Associations Between Youth Unemployment and Underage Gambling in Europe

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Abstract

The aim of this work was to explore the associations between youth unemployment and youth engagement in gambling forms that have age limits, namely, slots, sports betting, and cards, both online and offline. Cross-country data were provided by the 2015 European School Survey Project on Alcohol and Other Drugs, a school survey focused on 16-year-olds. Gambling analyses included 30 countries (*n* = 81,229 respondents). Descriptive analysis with statistical plot diagrams was used and the computed coefficient of determination adopted to identify correlations. The suggested correlation was further tested by multilevel logistic regression analysis, controlling for gender at Level 1 and for the Inequality Human Development Index, gross domestic product/capita, and public health expenditure at Level 2. Underage gambling was associated with a higher degree of adolescent unemployment. The results indicate that youth unemployment is associated with underage gambling, implying that a broad public health framework is needed in the prevention of problem gambling.

Keywords: underage gambling, youth unemployment, public health, Europe, ESPAD

Résumé

Ce travail de recherche visait à étudier le rapport entre le chômage des jeunes et leur pratique des jeux de hasard qui comportent une limite d'âge, à savoir les machines à sous, les paris sportifs et les cartes, tant en ligne que hors ligne. Il s'appuie sur des données transnationales provenant de l'European Survey Project on Alcohol and Other Drugs(ESPAD) de 2015, une enquête menée dans les écoles auprès des jeunes de 16 ans. L'étude couvre 30 pays (n= 81 229 répondants). Une analyse statistique descriptive a été réalisée dans le but d'établir des corrélations. La corrélation ainsi

relevée a fait en outre l'objet d'une analyse de régression logistique en considérant le sexe comme facteur principal et, comme facteurs secondaires, l'Indice de développement humain ajusté aux inégalités (IDHI), le produit intérieur brut (PIB) par habitant et les dépenses de santé publique. La pratique des jeux de hasard en deçà de l'âge limite est associée à un degré élevé de chômage chez les adolescents. Les résultats indiquent qu'il existe un lien entre le chômage des jeunes et la pratique des jeux de hasard en deçà de l'âge limite, d'où la nécessité de mettre en place un cadre de santé publique élargi en matière de prévention du jeu pathologique.

Introduction

Problem gambling is increasingly recognized as a public health issue (Gambling Research Exchange Ontario, 2017; Korn, 2001). Sulkunen et al. (2018) advocated for a public interest approach to gambling, which is modelled on the public health perspective. The public interest approach aims to examine which policies will best serve the public good and to minimize individual and collective harm related to gambling. This approach emphasizes a call for action on political determinants. Examples of political determinants are gambling regulations and structural determinants of health, such as welfare policies and employment.

Emerging adulthood, which occurs in late adolescence, is characterized by a high degree of insecurity in the areas of education and work. In recent decades, changes in educational participation with protracted labour market transitions, in combination with an extension of the period of dependency among youth, have had implications for lifestyle choices (Furlong & Cartmel, 2007). Non-employment and job insecurity are widespread among young people in Europe. The European mean youth unemployment rate (among European Union member states, seasonally adjusted, defined as unemployment of people younger than 25 years) was 14.1% in December 2019 (Eurostat, 2019). There were large differences between countries, the highest rate being in Greece (35.6%) and the lowest in the Czech Republic (4.3%).

Youth unemployment is associated with poorer mental health (Bartelink et al., 2019). A cross-country multilevel analysis based on the European Social Survey demonstrated that well-being and health are lower among the unemployed than among the employed and that subjective job insecurity is negatively associated with well-being and health (Athanasiades et al., 2016). Nevertheless, there is a moderating effect of societal inequality, which suggests that in societies that are more equal, the negative effect of labour market insecurity on the life satisfaction of youth is buffered.

Less is known about the relation between youth unemployment at the country level and adolescent gambling (Canale et al., 2017). Connections between unemployment

and gambling were found in a study by Xouridas et al. (2016), which identified unemployment as the only relevant explanatory factor for the density of slot machines in Germany. Gori et al. (2015) found that gambling activity increased among adolescents who were neither working nor pursuing education or training. The prevalence of both at-risk and problem gambling (as defined by the South Oaks Gambling Screen) was higher for adolescents living in regions with higher rates of unemployment and a lower gross domestic product (GDP) per capita expended on gambling activity; this finding suggests that problem gambling is not only an individual issue, but also a social concern.

Aims

The overall aim of this study was to explore the associations between underage gambling and youth unemployment from a public health perspective. More specifically, we examined the associations between commercial gambling not allowed for youth under 18 years among 16-year-old adolescents and youth unemployment at the country level.

A Public Health Approach to Youth Health and Gambling

Gambling, as is generally the case with addictions and other mental health concerns, has historically been conceptualized as an individual's own psychological, medical, or even moral problem (Castellani, 2000; Korn, 2001). However, a public health perspective is currently more common in gambling research (Gambling Research Exchange Ontario, 2017; Korn, 2001). When conceptualizing problem gambling as a public health concern, it is reasonable to emphasize whole populations and inequalities within and between those populations, in contrast to focusing on individuals with problems (Adams et al., 2009; Sulkunen et al., 2018). The lack of cross-country studies may explain why research on more macro-level environmental factors is scarce. Most environmental factors examined in research have been family oriented (Ariyabuddhiphongs, 2013), indicating that parents and family are important factors for youth gambling and problem gambling (McComb & Sabiston, 2010).

Aggregate-level research in other areas concerning youth has shown that some of the strongest determinants of adolescent health worldwide are structural factors, such as national wealth, income inequality, and access to education (Viner et al., 2012). Policies for reducing social inequalities, such as welfare policies and labour market policies, seem to have a positive effect on health indicators (Navarro et al., 2006; Popham et al., 2013). Findings suggest that economic policies that affect the distribution of wealth within societies may indirectly influence the use of alcohol during early and mid-adolescence, especially among younger adolescents (Elgar et al., 2005).

Molinaro et al. (2014) analysed aggregate data from the 2011 European School Survey Project on Alcohol and Other Drugs (ESPAD) and examined the associations

between problem gambling among 16-year-olds and public health expenditure, benefits in kind for families/children, and gross national product (GNP) per capita. Public health expenditure per capita showed a correlation with problem gambling among youth. Wealth, as measured by GDP per capita, and benefits in kind for families/children did not show any statistically significant correlation with problem gambling among youth in multivariate analyses (Molinaro et al., 2014). It is important to state that in 2011, ESPAD included questions on problem gambling but not on gambling. Further, other studies have shown that an economic crisis on a national level could also have an impact on gambling behaviour (Olason et al., 2015).

Youth gambling: A Risk Behaviour

Gambling among youth is a high-risk behaviour (Messerlian et al., 2007). Early initiation into gambling is linked to an increased risk of developing gambling problems later in life (Blake et al., 2019; Carbonneau et al., 2015; Delfabbro et al., 2014; Dowling et al., 2017; Grant et al., 2009; Jun et al., 2019; Slutske, Piasecki, et al., 2015; Winters et al., 2002). Problem gambling in adolescence is associated with various serious health problems and social problems, such as deteriorating family relations, delinquency, and criminality, as well as increased risk for other addictions, including substance abuse (Blinn-Pike et al., 2010; Dowling et al., 2017; Fröberg, 2015). Gambling prevalence among youth varies across studies and countries. Generally, cross-cultural studies are lacking (Calado, Alexandre & Griffiths, 2017). However, a previous study on data from ESPAD, which included statistics from 33 countries (n = 93,875), found that 22.6% of 16-year-old students in Europe had gambled in the past year (Molinaro et al., 2018). According to another cross-sectional school-based study (N = 13,284) conducted in Germany, Greece, Iceland, the Netherlands, Poland, Romania, and Spain, 12.5% of the adolescents surveyed had gambled in the past year (Andrie et al., 2019).

Gambling Policies and Regulations in Europe

Gambling policies in Europe vary from country to country. Regulations stem from national prioritization and needs rather than regulatory imperatives from the European Union (Nikkinen, Egerer & Marionneau, 2018). In 2014, the European Commission launched a non-binding recommendation on consumer protections in online gambling that outlined a series of principles regarding risk information, rules on underage gambling, advertising, self-restraint measures, and problem gambling identification systems (Örnberg & Hettne, 2018).

The legal age for gambling varies in Europe from 16 to 25 years, depending on the gambling modality, 18 being the most common age limit. Age limits are likely an important tool for preventing underage gambling (Nordmyr & Österman, 2016). For youth aged 16 years, which is the age group of interest for this study, lotteries are legal in some countries.

Method

Participants/Data

Data were provided by ESPAD, a survey conducted with a large sample of 16-year-old students. One objective of ESPAD is to monitor and compare trends between countries and groups of countries. These surveys were started in 1995 and have been repeated every 4 years since then. However, 2015 was the first year in which questions on gambling were included (for more information on ESPAD methods, see http://www.espad.org/).

From the total ESPAD sample of 33 countries, 30 countries were included in our gambling analysis (n = 81,229; 50.7% female and 49.3% male; the questionnaire offered no other options for gender). Countries with missing data regarding country-level macrosocial factors were excluded. ESPAD data were supplemented by data from Eurostat 2015 and from the Human Development Report (United Nations Development Programme [UNDP], 2016).

ESPAD Data

ESPAD measured underage gambling (in the past year) by asking respondents how often they had gambled through slot machines, cards, dice games, lotteries, and sports betting, both online and offline, for all gambling forms during the last 12 months, with the same response format and coding for overall underage gambling. In several countries, lotteries are permitted for 16-year-olds, whereas our interest focused on illegal commercial gambling behaviour among adolescents. Therefore, lotteries were excluded from the analysis. Further, lotteries may be perceived as a less harmful form of gambling (Binde et al., 2017).

Data on all gambling in each gambling modality, including lotteries, has been published in earlier research; see Molinaro et al. (2018) and the ESPAD website (Kraus et al., 2016).

Country-Level Data

All country-level variables for 2015 were obtained from the 2016 UNDP report: (a) adolescent unemployment statistics, measured by the percentage of the labour force population, 15–24 years old, not having paid employment or being self-employed but available for work and having taken steps to seek paid employment or self-employment; (b) GDP per capita; (c) percentage of GDP allotted to public health expenditure, that is, current and capital spending on health from government (central and local) budgets, external borrowing and grants (including donations from inter-national agencies and nongovernmental organizations), and social (or compulsory) health insurance funds, expressed as a percentage of GDP; and (d) the Inequality-adjusted Human Development Index (IHDI). The IHDI measures levels of human development, including life expectancy dimensions, years of schooling, and GNP per

capita, when inequality is accounted for. Under perfect equality, the IHDI is equal to the Human Development Index (HDI) but falls below the HDI when inequality rises (UNDP, 2016).

Analysis

First, we present the proportions of underage gambling on an aggregate level for each country (Table 1), as well as each country's value for each of the country-level variables (Table 2). Second, we investigate the associations between adolescent

Table 1

Participants and Percentage of Underage Gambling in 2015 for All Included Countries

| Country	Total n (% girls)	Percentage of underage gambling		
		Total	Boys	Girls
Albania	2,553 (52.3)	19.9	30.5	10.3
Austria	3,684 (52.3)	10.5	15.0	6.5
Bulgaria	2,922 (50.3)	24.8	36.4	13.5
Croatia	2,558 (47.7)	24.2	39.9	7.8
Czech Republic	2,738 (53.3)	13.0	19.9	7.0
Cyprus	2,098 (52.0)	21.1	34.1	9.2
Denmark	1,670 (52.3)	15.4	24.6	7.1
Estonia	2,452 (50.1)	15.9	23.2	8.8
Finland	4,049 (51.6)	24.9	39.2	11.6
France	2,714 (50.8)	15.8	41.1	14.0
Georgia	1,966 (46.7)	19.1	25.6	6.4
Greece	3,202 (50.8)	26.1	30.4	10.1
Hungary	2,735 (49.8)	14.3	40.7	12.1
Iceland	2,663 (50.7)	9.1	28.9	6.0
Ireland	1,470 (49.0)	17.5	15.2	3.3
Italy	4,059 (48.4)	24.3	28.8	10.0
Latvia	1,119 (50.1)	24.3	36.3	11.6
Lithuania	2,573 (49.4)	15.2	33.3	15.0
Macedonia	2,428 (51.4)	27.1	22.9	7.2
Malta	3,326 (49.9)	9.4	13.3	5.5
Moldova	2,586 (48.8)	6.1	9.9	2.1
Montenegro	3,844 (49.1)	29.5	46.8	11.7
Netherlands	1,684 (49.3)	10.9	16.6	5.1
Norway	2,584 (47.6)	9.8	13.1	6.2
Portugal	3,456 (54.6)	9.9	15.4	5.5
Romania	2,208 (49.8)	25.2	37.6	13.4
Slovakia	3,484 (49.8)	18.9	29.1	8.8
Slovenia	2,554 (50.5)	16.0	27.3	5.6
Sweden	2,349 (52.1)	12.8	17.2	8.5
Ukraine	2,350 (52.2)	13.8	19.6	8.6
Mean	2,642 (50.7)	17.9	27.1	8.7
Range	1,119–4,049	6.1–27.1	9.9–46.8	2.1–15.0

Table 2

Youth Unemployment and Other Country-Level Variables in 2015 by Country, Mean and Range

| Country	Youth unemployment (%)	GDP/capita	IHDI	Health expenditure (% of GDP)
Albania	32.7	10.4	0.66	2.9
Austria	10.2	43.9	0.82	8.7
Bulgaria	22.2	16.6	0.71	4.6
Croatia	43.8	20.4	0.75	6.4
Czech Republic	13.0	29.8	0.83	6.3
Cyprus	32.3	30.3	0.76	3.3
Denmark	10.8	44.4	0.86	9.2
Estonia	11.3	26.9	0.79	5.0
Finland	23.2	38.6	0.84	7.3
France	24.7	37.3	0.81	9.0
Georgia	29.8	9.1	0.67	1.6
Greece	49.2	24.6	0.76	5.0
Hungary	18.2	24.5	0.77	4.9
Iceland	8.7	42.4	0.87	7.2
Ireland	20.9	51.9	0.85	5.1
Italy	42.1	33.6	0.78	7.0
Latvia	14.8	22.6	0.74	3.7
Lithuania	17.6	26.4	0.76	4.4
Macedonia	49.4	12.7	0.62	4.1
Malta	12.3	28.8	0.79	6.7
Moldova	15.6	15.5	0.63	5.3
Montenegro	37.5	15.0	0.74	3.7
Netherlands	8.8	46.4	0.86	9.5
Norway	10.1	64.4	0.90	8.3
Portugal	30.1	26.7	0.76	6.2
Romania	23.1	19.9	0.71	4.5
Slovakia	25.2	27.4	0.79	5.8
Slovenia	16.7	28.9	0.84	6.6
Sweden	20.8	45.3	0.85	10.0
Ukraine	23.1	7.4	0.69	3.6
Mean	23.1	29.1	0.77	5.9
Range	8.7–49.4	7.4–64.5	0.62–0.90	2.9–10.0

Note. GDP = gross domestic product; IHDI = Inequality-adjusted Human Development Index.

unemployment, GDP per capita, IHDI, and public health expenditure by use of plot diagrams (Figures 1–4). The proportion of variance in the dependent variable that could be explained by the independent variable was calculated by the coefficient of determination, *r*-squared (r^2). In our analysis with complex relations on structural factors and aggregate cross-sectional gambling data, we did not expect R^2 values over .5. To examine eventual gender differences, we used plots and calculated r^2 for male and female gambling. No gender differences were identified regarding the association between the structural variables and underage gambling at the aggregate level, although correlations were often weaker for

Figure 1
*Youth unemployment and underage gambling.*
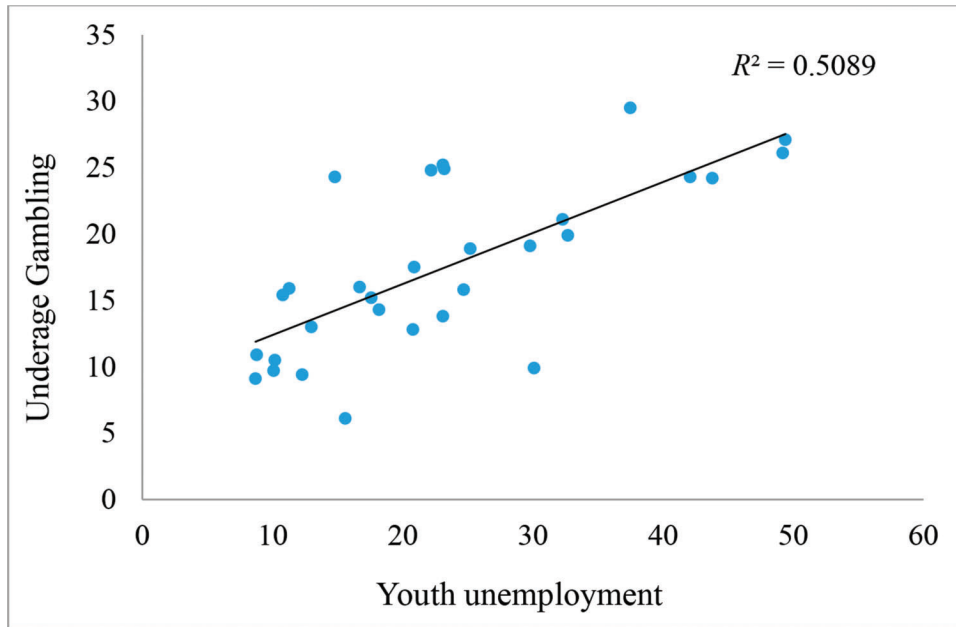
Figure 2
*Gross National Product (GNP) per capita and underage gambling.*
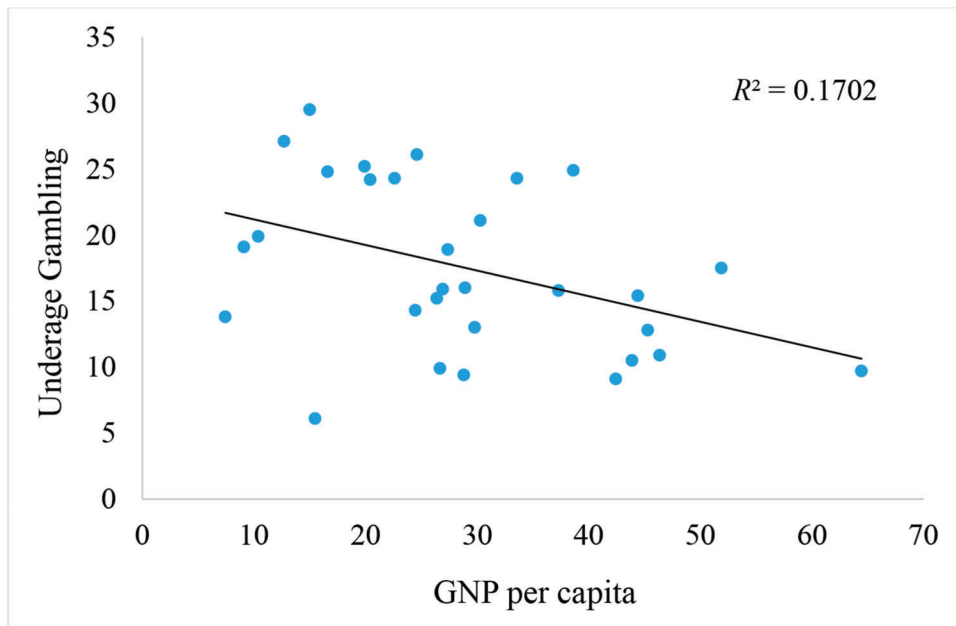
females. The coefficient of determination between male and female gambling was substantial ($r^2 = .71$). Therefore, we did not perform separate analyses for boys and girls in the multilevel analyses.

Figure 3
Inequality Human Development Index (IHDI) and underage gambling.
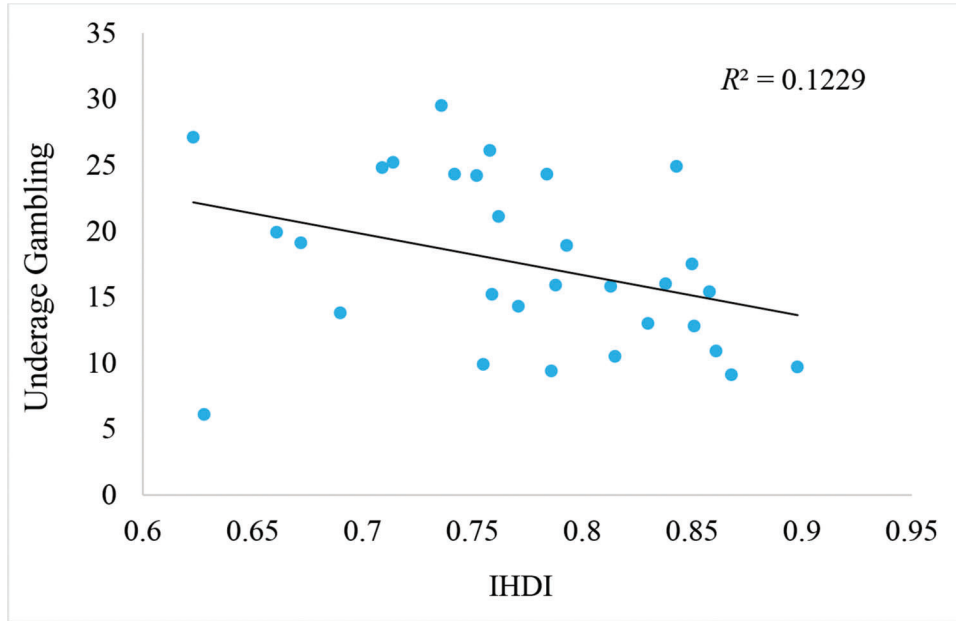
Figure 4
Public health expenditure per capita and underage gambling.
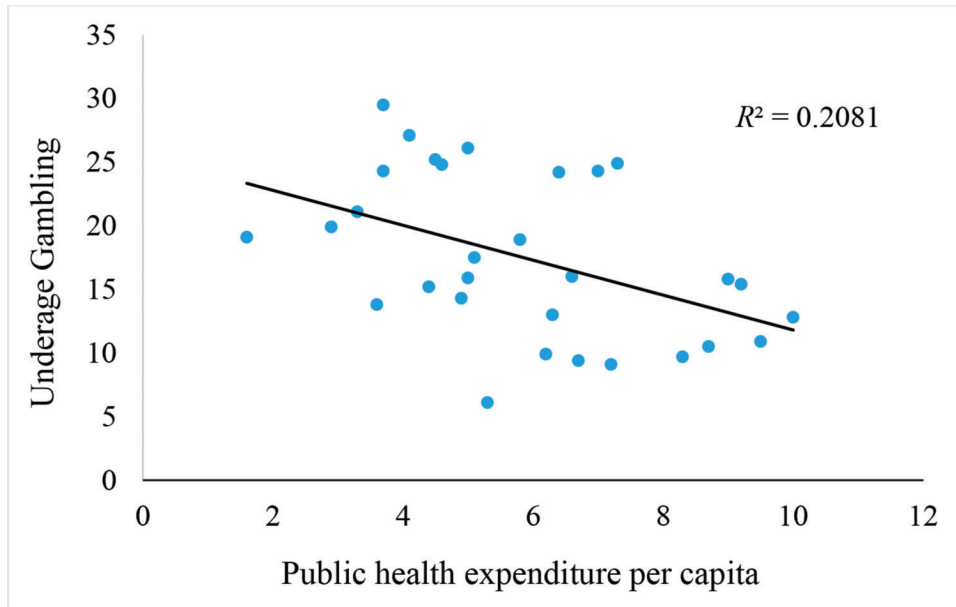
Third, plot diagrams showed only crude associations. Therefore, the results from the plots were tested in a multilevel logistical regression analysis. First, we built an empty model to assess the variation in the log odds from one cluster to another with a random intercept when all predictor variables were set to zero. We then built a final

model to test the hypothesis that youth unemployment is associated with underage gambling, as follows.

Final model: Underage gambling$_{ij}$ = β_0 + β_1 × Sex$_{ij}$ + β_2 × Youth Employment$_j$ + β_3 × GDP/capita$_j$ + β_4 × IHDI$_j$ + β_5 × Public Health Expenditure$_j$ + U_j + e_{ij}

The j subscripts indicate variables that vary across groups (country), and the i subscripts indicate variables that vary across individuals. β_0 = fixed intercept, β_1 to β_5 = fixed slope coefficients, U_j = random intercept for groups (country), and e_{ij} = residual term.

Results

Sample Description

In the investigated sample, the cross-country mean proportion of youth engaging in underage gambling was 17.9% (27.5% male; 8.6% female; Table 1). A total of 18.5% of all respondents had gambled in the past year (28.4% male; 8.8% female). As explained earlier, we excluded lotteries from underage gambling in this study. Underage gambling was most common among adolescents in Montenegro and Macedonia, where 29.5% and 27.1% of participants, respectively, had gambled in the past year. Greece also had a high percentage of underage gambling (26.1%). The proportion of adolescents who had gambled in the past year was lowest in Moldova (6.1%), followed by Iceland (9.1%), Malta (9.4%), Norway (9.8%), and Portugal (9.9%).

Table 2 presents the country-level variables. Unemployment among youth was highest in Greece (49.2%) and lowest in Iceland (8.7%), with a mean of 23.1%. Table 1 also illustrates gambling as a gendered activity, since gambling was more prevalent among boys than among girls in all countries.

The other country-level variables were used as control variables. The mean GNP per capita was 30.1 and ranged from 7.5 (Ukraine) to 64.5 (Norway). The mean IHDI was 0.78, ranging from 0.62 (Macedonia) to 0.9 (Norway). Public health expenditure was an average of 6.3% of GDP, ranging from 2.9% (Albania) to 10.0% (Sweden).

Youth Unemployment and Control Factors at the Country Level in the Scatter Plot

There was a moderate to strong positive association between youth unemployment and gambling (r^2 = .51; Figure 1). The plots show a negative and moderate association between GDP per capita and gambling (r^2 = .17; Figure 2). The association between IHDI and gambling was negative and moderately weak (r^2 = .12; Figure 3). Further, we found a negative association between public health expenditure and gambling (r^2 = .21; Figure 4).

Youth Unemployment and Control Factors at the Country Level in Multilevel Analyses

The multilevel models are shown in Table 3. A preliminary step was to use an unconditional model (Model 1) and compare this empty model at two levels with the empty model at Level 1. This comparison showed a significant main effect of country. Youth unemployment was a significant predictor after we controlled for Level 1 covariates and GDP per capita, IHDI, and public health expenditure (odds ratio 1.024, 95% confidence interval 1.013-1.034, p<0.001). Hence, a one-unit increase in youth unemployment was associated with a 2% increase in the probability of gambling. Public health expenditure had a significant negative association with underage gambling (odds ratio 0.906, 95% confidence interval 0.857-0.959, p<0.001).

Discussion

Underage gambling was associated with the level of youth unemployment after we controlled for gender at Level 1 and for structural country variables at Level 2. An examination of the control variables revealed that public health expenditure was also related to underage gambling, suggesting that a country's investment in public health could act as a buffer to youth unemployment. The reasons for the association between youth unemployment at the country level and the rate of underage gambling in a country are unclear. However, a high unemployment rate among adolescents may contribute to a lack of faith in the future and in a possible means of obtaining income, which in turn is linked to gambling. A recent Swedish study identified an association between adolescents' future orientation and their engagement in both gambling and at-risk gambling. They showed that young people aged 15–18 years who expected their future to be "much worse" than that of others were more inclined to engage in problem and at-risk gambling compared with adolescents who expected their future to be similar to that of others (Brolin-Låftman et al., 2019). Griffiths (2002) suggests that high unemployment rates among young people contribute to a lack of faith in the future. Considering these previous results, it is reasonable to hypothesize an association between youth unemployment rates at a country level and both gambling and problem gambling.

A high level of unemployment in a country may further contribute to disinhibition, which has been linked to problem gambling among youth (Gupta et al., 2006). A review of qualitative studies of youth gambling showed that two motivational factors for gambling among youth are the chance to win money and the notion that gambling may be a way to assert social status (Wardle et al., 2011). A high level of youth unemployment may lead youth to seek alternative ways to assess money and status, such as through gambling.

Gambling regulation and availability are important factors that may mediate the impact of other structural factors. Gambling opportunities are a direct and specific risk factor for problem gambling (Abbott et al., 2018). Therefore, regulations and policies are central in the prevention of problem gambling. In addition, the

Table 3
Multilevel Model for Underage Gambling

Effect	Model 1 (empty model)		Model 2	
	Coeff (SE)	OR [95% CI]	Coeff (SE)	OR [95% CI]
Fixed effect				
Intercept	-1.599 (0.0858)***	0.202 [0.171, 0.239]***	-1.810 (1.2594)	0.164 [0.014, 1.932]*
Individual factors (Level 1)				
Sex[a]			-1.403 (0.5063)	0.246 [0.220, 0.274]***
Country factors (Level 2)				
Youth unemployment			0.023 (0.0052)	1.024 [1.013, 1.034]***
GNP/capita			-0.003 (0.0060)	0.997 [0.985, 1.009] *ns*
IHDI			1.288 (1.7042)	3.626 [0.128, 10.324] *ns*
Public health expenditure			-0.098 (0.0285)	0.906 [0.857, 0.959] **
Random effect (variance)				
Variance component	0.225 (0.060)	Z = 3.749 [0.134, 0.380]***	0.100 (0.032)	Z = 3.107 [0.053, 0.188]**

Note. Covariates and factors at Level 1 and Level 2 fixed effects. Country used as a block variable with random effects. Coeff = coefficient; *OR* = odds ratio; CI = confidence interval; *ns* = not statistically significant; GNP = gross national product; IHDI = Inequality-adjusted Human Development Index. *p < 0.05 **p < 0.01 ***p < 0.001.
[a] Girls compared with boys.

above-mentioned review found that advertising influences the normative environment for gambling and encourages some youth to gamble. Technology may also have an important role in shaping perceptions of gambling and facilitating gambling behaviour. However, it is problematic to examine the diverse gambling regulations and policies in all 30 countries, as the law varies across them, making it difficult to draw conclusions.

Molinaro et al. (2018), who used the same ESPAD data as we did, showed a lower rate of online gambling among adolescents in countries where online gambling at the time was banned or restricted to a monopoly, such as Iceland (16.0%), the Netherlands (10.9), Norway (13.2), Austria (10.4%), Sweden (14.7), and Portugal (15.1%). Nevertheless, Malta, a country with liberal online gambling regulations, had a low rate of online gambling among 16-year-olds (11.2%). Another outlier in the plots for IHDI and GNP/capita with low rates of underage gambling (both online and offline gambling) is Moldova. Nevertheless, the youth unemployment rate in Moldova was rather low (15.6 %), and the expenditure on public health was medium high (5.2 %).

The IHDI was not associated with underage gambling in our study. On an individual level, problems related to youth gambling (Martins et al., 2013), as well as adult gambling (Barnes et al., 2013; Slutske, Deutsch, et al., 2015), have a social gradient. For instance, adults experiencing gambling-related harm often live in areas of greater deprivation (Barnes et al., 2013; Slutske, Deutsch, et al., 2015), are unemployed (particularly among women; Merkouris et al., 2016), and have lower income (Williams et al., 2012). An Italian study showed that high deprivation and low peer support had interactive links to disordered gambling among adolescents (Elgar et al., 2018). Symptoms were also more prevalent in males, first-generation immigrants, and less supported youth. It is possible that inequality has an impact on problem gambling among youth but not on underage gambling, or that it affects the distribution of underage gambling. Hence, a high IHDI may have less effect on overall underage gambling within a country but may contribute to a more uneven distribution of underage gambling, thus contributing to inequality in health. This would be consistent with the suggestion by Athanasiades et al. (2016) that in societies that are more equal, the negative effect of labour market insecurity on the life satisfaction of youth is buffered.

Because our study was descriptive, the results must be interpreted carefully, and further analysis should be performed for a better understanding of the associations found. For example, more variables regarding gambling culture and regulations could be incorporated in the analyses. One way to operationalize gambling culture is by examining gambling behaviour among adults in a population and gambling marketing in future cross-country studies. For example, wagering on sporting events is becoming linked with sports competitions and activities and is normalizing gambling among youth (Monaghan & Derevensky, 2008; Thomas et al., 2018). Further, time series with more sensitivity to trends within countries would be desirable.

Our study also had limitations. First, we used cross-sectional data and examined youth unemployment in relation to underage gambling, with sex as the only covariate at the individual level. Several other possible Level 1 factors could contribute to a model, such as socio-economic factors, parental support, and alcohol consumption. Individual factors interact not only with unemployment and factors related to wealth distribution, but also with cultural factors, and future studies should investigate these interactions. Social and cultural factors, as well as the amount of available spare time, have significant impacts on the age of gambling onset and early experiences of gambling among young people (Kristiansen et al., 2015). Nevertheless, according to earlier research on adolescent gambling in Europe, cultural factors that depend on geographic proximity are regarded as having a limited role or being outweighed by the influence of country socio-economic indicators or individual factors (Molinaro et al., 2018).

We did not test whether adolescent unemployment correlates with problem gambling, although we argue that underage gambling could be a proxy for risky gambling behaviour.

Conclusions

Our findings suggest that youth unemployment affects underage gambling as a risk factor at a societal level. Youth unemployment is an important determinant of youth health. More knowledge is needed about how adolescents experience unemployment at a national level and how this experience transfers to gambling. Further, public health expenditure may buffer the effects of youth unemployment in a country. These and other possible associations between underage gambling and structural factors deserve more attention in research and policy making. Our results indicate that more structural variables should be discussed and investigated in order to develop policies and structures on gambling to enhance public health and public interest. Our results support the public interest approach and the need to consider public goods when discussing policies and the prevention of gambling-related harm. Macro structural factors need to be explored with more cross-national gambling surveys and collaborations. Labour market measures are important for both general health and the prevention of problem gambling. Measures that increase employment rates among youth constitute a form of health promotion.

References

Abbott, M., Binde, P., Clark, L., Hodgins, D., Johnson, M., Manitowabi, D., & Williams, R. (2018). *Conceptual framework of harmful gambling: An international collaboration* (3rd ed.). Gambling Research Exchange Ontario (GREO) https://www. greo.ca/Modules/EvidenceCentre/files/Abbott%20et%20al%20(2018)%20Conceptual %20framework%20of%20harmful%20gambling%20-%20third%20edition.pdf.

Adams, P. J., Raeburn, J., & de Silva, K. (2009). A question of balance: Prioritizing public health responses to harm from gambling. *Addiction, 104*(5), 688–691. https://doi.org/10.1111/j.1360-0443.2008.02414.x

Andrie, E. K., Tzavara, C. K., Tzavela, E., Richardson, C., Greydanus, D., Tsolia, M., & Tsitsika, A. K. (2019). Gambling involvement and problem gambling correlates among European adolescents: Results from the European Network for Addictive Behavior study. *Social Psychiatry and Psychiatric Epidemiology, 54*(11), 1429–1441. https://doi.org/10.1007/s00127-019-01706-w

Ariyabuddhiphongs, V. (2013). Adolescent gambling: A narrative review of behavior and its predictors. *International Journal of Mental Health and Addiction, 11*(1), 97–109. https://doi.org/10.1007/s11469-012-9401-6

Athanasiades, C., Figou, L., Flouli, A., Gebel, M., Gousia, K., Högberg, B., Kostouli, M., Nizalova, O., Shapoval, N., Sourvinou, M., Strandh, M., Täht, K., Unt, M., Voßemer, J., & Xanthopoulou, D. (2016). *Report on the impact of the institutional setting and policies on the well-being and health of youth in insecure labour market positions in EU-28 and Ukraine* (EXCEPT Working Paper No 7). Tallinn University http://www.except-project.eu/working-papers/

Barnes, G. M., Welte, J. W., Tidwell, M.-C. O., & Hoffman, J. H. (2013). Effects of neighborhood disadvantage on problem gambling and alcohol abuse. *Journal of Behavioral Addictions, 2*(2), 82–89. https://doi.org/10.1556/JBA.2.2013.004

Bartelink, V. H. M., Ya, K. Z., Guldbrandsson, K., & Bremberg, S. (2019). Unemployment among young people and mental health: A systematic review. *Scandinavian Journal of Public Health*, 1–15. https://doi.org/10.1177/1403494819852847

Binde, P., Romild, U., & Volberg, R. A. (2017). Forms of gambling, gambling involvement and problem gambling: Evidence from a Swedish population survey. *International Gambling Studies, 17*(3), 490–507. https://doi.org/10.1080/14459795.2017.1360928

Blake, M., Pye, J., Mollidor, C., Morris, L., Wardle, H., & Reith, G. (2019). *Measuring gambling-related harm among children and young people: A framework for action*. Ipsos MORI, Social Research Institute. https://www.gamblingcommission.gov.uk/PDF/Measuring-GRH-in-CYP-A-framework-for-action.pdf

Blinn-Pike, L., Worthy, S. L., & Jonkman, J. N. (2010). Adolescent gambling: A review of an emerging field of research. *Journal of Adolescent Health, 47*(3), 223–236. https://doi.org/10.1016/j.jadohealth.2010.05.003

Brolin-Låftman, S., Alm, S., Olsson, G., Sundqvist, K., & Wennberg, P. (2019). Future orientation, gambling and risk gambling among youth: A study of

adolescents in Stockholm. *International Journal of Adolescence and Youth, 25*(1), 52–62. https://doi.org/10.1080/02673843.2019.1581069

Calado, F., Alexandre, J., & Griffiths, M. D. (2017). Prevalence of adolescent problem gambling: a systematic review of recent research. *Journal of Gambling Studies, 33*, 397–424 https://doi.org/10.1007/s10899-016-9627-5

Canale, N., Vieno, A., Lenzi, M., Griffiths, M. D., Borraccino, A., Lazzeri, G., Lemma, P., Scacchi, L., & Santinello, M. (2017). Income inequality and adolescent gambling severity: Findings from a large-scale Italian representative survey. *Frontiers in Psychology, 8*(1318), 1–10. https://doi.org/10.3389/fpsyg.2017.01318

Carbonneau, R., Vitaro, F., Brendgen, M., & Tremblay, R. E. (2015). Trajectories of gambling problems from mid-adolescence to age 30 in a general population cohort. *Psychology of Addictive Behaviors, 29*(4), 1012–1021. https://doi.org/10.1037/adb0000102

Castellani, B. (2000). *Pathological gambling: The making of a medical problem*. State University of New York.

Delfabbro, P., King, D., & Griffiths, M. D. (2014). From adolescent to adult gambling: An analysis of longitudinal gambling patterns in South Australia. *Journal of Gambling Studies, 30*(3), 547–563. https://doi.org/10.1007/s10899-013-9384-7

Dowling, N., Merkouris, S., Greenwood, C., Oldenhof, E., Toumbourou, J., & Youssef, G. (2017). Early risk and protective factors for problem gambling: A systematic review and meta-analysis of longitudinal studies. *Clinical Psychology Review, 51*, 109–124. https://doi.org/10.1016/j.cpr.2016.10.008

Elgar, F. J., Canale, N., Wohl, M. J. A., Lenzi, M., & Vieno, A. (2018). Relative deprivation and disordered gambling in youths. *Journal of Epidemiology and Community Health, 72*(7), 589–594. https://doi.org/10.1136/jech-2017-209858

Elgar, F. J., Roberts, C., Parry-Langdon, N., & Boyce, W. (2005). Income inequality and alcohol use: A multilevel analysis of drinking and drunkenness in adolescents in 34 countries. *European Journal of Public Health, 15*(3), 245–250. https://doi.org/10.1093/eurpub/cki093

Eurostat. (2019). *Unemployment statistics*. Retrieved 02 19, 2019, from https://ec.europa.eu/eurostat/statistics-explained/index.php/Unemployment_statistics

Fröberg, F. (2015). *Problem gambling among young women and men in Sweden* [doctoral dissertation]. Karolinska Institutet https://openarchive.ki.se/xmlui/handle/10616/44557 Stockholm University.

Furlong, A., & Cartmel, F. (2007). *Young people and social change: New perspectives*. Open University Press.

Gambling Research Exchange Ontario. (2017). *Applying a public health perspective to gambling harm*. https://www.greo.ca/en/programs-services/resources/Applying-a-public-health-perspective-to-gambling-harm---October-2017.pdf

Gori, M., Potente, R., Pitino, A., Scalese, M., Bastiani, L., & Molinaro, S. (2015). Relationship between gambling severity and attitudes in adolescents: Findings from a population-based study. *Journal of Gambling Studies, 31*(3), 717–740. https://doi.org/10.1007/s10899-014-9481-2

Grant, J. E., Kim, S. W., Odlaug, B. L., Buchanan, S. N., & Potenza, M. N. (2009). Late-onset pathological gambling: Clinical correlates and gender differences. *Journal of Psychiatric Research, 43*(4), 380–387. https://doi.org/10.1016/j.jpsychires.2008.04.005

Griffiths, M. (2002). *Gambling and gaming addictions in adolescence*. British Psychological Society.

Gupta, R., Derevensky, J. L., & Ellenbogen, S. (2006). Personality characteristics and risk-taking tendencies among adolescent gamblers. *Canadian Journal of Behavioural Science / Revue Canadienne des Sciences du Comportement, 38*(3), 201–213. https://doi.org/10.1037/cjbs2006008

Jun, H.-J., Sacco, P., & Cunningham-Williams, R. M. (2019). Gambling in emerging adulthood: The role of adolescent depressive symptoms, antisocial behaviors, and alcohol use. *International Journal of Mental Health and Addiction*, 1–14. https://doi.org/10.1007/s11469-019-00087-0

Korn, D. A. (2001). Examining gambling issues from a public health perspective. *Journal of Gambling Issues*, 4. https://doi.org/10.4309/jgi.2001.4.9

Kraus, L., Guttormsson, U., Leifman, H., Arpa, S., Molinaro, S., Monshouwer, K., Trapencieris, M., Vicente, J., Már Arnarsson, Á., Balakireva, O., Bye, E. K., Chileva, A., Ciocanu, M., Clancy, L., Csémy, L., Djurisic, T., Elekes, Z., Feijão, F., Florescu, S., Hibell, B. (2016). *ESPAD Report 2015: Results from the European School Survey Project on alcohol and other drugs*. Publications Office of the European Union. https://www.greo.ca/en/programs-services/resources/Applying-a-public-health-perspective-to-gambling-harm---October-2017.pdf

Kristiansen, S., Trabjerg, M. C., & Reith, G. (2015). Learning to gamble: Early gambling experiences among young people in Denmark. *Journal of Youth Studies, 18*(2), 133–150. https://doi.org/10.1080/13676261.2014.933197

Martins, S. S., Storr, C. L., Lee, G. P., & Ialongo, N. S. (2013). Environmental influences associated with gambling in young adulthood. *Journal of Urban Health, 90*(1), 130–140. https://doi.org/10.1007/s11524-012-9751-1

McComb, J. L., & Sabiston, C. M. (2010). Family influences on adolescent gambling behavior: A review of the literature. *Journal of Gambling Studies, 26*(4), 503–520. https://doi.org/10.1007/s10899-010-9181-5

Merkouris, S. S., Thomas, A. C., Shandley, K. A., Rodda, S. N., Oldenhof, E., & Dowling, N. A. (2016). An update on gender differences in the characteristics associated with problem gambling: A systematic review. *Current Addiction Reports, 3*(3), 254–267. https://doi.org/10.1007/s40429-016-0106-y

Messerlian, C., Gillespie, M., & Derevensky, J. L. (2007). Beyond drugs and alcohol: Including gambling in a high-risk behavioural framework. *Paediatrics & Child Health, 12*(3), 199–204. https://doi.org/10.1093/pch/12.3.199

Molinaro, S., Benedetti, E., Scalese, M., Bastiani, L., Fortunato, L., Cerrai, S., Canale, N., Chomynova, P., Elekes, Z., Feijão, F., Fotiou, A., Kokkevi, A., Kraus, L., Rupšienė, L., Monshouwer, K., Nociar, A., Strizek, J., & Urdih Lazar, T. (2018). Prevalence of youth gambling and potential influence of substance use and other risk factors throughout 33 European countries: First results from the 2015 ESPAD study. *Addiction, 113*(10), 1862–1873. https://doi.org/10.1111/add.14275

Molinaro, S., Canale, N., Vieno, A., Lenzi, M., Siciliano, V., Gori, M., & Santinello, M. (2014). Country- and individual-level determinants of probable problematic gambling in adolescence: A multi-level cross-national comparison. *Addiction, 109*(12), 2089–2097. https://doi.org/10.1111/add.12719

Monaghan, S. M., & Derevensky, J. (2008). An appraisal of the impact of the depiction of gambling in society on youth. *International Journal of Mental Health and Addiction, 6*(4), 537–550. https://doi.org/10.1007/s11469-008-9155-3

Navarro, V., Muntaner, C., Borrell, C., Benach, J., Quiroga, Á., Rodríguez-Sanz, M., Vergés, N., & Pasarín, M. I. (2006). Politics and health outcomes. *The Lancet, 368*(9540), 1033–1037. https://doi.org/10.1016/s0140-6736(06)69341-0

Nikkinen, J., Egerer, M., & Marionneau, V. (2018). Introduction: Gambling regulations and the use of gambling revenues in European welfare states. In M. Egerer, V. Marionneau, & J. Nikkinen (Eds.), *Gambling policies in European welfare states: Current challenges and future prospects* (pp. 1–14). Palgrave Macmillan.

Nordmyr, J., & Österman, K. (2016). Raising the legal gambling age in Finland: Problem gambling prevalence rates in different age groups among past-year gamblers pre- and post-implementation. *International Gambling Studies, 16*(3), 347–356. https://doi.org/10.1080/14459795.2016.1207698

Olason, D. T., Hayer, T., Brosowski, T., & Meyer, G. (2015). Gambling in the mist of economic crisis: Results from three national prevalence studies from Iceland. *Journal of Gambling Studies, 31*(3), 759–774. https://doi.org/10.1007/s10899-015-9523-4

Örnberg, J. C., & Hettne, J. (2018). The future Swedish gambling market: Challenges in the law and public policies. In M. Egerer, V. Marionneau, & J. Nikkinen (Eds.), *Gambling policies in European welfare states: Current challenges and future prospects* (pp. 297–314). Palgrave Macmillan.

Popham, F., Dibben, C., & Bambra, C. (2013). Are health inequalities really not the smallest in the Nordic welfare states? A comparison of mortality inequality in 37 countries. *Journal of Epidemiology and Community Health, 67*(5), 412–418. https://doi.org/10.1136/jech-2012-201525

Slutske, W. S., Deutsch, A. R., Statham, D. J., & Martin, N. G. (2015). Local area disadvantage and gambling involvement and disorder: Evidence for gene-environment correlation and interaction. *Journal of Abnormal Psychology, 124*(3), 606–622. https://doi.org/10.1037/abn0000071

Slutske, W. S., Piasecki, T. M., Deutsch, A. R., Statham, D. J., & Martin, N. G. (2015). Telescoping and gender differences in the time course of disordered gambling: Evidence from a general population sample. *Addiction, 110*(1), 144–151. https://doi.org/10.1111/add.12717

Sulkunen, P., Babor, T. F., Cisneros Ornberg, J., Egerer, M., Hellman, M., Livingstone, C., Marionneau, V., Nikkinen, J., Orford, J., Room, R., & Rossow, I. (2018). *Setting limits: Gambling, science and public policy*. Oxford University Press.

Thomas, S., Pitt, H., Bestman, A., Randle, M., McCarthy, S., & Daube, M. (2018). *The determinants of gambling normalisation: Causes, consequences and public health responses*. Victorian Responsible Gambling Foundation. https://responsiblegambling.vic.gov.au/resources/publications/the-determinants-of-gambling-normalisation-causes-consequences-and-public-health-responses-349/

United Nations Development Programme. (2016). *Human development report 2016: Human development for everyone*. http://hdr.undp.org/en/content/human-development-report-2016-human-development-everyone

Viner, R. M., Ozer, E. M., Denny, S., Marmot, M., Resnick, M., Fatusi, A., & Currie, C. (2012). Adolescence and the social determinants of health. *The Lancet, 379*(9826), 1641–1652. https://doi.org/10.1016/s0140-6736(12)60149-4

Wardle, H., Moody, A., Spence, S., Orford, J., Jotangia, D., Griffths, M., Hussey, D., & Dobbie, F. (2011). *British gambling prevalence survey 2010*. National Centre

for Social Research. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/243515/9780108509636.pdf

Williams, R., Volberg, R., & Stevens, R. (2012). *The population prevalence of problem gambling: Methodological influences, standardized rates, jurisdictional differences, and worldwide trends.* Report prepared for the Ontario Problem Gambling Research Centre and the Ontario Ministry of Health and Long-Term Care. https://www.greo.ca/Modules/EvidenceCentre/files/Williams%20et%20al(2012)The_population_prevalence_of_problem_gambling.pdf

Winters, K. C., Stinchfield, R. D., Botzet, A., & Anderson, N. (2002). A prospective study of youth gambling behaviors. *Psychology of Addictive Behaviors, 16*(1), 3–9. https://doi.org/10.1037/0893-164x.16.1.3

Xouridas, S., Jasny, J., & Becker, T. (2016). An ecological approach to electronic gambling machines and socioeconomic deprivation in Germany. *Journal of Gambling Issues, 33*, 82. https://doi.org/10.4309/jgi.2016.33.6

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