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Emotion regulation interacts with gambling motives to predict problem gambling among emerging adults

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HIGHLIGHTS

- 15.2% and 8.1% of gamblers (18–27 years old) reported moderated and problem gambling levels.
- Difficulties with impulse, emotional awareness and clarity were significant predictors of PG.
- Among motives enhancement and coping motives uniquely predicted PG.
- Coping interacted with goal-directed behavior, awareness and clarity in predicting PG.

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ABSTRACT

Background: It is presently estimated that as much as 10% of emerging adults are at risk for a gambling disorder. The consequences stemming from problematic gambling engagement include increased substance use, mental health disorders, suicidality, financial strain and legal issues. The present study explores whether deficits in specific dimensions of emotion regulation coupled with the motivation to escape negative emotions (i.e., coping motives) increases the likelihood of problem gambling severity, while controlling for variables such as gambling frequency, age, and sex.

Methods: A sample of 919 emerging adult gamblers (M_{age} = 21.16 years-old, *SD* = 2.90, 48.1% female) completed an online survey including an assessment of problematic engagement in gambling over the past year, gambling motivations, and difficulties in emotion regulation. In total, 15.2% and 8.1% of this sample were at moderate or high risk for gambling disorder.

Results: A series of six moderation analyses revealed that the total models accounted for approximately 37–38% of the variance in problem gambling and that coping motives interacted with less difficulties engaging in goal-directed behavior, increased lack of emotional clarity, and increased lack of emotional awareness to create a toxic mixture for problem gambling.

Conclusions: These findings reveal the importance of considering both psychological factors such as emotion regulation and motivational factors in understanding who is at greatest risk for gambling problems

1. Introduction

It is well acknowledged that young people represent a population at significant risk for the development of gambling problems with rates often exceeding the adult population (Calado, Alexandre, & Griffiths, 2017). Findings from a national U.S study found that rates of past year gambling peaked between 22 and 30 years old with 89% of young adults reporting having gambled in the past year and rates of problem gambling exceeding alcohol dependence after the age of 21 (Welte, Barnes, Tidwell, & Hoffman, 2011). Further, Welte and colleagues (2011) also found linear increases in rates of problem gambling from adolescence into young adulthood, with 1.3% of 14- to 15-year-olds and 3.9% of 22- to 30-year-olds meeting criteria for problem gambling. These peaks in gambling problems coincide with the developmental period of emerging adulthood, often associated with increased participation in a variety of risky behaviors including binge drinking, illegal drug use, cigarette use, risky sexual behaviors, and gambling (Arnett, 2007; St-Pierre, Temcheff, Gupta, Derevensky, & Paskus, 2014).

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Despite evidence of increased rates of problem gambling during emerging adulthood, the psychological factors associated with problem gambling have yet to be well understood. Theories of problem gambling have suggested that gambling may serve as a function to regulate one's affect or avoid negative mood states (Jacobs, 1986). Psychological factors like emotion regulation skills are often considered inherent traits that can change an individual's mood states along dimensions such as valence, arousal, approach and avoidance (Thompson, 1994). As such, having strong ER skills would allow an individual to experience more positive global mood states. Additionally, ER may be considered a set of psychological skills that can be enhanced through training (Gross & Munoz, 1995). Thus, understanding the relationship between ER processes and gambling behaviors is a first step in determining the clinical implications of such interactions. While the research is still in its infancy, preliminary results suggest that emotion regulation does play a significant role in the development of problem gambling (Navas et al., 2017; Williams, Grisham, Erskine, & Cassedy, 2012).

Emotion regulation (ER), a transdiagnostic construct, is said to encompass six dimensions; (1) an *awareness,* and (2) *understanding or clarity* of emotions, (3) an *acceptance* of experienced emotions, (4) the ability to engage in *goal-directed* behavior when experiencing negative emotions, (5) the ability to control *impulsive* behaviors when experiencing negative emotions, and (6) the ability to exert *flexibility* in using different ER strategies (Gratz & Roemer, 2004). Difficulties in any of these dimensions may result in pathological behaviors or distress, with research consistently confirming that ER deficits are predictive of increased risk for mental health disorders (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Sheppes, Suri, & Gross, 2015; Montreuil & Kimhy, 2015). Further, the expectancy-value model of ER suggests that the motivation to experience an emotion (i.e., choose to use ER skills) is reliant on the expectation that the emotion will lead to a desired outcome (Tamir, Bigman, Rhodes, Salerno, & Schreier, 2015). However, the current literature within the ER and gambling field has failed to acknowledge the likely effect of motivation and how motivators for gambling may potentially play a moderating role in this relationship.

1.1. Motivational models of gambling

Previous research has identified several motivational factors that are predictive of greater engagement in gambling-related activities (Juodis & Stewart, 2016). Stewart and Zack (2008) gambling motivations questionnaire, is one of the most widely used frameworks for investigating gambling motivations. These motivations include gambling to escape/avoid negative affect (coping motives), gambling to increase positive affect (enhancement motives), and gambling for social rewards (social motives) (Stewart & Zack, 2008). Enhancement motives have been identified as a significant predictor of gambling behaviors and both enhancement and coping motives were significantly related to problem gambling (Lambe, Mackinnon, & Stewart, 2015; Stewart & Zack, 2008). These findings reveal the importance of both coping and enhancement motives in understanding problematic forms of gambling. Therefore, in addition to difficulties with ER, both enhancement and coping motives seem to play a significant role in predicting problem gambling. However, it is suggested that although ER, coping, and enhancement motives may independently predict problem gambling (Lambe et al., 2015; Stewart & Zack, 2008; Marchica, Mills, Derevensky, & Montreuil, 2019), the combination of these motives (exceptionally coping motives), with specific ER dimensions may be particularly harmful. For instance, a person who gambles because they have difficulties with emotional awareness, but gambles for social motives, will only play for social interactions, thus limiting engagement in gambling activities. However, individuals who have ER difficulties and are also gambling for coping motives, will possibly use gambling as an ER strategy, and are more likely to gamble when alone and for longer periods of time. The literature has not yet considered underlying psychological factors such as ER skills, and it is unknown to what extent these motives are associated with ER skills and how they may impact problem gambling.

1.2. The current study

Both enhancement (i.e., gambling to increase positive affect) and coping motives (i.e., gambling to escape/cope with negative affect) for gambling are heavily related to regulating emotions and research has consistently shown both motives to be related to problem gambling. As such, the goal of this study is to assess the moderating effect of enhancement and coping motives for gambling on the association between each dimension of ER and problem gambling, while controlling for social motives. Previous research on the relationship between the dimensions of ER and problem gambling (Marchica, Mills, Keough, Montreuil, & Derevensky, 2019) indicated that fewer difficulties engaging in goal-directed behaviors when experiencing negative affect was related to increased problem gambling severity. It was suggested that individuals with coping motivations were essentially partaking in goal-directed behaviors by making directed efforts to escape unwanted emotions through gambling. The current study aims to investigate this assumption, and it is hypothesized that the relationship between goal-directed behaviors and problem gambling will be moderated by coping motives. The hypotheses surrounding the remaining dimensions of ER are exploratory in nature.

2. Methods

2.1. Participants

Of a total of 2657 completed questionnaires with participants who consented to take part in the study, 332 were excluded for failing any of three attention items, completing the survey twice (based on IP and provided e-mail addresses) or in less than 5 min, inconsistent responding (e.g., reporting having gambled during the past 12 months but not reporting gambling on any gambling activities), and not meeting age requirements (18–27 years old).

Additionally, given that gambling motives are not applicable among non-gamblers (i.e., abstainers), only individuals who endorsed having gambled at least once in the year prior to survey completion were included in the analysis. As such, an additional 1406 participants were excluded for having not gambled in the past 12 months. A total of 919 gamblers (M_{age} = 21.16 years-old, SD = 2.90) were included in the final analyses. Table 1 illustrates sociodemographic characteristics of the sample. Within this sample of emerging adult gamblers, 15.2% met the criteria for moderate risk and 8.1% met the criteria for problem gambling according to the Canadian Problem Gambling Index (CPGI; Ferris & Wynne, 2001) (see Table 2).

2.2. Measures

2.2.1. Demographic items

Participants responded to five demographic items; their biological sex (male, female, intersex), age, ethnicity, level of current education, and country/province of residence.

2.2.2. Difficulties in emotion regulation scale

(DERS; Gratz & Roemer, 2004), is a 36-item six-scale self-report measure designed to assess six factors that correspond with Gratz and Roemer (2004) six dimensions of emotion regulation: (1) clarity (Cronbach's α = 0.81), (2) awareness (Cronbach's α = 0.82), (3) non-acceptance (Cronbach's α = 0.91), (4) impulse (Cronbach's α = 0.87), (5) strategies (Cronbach's α = 0.91), and (6) goals (Cronbach's α = 0.88). Participants respond on a 5-point Likert scale with responses ranging from 1 (*almost never*) to 5 (*almost always*). Lack of emotional awareness and clarity reflect the extent to which individuals are clear

Table 1
Sociodemographic characteristics of sample.

Characteristic	Percentage
Sex, n = 917	
Male	51.7%
Female	48.1%
Intersex	0.2%
Ethnicity, n = 919	
White/Caucasian	66.5%
Hispanic/Latino	4.9%
Asian/Pacific Islander	21.8%
Black/African American	5.0%
Native American Indian	2.7%
Other	0.5%
Education, n = 919	
Currently pursuing CEGEP degree	8.4%
Currently pursuing certificate at institution of higher education	3.1%
Currently pursuing an Undergraduate degree	62.2%
Currently pursuing a Graduate degree	11.5%
Not registered at any institution of higher education	14.8%
Country/Province n = 919	
Ontario	1.7%
Quebec	21.9%
Nova Scotia	0.6%
Manitoba	43.3%
British Columbia	0.8%
Prince Edward Island	0.1%
Saskatchewan	0.2%
Alberta	0.5%
Newfoundland	0.6%
USA	26.6%
Other	3.8%

Note. Percentages for ethnicity do not sum up to 100% as participants could choose multiple ethnicities; for countries/province "other" includes Europe and Asia.

about which emotions they are experiencing or the extent to which they can attend to emotional responses. Non-acceptance of emotional responses reflects the degree that an individual responds negatively to negative emotions and/or denies any form of distress. Impulse control difficulties reflects the struggle or control an individual has over their behaviors when upset, limited access to ER strategies reflects the ability an individual has to retrieve and use various ER strategies when upset, and difficulty engaging in goal-directed behaviors reflects the ability an individual has to concentrate and focus on goal-directed behaviors when experiencing negative emotions (Gratz & Roemer, 2004).

2.2.3. Canadian problem gambling Index

(CPGI; Ferris & Wynne, 2001), is a 9-item scale used to assess prevalence of past-year problem gambling. Items are scored using a 4-point Likert scale 0 (*never*) to 3 (*almost always*). The CPGI also includes items that measure gambling participation and frequency. Gambling participation was rated on a 5-point Likert scale from 0 *(never)* to 4 *(daily)*. In the following sample the CPGI total score demonstrated a high internal consistency (Cronbach's $\alpha = 0.88$).

2.2.4. Gambling motivations Questionnaire-9 items

(GMQ; Stewart & Zack, 2008) is a 9-item scale divided into three subscales: *Social, Coping* and *Enhancement* motives for gambling. Items are scored on a 4-point Likert scale from 1 *(almost never/never)* to 4 *(almost always)*. A Confirmatory Factor Analysis (CFA) with the 9-item GMQ showed that the three-factor model was an excellent fit for the data and reports have shown stronger absolute fit indices than the original 15-item questionnaire (Lambe et al., 2015). In the following sample the GMQ demonstrated high internal consistency for coping motives (Cronbach's $\alpha = 0.80$), enhancement motives (Cronbach's $\alpha = 0.80$), and acceptable internal consistency for social motives (Cronbach's $\alpha = 0.76$).

2.3. Procedure

Ethical approval was obtained from the Universities and CEGEPs (i.e., publicly funded pre-university college in Quebec) where recruitment and data collection took place (Manitoba and Quebec). Participants from a general North American population sample were recruited using three methods (campus flyers/discussion boards, university participant pools, and Amazon's *Mturk)* as part of a larger study investigating the relationship between ER and gambling (see Marchica et al., 2019 for further details on study procedure).

2.4. Statistical analysis

Participants with and without missing data were compared using Little (1988) missing completely at random (MCAR) test. A χ^2/df ratio value of two or less suggests that missing values can be estimated reliably. The following sample revealed a χ^2/df ratio of 1.18. As a result, missing values were estimated using the expectation–maximization algorithm. A bivariate correlational analysis was conducted using SPSS v25 (2017) in order to evaluate the relationships between all variables. Second, a series of six moderation analyses were conducted using the PROCESS v3.3 bootstrapping procedure in SPSS v25 (2017) with 5,000 resamples (Hayes, 2013) to examine the interaction between the dimensions of ER (non-accept, goals, impulse, aware, strategies, clarity) and gambling motives on problem gambling.

3. Results

Bivariate correlations are presented in Table 3.

3.1. Moderation analyses

The main objective of this study sought to assess the moderating effect of enhancement and coping motivations for gambling on the association between each dimension of ER and problem gambling severity. Previous research has shown that sex and gambling frequency are highly associated with problem gambling (Scholes-Balog, Hemphill, Dowling, & Toumbourou, 2014; Welte, Barnes, Wieczorek, Tidwell, & Parker, 2004), as such we tested these variables in our model. Given that there was a significant interaction in the present sample these

Table 2
Distribution of sample according to the Canadian Problem Gambling Index categories.

	Percent		
CPGI Categories	Male (n = 474)	Female (n = 441)	Overall (n = 919)
Non-problem gambler/Social gambler	39.8%	54.7%	46.8%
Low-risk problem gambler	32.8%	26.7%	29.9%
Moderate risk problem gambler	17.8%	12.5%	15.2%
Problem gambler	9.6%	6.1%	8.1%

Note. N_s for male and female participants do not sum to 919 as two participants reported *Intersex* and two participants did not report their biological sex. It is important to note that the percentages exclude non-gamblers.

Table 3
Bivariate correlations between variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	*M*	*SD*
1. Sex	1								.						
2. Age	−0.02	1												21.16	2.90
3. Gambling Frequency	−0.10**	0.13**	1											1.46	0.76
4. CPGI	−0.11**	0.12**	0.41**	1										2.10	3.60
5. DERS total	0.21**	−0.08*	−0.04	0.15**	1									89.33	23.19
6. Non-Accept	0.19**	−0.06	−0.05	0.09**	0.81**	1								14.20	5.80
7. Goals	0.21**	−0.11**	−0.07*	0.02	0.73**	0.51**	1							14.92	4.80
8. Impulse	0.20**	−0.04	0.00	0.18**	0.82**	0.61**	0.59**	1						12.60	4.97
9. Awareness	−0.07*	−0.05	0.03	0.12**	0.36**	0.10**	0.00	0.10**	1					16.72	4.65
10. Strategies	0.23**	−0.03	−0.04	0.13**	0.90**	0.70**	0.66**	0.76**	0.13**	1				18.75	7.19
11. Clarity	0.14**	−0.09*	−0.04	0.13**	0.73**	0.50**	0.38**	0.47**	0.45**	0.54**	1			12.15	3.82
12. GMQ-Enhancement	−0.14**	−0.08*	0.29**	0.43**	0.08*	0.09**	0.04	0.10**	0.01	0.07*	0.04	1		1.98	1.96
13. GMQ-Social	−0.08*	−0.01	0.12**	0.20**	0.04	0.04	0.05	0.06	0.01	0.01	0.03	0.41**	1	1.91	1.89
14. GMQ- Coping	−0.05	0.11**	0.27**	0.51**	0.20**	0.16**	0.08*	0.27**	0.02	0.19**	0.11**	0.54**	0.41**	0.70	1.41

Note. *p ≤ 0.05; **p ≤ 0.01 (2-tailed). CPGI = Problem gambling, GMQ = Gambling Motivations Questionnaire.

variables, along with age, were included as covariates. Additionally, social motives for gambling and the ER dimensions not included in each moderation as the independent variables were also included as covariates. Data was fit to the Model 2 Template of the PROCESS bootstrapping for SPSS v25 (2017) with 5,000 resamples (Preacher & Hayes, 2004). This particular model automatically creates two mean-centered interaction terms, *DERS dimension* × *Enhancement Motives* and *DERS dimension* × *Coping Motives* and assesses their unique contribution in a linear regression predicting problem gambling severity.

In the first moderation analysis, *non-acceptance* was entered as the independent variable and problem gambling as the dependent variable. The overall model significantly accounted for 37% of the variance in problem gambling ($F(14, 902) = 38.44$, $p < .001$). Males and individuals who gambled more frequently were more likely to have higher problem gambling scores. Additionally, difficulty with emotional awareness and stronger endorsement of using coping motives for gambling contributed to problem gambling severity. Neither interactions (i.e., *Non-Accept* × *Enhancement* and *Non-Accept* × *Coping*) were significant predictors in this model (see Table 4).

In the second moderation analysis, *difficulty engaging in goal-directed behavior* was entered as the independent variable and problem gambling as the dependent variable. The overall model significantly accounted for 38% of the variance in problem gambling ($F(14, 902) = 39.11$, $p < .001$). Males and individuals who gambled more frequently were more likely to have higher problem gambling scores. Additionally, difficulty with emotional clarity and stronger endorsement of using coping motives contributed to problem gambling severity (see Table 4). Only the *Goals* × *Coping* interaction was significant, with an R^2 change of 0.01. The interaction was probed by testing the conditional effects of difficulty engaging in goal-directed behaviors at three levels of coping motivation, one standard deviation (*SD*) below the mean (or lowest unit possible within measure) (low = 0), at the mean ($M = 0.70$), and one *SD* above the mean (high = 2.10). Difficulties engaging in goal-directed behavior was significantly related to problem gambling when coping motivation was one *SD* above the mean gambling ($B = -0.12$, $SE = 0.04$, $t(9\,0\,2) = 3.22$, $p = .001$, 95CI [−0.19, −0.05]), approached significance when coping motivation was at the mean ($B = -0.05$, $SE = 0.03$, $t(9\,0\,2) = -1.92$, $p = .06$, 95CI [−0.10, 0.001]), but was not significant when coping motivation was one *SD* below the mean ($p = .52$) (see Fig. 1).

In the third moderation analysis, *impulse control difficulties* was entered as the independent variable and problem gambling as the dependent variable. The overall model significantly accounted for 37% of the variance in problem gambling ($F(14, 902) = 38.51$, $p < .001$). Males and individuals who gambled more frequently were more likely to have higher problem gambling scores. Additionally, higher levels of impulse control difficulties, stronger endorsement of enhancement and coping motives for gambling contributed to problem gambling severity. Neither interactions (i.e., *Impulse* × *Enhancement* and *Impulse* × *Coping*) were significant predictors in this model (see Table 4).

In the fourth moderation analysis, *lack of emotional awareness* was entered as the independent variable and problem gambling as the dependent variable. The overall model significantly accounted for approximately 38% of the variance in problem gambling. Males and individuals who gambled more frequently were more likely to have higher problem gambling scores. Additionally, reporting stronger endorsement of enhancement motives for gambling contributed to problem gambling severity (see Table 4). Only the *Awareness* × *Coping* interaction was significant, with an R^2 change of 0.01. The interaction was probed by testing the conditional effects of lack of emotional awareness at three levels of coping motivation, one *SD* below the mean, at the mean, and one *SD* above the mean. Lack of emotional awareness was significantly related to problem gambling when coping motivation was one *SD* above the mean ($B = 0.13$, $SE = 0.03$, $t(9\,0\,2) = 3.97$, $p < .001$, 95CI [0.07, 0.20]), approached significance when coping motivation was at the mean ($B = 0.04$, $SE = 0.02$, $t(9\,0\,2) = 1.88$, $p = .06$, 95CI [−0.002, 0.08]), but was not significant when coping motivation was one *SD* below the mean ($p = .95$) (see Fig. 2).

In the fifth moderation analysis, *limited access to ER strategies* was entered as the independent variable and problem gambling as the dependent variable. The overall model significantly accounted for approximately 37% of the variance in problem gambling ($F(14, 902) = 38.17$, $p < .001$). Males and individuals who gambled more frequently were more likely to have higher problem gambling scores. Additionally, stronger endorsement of enhancement and coping motives for gambling contributed to problem gambling severity. Neither interactions (i.e., *Strategies* × *Enhancement* and *Strategies* × *Coping*) were significant predictors in this model (see Table 4).

In the sixth moderation analysis, *lack of emotional clarity* was entered as the independent variable and problem gambling as the dependent variable. The overall model significantly accounted for 38% of the variance in problem gambling ($F(14, 902) = 39.89$, $p < .001$). Males, individuals who gambled frequently, and difficulties with emotional awareness was associated with higher problem gambling scores (see Table 4). Only the *Clarity* × *Coping* interaction was significant, with an R^2 change of 0.01. The interaction was probed by testing the conditional effects of lack of emotional clarity at three levels of coping motivation, one *SD* below the mean, at the mean, and one *SD* above the mean. Lack of emotional clarity was significantly related to problem gambling when coping motivation one *SD* above the mean ($B = 0.15$, $SE = 0.05$, $t(9\,0\,2) = 3.35$, $p < .001$, 95CI [0.06, 0.24]), approached significance at the mean ($B = 0.06$, $SE = 0.03$, $t(9\,0\,2) = 1.79$, $p = .07$, 95CI [−0.01, 0.13]), and was not significant when coping motivation was one *SD* below the mean ($p = .68$) (see Fig. 3).

Table 4
Regression results of moderation analyses.

Moderation	Variables	B	SE B	t	R^2
1 *Non-Acceptance as IV*					0.37
	Non-Acceptance	−0.03	0.03	−0.87	
	Goals	−0.04	0.03	−1.60	
	Impulse	0.05	0.03	1.50	
	Awareness	0.05	0.02	1.97*	
	Strategies	0.02	0.02	0.79	
	Clarity	0.06	0.03	1.66	
	Enhancement	0.28	0.15	1.87	
	Coping	0.53	0.22	2.41*	
	Social	−0.06	0.06	−1.06	
	Age	0.03	0.03	0.95	
	Sex	−0.43	0.20	−2.18*	
	Gambling Frequency	1.21	0.13	9.16**	
	Enhance × Non-Accept	0.002	0.01	0.16	
	Coping × Non-Accept	0.02	0.01	1.31	
2 *Difficulty engaging in Goal-directed behavior as IV*					0.38
	Non-Acceptance	−0.01	0.02	−0.45	
	Goals	−0.04	0.03	−1.30	
	Impulse	0.05	0.03	1.75	
	Awareness	0.04	0.02	1.67	
	Strategies	0.02	0.02	0.87	
	Clarity	0.06	0.03	1.92*	
	Enhancement	0.14	0.18	0.77	
	Coping	1.56	0.27	5.84**	
	Social	−0.07	0.06	−1.28	
	Age	0.03	0.03	0.85	
	Sex	−0.47	0.19	−2.43*	
	Gambling Frequency	1.19	0.13	9.04**	
	Enhance × Goals	0.01	0.01	1.06	
	Coping × Goals	−0.05	0.02	−2.90*	
3 *Difficulties with Impulse control as IV*					0.37
	Non-Acceptance	−0.01	0.02	−0.47	
	Goals	−0.04	0.03	−1.64	
	Impulse	0.08	0.04	2.31*	
	Awareness	0.04	0.02	1.65	
	Strategies	0.0	0.02	0.71	
	Clarity	0.06	0.03	1.86	
	Enhancement	0.54	0.15	3.62**	
	Coping	0.81	0.23	3.60**	
	Social	−0.07	0.05	−1.31	
	Age	0.02	0.03	0.72	
	Sex	−0.44	0.19	−2.24*	
	Gambling Frequency	1.18	0.13	8.91**	
	Enhance × Impulse	−0.02	0.01	−1.67	
	Coping × Impulse	0.01	0.01	0.35	
4 *Lack of Emotional Awareness as IV*					0.38
	Non-Acceptance	−0.01	0.02	−0.47	
	Goals	−0.04	0.03	−1.62	
	Impulse	0.05	0.03	1.52	
	Awareness	0.01	0.03	0.29	
	Strategies	0.02	0.02	0.88	
	Clarity	0.06	0.03	1.78	
	Enhancement	0.40	0.20	1.98*	
	Coping	−0.26	0.30	−0.87	
	Social	−0.06	0.06	−1.00	
	Age	0.03	0.03	0.81	
	Sex	−0.43	0.19	−2.20*	
	Gambling Frequency	1.22	0.13	9.33**	
	Enhance × Awareness	−0.01	0.01	−0.44	
	Coping × Awareness	0.05	0.02	3.76**	
5 *Limited access to ER strategies as IV*					0.37
	Non-Acceptance	−0.01	0.02	−0.43	
	Goals	−0.05	0.03	−1.68	
	Impulse	0.05	0.03	1.47	
	Awareness	0.04	0.02	1.78	
	Strategies	0.03	0.03	0.96	
	Clarity	0.06	0.03	1.79	
	Enhancement	0.42	0.16	2.66**	
	Coping	0.67	0.23	2.88**	
	Social	−0.07	0.06	−1.25	
	Age	0.03	0.03	0.84	
	Sex	−0.43	0.20	−2.22*	
	Gambling Frequency	1.20	0.13	9.05**	
	Enhance × Strategies	−0.01	0.01	−0.78	
	Coping × Strategies	0.01	0.01	0.74	
6 *Lack of emotional clarity as IV*					0.38
	Non-Acceptance	−0.02	0.02	−0.75	
	Goals	−0.04	0.03	−1.65	
	Impulse	0.03	0.03	1.11	
	Awareness	0.05	0.02	2.01*	
	Strategies	0.03	0.02	1.16	
	Clarity	0.004	0.04	0.10	
	Enhancement	0.23	0.18	1.24	
	Coping	−0.03	0.28	−0.10	
	Social	−0.05	0.06	−0.95	
	Age	0.03	0.03	0.83	
	Sex	−0.42	0.19	−2.16*	
	Gambling Frequency	1.21	0.13	9.19**	
	Enhance × Clarity	0.01	0.01	0.39	
	Coping × Clarity	0.06	0.02	3.05**	

Note. Problem Gambling was entered as the DV in all moderation analyses.
*p ≤ 0.05 and ** p ≤ 0.001.

4. Discussion

Emerging adulthood is considered a high-risk developmental period characterized by five psychosocial features: identity exploration, instability, self-focus, feelings of in-between, and exploration of possibilities; all of which may potentially play a unique role in the increased engagement in various risky behaviors (Arnett, 2005). In fact, previous research among emerging adults has revealed elevated levels of engagement in risky behaviors including substance and alcohol use, risky sexual behaviors, and excessive gambling engagement (Arnett, 2007; St-Pierre et al., 2014). Specifically, problem gambling prevalence rates among emerging adults have been consistently higher compared to adult samples with rates ranging from 0.2%−12.3% (Calado et al., 2017; Nowak, 2018). In the current study, this sample of gamblers was no exception, with rates for moderate risk and disordered gambling categories at 15.2% and 8.1% respectively. Although it is important to note that the sample consistent only of gamblers thereby potentially inflating observed prevalence rates.

Problem gambling has been reported to be highly associated with gambling motivations of enhancement (to increase positive emotions) and coping (to decrease/escape negative emotions) (Stewart & Zack, 2008). Given the strong relationship between these motives and intent to regulate affect, this study sought to understand the moderating effect of enhancement and coping motives on the relationship between each dimension of ER and problem gambling. It was hypothesized that the relationship between difficulty engaging in goal-directed behaviors and problem gambling would be moderated by coping motives. Hypotheses surrounding the remaining dimensions of ER were exploratory in nature.

In the current study, we found that aside from control variables, difficulties with impulse control when upset, difficulties with emotional awareness and emotional clarity, enhancement motives for gambling and coping motives for gambling were uniquely associated with problem gambling behavior. Each of the six regression models were significantly associated with problem gambling, accounting for approximately 37–38% of the variance. The moderation analyses demonstrated that enhancement motives did not significantly interact with any ER dimension. Given that the DERS assesses ER competency, specifically difficulties in engaging in ER skills during high *negative* emotional experiences, it is not surprising that a motivation defined by gambling to increase *positive* emotions would not be significant. In line with our hypothesis, coping motives was found to have significantly interacted with difficulties engaging in goal-directed behavior. Additionally, coping motives significantly interacted with lack of emotional clarity and lack of emotional awareness. Specifically, these interactions

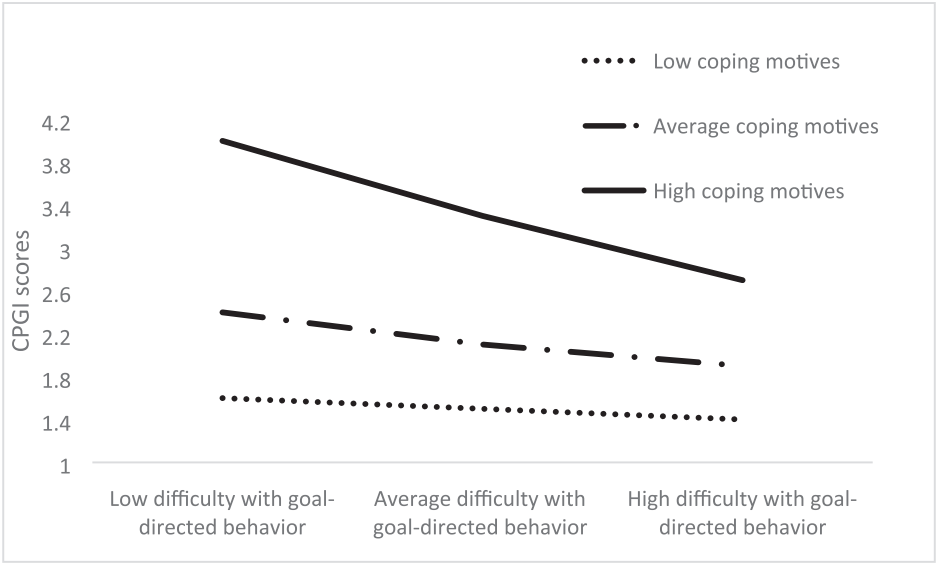

Fig. 1. Moderating effect of coping motives on the relationship between difficulties with goal-directed behaviors when upset and problem gambling.

suggest that co-occurring poor emotional awareness and poor emotional clarity combined with a high motivation to relieve/escape dysphoric mood states (i.e., coping motives) are significant risk factors for problem gambling. While, stronger goal-directed behavior (i.e., less difficulties engaging in goal-directed behaviors when upset) combined with a high motivation to relieve negative mood states is a particularly troublesome mixture for problem gambling. This direction although surprising, is in line with previous research reporting that less difficulties engaging in goal-directed behaviors was significantly related to problem gambling severity (Marchica et al., 2019). It is hypothesized that when gambling to cope with negative emotions, individuals are making a conscious or unconscious effort to distract themselves through gambling and are thus essentially involved in goal-directed behaviors. Executive control allows the individual to focus their attention on the most salient goal, to find the easiest avenue to achieve this goal while potentially disregarding alternative goals, values, and long-term consequences (Kopetz, Woerner, & Briskin, 2018). As such, the current study provides evidence for this suggested hypothesis in that individuals with high coping motivations are essentially partaking in goal-directed behaviors by making directed efforts to escape or distract themselves from unwanted negative emotions through gambling.

4.1. Limitations and future directions

The findings of this study consider precursor psychological factors to problem gambling, such as ER skills and how they interact with motives for gambling. However, the results should be understood under the context of the study's limitations. This study utilized self-report data, which allows for a certain level of potential biases to occur. Given the sensitive nature of survey questions (i.e., problematic gambling participation), it is always possible that participants were not sincere or fully engaged when completing the survey. However, a series of checks and filters were employed to help confirm the validity and sincerity of responses. Nevertheless, the data is cross-sectional, which makes it impossible to convey a causal/directional relationship between the variables of interest. Future research should examine this relationship longitudinally in order to better understand the directionality between ER and problem gambling. Second, there are several other potential psychosocial factors that may potentially affect the relationship between gambling motives, ER, and problem gambling. As such, future studies should examine additional factors including mood, social status, and a comparison between developmental levels. Finally, although the interaction between coping motives and the three dimensions of ER

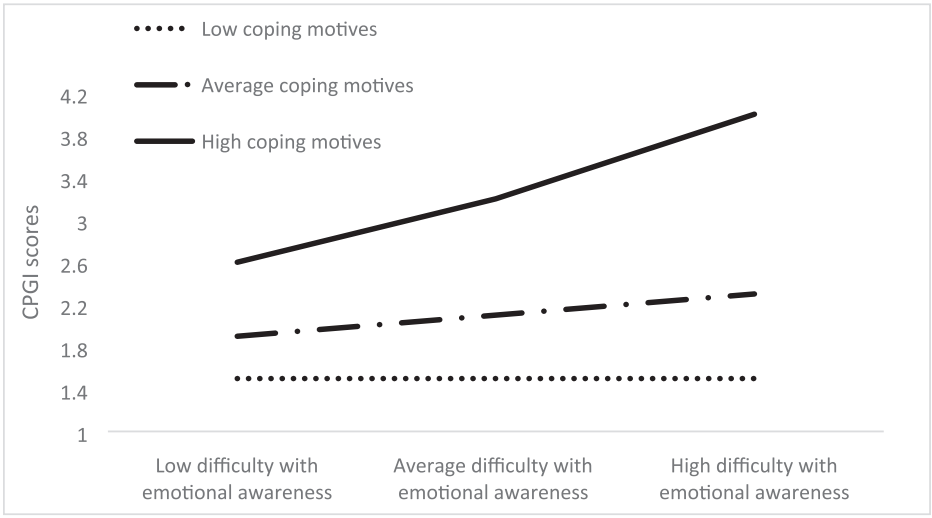

Fig. 2. Moderating effect of coping motives on the relationship between lack of emotional awareness and problem gambling.

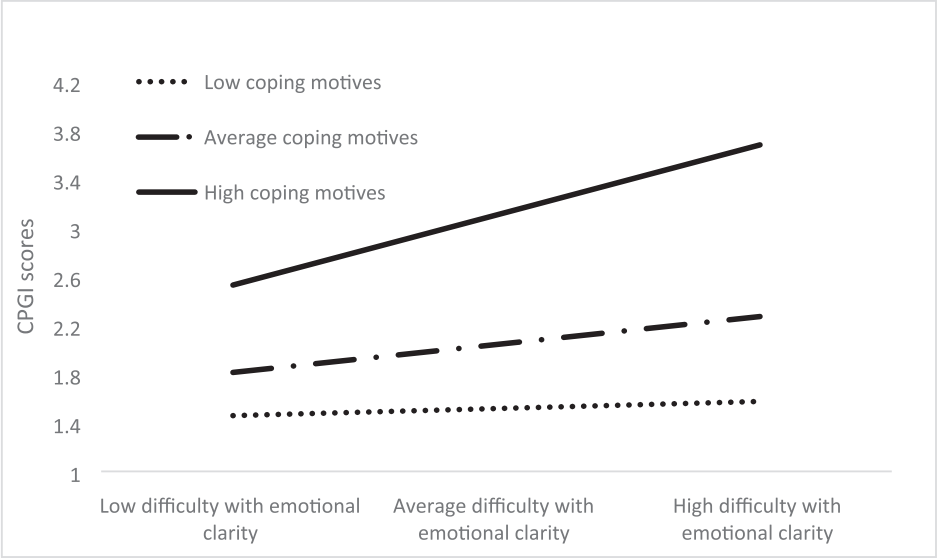

Fig. 3. Moderating effect of coping motives on the relationship between lack of emotional clarity and problem gambling.

(goals, clarity, and awareness) were statistically significant the change in R^2 of each only accounted for 1% of the variance in problem gambling. While from a clinical perspective this may seem marginal, from a theoretical perspective the results do provide insight into the interplay between coping motives and ER; thereby suggesting additional research be conducted to further understand these interactions in greater detail. Future studies would also benefit from investigating this relationship using experimental paradigms in order to see the effect of ER skills on problem gambling when specific mood states are induced in participants.

5. Conclusions

No study to date has examined the moderating effect of gambling motivations on the relationship between ER and problem gambling. Previous research has shown that difficulties with ER (i.e., low levels of general emotional competence) is related to higher levels of problem gambling with medium to large effect sizes (Ciccarelli, Nigro, Griffiths, Cosenza, & D'Olimpio, 2016; Elmas, Cesur, & Oral, 2017; Jauregui, Estévez, & Urbiola, 2016; Navas et al., 2017; Poole, Kim, Dobson, & Hodgins, 2018; Rogier & Velotti, 2018; Williams et al., 2012). Additionally, research in the area of gambling motivation has shown that enhancement and coping motives for gambling are consistently associated with elevated levels of gambling participation and problem gambling (Mcgrath et al., 2010; Stewart & Zack, 2008; Stewart, Zack, Collins, & Klein, 2008). Specifically, recent research examining the relationship between four motivational factors of gambling (social, financial, fun/thrilled-related, and affective) demonstrated that affective motives (i.e., gambling to regulate affect) was the only direct predictor of gambling symptoms (Barrada et al., 2019). Finally, a recent study by Jauregui and Estevez (2019) not only found that difficulties with ER significantly correlated with gambling severity among adolescents, but that difficulties with ER also mediated the relationship between gambling motives and gambling severity. These studies along with the current findings reveal the importance of considering psychological factors such as ER as well as motivational factors (i.e. enhancement/coping motives) in understanding the underlying mechanisms for why, how, and for whom this activity can become problematic.

Despite the limitations of the current study, the results suggest that researchers and clinicians working with emerging adults should be aware of the potential combinations of difficulties with ER and gambling motivations that are especially risky for young adults. Without discounting other factors potentially at play such as, interpersonal and social processes (Hofmann, 2014), the results suggest that ER difficulties are specifically troublesome when combined with a motivation to cope with negative emotions. As such, depending on the combination, different intervening measures should ensue. For instance, emerging adults who have difficulties with emotional awareness and emotional clarity and who are motivated to gamble to escape negative emotions should be taught how to label and recognize emotions, along with non-judgemental acceptance (often seen in mindfulness-based programs) so that they can overcome periods of negative emotionality without needing to *escape* or *avoid* their experienced emotions. Additionally, problem gamblers who are better at engaging in goal-directed behaviors, especially when they are motivated to escape negative emotions, tend to use gambling as their ER strategy and thus should be taught alternative and more adaptive methods to regulate their mood, for instance, through activities that increase positive mood (e.g., exercise, drawing, etc.).

More importantly, given that ER is a fluid construct that is continuously evolving throughout development, it can be taught and enhanced within individuals (Gross & Munoz, 1995). As such, the potential for using ER as a preventative measure for problem gambling is great. Global direct and indirect economic costs of mental disorders have been estimated at US$2.5 trillion and are expected to double by 2030 (Trautmann et al., 2016), demonstrating a substantial impact on health services. However, few adults and even fewer adolescents actually seek treatment for mental health disorders. Therefore, proactive prevention efforts and outreach programs may be a cost-effective solution to address these problems. ER is a transdiagnostic construct that has been linked to several other psychological disorders (Aldao et al., 2010), with this study also linking it to problem gambling. Thus, by promoting the implementation of prevention programs that increase the development of ER skills as early as possible (e.g., elementary school and high school) we would be reducing the risk for mental disorders and the economic burden currently impacting our health services.

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6. Author disclosure

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7. Contributors

Loredana A. Marchica: was responsible for study design, wrote the initial manuscript, and collected the data for the Quebec sample.

Matthew T. Keough: was responsible for data collection in Manitoba and provided consultation on statistical analysis and manuscript edits.

Tina C. Montreuil: helped supervise the project and provided manuscript edits.

Jeffrey L. Derevensky: supervised the project and provided final manuscript edits.

*All authors discussed the results and contributed to the final manuscript.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.addbeh.2020.106378.

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