

Canale, N., Vieno, A., Griffiths, M.D., Siciliano, V., Cutilli, A., Molinaro, S. (in press). "I am becoming more and more like my eldest brother!": The relationship between older siblings, adolescent gambling severity, and the attenuating role of parents in a large-scale nationally representative survey study. *Journal of Gambling Studies, in press*

Abstract

Background: The present study examined the association between having older siblings who gamble and adolescent at-risk/problem gambling and how parents (i.e., parental knowledge of their whereabouts) and peers might moderate such effects.

Methods: Data were drawn from the ESPAD@Italia2012 survey (European School Survey Project on Alcohol and Other Drugs) comprising a nationally representative Italian sample of adolescents. The analysis was carried out on a subsample of 10,063 Italian students aged 15-19 years (average age = 17.10; 55% girls) who had at least one older sibling and who had gambled at some point in their lives. Respondents' problem gambling severity, older gambler sibling, gambler peers, parental knowledge, and socio-demographic characteristics were individually assessed. Multinomial logistic regression analyses including two- and three-way interactions were conducted.

Results: The odds of being an at-risk/problem gambler were higher among high school students with older siblings that gambled and those with peers who gambled. Higher parental knowledge (of who the adolescent was with and where they were in their leisure time) was associated with lower rates of at-risk/problem gambling. There was also an interaction between gamblers with older siblings and parental knowledge. The combination of having siblings who gambled and a greater level of parental knowledge was associated with lower levels of problem gambling.

Conclusion: The present study confirmed the occurrence of social risk processes (older siblings and peers who gambled) and demonstrated that gambling among older siblings and peers represents an important contextual factor for increased at-risk/problem gambling. However, parental knowledge appears to be sufficient to counterbalance the influence of older siblings.

Keywords: siblings; parents; gambling; ESPAD data; adolescents.

Introduction

Problem gambling among adolescents and young adults is an emerging public health issue in many European countries (Molinaro et al., 2014). Many previous studies have demonstrated the adverse consequences of problem gambling in adolescence, including strained relationships with family members and friends, educational detriments, criminal behavior, depressive symptoms, suicidal thoughts and attempts, and substance addiction (e.g., Blinn-Pike, Worthy, & Jonkman, 2010; Griffiths, 2011). “Over the past 25 years, various family influences on adolescent gambling behavior have been identified including family structure (i.e., Canale et al., 2016a; Hayer, 2012; McComb & Sabiston, 2010), parental gambling participation (i.e., Delfabbro et al., 2005; Ólason et al., 2006; Wickwire, Whelan, Meyers, & Murray, 2007) and family climate (Magoon & Ingersoll, 2006; Skokauskas & Satkeviciute, 2007). For example, adolescents who lived with unrelated others (e.g., with step-parents or neither natural parent) have been found to be significantly more likely than adolescents who lived with one-parent/two parents to be problem gamblers (Canale et al., 2016a). In addition, perceived parental knowledge (children’s perceptions of their parents’ knowledge of their whereabouts and companions) has both direct (i.e., McComb & Sabiston, 2010 for a review) and indirect effects on adolescent gambling (Canale et al., 2016b). Furthermore, inadequate disciplinary practices, such as hostile parenting, have been related to heightened levels of adolescent gambling problems (Vachon, Vitaro, Wanner, & Tremblay, 2004).”

However, most of these studies have typically focused on parental influences. Little attention has been paid in previous research to what degree and in which way sibling behaviors influence adolescent gambling or modify parental influences. The present study aimed to examine the influence of older siblings that gamble in explaining at-risk/problem gambling in younger siblings’ adolescent gambling.

Only recently have siblings received attention as a form of peer influence in adolescent risk behavior. Although there is some mutual shaping between siblings, the present authors consider older siblings to serve more of a “reference individual” function (Merton, 1957). Consequently, older siblings have a stronger role in shaping younger siblings’ gambling (than vice versa) by exerting their influence as role models and through active reinforcement (Boyle, Sanford, Szatmari, Merikangas, & Offord, 2001; Whiteman & Christiansen, 2008). Numerous studies have examined the influence of siblings on antisocial behaviors, such as violent behavior (e.g., Kuntsche, Gossrau-Breen, & Gmel, 2009) and substance abuse (e.g., Gossrau-Breen, Kuntsche, & Gmel, 2010; Scholte, Poelen, Willemsen, Boomsma, & Engels, 2008; Whiteman, Jensen, Mustillo, & Maggs, 2016). However, very few studies have investigated this relationship in the case of problem gambling (Hayer & Griffiths, 2015; McComb & Sabiston, 2010). Two studies reported that having a sibling who gambles can be a significant risk factor for adolescents (Gupta & Derevensky, 1997; Dickson et al., 2008) while another study found no relationship between sibling gambling and problem gambling in a sample of adolescents aged 13-16 years (Casey et al., 2011). Therefore, the influence of older siblings on adolescent problem gambling remains unclear. Furthermore, these previous studies did not comprise samples that were representative of the general adolescent population. These three studies had relatively small sample sizes (between 436 and 2179 participants), and limit the generalizability of the results. In addition, these studies did not provide information about the age of the participant’s siblings (i.e., older siblings). Consequently, the principal aim of the present study was to investigate the intrafamilial risk factors (i.e., gambling by older siblings) of problem gambling among a nationally representative sample of Italian adolescents.

Despite recent (but inconsistent) research on sibling influence, parental influences have been consistently associated with problem gambling. During adolescence, parenting behaviors more focused upon autonomy development, such as parental knowledge of their children’s whereabouts, their friends, and their leisure activities gain greater relevance (Barber et al., 2005) because teenagers spend more time with peers and less time under direct supervision and control of parents

and other adults (Patterson & Stouthamer-Loeber, 1984). Several cross-sectional and longitudinal studies have found that parental knowledge and/or monitoring are a protective factor in adolescent gambling (e.g., Lee, Stuart, Ialongo, & Martins, 2014; Molinaro et al., 2014). As children grow up, the influence of theory peer groups and larger social networks become more salient. Adolescent problem gamblers are significantly more likely to have friends who approve of gambling or who gamble excessively themselves (e.g., Whelan, Meyers, & Murray, 2007; Ólason et al., 2006).

Like other addictions (e.g., alcoholism and substance abuse) and antisocial behaviours (e.g., violence and delinquency), a multiplicity of causes and social/familial factors have been shown to be associated with problematic gambling behaviour (Hayer & Griffiths, 2015; Gupta & Derevensky, 1997). For example, it is argued that at an individual level, adolescents with high sensation-seeking and impulsivity, and who exhibit emotion-focused coping styles were more likely to be problematic gamblers (see Shead, Derevensky, & Gupta, 2010 for a review). Regarding perceived descriptive norms (i.e., perceptions of what others do), adolescents who perceived their friends as gamblers were more likely to participate in gambling activities (Canale et al., 2016b; Foster et al., 2014).

Research has supported the proposition that the interaction of parents, older siblings, and peers help explain risky alcohol drinking (Gossrau-Breen, Kuntsche, & Gmel, 2010) and antisocial behaviors (Kuntsche, Gossrau-Breen, & Gmel, 2009). More specifically, Gossrau-Breen and colleagues (2010) found that parental monitoring appears to be an effective tool in managing risky alcohol drinking, even if older siblings drink alcohol riskily. In addition, the interplay of individuals having drunken older siblings, drunken peers, and a high level of risky single occasion alcohol drinking has been significantly associated with higher levels of violence and delinquency (Kuntsche, Gossrau-Breen, & Gmel, 2009). Despite the importance of exploring the interplay of contextual factors for adolescent gambling (Gupta & Derevensky, 2007), no studies have previously investigated the interplay of parents, older siblings, and peers among gambling teenagers.

Therefore, specific investigations into the combination of social and familial factors surrounding youth problem gambling warrant empirical consideration.

The present study aims to fill this gap in previous gambling literature by exploring the complex interaction between intrafamilial (parental knowledge and gambling of older sibling) and extrafamilial (gambling among peers) gambling-related risk factors on younger siblings' problem gambling. Two specific questions are central to the analysis. First, what is the relationship between older gambler siblings and patterns of adolescent gambling? Based on prior studies with non-representative samples (Gupta & Derevensky, 1997; Dickson et al., 2008), it was hypothesized that adolescents who have at least one older sibling who gambles will be more likely to report higher levels of at-risk/problem gambling. Second, what intrafamilial and extrafamilial characteristics might account for this relationship? The study also examined the interplay of parents, older siblings, and peers with problem gambling severity. In particular, the study examines whether the association between parental knowledge, gambling among peers and at-risk/problem gambling vary with older sibling who gambled. It was hypothesized that high parental knowledge will ameliorate the effect of sibling gambling on adolescent problem gambling (Gossrau-Breen, Kuntsche, & Gmel, 2010). In addition, it was hypothesized that there would be high levels of problem gambling among adolescents who have both older siblings and peers who gamble (Kuntsche, Gossrau-Breen, & Gmel, 2009).

Methods

Study design

This study uses data from ESPAD@Italia2012 (European School Survey Project on Alcohol and Other Drugs), a national school survey conducted regularly to monitor risk-behaviors among Italy's youth population. Sampled schools, public and private, were divided into three groups: upper secondary general schools (classical, scientific, linguistic, pedagogic), art institutes, and upper secondary vocational schools (professional, technical). Private schools that were not legally recognized (0.3% of total schools)

were not included in the sample. The multistage stratified sampling method was utilized, taking into account the type of school and other variables, such as geographical area (north, center, south, and islands) and population density. Students were sampled in proportion to the size of each stratum. Sampled schools were contacted asking teachers responsible for health education to present the research project to the school board. The authorization by the school director was required to allow students complete the questionnaire. Parental permission for their children to participate was obtained prior to survey administration. Students were informed that participation was anonymous and voluntary. Self-administered questionnaires were completed by a representative sample of high school students, aged 15–19 years, in school classrooms. Each student placed their own completed questionnaire inside a blank envelope that was subsequently collected and sent to the research center. Detailed information about the procedures is available in Hibell et al. (2012).

The total sample comprised 31,696 students. Due to the aims of the study, participants who did not have older siblings ($n = 16,804$, 53%) were excluded from the analyses. There were no differences in terms of age between students with older siblings ($M = 17.03$, $SD = 1.43$) and students without older siblings ($M = 17.03$, $SD = 1.43$), $F_{(1, 29,980)} = .23$, $p = .93$, although there was a difference in terms of gender, $\chi^2 (1, n = 29,658) = 8.50$, $p = .004$, with more students with older siblings being female (52%) than students without older siblings (50%). Of the 16,114 adolescents, a total of 13,796 students completed the South Oaks Gambling Screen- Revised for Adolescents (SOGS-RA; Winters, Stinchfield, & Fulkerson, 1993; Italian version: Colasante et al., 2014). All students who did not answer to other questions ($n = 3,733$) were excluded from the analyses. The final sample comprised 10,063 students.

Measures

Modules and optional questions were added to the 2011 ESPAD questionnaire (Hibell et al., 2012) in order to investigate specific areas of interest (i.e. gambling, eating disorders, problematic internet use, etc.).

Older siblings who gamble

Participants answered the question ‘Do any of your older siblings gamble?’ with either ‘no’ (coded as 0) or ‘yes’ (coded as 1).

Peers who gambled

The answer categories to ‘How many of your friends would you estimate gamble?’ were dichotomized, with ‘none’ or ‘few’ coded as 0 and ‘some’, ‘most’ or ‘all’ coded as 1.

Parental knowledge

Parental knowledge was assessed by three questions: ‘My parent(s) know who I am with in the evenings’, ‘My parent(s) know where I am in the evenings’ (responses on a five-point scale from ‘almost never’ to ‘almost always’) and ‘Do your parents know where you spend Saturday evenings?’ (response on a four-point scale from ‘usually don’t know’ to ‘always know’). On the basis of $\alpha = 0.84$ [CI: .84/.85], the total score for this scale was used for the current analysis (Kokkevi et al., 2014; Molinaro et al., 2014).

Gambling behaviours

Gambling problems were assessed using the South Oaks Gambling Screen-Revised for Adolescents (SOGS-RA; Winters, et al., 1993; Italian version: Colasante et al., 2014). Students were presented with 12 items assessing negative feelings and behaviours associated with gambling. In reporting past-year prevalence rates, Winters et al.’s (1995) original scoring system was used. A SOGS-RA score of 0-1 indicated ‘no problem,’ 2-3 indicated ‘at-risk’ gambling, and 4 or more indicated ‘problem’ gambling. For further analyses, a dichotomized variable was generated by merging at-risk gamblers and problem gamblers into a single group labelled ‘at risk-problem gamblers’ (with the remainder being labelled ‘non-problem gamblers’ (i.e., Carbonneau, Vitaro, Brendgen, & Tremblay, 2015; Walther, Morgenstern, & Hanewinkel, 2012).

Control variables

Several control variables were included. Participant's gender was coded 0 for females and 1 for males. Family structure was obtained by recoding the responses to the question: 'Which of the following people live in the same household with you?' to indicate living with both parents (0 = 'no'/1 = 'yes'). Level of parents' schooling was assessed by the question: "What is the highest level of schooling your mother/father completed?". The coding included: "completed primary school or less", "some secondary school", "completed secondary school", "some college", "completed college or some university", "completed university". On the basis of $\alpha = 0.71$ [CI: .70/.72], the total score for this scale was used for the current analysis (Molinaro et al., 2014).

Statistical Analysis

To test for the possible contribution of older gambler siblings, gambler peers, and parental knowledge to gambling problems, a multinomial logistic regression analysis was applied. The regression analysis was conducted controlling for the effect of confounding factors (sex, age, family structure, and level of parents' schooling effects). In order to test for the two-way and three-way interactions between older gambler siblings, gambler peers, and parental knowledge, the steps involved included: transforming predictor and moderator variables by standardizing (variables were centred to a zero mean), creating interaction terms, and structuring the equation.

Results

Descriptive statistics of all variables are listed in Table 1. Results revealed that less than half of the participants were boys (45%), with an overall mean age of 17 years (SD= 1.43). Within the whole sample, 7% of the participants had older siblings who gambled, and 21% of the participants indicated that at least some of their peers were gamblers. In the past-year gambler sample, 8,915

(88.6%) had no gambling problem; 711 (7.1%) were at-risk gamblers, and 437 (4.3%) were problem gamblers.

Results from multinomial logistic regression analyses revealed that participants with older gambler siblings and those with peers who gambled had higher rates of at-risk/problem gambling (Table 2). Moreover, higher parental knowledge was associated with lower gambling severity. Finally, there was a positive interaction between gambling of older sibling, parental knowledge, and gambling severity. More specifically, the combination of having older gambler siblings and higher level of parental knowledge was associated with a much lower level of at-risk/problem gambling (see Figure 1). In contrast, the combination of having older gambler siblings and peers who gambled was not associated with a high level of gambling severity.

Discussion

The present study is the first to investigate the role of gambling among older sibling in explaining at-risk/problem gambling among a nationally representative sample of adolescents. The results indicated that, gambling of older siblings was significantly associated with greater problem gambling severity and, more specifically, rates of adolescent at-risk/problem gambling were twice as high among adolescents who had older siblings who gambled. This result supports the first hypothesis and confirms previous findings with adolescent gamblers (Gupta & Derevensky, 1997; Dickson et al., 2008). It also extends research in the gambling studies field by demonstrating that adolescents who have an older sibling who gambles may be more likely to experience gambling problems than those without older siblings who gamble. This might be due to the fact that specific characteristics of the sibling relationship may heighten the possibility that younger siblings' behavior is shaped by the behavior of older siblings. First, the inherent power imbalance between older and younger siblings fosters the view of older siblings as “role models” (Boyle, Sanford, Szatmari, Merikangas, & Offord, 2001; Whiteman & Christiansen, 2008). In addition, greater identification with siblings might promote similarity in values and attitudes (Brook, Brook, Richter,

& Whiteman, 2003). This suggests the important and powerful role of sibling influence in adolescence, even in the context of parental influence (McHale & Crouter, 1996).

The findings from the main effects models in this study indicated that adolescents who perceived higher levels of parental knowledge were associated negatively with problem gambling severity. In line with previous studies, parental knowledge (of who the adolescent was with and where they were in their leisure time) showed a negative relationship with gambling severity (Molinaro et al., 2014), because adolescents may have more social resources to turn to when they get into trouble. Through knowledge of their adolescent offspring's whereabouts and activities, parents have a fundamental role in buffering different types of risk behaviors, be it substance use (Kiesner et al., 2010) or gambling behavior (Molinaro et al., 2014). This might be due to the fact that parents who are knowledgeable about youth activities may have the information necessary to provide the supervision, structure and discipline indispensable for monitoring peer relationships and, subsequently, for reducing youth deviant behavior (Crouter & Head, 2002). Consistent with results from previous studies (e.g., Wickwire, Whelan, Meyers, & Murray, 2007; Ólason et al., 2006), adolescents who reported their friends as gamblers were more likely to participate in gambling activities (i.e., friend models displayed a significant positive relation to gambling severity). These results are also consistent with a false consensus effect or normative fallacy, according to which people believe that others behave as they do (Henry, Kobus, & Schoeny, 2011). The present study extends earlier research by confirming the hypothesis that high parental knowledge ameliorates the effect of sibling gambling on adolescent gambling severity. More specifically, among students with siblings who gambled, the probability of at-risk/problem gambling decreased over the higher rates of perceived parental knowledge. This might be due to the fact that experiencing involved parenting promoted adolescent's resiliency toward their older siblings' gambling (Conger, Rueter, & Conger, 1994). In addition, the findings could also indicate that with increased gambling involvement as an effect of gambling of older sibling, younger siblings may share even fewer experiences with their parents to avoid parental disapproval and its

related consequences (Gossrau-Breen et al., 2010). For families with siblings, parental knowledge may provide an important means by which parents manage the modeling in gambling behaviors than can occur in sibling relationships.

In contrast to findings for parental knowledge, the association between gambling of older siblings and problem gambling severity did not vary significantly with peers who gambled. It appears that social processes in sibling relationships do not influence adolescent gambling severity via their impact on peer affiliations. This may have been because family influences (i.e., parents and siblings) occur earlier than peer influences and so family influences may exert the more prominent effect (Browne & Brown, 1994).

Although results from the present study should be interpreted cautiously, the study's findings may have implications for practice. Practitioners and prevention researchers should be encouraged to incorporate and address the multiple social processes and diverse ecologies both within and outside the family environment that contribute to adolescent problem gambling. Preventive intervention programs may promote more constructive relationship processes (McHale & Crouter, 1996) or mitigate such influence through enhanced monitoring of activities and whereabouts to include siblings as well as peers.

Limitations and strengths

This present study is not without its limitations. First, a significant limitation of the current study was the cross-sectional design. Investigating a casual interplay of different factors over time would require large longitudinal data sets. Secondly, findings were based on self-report data that are subject to well-known biases (social desirability, recall, etc.). It would be desirable to gather responses from peers and siblings, to avoid the problem of "shared method variance" (Sweeting, 2001). In addition, information on the number of older siblings, their age, and gender was not available in the dataset. These factors can help researchers in the gambling studies field because

stronger behavioral resemblance in substance use and delinquency has been found for same sex siblings (rather than opposite sex) and those closer in age (i.e., McGue, Sharma, & Benson, 1996). Additionally, the amount of parental gambling and what they gamble upon can also be useful measures that make the intrafamilial influences on adolescent gambling more accurate. Thirdly, in explaining the potential effect of older gambler sibling on adolescent gambling severity, other unconsidered factors associated with sibling relationship such as values, attitudes and personality (Barni, Roccato, Vieno, & Alfieri, 2014; Canale, Vieno, Pastore, Ghisi, & Griffiths, 2016) may also predict sibling resemblance. Notwithstanding these limitations, the strengths of the study include the use of a large sample representative of the Italian high school population. Moreover, the study clearly demonstrated that: the odds of adolescent at-risk/problem gambling were twice as high among adolescent who have older siblings who gamble than those without older gambler siblings. Furthermore parental knowledge of their children appears an effective tool in managing adolescent behavior, even within the risk-promoting context of an older sibling who gambles.

Compliance with Ethical Standards

Funding None.

Disclosure of potential conflicts of interest The authors declare that they have no conflict of interest.

Ethical approval Ethical principles were carried out in accordance with the Declaration of Helsinki. The survey was included in each school's annual Teaching Programme (Decree of the President of the Italian Republic n.275/1999, Art. 8), edited, agreed and approved by Collegial Bodies composed of teachers, parents and students (Legislative Decree n.297/1994).

Informed consent Parents provided passive consent.

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