



Cross-national comparisons of the prevalence of gambling, problem gambling in young people and the role of accessibility in higher risk gambling: A study of Australia, Canada, Croatia and Israel

Belle Gavriel-Fried¹ · Paul Delfabbro² · Neven Ricijas³ · Dora Dodig Hundric³ · Jeffrey L. Derevensky⁴

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Abstract

Countries with public policies that support gambling through gambling legislation foster an environment in which gambling is socially accepted, tacitly encouraged and actively promoted. Although gambling worldwide has features in common, countries differ in terms of the nature of their gambling markets. The current study examined the role of perceived gambling accessibility in gambling behaviors and problem gambling in four different countries: Australia, Canada, Croatia and Israel. A convenience sample comprised 1787 university students aged 18–30. Gambling behaviors and problems were found to be more prevalent and gambling was perceived to be more accessible in liberalized markets (e.g. Australia, Canada and Croatia) as compared to Israel which is relatively more conservative and has more restrictive regulations. Social accessibility was perceived to be higher in those who gambled and associated with higher risk gambling, especially for women. The study highlights the potentially important role of social normalization of gambling and how supply variations can influence perceptions as well as impact gambling behavior.

Keywords Accessibility · Gambling behaviors · Liberal gambling markets

Introduction

Gambling is a social behavior that is embedded in specific social and environment contexts (Reith & Dobbie, 2011). Although the legitimacy and the legislation of gambling are manifested differently according to the socio-cultural context in which it occurs (Cosgrave & Klassen, 2001; McMillen, 2005), commercial gambling has over the last three decades proliferated and become widely viewed as a socially acceptable form of recreation in many countries (Banks, 2017). International prevalence studies show that around 70% of adults gamble at least once per year, with most studies reporting that 2–3% of the adult population can be identified

as either problem or moderate risk gamblers at a particular point in time (Calado & Griffiths, 2016). Much of this growth has been driven by regulatory changes that have increased the supply of gambling products (e.g., the legalization of slot-machines, opening of casinos, expansion of sports betting and online gambling). However, given that not all people gamble and not necessarily to the same degree, there is interest in understanding the different factors that influence people's involvement in gambling in different jurisdictions (LaPlante & Shaffer, 2007; St-Pierre et al., 2014).

An important factor in this context is accessibility which is a multidimensional concept that relates to the physical, social and cognitive influences on people's gambling. Physical gambling refers to geographic features such as the location of gambling venues, the number of venues, social accessibility as a function of social and cultural approval, and cognitive accessibility refers to people's understanding of how to gamble (Hing & Haw, 2009; Moore et al., 2011). The role of these factors is inherent in the Pathways Model (Blaszczynski & Nower, 2002) which recognizes ecological factors such as ease of access and the social accessibility of gambling serve as a “gateway” to gambling, irrespective of the role of other more specific factors (e.g., behavior or emotional vulnerability). Similarly, situational characteristics may serve a starting point for developing gambling problems (Griffiths, 2008).

✉ Belle Gavriel-Fried
bellegav@tauex.tau.ac.il

¹ The Bob Shapell School of Social Work, Tel Aviv University, 69978 Tel Aviv, Israel

² University of Adelaide, School of Psychology, 5005 Adelaide, Australia

³ University of Zagreb, Faculty of Education and Rehabilitation, Zagreb, Croatia

⁴ McGill University, Department of Psychiatry, Montreal, Canada

Social and environmental factors are also recognized by public health perspectives that propose a multidimensional model for understanding health related issues by highlighting the external social and environmental factors that promote or impede the transition from recreational gambling to problem related gambling (Shaffer, 2003).

Empirical studies worldwide have reported a positive association between gambling accessibility and gambling behaviors and its related harm (Pearce et al., 2008; Thomas et al., 2011; Welte et al., 2016), even though the relationship may be slightly non-linear. For example, a recent study conducted in the three largest states in Australia found a positive association between the number of gambling venues in a local geographic area and the number of personal insolvencies in this area (Badji et al., 2020). Another study in Australia presented a typology of six types of gambling venues according to their spatial and regulatory characteristics and assessed the association to the dangers of gambling (Young et al., 2012). The findings indicated that the proportion of problem gamblers tends to be highest in casino populations. An early study conducted in New Zealand found a positive association between problem gambling, gambling behavior and neighborhood access to gambling opportunities (Pearce et al., 2008). Other studies reporting similar associations mention the complexity inherent to measuring the relationship between accessibility and gambling behaviors and its negative consequences. A study conducted in all 50 states of the U.S with 2963 adults found that individuals who live close to the casinos gamble more than those who do not (Welte et al., 2016), although the design of the study precluded drawing causal conclusions. A similar study conducted in Canada suggested a positive link between casino proximity and gambling participation (Sevigny et al., 2008). A meta-analysis of 34 surveys conducted in Australia and New Zealand revealed interesting findings reflecting forces that operate simultaneously - the access and adaptation hypothesis. There was a positive association between the density of EGM's and problem gambling (which supports the access thesis), but over time, the prevalence of problem gambling was found to decrease (which supports the individual and community adaptation hypothesis) (Storer et al., 2009). While all these findings are based on quantitative designs, a recent study based on interviews with recovered gamblers in Israel indicated that an EGM-free environment, the result of a law prohibiting EGMs from operating was cited as one of the recovery capital dimensions that helped individuals with a life-time gambling disorder cope better during their recovery process (Gavriel-Fried & Lev-el, 2020).

Logically, countries with public policies that permit multiple forms of gambling through gambling legislation foster an environment in which gambling is socially accepted, encouraged and actively promoted. This can lead to more gambling and more gambling-related problems. However, until now, we note that no studies have explored the role of international

comparisons of perceived differences in gambling accessibility and how this might be associated with variations in gambling behavior or the development of gambling-related problems.

The Present Study

Accordingly, the aim of our research was to gain insights from four countries that either shared similarities or differences in their regulatory history: Australia, Canada, Croatia and Israel. The first three of these countries have highly liberalized gambling markets with less restrictive laws and regulations, ready access to slot-machines, casinos and a range of wagering products. Both Australia and Canada have well established markets (Abbott, 2017; Delfabbro & King, 2012), whereas Croatia has experienced more recent and rapid growth in the past 20 years (Ricijaš et al., 2016). By contrast, Israel has a more restricted gaming market that reflects the tension between its traditional influences and modern attributes (Gavriel-Fried, 2015). On the one hand, the modern-liberal position towards gambling can be seen in the statutory right awarded to two state-regulated enterprises to run gambling operations on its behalf. These two public gambling organizations operate in order to maximize their revenues, just as private companies, and provide the Israeli public with a range of gambling opportunities, whose popularity is evident in the significant and consistent rise in the revenues of these two bodies in recent years (Gavriel-Fried, 2015). However, under Israeli law, the operation of a casino or other gambling venues for recreational purposes is classified as a criminal offense - due to social and religious arguments (Gavriel-Fried & Ajzenstadt, 2013), and Israel still does not have the traditional land-based gambling establishments that are typically found in many other parts of the world (hence, for example, in 2017 the Ministry of Finance banned EGMs). This situation likely decreases exposure of individuals to gambling venues such as casinos or bars with EGMs, which may help them avoid gambling.

In this study we examined the role of perceived gambling accessibility in the development of gambling behaviors, problem gambling, in students at universities in these four different countries. The choice of this population was motivated by a desire to control for age and education differences, but also because this age-group is developmentally important. University aged students are considered to be in a developmental stage termed emerging adulthood which ranges from the late teens to the late 20s, and even thirty (Arnett, 2007; Wilson & Love, 2018). This period of life is typically characterized as an age of instability, possibilities and identity explorations in which the individual extends the period of learning and experimentation (Arnett, 2005). As result, individuals at this stage are most prone to exploring new activities

(Sussman & Arnett, 2014) and may be more susceptible to engaging excessively in potentially addictive behaviors. Central to this investigation was the study of gender differences. Gender is one of the common sociodemographic characteristics that has consistently shown to be associated with differences in gambling behavior and problems in different developmental stages (e.g., males usually start gambling at a younger age, Delfabbro, 2000). The prevalence of gambling, involvement, gambling problems, or disorders are consistently higher among men than women (Husky et al., 2015; Wong et al., 2013). In term of accessibility, a study conducted in Brazil on 3007 risk gamblers revealed that men started to gamble earlier than women, and were at a higher risk of being exposed to gambling and develop gambling-related problems (Carneiro et al., 2020), and this been borne out in a number of reviews (González-Ortega et al., 2015; Merkouris et al., 2016). Studies have also shown that increases in the social accessibility of gambling is linked to their appeal and increases in women's gambling involvement when gambling venues are perceived as safer and trustworthy (Thomas et al., 2011).

Aims and Hypotheses

This study examined whether: (a) broader regulatory differences across countries would be reflected in differences in perceived physical, cognitive and social accessibility of gambling; (b) whether differences in perceived accessibility would be related to a higher risk of gambling in different countries; and (c) the consistency of gender differences observed within countries as based on the assumption that gambling may be more or less acceptable for women in the different cultures. The study used a correlational design so that the principal focus was upon the relationship between key variables as opposed to estimating prevalence. Nevertheless, the paper includes comparative data relating to gambling participation to highlight differences in the gambling habits of the different samples and to study gender differences. It was anticipated that gambling participation and PG would be higher in countries with more liberalized markets (Canada, Australia and Croatia). Our principal correlational hypotheses were that; (1) Gambling would be viewed as more accessible in Canada, Australia and Croatia than in Israel; (2) Individuals who perceive gambling to be more accessible were predicted to be more likely to report a higher risk of gambling (moderate risk or problem gambling as based on the Problem Gambling Severity Index); and (3) Gambling involvement and the prevalence of higher risk gambling would be greater in men than women in each country.

Method

Participants

The study involved 1787 young adults aged 18–30 years (634 men; 1153 women) drawn from four countries (477 from Australia; 542 from Israel; 535 from Croatia and 233 from Canada). The gender profile of the sample differed across the countries, $\chi^2(df=3, N=1787) = 38.9, p < .001$. The percentage of men was as follows: 32% in Australia; 28% in Israel; 46% in Croatia and 37% in Canada. There were also significant age differences, $F(3, 1787) = 199.6, p < .001$: Australia ($M = 19.6, SD = 2.11$); Israel ($M = 23.3, SD = 2.8$); Croatia ($M = 21.6, SD = 2.5$); Canada ($M = 21.0, SD = 2.4$). The Israeli students are older than students from other countries due to the army service which is compulsory in this country (two years and eight months for man and one year and ten months for women).

Measures

Gambling Behavior

Participants were asked how often they had engaged in different forms of gambling in the past year. Activities included lottery products, gaming, casino gambling, bingo, keno, EGMs, sports or race betting and private card games. In order to capture all types of gambling activities one of the items was labeled as “other”. A 6-item scale was used ranging from 1 = Never to 6 = Almost every day.

Problem Gambling Severity Index (PGSI)

Respondents completed the 9-item PGSI (Ferris & Wynne, 2001). Statements were presented using a past 12-month time-frame with respondents providing answers on a four-point scale ranging from 0 = ‘Never’ to 3 = ‘Almost always’. Total scores of 0 = ‘non problem gamblers’; 1–2 = ‘low-risk gamblers’; 3–7 = ‘moderate risk gamblers’; and 8+ = ‘problem gamblers’. The Cronbach's Alpha for the PGSI ranged from .81 to .92 in four countries.

Perceived Accessibility

The Gambling Accessibility Scale (Hing & Haw, 2009) comprises 13 items assessing different dimensions of accessibility: physical, social and cognitive. Physical (5 items) refers to the geographical accessibility of gambling; social (6 items) refers to approval from family, friends and colleagues, and cognitive (2 items) that measures understanding and familiarity of how the gambling products work. These items were completed by participants who gambled at land-based venues. An example item for physical accessibility was: “If you gamble, how easy

or difficult would it be for you to *find a venue with games of chance that is convenient to go to*". Participants were asked to rate each item on a 4-point scale (extremely easy, quite easy, quite difficult, extremely difficult). The Cronbach's Alpha values for the 3 subscales were all very good across the four countries: .91 to .95 for Physical; .85 to .91 for Social; and .88 to .90 for Cognitive accessibility.

Perceptions of Regulation

Participants indicated the extent to which gambling is regulated in their country on a 5-point scale from 1 = *Very poorly regulated* to 5 = *Very well regulated*. They were also asked to indicate whether there was: (1) Far too much gambling, (2) Just about the right amount, (2), or (3) Too little gambling in their country. These two items were developed for this study.

Procedure

An on-line survey, using Qualtrics software, was distributed to students aged 18+ enrolled at five universities located in the large cities of Adelaide, Tel Aviv, Montreal, and Zagreb. This age group is considered to be highly familiar with online and social media and tend to use it on a daily basis (Duggan & Brenner, 2013). In Adelaide, first year psychology students were offered course credit. In Israel, the survey was distributed via the Facebook pages of groups of students at Tel Aviv University. In Canada instructors teaching large classes (250 students plus) were asked by the researchers to display a power point slide presenting the study and providing a link to the online survey. A poster with study information and a direct link to the online survey was posted on local university Facebook groups at McGill and Concordia. In the University of Zagreb, several approaches were used: (1) General information about the study and its main goals with the link to the study was sent to vice deans for students affairs at all faculties and were asked to distribute the link with their students, i.e., to distribute the link to students' official e-mails; (2) Students associations were contacted and informed about the research and asked to put the link to the survey on their web-sites and social networks; (3) The instructions for the participation in the study included an appeal asking students to share the link with their peers. The data was collected from August 2017 to April 2019. The study protocol was reviewed and approved by four institutional review boards of Tel Aviv, Adelaide, Zagreb and McGill universities.

Analytical Strategy

It was important to rule out the possibility that findings would be confounded by age and gender differences between the countries. Preliminary analyses indicated that age was unrelated to the principal variables in this study, so that the small

variations in age observed in the sample were unlikely to have had any significant influence on the results. However, this was not true of gender, so analyses are presented separately by gender. Univariate analyses were undertaken using chi-square and ANOVAs (confirmed using Kruskal-Wallis tests were used when there was strong evidence of skewed data). Logistic regression was used to examine the best predictors of higher risk gambling behaviors (moderate and problem gambling).

Results

General Gambling Participation

Table 1 summarizes three variables: the overall percentage of respondents reporting engagement in at least one gambling activity in the previous 12 months and the percentage who reported weekly participation. One analysis examines all gambling activities and a second excluded lottery products. The results are presented separately for men and women. Male participation rates (both overall and weekly) are significantly lower in Israel than in the other countries; with the highest rates of participation being observed in Canada; both Canadian and Croatian students had the highest weekly (not lottery) participation rates, whereas Croatian respondents were most likely to report weekly participation when lotteries were included. Differences in overall participation were observed for women, with Israeli students found to have significantly lower rates than the other countries. However, no significant differences were observed for weekly participation. Comparisons within countries indicated that the overall participation rates for men were higher than for women in all countries except Australia. Weekly participation (excluding lotteries) was higher for women in Canada and Australia, whereas weekly participation that included lotteries was higher for men in all countries. In other words, men were generally more likely to gamble overall and gamble weekly, but this effect was not consistently observed in Australia.

Gambling on Specific Activities

Participation rates for individual activities are summarized in Table 2. For males, differences in participation varied by activity. EGM participation was most common in Canada, but less common in Israel (where it is not legally permissible); racing participation was most common in Australia and Croatia; lottery participation was highest in Canada and Croatia; Keno in Australia; and private card-games were most common in Canada, Australia and Croatia, but rare in Israel. Overall, consistent with Table 1, the results showed that Israeli respondents reported lower levels of gambling on most activities, except for scratch tickets, bingo and sports-betting.

Table 1 Country differences in gambling participation

	Australia (<i>n</i> =151) <i>N</i> (%)	Canada (<i>n</i> =85) <i>N</i> (%)	Croatia (<i>n</i> =244) <i>N</i> (%)	Israel (<i>n</i> =154) <i>N</i> (%)	χ^2
Men					
Overall	110 (72.8)	68 (80.0)	169 (69.3)	75 (48.7)	32.5***
Weekly (non lotto)	11 (7.3)	12 (14.1)	34 (13.9)	7 (4.5)	12.0***
Weekly (lotto inc)	19 (12.6)	13 (15.3)	18 (23.8)	12 (7.8)	19.9***
	(<i>n</i> =326) <i>N</i> (%)	(<i>n</i> =148) <i>N</i> (%)	(<i>n</i> =291) <i>N</i> (%)	(<i>n</i> =388) <i>N</i> (%)	χ^2
Women					
Overall	212 (65.0)	92 (62.2)	148 (50.9)	102 (26.3)	124.0***
Weekly (non lotto)	11 (3.4)	3 (2.0)	41 (1.4)	6 (1.5)	3.93
Weekly (lotto inc)	12 (3.7)	4 (2.7)	9 (3.1)	8 (2.1)	1.75
Gender differences	χ^2	χ^2	χ^2	χ^2	
Overall	2.9	8.0**	18.6***	25.2***	
Weekly (non lotto)	3.6	13.1***	31.7***	4.2	
Weekly (lotto inc)	13.7**	12.7***	51.8***	10.2***	

* $p < .05$ ** $p < .01$ *** $p < .001$

Table 2 Country differences in gambling involvement in specific activities

	Australia (<i>n</i> =151) <i>N</i> (%)	Canada (<i>n</i> =85) <i>N</i> (%)	Croatia (<i>n</i> =244) <i>N</i> (%)	Israel (<i>n</i> =154) <i>N</i> (%)	χ^2
Men					
EGMs	50 (33.1)	34 (40.0)	23 (29.9)	21 (13.6)	24.2***
Racing	20 (13.2)	5 (5.9)	34 (13.9)	4 (2.6)	17.0***
Scratchies	36 (23.8)	28 (32.9)	57 (23.4)	41 (26.6)	3.4
Lottery	30 (19.9)	27 (31.8)	80 (32.8)	33 (21.4)	11.5**
Keno	16 (10.6)	7 (8.2)	7 (2.9)	8 (5.2)	10.8***
Casino tables	44 (29.1)	30 (35.3)	76 (31.1)	30 (19.5)	9.0*
Bingo	16 (10.6)	9 (10.6)	21 (8.6)	5 (3.2)	7.0
Sports	36 (23.8)	23 (27.1)	48 (19.7)	34 (22.1)	3.0
Cards	63 (41.7)	48 (56.8)	86 (35.2)	12 (7.8)	71.3***
	(<i>n</i> =326) <i>N</i> (%)	(<i>n</i> =148) <i>N</i> (%)	(<i>n</i> =291) <i>N</i> (%)	(<i>n</i> =388) <i>N</i> (%)	
Women					
EGMs	121 (37.1)	31 (20.9)	26 (8.9)	39 (10.1)	110.0***
Racing	43 (13.2)	6 (4.1)	2 (0.7)	7 (1.8)	65.7***
Scratchies	80 (24.5)	41 (27.7)	78 (26.8)	60 (15.5)	17.2***
Lottery	56 (17.2)	35 (23.6)	63 (21.6)	33 (8.5)	29.5***
Keno	31 (9.5)	4 (2.7)	2 (0.7)	3 (0.8)	50.9***
Casino tables	41 (12.6)	20 (13.5)	23 (7.9)	14 (3.6)	23.8***
Bingo	41 (12.6)	19 (12.8)	32 (11.0)	10 (2.6)	29.1***
Sports	29 (8.9)	17 (11.5)	19 (6.5)	16 (4.1)	11.4***
Cards	83 (25.5)	44 (29.7)	51 (17.5)	4 (1.0)	108.8***

* $p < .05$ ** $p < .01$ *** $p < .001$

Analysis of the results for women indicated that Israeli women had the lowest level of participation on all activities except for racing, EGMs and keno. EGM, racing and keno participation rates were highest in Australia. Further, within country comparisons summarized in Table 3 (results of chi-squared tests) indicate a stronger pattern of activity specific gender differences for respondents from Israel and Croatia, with the fewest differences observed in Australia.

Table 3 Gender differences in gambling involvement in specific activities within countries (χ^2)

	Australia (<i>n</i> =477) χ^2	Canada (<i>n</i> =233) χ^2	Croatia (<i>n</i> =535) χ^2	Israel (<i>n</i> =542) χ^2
M vs F				
EGMs	–	9.7*	38.7***	–
Racing	–	–	37.1***	–
Scratchies	–	–	–	9.1*
Lottery	–	–	8.4*	17.2**
Keno	–	–	–	10.8*
Casino tables	19.3***	15.2**	47.5***	37.2**
Bingo	–	–	–	–
Sports	10.6**	9.2*	20.9**	42.4***
Cards	12.8**	16.2**	21.9**	17.6*

* $p < .05$ ** $p < .01$ *** $p < .001$. Only significant results are presented to facilitate interpretation

Table 4 Country comparisons of Problem Gambling Severity Index (PGSI) scores and classifications

	Australia (n=151) N (%)	Canada (n=85) N (%)	Croatia (n=244) N (%)	Israel (n=154) N (%)	χ^2
Men					
Non-problem	91 (60.3)	48 (56.5)	143 (58.6)	114 (74.0)	
Low risk	35 (23.2)	15 (17.6)	44 (18.0)	20 (13.0)	
Moderate risk	20 (13.2)	13 (15.3)	38 (15.6)	12 (7.8)	
Problem	5 (3.3)	9 (10.6)	19 (7.8)	8 (5.2)	19.3***
	M (SD)	M (SD)	M (SD)	M (SD)	F/ KW Test
PGSI scores	1.2 (2.31) (n=326) N(%)	2.4 (4.52) (n=148) N (%)	2.1 (4.05) (n=291) N (%)	1.2 (3.12) (n=388) N (%)	3.75/ 12.1*
Women					
Non-problem	232 (71.2)	114 (77.0)	257 (88.3)	350 (90.2)	
Low risk	64 (19.6)	26 (17.6)	19 (6.5)	24 (6.2)	
Moderate risk	24 (7.4)	4 (2.7)	13 (4.5)	12 (3.1)	
Problem	6 (1.8)	4 (2.7)	2 (0.7)	2 (0.5)	63.2***
	M (SD)	M (SD)	M (SD)	M (SD)	F/ KW-test
PGSI scores	.77 (1.91)	.68 (2.05)	.35 (1.40)	.26 (1.11)	7.5/ 53.6**

* $p < .05$ ** $p < .01$ *** $p < .001$; KW = Kruskal Wallis test

Problem Gambling

The PGSI scores and classifications for men and women among the entire sample separately are summarized in Table 4. Post hoc comparisons (Fisher Least Significant Difference Tests) applied to the results for men indicate that total PGSI scores and the proportion of problem gamblers were highest in Canadian and Croatian respondents than in the other two countries. On the other hand, among women, total PGSI scores were highest for Australian and

Canadian respondents. In general, however, the total percentage of higher risk gamblers (moderate-risk and problem gamblers combined) was lowest in Israeli respondents compared with the other three groups.

Accessibility and Gambling

Table 5 summarizes the mean item scores for the three accessibility subscales reverse-scored so that higher scores indicate a perception of greater accessibility. The results for men

Table 5 M (SD) accessibility scores by gender and country

	1 Australia (n =477) M (SD)	2 Canada (n =233) M (SD)	3 Croatia (n =535) M (SD)	4 Israel (n =542) M (SD)	F (3, 548)	Post hoc
Men						
Physical	3.18 (0.60)	3.01 (0.69)	3.53 (0.57)	2.68 (0.95)	42.0***	3>1,2,4; 1>4, 2>4
Cognitive	2.93 (0.68)	3.05 (0.81)	3.26 (0.67)	2.97 (0.84)	7.0***	3>1,2,4
Social	2.49 (0.56)	2.62 (0.69)	2.49 (0.65)	2.29 (0.85)	3.9**	1–3>4
					F (3, 896)	
Women						
Physical	3.27 (0.65)	2.84 (0.81)	3.53 (0.58)	2.51 (0.94)	88.1***	3>1,2,4; 1,2>4; 1>2
Cognitive	2.71 (0.79)	2.71 (0.79)	3.15 (0.73)	2.63 (0.88)	20.2***	3>1,2,4
Social	2.39 (0.64)	2.26 (0.69)	2.18 (0.66)	2.01 (0.79)	13.5***	1>3–4; 2>4; 3>4

* $p < .05$ ** $p < .01$ *** $p < .001$

showed that perceptions of physical accessibility differed significantly. Post-hoc comparisons showed that this perception was strongest in Croatia followed by Canada and Australia with the lowest level observed in Israel. Cognitive accessibility was higher in Croatia compared with the other three country groups. Social accessibility was lower in Israel than for the other countries. For women, the results were similar: Croatian women reported the highest physical accessibility followed by Australia, with lower levels in Canada and Israel. Cognitive accessibility was again higher in Croatia than the other countries. Social accessibility was higher among women in Australia, Canada and Croatia than in Israel. Further analysis revealed that those who gambled (as compared to those who did not) scored significantly higher on social accessibility in all four countries. No significant differences were observed for physical accessibility and cognitive accessibility was only higher for gamblers among Canadian respondents.

Accessibility and Higher Risk Gambling

An important question is whether greater accessibility of gambling is related to a higher risk gambling. Table 6 presents a series of logistic regression analyses that examined how well the three dimensions of accessibility predicted moderate-risk and problem gambling for men and women by country of residence. This analysis controlled for differences in the perceived level of regulation and availability of gambling in each country. In the Australian sample, no dimension of risk was significant for men, but women were more likely to be higher risk gamblers if they reported greater social and cognitive accessibility (i.e., knew how to gamble and it was socially acceptable). In the Israeli sample, social acceptability was the only significant factor for both men and women. In the Croatian sample, social accessibility was the only significant predictor (for women only). No significant results were obtained for the Canadian sample. The perception of availability was significant in Australian women (a perception of there being a need for more gambling was associated with higher risk gambling). In Croatian men, a more positive appraisal of gambling regulation was associated with higher risk gambling. Overall, the results suggest that physical accessibility is less important than the other dimensions of accessibility and that it was more common to find that social availability was an important factor for higher risk gambling among women. These findings held after controlling for country, age, gender and perceptions of regulation and availability.

Discussion

The principal aim of this study was to examine cross-country differences in the perception of gambling accessibility and the nature of gender differences. The results showed that country

Table 6 Accessibility as a predictor of moderate-risk/ problem gambling in each country

Australia					
Men					
Variable	B	SE	Wald	OR	95% CI
Regulation	.19	.27	< 1	1.21	.71–2.06
Availability	.01	.53	< 1	1.01	.36–2.87
Physical (A)	-.22	.42	< 1	.80	.35–1.81
Cognitive (A)	.22	.39	< 1	1.24	.58–2.66
Social (A)	.50	.46	1.19	1.65	.67–4.08
Constant	-3.29				
81% of cases correctly classified					
Women					
Regulation	-.18	.25	< 1	.83	.51–1.36
Availability	1.22	.42	8.49**	3.40	1.49–7.34
Physical (A)	-.55	.36	2.31	.58	.28–1.17
Cognitive (A)	.65	.31	4.37*	1.92	1.04–3.53
Social (A)	1.07	.40	7.19**	2.93	1.34–6.42
Constant	-6.64				
90% of cases correctly classified					
Israel					
Men					
Variable	B	SE	Wald	OR	95% CI
Regulation	.15	.28	< 1	1.17	.68–2.02
Availability	.88	.45	3.99	2.41	1.0–5.83
Physical (A)	-.17	.36	.24	.84	.42–1.69
Cognitive (A)	.18	.44	.17	1.20	.51–2.84
Social (A)	.96	.43	4.95*	2.61	1.21–6.06
Constant	-6.33	1.73			
83% of cases correctly classified					
Women					
Variable	B	SE	Wald	OR	95% CI
Regulation	-.05	.33	< 1	.95	.50–1.88
Availability	-.68	.49	1.97	.51	.20–1.31
Physical (A)	.24	.41	< 1	1.28	.58–2.82
Cognitive (A)	-.88	.46	3.77	.41	.17–1.01
Social (A)	1.13	.50	5.11*	3.09	1.16–8.20
Constant					
94% of cases correctly classified					
Croatia					
Men					
Variable	B	SE	Wald	OR	95% CI
Regulation	.39	.16	6.16**	1.47	1.08–1.99
Availability	-.33	.35	.90	.72	.36–1.43
Physical (A)	.60	.38	2.51	1.83	.87–3.86
Cognitive (A)	.19	.27	.52	1.21	.72–2.05
Social (A)	.41	.28	2.15	1.50	.87–2.60
Constant	-5.54	1.71			
75% of cases correctly classified					
Women					
Variable	B	SE	Wald	OR	95% CI

Table 6 (continued)

Australia					
Regulation	.17	.28	< 1	1.18	.69–2.03
Availability	-.26	.65	< 1	< 1	.22–2.78
Physical (A)	-.30	.59	< 1	.74	.24–2.36
Cognitive (A)	-.66	.44	2.28	.52	.22–1.22
Social (A)	1.44	.50	8.12**	4.21*	1.59–11.30
Constant	-3.15				
94% of cases correctly classified					
Canada					
Men					
Regulation	-.22	.30	< 1	.80	.44–1.46
Availability	.74	.59	1.57	2.09	.66–6.60
Physical (A)	-.06	.45	< 1	.94	.39–2.25
Cognitive (A)	.04	.36	< 1	1.05	.52–2.10
Social (A)	.07	.43	< 1	1.07	.46–2.51
Constant	-1.77	1.97			
71% of cases correctly classified					
Women					
Regulation	-.06	.48	< 1	.94	.37–2.40
Availability	.72	.94	< 1	2.05	.33–12.88
Physical (A)	-.31	.55	< 1	.73	.25–2.14
Cognitive (A)	-.30	.59	< 1	.74	.23–2.35
Social (A)	.48	.67	< 1	1.61	.43–6.02
Constant	-3.20				
93% of cases correctly classified					

Regulation = Perception of the quality of regulation of gambling in the country (higher scores indicate better regulation); Availability = Perception of how available gambling is in the country (higher scores indicate that there should be more gambling available, lower = too much gambling available)

differences were observed for all three dimensions of accessibility and that this difference was observed for both men and women. The strongest differences were observed for physical accessibility (i.e., how easy it was to access gambling opportunities) with the highest level of accessibility observed in Croatia (a newly liberalized market) and with lower levels of accessibility observed in Israel as might be expected based on its more restrictive gambling legislation. Physical accessibility was also generally the most strongly endorsed form of accessibility and therefore (by implication) considered to be most salient accessibility dimension. Similar patterns, but weaker effects, were observed for cognitive accessibility which was found to be highest in Croatian respondents for both men and women, which suggests that students in Croatia were more confident about how to gamble than those from other countries. On the other hand, social accessibility (whether people close to the respondent approved of gambling) was higher in Australia and Canada (the more established liberalized

markets) and lowest in Israel. In other words, while gambling was seen as very accessible in Croatia, people were less likely to approve of it. In Israel, gambling was generally perceived as less socially acceptable on all three dimensions; it was considered hard to access, people knew less about how/where to gamble, and it attracted less social approval.

The results also showed that physical accessibility (despite being the most endorsed form of accessibility), was not the principal predictor of gambling risk in the samples. Instead, the most important factor in Australia, Israel and Croatia was social accessibility, or whether people had friends and family members who approved of gambling. These findings are generally consistent with studies that have highlighted the important role of social norms and family influences in the uptake of gambling and in problem gambling risk (see Dowling et al., 2017; Lang & Randall, 2013; Thrasher et al., 2011; Zhai et al., 2017). According to these studies, this occurs because of a range of factors; social modeling (young people learn how to gamble and that it is an acceptable activity); common individual risk factors (parents who like risk-taking may have children with similar interests); or socialization (people interact with other people with similar interests). The reduced influence of physical accessibility might also reflect the fact that the participants were young adults who increasingly access gambling online rather than in land-based venues (Hollén et al., 2020; Sirola et al., 2018). A study conducted in Spain reported that a mixed-mode gambling access to gambling (both online gambling and land-based) successfully predicted at-risk and problem gambling in adolescents (González-Roz et al., 2017) and that this might also apply to young or emerging adults as well. Accordingly, future studies could include more refined measures of the mode of gambling. It may be that, when gambling is quite accessible and located near to other frequently visited locations (e.g., shopping centers), people no longer have to make special visits in order to gamble as would be the case with earlier destination venues such as larger casinos.

Gambling Patterns

The observed country differences in the perception measures were generally reflected in a similar pattern of differences for reported gambling participation and scores on the PGSI. This is important because it serves a form of concurrent or convergent validity for the perceived accessibility findings. In Canada, Australia and Croatia which have liberal gambling markets, students reported gambled at higher frequencies, have more gambling problems, and perceive the market as more accessible. By contrast, Israelis students were less involved in gambling, had fewer gambling problems and less physical and social accessibility to gambling. These findings are not unsurprising, given that EGMs are illegal in Israel. These findings are generally consistent with the view that

limiting the accessibility of certain forms of gambling changes patterns of gambling participation (although caution needs to be applied here because of the use of a convenience sample). Studies in Norway, for example, such as by Lund (2009) showed that a 2007 law banning EGMs in Norway reduced gambling among active EGM gamblers and high-risk gamblers (Lund, 2009). Similar changes in adolescent gambling occurred in Spain in response to more restrictive gambling legislation (González-Roz et al., 2017). In broad terms, these findings show how greater liberalization of markets appears to be associated with greater gambling participation and rates of problem gambling (Kingma, 2004).

At the same time, the results indicate that variations in exposure to gambling does not appear to affect people the same way (LaPlante & Shaffer, 2007), as the findings show in relation to women. Traditionally, gambling venues were male dominated since not all types of gambling were equally accessible or culturally acceptable for women (Delfabbro, 2000; Mark & Lesieur, 1992). Women were less likely to take part in gambling activities as female gambling was often associated with the violation of cultural and traditional gender roles. However, as gambling has become normalized and socially acceptable women have started to gamble in higher numbers (Hing & Breen, 2001; Ladd & Petry, 2002). This normalization and the social legitimacy of this behavior may be a double edged sword and a risk factor for women. As can be seen in the findings related to gambling rates, although in all four countries men had higher rates of gambling and problem gambling, Australia and Canada were the exceptions in that women engaged more in weekly gambling (excluding lotteries). This may be because gambling has become more normalized in these countries. In Australia, for example, venues with gaming machines are now gender neutral. They are located in clean safe venues, with many women working on staff, game themes are not strongly masculine, and gambling venues are typically offered in multi-functional venues (e.g., restaurants, event centers, social clubs). People may, in fact, visit the venues for reasons other than gambling and then gamble, or gambling may be part of a range of activities undertaken on the same visit (see Thomas et al., 2011). Similarly, in Croatia, almost every shopping mall has slot-machine clubs and small casinos, often co-located with cinemas. There are also sports betting outlets in neighborhoods and sports betting can be undertaken at local bars (Ricijaš et al., 2019).

Methodological Considerations and Implications

The current study has a number of methodological limitations. First, this is a cross sectional study and as such cannot make causal determinations. The study incorporated a convenience sample, mostly based on a particular segment of the population who are more likely to come from higher SES and who

have higher levels of education. This is a potential strength of the study in that it enabled age and education level to be kept relatively consistent across the samples, but future cross-national comparative studies should be conducted on other segments of population. Second, although the study was able to control for gender, age and educational differences by separately analyzing responses by gender and also focusing on university populations, there are other variables which may be important. These include differences in the disposable income or socio-economic status across the countries or religious differences. For example, the lower rates of gambling in Israel may be due to the relatively higher proportion of people with strong faith (Judaism or Islam). Finally, the current study measured accessibility through the subjective point of view of the participants. Thus, future studies should combine objective measures of accessibility, and also include accessibility to internet/mobile gambling.

This study highlights the importance of differences in the regulation and supply of gambling on gambling behavior and the development of gambling-related harms. Different regulatory systems have the potential to influence people's engagement in gambling, the types of activities engaged in, and the level of associated harm. The study also highlights the importance of studying the multidimensional aspects of accessibility and, in particular, how social legitimacy plays an important role in the uptake of gambling and how this can impact specific segments of population. In this study, we showed how this dimension appears to be particularly influential in women's gambling behaviors, but such analyses could be extended to other higher risk populations including adolescent gamblers, those in developing countries where gambling markets might be still in the earlier stages of development, or where previously more restricted markets are opened up through the introduction of more liberalized or free market legislation.

Conclusions

This research yielded a number of insights. First, it showed that variations in perceptions of the accessibility can be reliably differentiated across countries that are known to differ in the nature of their gambling markets. In particular, it showed how both the level of liberalization (as shown in comparisons between Israel and the other three countries) as well as the maturity of the market (Croatia as compared with Australia and Canada) appears to be important in understanding how people perceive gambling and their level of gambling involvement.¹ Second, the paper confirms Hing and Haw's (2009)

¹ Note that we include measures of religious engagement and identification in this study which are reported in another paper. The effects for religion were generally small and do not explain or confound the gender and accessibility measure effects reported in this paper.

emphasis on the multi-dimensional nature of accessibility. In particular, it shows that physical accessibility (while often the most endorsed dimension) does not appear as influential as social factors in determining whether people might be more likely to develop a stronger or problematic level of gambling involvement. These findings have important implications for understanding the role of socialization, the normalization and cultural acceptance of gambling. Future studies into the gambling accessibility relating to the effects new gambling opportunities are likely to be limited unless they can capture the social dimension of accessibility. This appears particularly important given the growing prevalence of remote or internet gambling that does not require a physical location.

Author's Contribution Statements Belle Gavriel-Fried- Was the one of the principal architects of the project, was in charge of the study design, and was the principal coordinator of the project. She collected the Israeli data., and wrote the manuscript.

Paul Delfabbro- Coordinated the Australian leg of the project. He conducted the statistical analysis, wrote the “Results” section, and drafted the manuscript.

Neven Ricijas - Was one of the principal architects of the project, contributed to the development of the survey, and conducted preliminary analyses. Dora Dodig Hundric - Was one of the principal architects of the project, compiled the measures, and coordinated the Croatian leg of the project.

Professor Derevensky- Co-ordinated the Canadian leg of the project, contributed to the preparation of the manuscript.

All the authors reviewed and approved the final version of the manuscript.

Data Availability The datasets generated during and/or analysed during the current study are available from the corresponding author upon reasonable request.

Declarations

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of four institutional review boards of Tel Aviv, Adelaide, Zagreb and McGill universities.

Conflict of Interest Belle Gavriel-Fried has received a seed grant from the International Center for Responsible Gaming in 2017 for exploration of recovery capital in gambling disorder. She has received a grant from the ministry of science (Israel) for a study about the success of Israeli Arab students in higher education in Israel in 2017. She has never received direct gambling industry funding for any research.

Paul Delfabbro has received funding for research, support for conference travel and speaking engagements from government and non-government research bodies such as AGRI, VRGF, IAGR and the Department of Consumer Affairs, GambleAware/ RGT, Gambling Research Australia, Independent Gambling Authority, the ARC, NHMRC, Channel 7 Children's Foundation and Australian Institute of Criminology. He has conducted paid consultancy work on responsible gambling for regulatory bodies, government, peak bodies such as the Australasian Gambling Commission and reviews of responsible gambling programs for some industry groups (e.g., reviews of list of indicators, self-exclusion program, host responsibility quality in relation to international best practice), but not received direct industry funding for any

research. He acknowledges that many peak research bodies are indirectly funded by industry through levies or contributions.

Neven Ricijaš has received funds for most of my research from the University of Zagreb, Faculty of Special Education and Rehabilitation Sciences, other governmental institutions (e.g. Ministry of Science, Education and Sport, Ministry of Justice, Croatian Institute of Public Health), and non-governmental institutions (e.g. UNICEF Office for Croatia). Some of the research focused on exploring gambling among different Croatian populations was co-funded and supported by the Croatian Lottery. He has conducted paid consultative work or training for the gambling industry (e.g. Croatian Lottery, Croatian Association for the Games of Chance) in the field of promoting responsible gambling principles and strategies.

Dora Dodig Hundric has received most of the funding for my research and support for conference travel from University of Zagreb (Faculty of Education and Rehabilitation Sciences). She has also participated in research and projects funded by other governmental institutions such as relevant ministries, NGOs, Croatian Lottery and Croatian Association for the Games of Chance.

Dr. Derevensky Jeff holds or has held several recent research grants from the NCAA, Manitoba Gambling Foundation, Florida Council on Compulsive Gambling, U.S. National Council on Problem Gambling, and Social Sciences and Humanities Council in Canada.

He has provided consultations to the Gerald Schwartz and Heather Reisman International Conference on Child Health, Development and Welfare, Jerusalem; National Science Foundation (U.S.); By Kids for Kids; Marsden Fund Council; New Zealand Government; National Collegiate Athletic Association's Sports Wagering Task Force; Gamble Aware, UK; International Olympic Committee, Mental Health Task Force; The Research Foundation - Flanders (FWO), Belgium; National Council on Problem Gambling (U.S.); Fonds National de la Recherche, Luxembourg; International Research Institute for Gambling and Gaming, Germany; University of Newcastle; Gambling Commission, U.K.; Government of Hong Kong; Australian Research Council; University of British Columbia Gambling Research Center; Ontario Ministry of Health and Long-Term Care; National Association for State and Provincial Lotteries.

Dr. Derevensky has received honoraria for speaking at conferences and workshops organized by the University of North Carolina; Moreau Shepell; Canadian Paediatric Society; New Jersey Council on Problem Gambling; Champlain College; Montreal Junior Chamber of Commerce; Massachusetts Council on Problem Gambling; Florida Council on Compulsive Gambling; Kentucky Council on Problem Gambling.

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