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Gambling and Gaming in an Ontario Sample of Youth and Parents

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Abstract

Despite the convergence of the gambling and gaming worlds, the majority of studies of gambling behaviour are void of gaming behaviour and vice versa. Further, many studies examine specific age ranges rather than covering the entire span of adolescence and young adulthood. The current study improves our knowledge of gambling and gaming behaviours, as well as their convergence, by examining young people aged 8 to 24 and parents of children 8 to 17 years in Ontario. Descriptive and bivariate analyses were performed on a survey of 2,651 Ontarians (678 adolescents, 973 young adults, and 1,000 parents who reported on themselves and their child). Young people and parents are engaging in games that combine gambling and gaming at substantial rates and frequencies, and playing these games is associated with a higher level of risk. In this sample, playing video games for money and social casino games were associated with a higher level of gambling problems among adolescents ($p < .001$, $p = .001$), young adults ($p < .001$, $p < .001$), and parents ($p < .001$, $p < .001$). Further, parent reports of their own and their child's gambling ($p < .001$), social casino play ($p < .001$), and gambling concerns were linked ($p < .001$). In summary, we found that playing games that combine gambling and gaming was associated with increased risk across youth age groups. Parents who reported gambling, social casino play, and gambling concerns also tended to report these behaviours among and concerns for their children.

Keywords: Adolescents, young adults, parents, gambling, gaming, video gaming, CAGI, CPGI

Résumé

Malgré la convergence entre les univers des jeux de hasard et des jeux vidéo, la majorité des études sur le comportement des joueurs excluent l'une ou l'autre activité. De plus, elles se limitent à une tranche d'âge précise plutôt que de couvrir la période entière de l'adolescence et de la jeune vie adulte. Notre enquête ajoute aux connaissances sur les habitudes en matière de jeux de hasard et de jeux vidéo et la convergence entre ces activités. Elle a été menée en Ontario auprès de jeunes âgés de huit à 24 ans et de parents d'enfants âgés de huit à 17 ans. 2651 Ontariens (678 adolescents, 973 jeunes adultes et 1000 parents répondant en leur propre nom et en celui de leur enfant) ont répondu à un questionnaire dont les résultats ont fait l'objet d'une analyse descriptive et bivariée. Un grand nombre de jeunes et de parents combinent fréquemment jeux de hasard et jeux vidéo, une activité liée à un niveau de risque élevé. Dans notre échantillon, la pratique des jeux vidéo pour de l'argent et des jeux de casino est associée à un risque élevé de problèmes de jeu chez l'adolescent ($p < .001$, $p = .001$), le jeune adulte ($p < .001$, $p < .001$) et les parents ($p < .001$, $p < .001$). De plus, un lien a été établi entre les habitudes de jeu déclarées par les parents à propos d'eux-mêmes et de leurs enfants ($p < .001$), les jeux de casino ($p < .001$) et les problèmes de jeu ($p < .001$). La pratique combinée des jeux de hasard et des jeux vidéo est associée à une augmentation du risque dans tous les groupes d'âge. Ainsi, les comportements et les problèmes de jeu observés chez les parents tendent à se refléter chez leurs enfants.

Introduction

The past decade has given rise to a more gameful world—a diffusion of game-like structures in everyday life. As a result, a convergence has taken place between digital media, gambling, and gaming (Gainsbury, Hing, Delfabbro, & King, 2014; King & Delfabbro, 2020). The lives of today's young people are directly playing out within this digital sphere, where they are gambling online, playing gambling-style games through social networking sites and in video games, making in-game purchases, and betting on the outcomes of video games (King, Delfabbro, Kaptsis, & Zwaans, 2014; Wardle, 2019). However, despite the convergence of the gambling and gaming worlds, the majority of studies of gambling behaviour are void of gaming behaviour and vice versa. Further, many studies examine specific age ranges rather than covering the entire span of adolescence and young adulthood (Calado, Alexandre, & Griffiths, 2017). Given the convergence, it is imperative to begin to understand both the gambling and gaming behaviours of adolescents and young adults, and where they intersect, to illustrate gameplay experiences and change as youth grow older.

Canada's video game industry is booming, contributing $4.5 billion to the economy in 2019 (Entertainment Software Association of Canada, 2019). In 2018, 61% of

Canadians self-identified as a "gamer," spending on average approximately 10 hours per week gaming (Entertainment Software Association of Canada, 2018). In-game monetization practices make vast amounts of money for game developers. Juniper Research (2018) estimates that players will spend up to $50 billion on loot boxes and skins gambling by 2022, up from under $30 billion in 2018.

While the convergence of gambling and gaming can be witnessed in several ways, the emergence of social casino games played on social networking sites (e.g., Facebook, Steam) and mobile apps is a clear example of how games are challenging our understanding of what it means to gamble (Reynolds, 2019). At the present time, the social casino gaming industry is unregulated, primarily because it is not considered to be gambling according to various interpretations of the traditional legal coordinates of consideration, chance, and prize (Derevensky & Gainsbury, 2016; Gainsbury, 2019; Kim, Wohl, Salmon, Gupta, & Derevensky, 2015; Owens, 2010). Casino-style games are referred to by a myriad of terms, and this lack of consistency may create confusion among people. However, despite the fluctuating terms, a consistent set of characteristics underpins these games—the games simulate traditional casino-style games and are based on a free-to-play business model predominantly found on social networking sites (Reynolds, 2016).

Evidence demonstrates that developers are actively framing social casino games as a harmless form of entertainment (Reynolds, 2019). Research illustrates that social casino games influence the migration of play over to monetary gambling (Gainsbury, Russell, King, Delfabbro, & Hing, 2016; Gupta, Derevensky, & Wohl, 2013; Hayer, Kalke, Meyer, & Brosowski, 2018; Kim et al., 2015; Veselka, Wijesingha, Leatherdale, Turner, & Elton-Marshall, 2018). Further, engagement in micro-transactions on social casino games is found to be a unique predictor to transitioning over to real money online gambling (Kim et al., 2015). Finally, evidence is emerging that social casino games are in fact "teaching young people to gamble" (Reynolds, 2016; Kim et al., 2015; Morgan Stanley, 2012, p. 6). This is of particular concern for youth who might not otherwise have gambled at such a young age. Essentially, the proliferation of gambling opportunities is now embedded into the daily fabric of young people, offering youth more opportunities to gamble and foster migration of their gameplay over to real-money gambling sites once they develop a level of experience and skilled play (Kim et al., 2015; Kim, Wohl, Gupta, & Derevensky, 2017). While these games may not legally be considered gambling given the absence of monetary reward, many youth perceive social casino gameplay as a form of lower-stakes gambling (Reynolds, 2016).

Video game in-game purchases including loot boxes and skins, are an area of contention, with various jurisdictions having considered or currently considering whether these types of products or features are a form of gambling (Griffiths, 2018). Evidence finds that to maximize continuous purchasing these game offerings use player data to tailor the features offered to players (King et al., 2019). Several studies report that making in-game purchases is linked with an increased level of problem gambling severity (Li, Mills, & Nower, 2019; Zendle & Cairns, 2018 2019). In fact,

the association between spending money on loot boxes and problem gambling severity is medium to large among adolescents, and larger in magnitude than other risk factors for gambling problems like alcohol dependence (Zendle, Meyer, & Over, 2019).

Playing video games for money is a third important convergence of gambling and gaming. Gamers can bet informally with friends on the outcomes of their or others' games. Little research considers this type of betting, outside of esports. Gamers can also place more formal wagers on the outcomes of their play within the games themselves (Zendle, 2019a, 2019b). This combination of video gaming and gambling is to date unregulated, and may contain game features that make the outcomes of a player's efforts or bets unfair (Zendle, 2019b). While little research has focused on playing video games for money, some research finds that doing so within the games themselves is associated with problem gambling (Zendel, 2019a).

In addition to examining youth of varying ages, it is also important to consider parental behaviours, as strong links are operating between parental gambling behaviours and problems, and child gambling behaviours and problems. Children of parents who gamble are more likely to gamble, gamble at a young age, and have gambling problems (Magoon & Ingersoll, 2006; Vitaro & Wanner, 2011; Wickwire, Whelan, Meyers, & Murray, 2007). Further, children spend more time gambling, gamble more frequently, and are more likely to have gambling problems if they have a parent with a gambling problem (King, Abrams, & Wilkinson, 2010; Tepperman, Albanese, Stark, & Zahlan, 2013; Vachon, Vitaro, Wanner, & Tremblay, 2004). Research finds that children of parents with a gambling disorder are 2 to 10 times more likely to develop a gambling disorder themselves than children of parents with no gambling disorder (Dowling et al., 2016; Dowling, Jackson, Thomas, & Frydenberg, 2010).

Aim of the Study

The current study improves our knowledge of gambling and gaming behaviours, as well as their convergence, by examining a sample of young people aged 8 to 24 and parents of children 8 to 17 years in Ontario.

Methods

Participants

Three quantitative surveys were conducted, including a survey of adolescents (12–17 years), young adults (18–24 years), and parents with children in the household between the ages of 8 and 17 years. In total, 2,651 participants (678 adolescents, 973 young adults, and 1,000 parents) were included in the study. Both telephone and online methods were used for data collection with adolescents (50.9% telephone) and young adults (46.5% telephone). All parent data was collected online as it was more

efficient to screen for and identify parents through the online panel of known participants compared to through Random Digit Dialing.

Survey Design

Adolescents and young adults were asked about their gambling behaviours and problems, video game behaviours, and socio-demographic characteristics. Parents of children 8 to 17 were asked about their gambling behaviours, problems, and socio-demographics, in addition to questions about their child with the most recent birthday's demographics, gambling and video gaming behaviours, and their concerns about these behaviours.

Gambling Behaviours

All participants were asked about their lifetime gambling participation ("Have you ever gambled or placed a bet, by betting or risking money or something of value?"). Those respondents who had gambled in their lifetime were asked their participation in 12 types of gambling, and frequency of play for each game (*About once a month or less*, *A few times a month*, *Once a week*, *About once a day*) in the past 3 months for adolescents and 12 months for young adults and parents. Parents were asked if they think their child has ever gambled or placed a bet. Those participants who indicated yes were then asked which games they think their child has played.

The analysis below focuses on whether participants have played social casino games or more specifically "played casino-style games on the Internet like Facebook/social networking sites with virtual credits, where you do not win money" and whether they have "played video games for money or something of value"—wagering on the outcome of one's own performance on a video game.

Gambling Problems

Problem gambling among adolescents 12–17 years over the past 3 months was measured using the 9-item Gambling Problem Severity Subscale (GPSS) of the Canadian Adolescent Gambling Inventory (CAGI; Tremblay, Stinchfield, Wiebe, & Wynne, 2010). The GPSS is the first measure of gambling problems developed specifically for adolescents, and not adapted from an instrument designed for adults (Stinchfield, 2011). The scale represents a continuum of gambling problem severity—No Problem (0–1), Low to Moderate Severity (2–5), and High Severity (6–27)—which sets it apart from the other adapted scales that target high severity rather than a continuum (Stinchfield, 2011). According to psychometric testing (Turner et al., 2018), the GPSS demonstrates good reliability with an alpha of .789. The GPSS is a valid instrument, correlating with known correlates of problem gambling.

Problem gambling among young adults 18–24 years and parents over the past 12 months was measured using the Problem Gambling Severity Index (PGSI) of the Canadian Problem Gambling Index (CPGI; Ferris & Wynne, 2001). The CPGI was

selected because it is one of the few instruments specifically designed for use in general population surveys, and it demonstrates improved measurement properties versus other popular screens (Mcmillen & Wenzel, 2006). Responses were classified into Non-Problem (0), Low Level of Problems (1–2), Moderate Level of Problems (3–7), and Problem Gambling (8–27). The CPGI has undergone extensive psychometric testing, with good reliability (alpha = .84) and acceptable test-retest analysis (correlation of .78; Ferris & Wynne, 2001).

Parents were asked "Have you ever been worried or had concerns about your child's gambling?"

Video Game Behaviours

Adolescents and young adults were asked if they had played video games in their lifetime (Have you ever played video games on a computer, phone, tablet or game console?). Parents were asked if they thought their child had played in their lifetime.

Adolescents and young adults who had played video games and parents who thought their child had played video games were asked the types of games they played or preferred (*Console-based video games like on X-Box, Wii, Playstation [with or without Internet for young adults and parents]*; *Video games that you download and play on a phone, tablet, computer [purchased or for free for young adults and parents]*; *Gambling-style games that do not let you win real money played on a phone, tablet, computer*; *A gambling game in which you can win real money played on a phone, tablet or computer*). The latter two options were designed to capture play on online casino-style games, for comparison to the responses provided by past-year gamblers. Adolescent and young adult video game players were also asked their duration of play in most recent use (only 16–17 year olds among adolescents), and parents who thought their child had played were asked how long their child usually plays in one session (*Less than 30 minutes*; *Between 30 minutes and 1 hour*, *Between 1–2 hours*, *Between 2–3 hours*, *Between 3–4 hours*, *More than 4 hours*). Adolescents, young adults, and parents were asked "Have you /your child ever spent money within the video game?". If yes, adolescents and young adults were asked "On what type of game feature(s) did you spend the money on?" (*Enter a new level*, *Gain more lives*, *Gain more in-game chips/gold*, *A specific item for your avatar*). Finally parents were asked "Have you ever been worried or had concerns about how much your child spends playing video games?".

Sampling Strategy

Representative sampling designs were used for both the telephone and online surveys, using sampling quotas for age, gender, and region in line with the population of Ontario. Census-based weighting is also applied to the final samples. The cellular and landline telephone samples were dialed using Random Digit Dialing and interviews were performed using a Computer Assisted Telephone Interview. Invitations to participate in the survey were sent to online survey panelists via email.

Potential participants were screened according to age and gender, and told that participation would be anonymous and voluntary. The rate of response for the telephone survey was 19.85%. At the 95% confidence interval, "worst-case" potential sampling error for the telephone sample is +/-3.5%. Because the online panel includes pre-recruited participants, we were unable to calculate the response rate for the online survey.

This study was approved by the Ontario Institutional Review Board of Institutional Review Board Services (protocol number Pro00011287, obtained March 17, 2015). Institutional Review Board Services is a private, independent company that specializes in ethics reviews for research involving human subjects in Canada and other countries. Ethics approval is in accordance with ethical guidelines detailed in the 1964 Helsinki Declaration or any of its succeeding amendments.

Socio-Demographic Characteristics

Most adolescents were 16–17 years (42.4%) and over half were male (52.5%). Most young adults were 21–24 years (57.9%) and half were male (50.1%). The majority of parents were 35–54 years (77.1%) and female (64.0%). The children were half male (51.8%) and mostly 8–11 years and 12–15 years (40.0% each).

Analysis

Frequency data for all gambling and video game items were examined to determine the rates of each across samples. Non-parametric tests (e.g., chi-square, cross-tabulations) were used to examine the associations between the gambling and video gaming variables with demographic variables, as well as gambling and video gaming variables by each other in each sample.

Results

Gambling Behaviours

Participation

Among adolescents in this sample, 20.8% have gambled in their lifetime. Lifetime gambling participation did not differ by lifetime video game participation (X^2 (1, N= 695) = .009, p =.925). Among the young adults surveyed, 60.0% have gambled in their lifetime. Those adults who have played video games in their lifetime were more likely to have also gambled (61.7% vs. 41.0%; X^2 (1, N= 955) = 12.74, $p < .001$). The majority of parents (69.9%) in this sample have gambled in their lifetime.

According to the parents surveyed, 18.4% of their children have gambled in their lifetime. Parents who have gambled were more likely to think their child has gambled than those parents who have not (22.9% vs. 8.0%; X^2 (1, N= 1001) = 31.08,

$p < .001$). The parents with a gambling problem were more likely to think their child has gambled than other risk groups (41.0%; X^2 (4, N= 1002) = 53.23, $p < .001$). Child gambling participation did not differ by child video game participation (X^2 (1, N= 1003) = 3.48, $p = .062$).

Parents who think their child gambled were asked how they learned their child gambled. Parents reported they most often learn about their child's gambling by being present for the gambling (44.3%) or the child admitting to gambling (43.1%).

Game Type

Almost one quarter of the adolescent gamblers played social casino games (23.0%) and 16.9% played video games for money or something of value. Male adolescents were more likely to have played video games for money than female adolescents (24.2% vs. 2.0%; X^2 (1, N= 144) = 11.44, p =.001). Playing video games for money or social casino games did not differ by age (X^2 (2, N= 144) = .52, p =.772; X^2 (2, N= 144) = 2.16, p =.340) or lifetime video game participation (X^2 (1, N= 145) = .001, p =.970; X^2 (1, N= 144) = 1.86, p =.172). Participation in social casino games did not differ by gender (X^2 (1, N= 144) = 2.49, p =.115).

One in five (20.1%) young adult gamblers had played social casino games and 17.7% had played video games for money. Young men in this sample were more likely to play video games for money than young women (25.7% vs. 8.4%; X^2 (1, N= 573) = 29.18, $p < .001$). Young adults 18–20 were more likely to have played video games for money than those 21–24 (X^2 (1, N= 573) = 11.83, $p = .001$). Participation in social casino games did not differ by gender (X^2 (1, N= 572) = 2.58, p=.108) or age (X^2 (1, N= 572) = 2.46, $p = .116$). Cell sizes were too small to examine either playing video games for money or social casino games by lifetime video game participation.

Over one in five parent gamblers reported playing social casino games (22.5%) and 8.4% had played video games for money in the last year. Younger parents 18–24 in this sample were more likely than those parents 35–54 or 55 and over to have played video games for money (18.1% vs. 7.6% and 2.6%; X^2 (2, N= 699) = 13.98, $p = .001$) and social casino games (43.4% vs. 21.1% and 9.1%; X^2 (2, N= 700) = 29.34, $p < .001$). Neither differed by gender (X^2 (1, N= 701) = 1.32, $p = .252$; X^2 (1, N= 700) = .14, $p = .709$).

Over one third of parents who thought their child had gambled felt they had played social casino games (33.8%). Parents that reported gambling on social casino games were more likely than those parents who did not to think their child has wagered on these games as well (58.3% vs. 26.5%; X^2 (1, N= 161) 14.77, $p < .001$). Participation in social casino games did not differ by child age (X^2 (2, N= 184) = 1.74, $p = .418$) or gender (X^2 (1, N= 174) = .006, $p = .937$).

Gambling Frequency

Almost one third of adolescents who played social casino games (29.6%) and one quarter of those adolescents who bet on video games (25.0%) reported playing weekly or more. Cell sizes were too small for bivariate analyses.

Roughly one in five young adults who play video games for money (21.6%) and 16.7% of those young adults who play social casino games reported doing so at least once a week. Playing video games for money or social casino games weekly did not differ by age (X^2 (1, N= 101) = .76, p = .382; X^2 (1, N= 115) = .470, p = .493). Frequency of social casino gaming did not differ by gender (X^2 (1, N= 114) = .118, p = .731). Cell sizes were too small to examine either by lifetime video game participation or level of gambling problems, or playing video games for money by gender.

Among the parents surveyed, social casino games were the most frequently played game, with 39.4% reporting weekly play. Roughly one third of parents that gambled on video games (31.2%) indicated doing so once a week or more. Weekly video game betting and social casino games did not differ by parent gender (X^2 (1, N= 59) = 2.46, p = .117; X^2 (1, N= 157) = 1.56, p = .212). Weekly video game gambling did not differ by level of gambling problems (X^2 (3, N= 157) = 6.15, p = .105). Cell sizes were too small to examine either by parent age or weekly video game gambling by level of gambling problems.

Gambling Problems

According to the GPSS, 1.9% of adolescents in this sample have a severe gambling problem (see Table 1). Adolescents that played video games for money (20.8% and 33.3%; X^2 (3, N= 114) = 25.20, $p < .001$) and social casino games (23.5% and 17.6%; X^2 (1, N= 145) = 17.35, p=.001) were more likely to be classified as low to moderate and high severity than those adolescents who had not. Cell sizes were too small to examine by lifetime video game participation.

According to the PGSI, 7.1% of young adults in this sample have a severe gambling problem. Those young adults who played video games for money were more likely

Table 1
Gambling Problems across Participant Groups

Level of Gambling	Adolescents	Young Adults	Parents
Non-Gambler	83.5%	47.6%	38.5%
Non-Problem Gambling	12.0%	26.7%	39.0%
Low Level Gambling	-	11.1%	9.3%
Low to Moderate Gambling	2.5%	-	-
Moderate Gambling	-	7.5%	5.3%
Problem Gambling	1.9%	7.1%	7.8%

than those young adults who had not to have moderate and severe gambling problems (23.5% vs. 10.2% and 31.4% vs. 7.6%; X^2 (4, N= 572) = 85.62, $p < .001$). Young adults who played social casino games (31.3% vs. 7.0%; X^2 (2, N= 572) = 48.16, $p < .001$) were more likely than the young adults who had not to have severe gambling problems. Young adults who had played video games were more likely to have no or low levels of problems than e young adults who had not (38.8% vs. 25.6%; X^2 (2, N= 956) = 6.97, p =.031).

According to the PGSI, 7.8% of parents in this sample have a severe gambling problem. For the bivariate analyses, no and low problems were collapsed as well as moderate and high problems. Parents who had played video games for money (79.7% vs. 13.2%; X^2 (2, N= 701) = 156.54, $p < .001$) and social casino games (41.4% vs. 12.3%; X^2 (2, N= 701) = 82.46, $p < .001$) were more likely to be at moderate or high risk of gambling harm than those parents who had not.

Among parents who said their child gambled, 20.5% have been worried or concerned about their child's gambling. In this sample, parents with moderate or severe gambling problems were more likely than parents with no or low problems to have concerns about their child's gambling (50.0% vs. 10.5%; X^2 (2, N= 183) = 28.63, $p < .001$). Parents were more concerned about children who played social casino games than children who did not (33.9% vs. 13.8%; X^2 (1, N= 185) = 10.15, p =.001). Parental concern did not differ by child lifetime video game participation (X^2 (1, N= 185) = .95, p =.330).

Video Game Behaviours

Participation

Over 90% of all youth samples have played video games in their lifetime (see Table 2).

Game Type

The majority of adolescents surveyed play mobile/computer-based games (73.3%) and console-based games (71.3%; see Table 2). Certain adolescents play gambling-style video games for virtual credits (8.5%) and for real money (0.8%).

In this sample, adolescents who had gambled in their lifetime (18.2% vs. 6.1%; X^2 (1, N= 662) = 20.39, $p < .001$) and played social casino games (41.2% vs. 10.7%; X^2 (1, N= 137) = 15.94, $p < .001$) were more likely to play gambling-style video games for virtual credits than those adolescents who had not, suggesting these two survey items are tapping into the same behaviour. Playing these games for virtual credit did not differ by age (X^2 (2, N= 661) = 2.88, p =.237) or playing video games for money (X^2 (1, N= 137) = .23, p =.635). Playing gambling games for credit or money did not differ by gender (X^2 (2, N= 661) = .127, p=.939; X^2 (2, N= 662) = .183, p =.913).

Table 2
Video Game Participation, Type, Duration, and In-Game Features Purchased across Youth Participant Groups

Variable	Adolescents	Young Adults	Children 8-17
Lifetime Video Game Participation	96.0%	91.8%	91.8%
Game Type			
Mobile/computer game downloaded for free	73.3%	61.9%	51.2%
Mobile/computer game purchased online	33.4%	24.5%	
Console-based games without Internet	71.3%	51.4%	53.7%
Console-based games with Internet	46.4%	40.9%	
Gambling-style games for virtual credits on mobile or computer	8.5%	12.0%	6.8%
Gambling game for real money on mobile or computer	0.8%		
Other	2.1%	3.2%	2.2%
Duration of Use			
Less than 30 Minutes	21.0%*	24.1%	14.2%
30 Minutes to 1 Hour	34.8%*	27.1%	37.3%
1–2 Hours	27.5%*	24.8%	29.6%
2–3 Hours	9.1%*	12.1%	10.5%
3–4 Hours	4.6%*	5.6%	3.0%
More than 4 Hours	3.0%*	6.0%	3.4%
Game Features Purchased			
Specific Item for Avatar	39.4%	39.7%	-
Gain More Chips/Gold	38.8%	37.5%	-
Gain More Lives	20.6%	16.4%	-
Enter a New Level	18.7%	22.3%	-
Other	20.0%	21.7%	-

Note. *Percentages reflect responses by 16-17 year olds only.

Cell sizes were too small to examine credit or money gambling-style games by level of gambling problems, or gambling-style games for money by age, lifetime gambling participation, or playing video games for money or social casino games.

Most young adults surveyed play free downloadable games on their mobiles or computers (61.9%) and console-based games without the Internet (51.4%). A portion play gambling-style video games for virtual credits (12.0%) and money (4.1%).

Young men in this sample were more likely than young women to have played gambling-style games for virtual credits (15.3% vs. 7.3%; X^2 (1, N= 435) = 6.96, p =.008). Gamblers were more likely than non-gamblers to play gambling-style video games for virtual credits (14.4% vs. 7.9%; X^2 (1, N= 823) = 7.51, p =.006) and for money (5.6% vs. 1.7%; X^2 (1, N= 824) = 1.36, p =.007). Those gamblers who have played social casino games were more likely than gamblers who have not to play gambling-style games for virtual credit (34.8% vs. 8.8%; X^2 (1, N= 521) = 48.30,

$p < .001$) and for money (14.3% vs. 2.9%; X^2 (1, N= 521) = 22.28, $p < .001$). These findings suggest the social casino and gambling-style video game questions are capturing the same behaviour. Gamblers with moderate or severe gambling problems in this analysis were more likely than non-gamblers or gamblers with no or low problems to play gambling-style games for virtual credits (21.4% vs. 8.1% and 12.7%; X^2 (2, N= 825) = 16.01, $p < .001$) and for money (14.4% vs. 1.4% and 3.0%; X^2 (2, N= 822) = 42.54, $p < .001$). Playing gambling-style games for virtual credit or for money did not differ by age (X^2 (1, N= 824) = .530, p =.466; X^2 (1, N= 823) = .298, p =.585) or participation in video game betting (X^2 (1, N= 522) = 1.70, p =.192; X^2 (1, N= 522) = 3.15, p =.076). Cell sizes were too small to examine playing gambling-style games for money by gender.

The parent sample reported that their children tend to play console-based games without the Internet (53.7%) and free downloadable games on their mobiles or computers (51.2%). Certain children also play gambling-style video games for virtual credits (6.8%) and money (3.1%).

According to parents surveyed, children aged 16 to 17 were more likely to play gambling-style games for virtual credit than younger children (10.0%; X^2 (2, N= 894) = 7.06, p = .029). Children who gambled were more likely than non-gamblers to have played gambling-style games for credit (17.0% vs. 4.4%; X^2 (1, N= 894) = 34.17, $p < .001$) and money (7.0% vs. 2.2%; X^2 (1, N= 894) = 10.52, p = .001). Children that have played social casino games were more likely to play these games for virtual credits than those children who have not (25.4% vs. 11.7%; X^2 (1, N= 170) = 5.27, p = .022). Again, these results suggest similarities between the social casino game and gambling-style video game items. Playing for virtual credit was more likely among children whose parents have been concerned about their gambling (31.4% vs. 13.2%; X^2 (1, N= 171) = 6.54, p = .011). Participation for credit or money did not differ by gender (X^2 (1, N= 858) = 1.24, p = .265; X^2 (1, N= 857) = .946, p = .331) or parental concern over child video game play (X^2 (1, N= 895) = .55, p = .458; X^2 (1, N= 895) = 1.67, p = .197). Playing gambling-style games for real money did not differ by age (X^2 (2, N= 895) = 3.47, p = .176). Cell sizes were too small to examine games for money by social casino game play.

Duration

Roughly one third of adolescents 16–17 (34.8%) played for 30 minutes to 1 hour in their last video game session (see Table 2). Non-gambling adolescents in this sample played for shorter durations than gamblers (X^2 (5, N= 216) = 20.93, p =.001), usually under 1 hour. Cell sizes were too small to examine by participation in video game betting or social casino games, or level of gambling problems.

In their last video game session, roughly one quarter of young adult video game players played for 30 minutes to 1 hour (27.1%), 1 to 2 hours (24.8%), and less than 30 minutes (24.1%). Gamblers in this sample played for longer periods than non-gamblers (X^2 (5, N= 822) = 15.16, p =.010), between 1 and 4 hours. Those

participants who had played video games for money spent more time playing video games than respondents who had not (X^2 (5, N= 522) = 35.91, $p < .001$), for 2 hours or more. Young adults with moderate or severe gambling problems in this sample played for longer durations than those at other risk levels (X^2 (10, N= 825) = 30.67, p =.001), at 1 hour or more. Time spent did not differ by social casino game participation (X^2 (5, N= 523) = 8.39, p =.136).

More than one third of parents in this sample (37.3%) said their child usually plays video games for 30 minutes to 1 hour. According to parents, gamblers played for longer durations than non-gamblers, at 2 hours or longer (X^2 (6, N= 894) = 18.10, p = .006). Children whose parents were concerned about their video game play played for longer, usually 1 hour or more (X^2 (6, N= 896) = 50.64, $p < .001$). Cell sizes were too small to examine by social casino game participation or parental concern over child gambling.

In-Game Purchasing

Among adolescent gamers in this sample, 28.6% have ever spent money within a video game. The adolescents who have gambled in their lifetime (46.7% vs. 24.0%; X^2 (2, N= 662) = 27.54, $p < .001$), played video games for money (69.6% vs. 41.6%; X^2 (1, N= 136) = 6.01, p =.014) and social casino games (63.6% vs. 41.3%; X^2 (1, N= 137) = 5.00, p =.025) were more likely than those adolescents who have not to have spent money within a video game. Cell sizes were too small to examine by level of gambling problems. Most adolescent gamers reported spending money on specific items for their avatar (39.4%) and gaining more chips/gold (38.8%; see Table 2).

Among young adult gamers in this sample, 47.1% spent money within a video game. Young adults who have gambled in their lifetime (51.9% vs. 38.7%; X^2 (2, N= 824) = 12.10, p =.001), played video games for money (79.4% vs. 45.6%; X^2 (2, N= 522) = 36.05, $p < .001$), and played social casino games (67.3% vs. 47.7%; X^2 (2, N= 522) = 13.73, p = .001) were more likely than those who have not to have spent money within a video game. Young adults with moderate or severe gambling problems in this analysis are more likely to have spent money within a video game than young adults non-gamblers or those with no or low problems (64.0% vs. 41.5% and 47.0%; X^2 (4, N= 824) = 20.55, $p < .001$). Young adult gamers most often purchased specific items for avatars (39.7%) and more chips/gold (37.5%).

Among parents of child gamers in this sample, 16.9% thought their child had spent money within a video game. Children that had gambled and played social casino games were more likely to have spent money within a game (33.9% vs. 12.8%; X^2 (1, N= 895) = 43.80, $p < .001$; 56.7% vs. 21.6%; X^2 (1, N= 171) = 21.34, $p < .001$). Children whose parents have been worried about their gambling (58.8% vs. 27.9%; X^2 (1, N= 170) = 11.54, p = .001) and video game play (24.0% vs. 13.1%; X^2 (1, N= 895) = 17.25, $p < .001$) were more likely to have spent money within a game.

Parental Concern

Among the parents of child gamers surveyed, 35.0% have ever been worried about how much their child plays. Parents who have been concerned about their child's gambling were more likely than those parents who have not to also have been concerned about their child's video game play (71.4% vs. 31.6%; X^2 (1, N= 171) = 18.42, $p < .001$). Concern did not differ by child lifetime gambling participation (X^2 (1, N= 895) = 51.65, $p = .199$).

Discussion

To shed light on the gambling and gaming behaviours of young people of varying ages, this study examined the participation, play behaviours, and problems in both of these areas among a sample of adolescents, young adults, and parents in Ontario. Several unique insights have been uncovered in this analysis.

We find that a notable portion of young people and parents surveyed are engaging in games that combine gambling and gaming. Over 20% of gamblers in all youth age groups had played social casino games, and over 15% of adolescents and young adult gamblers had played video games for money. Rates for playing video games for money are higher than those rates reported by other Canadian samples (Boak, Hamilton, Adlaf, Henderson, & Mann, 2018) and similar for social casino play (Veselka et al., 2018). Beyond these sizeable rates of participation for these games, the young people in this study play them on a frequent basis: over 20% of adolescents and young adults surveyed play social casino games on a weekly or more basis, and over 15% in each group play video games for money this often. Parents may be setting the example in this regard, with almost 40% in this sample playing social casino games weekly or more and over 30% doing so on video games for money.

This work also finds that playing games that combine gambling and gaming is associated with an increased level of risk. Playing social casino games and video games for money were associated with increased gambling problems among surveyed adolescents, young adults, and parents. Similarly, parents in this sample were more likely to have been concerned about children who played social casino games than children who did not. Recent research finds similar results, with social casino gambling and playing video games for money being linked with gambling problems in a sample of UK adults (Zendle, 2019a) and social casino play associated with gambling problems among Canadian adolescents (Veselka et al., 2018).

Our results find an association between in-game purchases and gambling behaviours. Young people in our sample were more likely to make in-game purchases if they were gamblers, played video games for money, or played social casino games. Previous research supports the link between participation in gambling and video game-based gambling-type behaviours. Wardle (2019) found that 39% of adolescents 11–16 years from Britain who engage in skins betting within video games also bet on some other form of gambling. Further, at-risk and problem gambling rates are

significantly higher among adolescents who had both bet on skins and engaged in other forms of gambling within the last month (Wardle, 2019). In our analyses, in-game purchasing was also higher among young adults with moderate or severe gambling problems and children whose parents have been worried about their gambling or video game play. These results add to a growing body of literature that finds links between in-game purchasing, specifically loot boxes, and problematic gambling and video game play (Li et al., 2019; Zendle & Cairns, 2018, 2019).

Our analysis supports studies that find associations between problematic gambling and problematic video game play (Karlsson, Broman, & Hakansson, 2019; Li et al., 2019). In our sample, parents who have been concerned about their child's gambling were likely to have been concerned about their video game play as well. Research also finds that video game duration is associated with problem video game play (King, Delfabbro, & Zajac, 2011) and links loot box purchasing with problem video gaming and gambling (Li et al., 2019). Here, we find that the young people we surveyed tended to play video games for longer durations—for one hour or more—if they were gamblers and if there were concerns about their gambling or gaming. Specifically, durations were longer for young adults with moderate or severe gambling problems and children whose parents had been concerned about their video game play.

This study contributes to research finding links between parent and child gambling behaviours (Magoon & Ingersoll, 2006; Vitaro & Wanner, 2011; Wickwire et al., 2007). In our sample, parents who have gambled, and those parents with a gambling problem, were more likely than non-gamblers and other risk groups to believe their child had gambled. Further, we find specific links for game type—parents who have played social casino games were more likely than those parents who have not to think their child had played these games as well. These results, along with the finding that over 40% of surveyed parents think their child gambles because they were present for the gambling, provide further support for the argument that parental gambling leads to child gambling, likely through learning processes, parental approval, and gambling cognitions (McComb & Sabiston, 2010; Oei & Raylu, 2004). Our finding that parents with moderate or severe gambling problems were more likely to be concerned about their child's gambling than parents at lower risk groups also points to the inheritance of gambling problems (King et al., 2010; Tepperman, et al., 2013; Vachon et al., 2004). Overall, these findings support the need to broaden youth prevention programming. Currently, most prevention programming focuses solely on the individual youth player, not taking into consideration familial and social influences. These findings warrant prevention programming that is more holistic in nature, that also targets and tailors messaging to possible sub-demographic youth populations that may be at greater risk as well as their parents.

This study experienced certain limitations. The rates of severe problem gambling found among young adults and parents are not reflective of results from previous Ontario surveys. Compared to the 7.1% found here for young adults, a previous telephone-based study in the province found a 1.4% rate (Wiebe, Mun, & Kauffman, 2006). In other adult telephone samples in Ontario, the rate of severe problem

gambling is 0.6% to 0.8% (Wiebe et al., 2006; Williams & Volberg, 2013), with a standardized adult past year prevalence rate across surveys of 2.4% (Williams, Volberg, & Stevens, 2012), which is much lower than the 7.8% found among parents in our sample. For adolescents, however, the rate of 1.9% found here is comparable to the 1.0% found in a class-based sample in Ontario (Turner et al., 2018). The discrepancies for young adults and parents are because of the online sample for parents and the online portion of the sample for young adults. While no significant differences existing between GPSS classifications for adolescents completing the survey online or by phone (2.6% vs. 1.2%; X^2 (3, N= 695) = 0.07, p =.045), PGSI classifications of both moderate and severe gambling problems are significantly higher in the online versus telephone sample for young adults (10.5% vs. 4.1%, 12.1% vs. 1.4%; X^2 (4, N= 956) = 66.18, p = <.001). In light of these findings, problem gambling prevalence among young adults and parents should not be inferred from this sample.

Because of their age, we were unable to question children under 12 years directly and had to rely on their parents' assessments and report of behaviours. Separate surveys were used for each sample which limits the possibilities for cross comparison. We were also limited in our analysis of gambling problems among adolescents because of small cell sizes. Because of survey length restrictions, the question about video game duration was not posed to 12–15 year olds and parents were not asked about their children playing video games for money. As loot boxes were not a topic of investigation when the study took place, more specific questions about purchased game features like loot boxes were not included in the survey. These limitations in the instruments used prevent complete statistical analyses across samples. Finally, our cross-sectional sample prevents us from drawing conclusions about causality, or describing how factors impact each other over time. It would be valuable for future, ideally longitudinal, research to consider how gambling and gaming behaviour and problems develop and change among young people over time.

References

Boak, A., Hamilton, H. A., Adlaf, E. M., Henderson, J. L., & Mann, R. E. (2018). *The mental health and well-being of Ontario students: 1991–2017: Detailed findings from the Ontario Student Drug Use and Health Survey* (CAMH Research Document Series No. 47). Toronto, ON: Centre for Addiction and Mental Health. https://www.camh.ca/-/media/files/pdf---osduhs/mental-health-and-well-being-of-ontario-students-1991-2017---detailed-osduhs-findings-pdf.pdf

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

Derevensky, J. L., & Gainsbury, S. M. (2016). Social casino gaming and adolescents: Should we be concerned and is regulation in sight? *International Journal of Law and Psychiatry*, *44*, 1–6. https://doi.org/10.1016/j.ijlp.2015.08.025

Dowling, N. A., Jackson, A. C., Thomas, S. A., & Frydenberg, E. (2010). *Children at risk of developing problem gambling: Final Report*. Australia: Gambling Research Australia. https://pdfs.semanticscholar.org/8a15/2bd9440727cdfa07517be2b4217548df0310.pdf?_ga=2.220177241.1960575250.1596240376-978602173.1596240376

Dowling, N. A., Shandley, K., Oldenhof, E., Youssef, G. J., Thomas, S. A., Frydenberg, E., & Jackson, A. C. (2016). The intergenerational transmission of problem gambling: The mediating role of parental psychopathology. *Addictive Behaviors*, *58*, 12–17. https://doi.org/10.1016/j.addbeh.2016.03.002

Entertainment Software Association of Canada. (2018). *The Canadian video game industry: 2018*. n.p.: Author. http://theesa.ca/wp-content/uploads/2018/10/ESAC18_BookletEN.pdf

Entertainment Software Association of Canada. (2019). *The Canadian video game industry: 2019*. n.p.: Author. http://theesa.ca/wp-content/uploads/2019/11/CanadianVideoGameSector2019_EN.pdf

Ferris, J., & Wynne, H. (2001). *The Canadian problem gambling index: Final report*. Ottawa, ON: Canadian Centre on Substance Abuse. https://www.greo.ca/Modules/EvidenceCentre/files/Ferris%20et%20al(2001)The_Canadian_Problem_Gambling_Index.pdf

Gainsbury, S. M. (2019). Gaming-gambling convergence: Research, regulation, and reactions. *Gaming Law Review*, *23*, 80–83. https://doi.org/10.1089/glr2.2019.2323

Gainsbury, S. M., Hing, N., Delfabbro, P. H., & King, D. L. (2014). A taxonomy of gambling and casino games via social media and online technologies. *International Gambling Studies*, *14*, 196–213. https://doi.org/10.1080/14459795.2014.890634

Gainsbury, S. M., Russell, A. M. T., King, D. L., Delfabbro, P., & Hing, N. (2016). Migration from social casino games to gambling: Motivations and characteristics of gamers who gamble. *Computers in Human Behavior*, *63*, 59–67. https://doi.org/10.1016/j.chb.2016.05.021

Griffiths, M. D. (2018). Is the buying of loot boxes in video games a form of gambling or gaming? *Gaming Law Review*, *22*, 52–54. https://doi.org/10.1089/glr2.2018.2216

Gupta, R., Derevensky, J., & Wohl, M. (2013, May 27–31). *A qualitative examination of online gambling culture among college students: Factors influencing participation, maintenance, and cessation* [Paper presentation]. 15th International Conference on Gambling and Risk Taking, Las Vegas, NV.

Hayer, T., Kalke, H., Meyer, G., & Brosowski, T. (2018). Do simulated gambling activities predict gambling with real money during adolescence? Empirical findings

from a longitudinal study. *Journal of Gambling Studies*, *34*, 929–947. https://doi.org/10.1007/s10899-018-9755-1

Juniper Research. (2018). *In-game gambling: The next cash cow for publishers*. Basingstoke, United Kingdom: Author. https://www.juniperresearch.com/document-library/white-papers/in-game-gambling-the-next-cash-cow

Karlsson, J., Broman, N., & Hakansson, A. (2019). Associations between problem gambling, gaming, and Internet use: A cross-sectional population survey. *Journal of Addiction*, 2019. https://doi.org/10.1155/2019/1464858

Kim, H. S., Wohl, M. J. A., Gupta, R., & Derevensky, J. (2017). Why do young adults gamble online? A qualitative study of motivations to transition from social casino games to online gambling. *Asian Journal of Gambling Issues and Public Health, 7*, 6–17. https://ajgiph.springeropen.com/articles/10.1186/s40405-017-0025-4

Kim, H. S. Wohl, M. J. A., Salmon, M. M., Gupta, R., & Derevensky, J. (2015). Do social casino gamers migrate to online gambling? An assessment of migration rate and potential predictors. *Journal of Gambling Studies*, *31*, 1819–1831. https://link.springer.com/article/10.1007/s10899-014-9511-0

King, D. R., Delfabbro, P. H., Gainsbury, S. M., Dreier, M., Greer, N., & Billieux, J. (2019). Unfair play? Video games as exploitative monetized services: An examination of game patents from a consumer protection perspective. *Computers in Human Behavior*, *101*, 131–143. https://doi.org/10.1016/j.chb.2019.07.017

King, D. L., & Delfabbro, P. H. (2020). The convergence of gambling and monetised gaming activities. *Current Opinion in Behavioral Sciences*, *31*, 32–36. https://doi.org/10.1016/j.cobeha.2019.10.001

King, D. L., Delfabbro, P. H., Kaptsis, D., & Zwaans, T. (2014). Adolescent simulated gambling via digital and social media: An emerging problem. *Computers in Human Behavior*, *31*, 305–313. https://doi.org/10.1016/j.chb.2013.10.048

King, D. L., Delfabbro, P. H., & Zajac, I. T. (2011). Preliminary validation of a new clinical tool for identifying problem video game playing. *International Journal of Mental Health and Addiction, 9*, 72–87. https://doi.org/10.1007/s11469-009-9254-9

King, S., Abrams, K., & Wilkinson, T. (2010). Personality, gender, and family history in the prediction of college gambling. *Journal of Gambling Studies*, *26*, 347–359. https://doi.org/10.1007/s10899-009-9163-7

Li, W., Mills, D., & Nower, L. (2019). The relationship of loot box purchases to problem video gaming and problem gambling. *Addictive Behaviors*, *97*, 27–34. https://doi.org/10.1016/j.addbeh.2019.05.016

Magoon, M. E., & Ingersoll, G. M. (2006). Parental modelling, attachment, and supervision as moderators of adolescent gambling. *Journal of Gambling Studies*, *22*, 1–22. https://doi.org/10.1007/s10899-005-9000-6

Mcmillen, J., & Wenzel, M. (2006). Measuring problem gambling: Assessment of three prevalence screens. *International Gambling Studies*, *6*, 147–174. https://doi.org/10.1080/14459790600927845

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

Morgan Stanley. (2012). *Social gambling: Click here to play*. New York, NY: Morgan Stanley Research. http://docplayer.net/17454249-Social-gambling-click-here-to-play.html

Oei, T. P. S., & Raylu, N. (2004). Familial influence on offspring gambling: A cognitive mechanism for transmission of gambling behavior in families. *Psychological Medicine*, *34*, 1279–1288. https://doi.org/10.1017/S0033291704003150

Owens, M. D., Jr. (2010). If you can't tweet 'em, join 'em: The new media, hybrid games, and gambling law. *Gaming Law Review and Economics, 14*, 669–672. https://doi.org/10.1089/glre.2010.14906

Reynolds, J. (2019). Gambling on big data: Designing risk in social casino games. *European Journal of Risk Regulation*, *10*(1), 116–131. doi: 10.1017/err.2019.18.

Reynolds, J. (2016). *Youth, Poker and Facebook: Another Case of Candy Cigarettes?* University of Toronto. Available at: https://tspace.library.utoronto.ca/handle/1807/73145.

Stinchfield, R. (2011). A critical review of adolescent problem gambling assessment instruments. In J. Derevensky, D. T. L. Shek, & J. Merrick (Eds.), *Youth gambling: The hidden addiction* (Pp. 147–164). Berlin, Germany: de Gruyter.

Tepperman, L., Albanese, P., Stark, S., & Zahlan, N. (2013). *The Dostoevsky effect: Problem gambling and the origins of addiction*. Toronto, ON: Oxford University Press.

Tremblay, J., Stinchfield, R., Wiebe, J., & Wynne, H. (2010). *Canadian Adolescent Gambling Inventory (CAGI) Phase III Final Report*. Canada: Canadian Consortium for Gambling Research and Interprovincial Consortium on Gambling Research. https://prism.ucalgary.ca/bitstream/handle/1880/48158/CAGI_Phase_III_Report_e.pdf?sequence=1&isAllowed=y

Turner, N. E., Elton-Marshall, T., Shi, J., Wiebe, J. Boak, A, van der Maas, M, & Mann, R. E. (2018). Cross validation of the Gambling Problem Severity Subscale of the Canadian Adolescent Gambling Index (CAGI/GPSS) on a sample of Ontario high school students. *Journal of Gambling Studies*, *34*, 521–537. https://doi.org/10.1007/s10899-017-9731-1

Vachon, J., Vitaro, F., Wanner, B., & Tremblay, R. (2004). Adolescent gambling: Relationships with parent gambling and parenting practices. *Psychology of Addictive Behaviors*, *18*, 398–401. https://doi.org/10.1037/0893-164X.18.4.398

Veselka, L., Wijesingha, R., Leatherdale, S. T., Turner, N. E., & Elton-Marshall, T. (2018). Factors associated with social casino gambling among adolescents across game types. *BMC Public Health*, 18. https://doi.org/10.1186/s12889-018-6069-2

Vitaro, F., & Wanner, B. (2011). Predicting early gambling in children. *Psychology of Addictive Behaviors*, *25*, 118–126. https://doi.org/10.1037/a0021109

Wardle, H. (2019). The same or different? Convergence of skin gambling and other gambling among children. *Journal of Gambling Studies*, *35*, 1109–1125. https://doi.org/10.1007/s10899-019-09840-5

Wickwire, E. M., Whelan, J. P., Meyers, A. W., & Murray, D. M. (2007). Environmental correlates of gambling behavior in urban adolescents. *Journal of Abnormal Child Psychology*, *35*, 179–190. https://doi.org/10.1007/s10802-006-9065-4

Wiebe, J., Mun, P., & Kauffman, N. (2006). *Gambling and Problem Gambling in Ontario 2005*. Toronto, ON: Responsible Gambling Council. https://prism.ucalgary.ca/ds2/stream/?#/documents/987f830c-2d2c-4361-8f56-f75c8a513893/page/1

Williams, R.J. & Volberg, R.A. (2013). *Gambling and Problem Gambling in Ontario*. Ontario: Ontario Problem Gambling Research Centre and the Ontario Ministry of Health and Long Term Care. http://hdl.handle.net/10133/3378

Williams, R.J., Volberg, R.A. & Stevens, R.M.G. (2012). *The Population Prevalence of Problem Gambling: Methodological Influences, Standardized Rates, Jurisdictional Differences, and Worldwide Trends*. Ontario: Ontario Problem Gambling Research Centre and the Ontario Ministry of Health and Long Term Care. http://hdl.handle.net/10133/3068

Zendle, D. (2019a). Gambling-like video game practices: A cross-sectional study of links with problem gambling and disordered gambling. https://psyarxiv.com/fh3vx/

Zendle, D. (2019b). Is real-money mobile gaming a form of gambling or video gaming? https://psyarxiv.com/9wp5h

Zendle, D., & Cairns, P. (2019). Video game loot boxes are linked to problem gambling: Results of a large-scale survey. *PLoS ONE*, 13(11). https://doi.org/10.1371/journal.pone.0206767

Zendle, D., & Cairns, P. (2019). Loot boxes again linked to problem gambling: Results of a replication study. *PLoS ONE*, 14(3). https://doi.org/10.1371/journal.pone.0213194

Zendle, D., Meyer, R., & Over, H. (2019). Adolescents and loot boxes: Links with problem gambling and motivations for purchase. *Royal Society Open Science*, 6. http://dx.doi.org/10.1098/rsos.190049

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Ethics approval: This study was approved by the Ontario Institutional Review Board of Institutional Review Board Services ("Youth Gambling 8 to 24 years in Ontario: Developing Best Practices for Prevention and Treatment," protocol number Pro00011287, obtained March 17, 2015). Institutional Review Board Services is a private, independent company that specializes in ethics reviews for research involving human subjects in Canada and other countries.

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