gambling in Tasmania*. Hobart, TAS. Department of Treasury and Finance.

Steinberg, L. (2008). A Social Neuroscience Perspective on Adolescent Risk-Taking. *Developmental Review,*28, 78-106.

Wenzel, M., McMillen, J., Marshall, D., & Ahmed, E. (2004). *Validation of the Victorian Gambling Screen*.Canberra, ACT. The Gambling Research Panel.

Williams, L. M., Brown, K. J., Palmer, D., Liddell, B. J., Kemp, A. H., Oliveri, G., Peduto, A., & Gordon, E. (2006). The Mellow Years? The Neural Basis of Improving Emotional Stability over Age. *The Journal of Neuroscience*,*26*, 6422-6430.

Williams, R. J., Volberg, R. A., & Stevens, M. G. (2012). *The Population Prevalence of Problem Gambling: Methodological Influences, Standardized Rates, Jurisdictional Differences, and Worldwide Trends*. Guelph, ON. The Ontario Problem Gambling Research Centre and the Ontario Ministry of Health and Long Term Care.

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