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Development and Validation of the Gambling Pathways Questionnaire (GPQ)

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The Pathways Model (Blaszczynski & Nower, 2002) is a theoretical framework that proposes three pathways for identifying etiological subtypes of problem gamblers. The model has been used to assist clinicians in developing individualized treatments that target not only the gambling behavior but also associated risk factors that may undermine recovery and precipitate relapse. The current study sought to develop and validate a new screening instrument, based on the Pathways Model for treatment-seeking gamblers. Participants were gamblers age 18 and over who scored 1+ symptoms on the Problem Gambling Severity Index of the Canadian Problem Gambling Index and presented to one of 22 participating treatment centers in Canada, the United States, and Australia (N = 1,176). Data were collected on 127 items, consisting of 62 core items that reflected variables in the Pathways Model and 65 experimental items derived from recent scholarly literature in gambling etiology. Exploratory and confirmatory factor analyses identified the following six factors: Antisocial Impulsive Risk-Taking, Stress-Coping, Mood Pre-Problem-Gambling Onset, Mood Post-Problem-Gambling Onset, Child Maltreatment, and Meaning Motivation. The Gambling Pathways Questionnaire showed excellent internal consistency (α = .937), with good to high reliability found for each of the six factors, ranging from .851 to .945. Cluster analysis results demonstrated that the three-factor model produced good model fit to the data: Cluster 1 (Behaviorally Conditioned Subtype), Cluster 2 (Emotionally Vulnerable Subtype) and Cluster 3 (Antisocial, Impulsive Risk-Taking Subtype). The present study is the first to present an empirical measure for assigning problem gamblers to etiological subtypes for use as a screening tool in treatment settings.

Keywords: gambling subtypes, gambling problems, gambling disorder, gambling treatment, etiology

Rates of problem and disordered gambling vary considerably, based on survey year, location, method of data collection, and diagnostic criteria. Internationally, statistically standardized rates of problem gambling generally range from .5% to 7.6% (average 2.3%), with lowest rates in Europe, intermediate in North American and Australia, and highest in Asia (Williams, Volberg, & Stevens, 2012). Researchers have proposed a number of theories to explain the etiology of gambling disorder, which typically evolves following early exposure to gambling opportunities: psychodynamic (Bergler, 1957), genetic (Comings et al., 2001; Slutske, Zhu, Meier, & Martin, 2010), public health (Korn & Shaffer, 1999), exposure (Shaffer, LaBrie, & LaPlante, 2004), neurobiological (Goudriaan, Oosterlaan, deBeurs, & Van den Brink, 2004), behavioral (McConaghy, 1980), and cognitive–behavioral (Sharpe, 2002). In 2002, Blaszczynski and Nower theorized that these diverse and potentially complementary perspectives essen-

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tially view gamblers as a homogeneous group and fail to account for the complex interplay among ecological and demographic factors, developmental history, and neurobiology that likely lead subtypes of gamblers to develop problems (Blaszczynski & Nower, 2002).

The resulting Pathways Model proposes that there are three subtypes of gamblers, distinguished by the presence or absence of specific premorbid psychopathology and biological vulnerabilities despite displaying similar phenomenological features (Blaszczynski & Nower, 2002). The model asserts that all individuals with gambling disorder share common ecological factors of availability, accessibility, and acceptability of gambling, combined with cognitive distortions and habituation, resulting from operant conditioning that occurs in the gambling environment. Pathway 1 "behaviorally conditioned" gamblers display an absence of premorbid psychopathology and develop problems mainly in response to reinforcement contingencies, cognitive distortions regarding the probability of winning, and the nature of randomness and control. Pathway 2 "emotionally vulnerable" gamblers present with premorbid mood disorders, a history of poor coping and problem-solving skills, childhood disturbances, and major traumatic life events that lead them to gamble for escape from aversive mood states. The model asserts that Pathway 3 gamblers, a likely subset of Pathway 2 gamblers, possess all the vulnerabilities of those in Pathway 2 but are distinguished by biologically-based traits of impulsivity and attentional deficits as well as antisocial personality traits that result in a variety of maladaptive behaviors and comorbid addictions.

A growing number of studies have found empirical support for subtypes suggested by the Pathways Model (see Milosevic & Ledgerwood, 2010, for a review), including subgroups characterized by personality, mood, and/or substance use problems or disorders (Chou & Afifi, 2011; Ledgerwood & Petry, 2010; Pietrzak & Petry, 2005; Sacco, Cunningham-Williams, Ostmann, & Spitznagel, 2008); impulsivity, sensation-seeking, and emotional vulnerability (Bagby et al., 2007; Bonnaire, Varescon, & Bungener, 2007; Clarke, 2006; Nower, Derevensky, & Gupta, 2004); distress tolerance (Daughters et al., 2005); and autonomic arousal (Moodie & Finnigan, 2005). A latent class analysis in a nationally-representative data set identified a three-class solution that paralleled the Pathways Model: Class 1 reported the lowest overall levels of psychopathology, including gambling problem severity and mood disorders; Class 2 had a high probability of endorsing past-year substance use disorders, moderate probabilities of having parents with alcohol or drug problems and of having a personality disorder, and the highest probability of past-year mood disorders; and Class 3 had the highest probabilities of personality and prior-to-past-year mood disorders, substance use disorders, separation or divorce, drinking-related physical fights, and parents with alcohol or drug problems and/or a history of antisocial personality disorder (Nower, Martins, Lin, & Blanco, 2013).

These findings suggest there are distinct etiological subgroups of disordered gamblers and that the Pathways Model, published nearly 15 years ago, continues to be a relevant, guiding conceptual framework in gambling studies. However, to date, no study has fully examined the range of factors identified by the model or measured the presence or absence of symptoms in relation to the development of gambling problems.

In addition to variables in the Pathways Model, recent investigations have highlighted other potentially important etiological factors that may play a role in subtyping: Stress-coping styles (Bergevin, Gupta, Derevensky, & Kaufman, 2006; Nower et al., 2004; Petry, Litt, Kadden, & Ledgerwood, 2007; Wood & Griffiths, 2007); social support (Petry & Weiss, 2009); gambling motivations (Stewart & Zack, 2008; Stewart, Zack, Collins, & Klein, 2008); eating patterns (Fischer & Smith, 2008); anger (Korman et al., 2008); guilt (Yi & Kanetkar, 2011); and self-hatred and/or self-loathing (Nuske & Hing, 2013; Reith & Dobbie, 2012). In addition, Turner, Jain, Spence, and Zangeneh (2008) suggested that erroneous cognitions alone may serve as a risk characteristic of a particular subgroup, in contrast to the Pathways Model, which asserts that erroneous cognitions are common to all gamblers, irrespective of subgroup.

The objectives of this study were to: (a) develop an instrument that captures all core features of the original Pathways Model; (b) examine potentially significant experimental items that have been proposed in the scholarly literature; and (c) validate a new etiological instrument using review by experts, counselors, and problem gamblers (content validity) and confirmatory factor analysis (construct validity).

Method

Participants

Participants were treatment-seeking problem gamblers (N = 1,176) who attended one of seven treatment centers and hospitals in Ontario, Canada; 12 facilities in five U.S. states; and three clinics in the Sydney, Australia, area. Given the small number of gamblers who present for treatment, obtaining a sufficient sample size for this project required data collection in three English-speaking countries with similar forms of gambling and treatment facilities; those samples were grouped together for use in both the development and validation samples, which were stratified by age, gender, and country. Participants were identified to the researchers only by gender, age, and location (facility, country). All treatment-seeking problem gamblers over 18 years who endorsed 1+ symptoms on the Problem Gambling Severity Index (PGSI) of the Canadian Problem Gambling Index (Ferris & Wynne, 2001) and attended one of the participating centers between 2010 and 2015 were eligible to participate.

To ensure proportionate representation by gender, age, country, and problem gambling severity in both the development and validation samples, we collected data on the full battery of items, and then the sample was randomly and proportionately divided into a development sample (n = 750) and a validation sample (n = 426). Chi-square and independent t-test procedures confirmed there were no significant differences between the two data subsets in gender composition, age distribution, percentage by country, or mean problem gambling severity score (see Table 1). This produced a good sample size in the development sample exploratory factor analysis (EFA; Comrey & Lee, 1992; Tabachnick & Fidell, 2007) and sufficient power to obtain good model fit in the confirmatory factor analysis (CFA; MacCallum, Browne, & Sugawara, 1996). By gender, there were 296 women (39.5%) and 453 men (60.5%) in the development sample and 177 women (41.6%) and

Table 1
Participant Sample by Gender, Age and Country for the Gambling Pathways Questionnaire (GPQ)

Sample	*N*	Gender: *n* (%)		Age: *M* (*SD*)	Country *n* (%)		
		Male	Female		U.S.	Canada	Australia
Development	750	453 (60.5)	296 (39.5)	46.26 (13.5)	432 (57.6)	181 (24.1)	137 (18.3)
Validation	426	248 (58.4)	177 (41.6)	46.27 (13.6)	245 (57.5)	103 (24.2)	78 (18.3)
Total	1,176	701 (59.6)	473 (40.2)	46.26 (13.5)	677 (57.6)	284 (24.1)	215 (18.3)

Note. Gender could not be determined for one participant in both the development and validation samples.

248 men (58.4%) in the validation sample. One participant in each group ($n = 2$) did not endorse a gender.

Measures

Prior to question generation, the researchers conducted an extensive review of the literature and existing instruments to identify factors in the model and items that would tap facets of those factors. We then generated a list of questions purporting to tap each of the facets in each subscale. Experimental scales were initially comprised of constructs that were empirically supported as potentially relevant in the research literature. In addition, the authors, both clinicians, added a subscale measuring meaning motivation (Frankl, 1985), which they theorized would be more relevant than would other commonly researched motivations to distinguishing among subgroups.

Notably, two aspects of the original model were intentionally omitted from the measure: age of gambling onset and problem gambling severity. The model suggests, for example, that earlier initiation of gambling and more severe problems are characteristic of Pathway 3 in contrast to Pathway 2 and, particularly, Pathway 1 gamblers, who are likely to report the latest onset and endorse the fewest criteria. However, it is difficult to accurately assess gambling onset, because there is considerable variability among individuals regarding what constitutes "gambling"; some individuals fail to view or endorse lottery and scratch-off play or other infrequent wagering as gambling (Lange, 2001). In addition, onset tends to vary by gender (Slutske, Piasecki, Deutsch, Statham, & Martin, 2015), with women typically reporting a later age of onset than men. For this reason, self-report of the age of gambling initiation would likely be unreliable and/or unduly complicated to score; therefore, it was omitted from the instrument. In addition, levels of problem severity between Pathways 2 and 3 were nonsignificantly different in a recent study (Nower, Martins, Lin, & Blanco, 2013), suggesting the level of gambling problems may not reliably differentiate among pathways and may vary depending on the measure used. For that reason, problem severity was used only to ensure all participants met the same inclusion criteria but was not included in the measure.

Content validity was established using panels of experts, which included experienced gambling counselors and disordered gamblers from the United States and Canada in addition to the authors, who are also counselors in the United States and Australia. All core and experimental questions were submitted for review to five gambling counselors (two male, three female) with 10 or more years of experience who worked extensively with a diverse gambling population and were known to the authors. These expert reviewers received a standard response framework and were asked to indicate which items were particularly relevant to their clients versus those that were neutral, poorly worded, or nonessential. Experts were also asked to suggest omitted items or areas that were not represented. Following the review, the researchers revised the questions. In response to clinical feedback, we added a brief subscale on health motivation, because several of the counselors suggested poor health or chronic pain may lead to the development of gambling problems in one subgroup; pain has also been associated with impaired decision-making on a gambling task (Apkarian et al., 2004).

The revised questionnaire was submitted to a second panel of six individuals over 18 who had been in recovery for gambling disorder for more than one year (four male, two female) and were known to the authors. These reviewers were asked to follow the same protocol as the former reviewers, except that they were also asked to select from among four response formats the one that was (a) most time efficient and (b) most reflective of their "true" answer to each item. One of these experts suggested that sexual risk-taking may be salient to one particular pathway, an assertion supported by recent literature (Grant & Steinberg, 2005; Huang, Jacobs, Derevensky, Gupta, & Paskus, 2007; Walker, Clark, & Folk, 2010); therefore, we added three facets of sexual risk-taking to our pool of experimental items. We also added questions on binge eating and an additional anger question. The gamblers in recovery unanimously preferred the six-category Likert response format with label anchors and no middle categories. The final questionnaire was then formatted and submitted to counselors at participating agencies for use at client intake. The Rutgers University Internal Review Board and ethics boards at participating treatment centers approved the project.

Results

Participants completed the measure as part of an intake battery; therefore, there was little missing data (.11%). To handle missing data, we used a method proposed by Graham (2009) and refined by Weaver and Maxwell (2014): Expectation Maximization (EM) covariances (and by extension EM correlations) via the missing value analysis procedure in SPSS.

One objective of this project was to ensure that the subscales adequately tapped all the domains of the Pathways Model. A second aim was to include other potentially significant etiological variables from the research literature to explore potential revisions to the Pathways Model. For that reason, we utilized a two-step EFA procedure to identify factors and items related to the Pathways Model, and explore whether additional items strengthened

the model. We then tested the proposed theory using CFA to obtain the best fit.

Exploratory Factor Analysis (EFA)

Principal axis factoring was performed using the development sample ($n = 750$) and 62 "core" items in nine subscales suggested by the Pathways Model: Mood Pre- and Post-Problem-Gambling Onset (anxiety, depression; 10 items); Substance Misuse Pre- and Post-Problem Gambling Onset (alcohol, drugs, prescription and over-the-counter medications, eight items); Child Maltreatment (abuse, neglect, trauma; seven items); Parent or Caregiver Addiction (three items); Narcissistic Traits (five items); Impulsivity (five items); Risk-Taking (six items); Attention-Deficit/Hyperactivity Disorder (ADHD) Symptoms (six items); and Antisocial Traits of Behaviors (12 items). These items were examined first, because an aim of this analysis was to develop an instrument that reflected the factors suggested by the Pathways Model and not simply to develop factors based on general etiological variables. In addition, given the potential number of items, this procedure kept the subject-to-item ratio low enough to ensure reliable results (Osborne & Costello, 2009).

The Kaiser-Meyer-Olkin measure of sampling adequacy was .914, suggesting distinct and reliable factors due to relatively compact patterns of correlation (Field, 2009). Bartlett's test of sphericity was significant ($p < .001$), indicating there were some relationships among the variables. The factors were subjected to Promax rotation. The initial factor analysis and scree test using the 62 core items showed that a five-factor model was most appropriate. Weak items were removed one at a time, using the criteria of low communality (cutoff at .30) and low factor loading (cutoff at .30 in the beginning and gradually increased to .55). A few items with cross-loadings on two factors were also removed. The final model had four factors containing 33 core items; all items had factor loading of .55 and above, and there were no items with substantial cross-loadings on other factors. All questions measuring substance abuse, narcissistic traits, ADHD symptoms, and parent or caregiver addiction dropped out of the final model.

An EFA was also run with 65 experimental items, which explored health concerns, overeating, anger, shame or self-hate or guilt, sexual risk-taking, social support, and four types of motivation (meaning, emotion-focused, social, stress-coping, and cognitive). Fifteen strong experimental items were retained in these categories: Sexual Risk-Taking (three items), Meaning Motivation (five items), and Coping Motivation (two emotion-focused and five stress-coping items, combined). In the final stage, all strong experimental items were added to the 33 core items for a final EFA run. Four of the core items fell below .55 and were removed. The final run yielded a six-factor model of 48 items, including both core and experimental items, and accounted for 54.91% of total variance in scores. As depicted in Table 2, a majority of the variance was accounted for by Factor 1, Antisocial Impulsive Risk-Taking (27.39% of the variance, eigenvalue = 13.146), and Factor 2, Stress-Coping (14.11% of the variance, eigenvalue = 6.772). Other factors assessed Child Maltreatment (Factor 3: abuse, neglect, trauma; 6.71% of the variance, eigenvalue = 3.221), Mood Pre-Problem-Gambling Onset (Factor 4: anxiety, depression; 5.20% of the variance, eigenvalue = 2.498), Mood Post-Problem-Gambling Onset (Factor 5: anxiety, depression; 3.32% of the variance, eigenvalue = 1.591), and Meaning Motivation (Factor 6; 3.13% of the variance, eigenvalue = 1.502).

Table 2 depicts the items and factors in the final EFA as well as the Cronbach's alpha reliability coefficients for each factor and the overall scale. The Cronbach's alpha value for the overall scale was high ($\alpha = .937$). Moderate to high reliability was also found for each of the six factors, ranging from .851 to .945.

Confirmatory Factor Analysis (CFA)

CFA was then conducted on the items in the final EFA using AMOS 23.0 and a representative sample of 426 participants as a validation sample. Because of the large samples size, the fit of the model was interpreted in light of a range of fit indices rather than chi-square (Marsh, Balla, & McDonald, 1988). Those included the Bentler Bonett normed fit index (NFI), Tucker–Lewis index (TLI), and comparative fit index (CFI), which are considered acceptable if they are generally greater than .9 (Bentler, 1990), and the root-mean-square error of approximation (RMSEA), which suggests a close fit at a value of .05 or less (Jöreskog & Sörbom, 1993). Using maximum likelihood estimation, AMOS accommodated missing values in model fitting. The analyses produced fit indices, NFI = .855, TLI = .910, CFI = .922, and RMSEA = 426 values in the accepted range (RMSEA = .048), indicating good model fit overall. Based on the CFA, the final instrument retained all 48 items across six factors (see Figure 1). The final model consisted of nine subscales across six factors: Antisocial Traits, Impulsivity, Risk-Taking, Sexual Risk-Taking (Factor 1); Stress-Coping (Factor 2); Child Maltreatment (Factor 3); Mood Pre-Problem-Gambling Onset (Factor 4); Mood Post-Problem-Gambling Onset (Factor 5); and Meaning Motivation (Factor 6).

Scoring

The factor analyses identified the strongest loading items within factors. To score the instrument, however, it was necessary to identify variations in those factors across etiological subtypes and to establish reliable cutoff scores and a scoring rubric that could be easily employed by treatment providers.

Accordingly, we carried out a two-step clustering procedure with a log-likelihood distance measure within SPSS 23, which automatically determined the optimal number of clusters to be three, based on the Schwarz's Bayesian information criterion. The silhouette measure of cohesion and separation indicated an adequate solution. Then we used K-means clustering in SPSS 23 with $k = 3$ for a final clustering analysis. This technique was selected because, unlike latent class analysis, it provides clear groupings by factor, which is needed to establish an easily-used scoring system for treatment providers. Means of the nine subscales retained in the CFA were used as the input variables for cluster analysis. The three-factor solution produced the best model fit, which generally corresponded with the Pathways Model: the Behaviorally Conditioned Subtype (Cluster 1); the Emotionally Vulnerable Subtype (Cluster 2); and the Antisocial, Impulsive Risk-Taking Subtype (Cluster 3; see Figure 2).

Means and standard deviation data for the variables by cluster identified high, medium, and low scores for each of the variables in the analyses. A significantly higher proportion of men compared to women were represented in Clusters 1, $\chi^2(1, n = 486) = 5.36$, $p = .02$, and 3, $\chi^2(1, n = 207) = 18.10$, $p = .0001$ (see Table 3).

Table 2
Factors Loadings, Communalities, and Cronbach's Alpha Coefficients for the Gambling Pathways Questionnaire

Subscale	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Communalities	Subscale α
Mood-Pre								.911
				.867			.709	
				.965			.840	
				.837			.717	
				.745			.674	
Mood-Post								.892
					.907		.769	
					.973		.859	
					.823		.698	
					.567		.565	
Risk-Taking								.859
	.582						.381	
	.650						.398	
	.645						.455	
	.675						.515	
	.638						.346	
	.664						.500	
	.658						.531	
Child Maltreatment								.852
			.757				.530	
			.603				.369	
			.720				.592	
			.562				.342	
			.765				.648	
			.655				.414	
			.648				.428	
Meaning Motivation								.886
						.643	.567	
						.740	.614	
						.703	.581	
						.561	.598	
						.786	.708	
Stress-Coping Motivation								.872
		.694					.416	
		.695					.433	
		.825					.645	
		.901					.721	
		.727					.671	
		.578					.573	
		.706					.606	
Impulsivity								.742
	.564						.369	
	.618						.384	
	.644						.430	
	.721						.529	
Antisocial								.909
	.611						.456	
	.663						.453	
	.796						.637	
	.764						.608	
	.749						.537	
	.635						.427	
	.704						.501	
	.729						.552	
	.705						.532	
	.692						.550	
%	27.39	14.11	6.71	5.20	3.32	3.13		
α	.945	.898	.851	.911	.895	.882	.937[a]	

Note. The items in each subscale are included in the GPQ appendix. Mood-Pre = Mood Pre-Problem-Gambling Onset; Mood-Post = Mood Post-Problem-Gambling Onset.

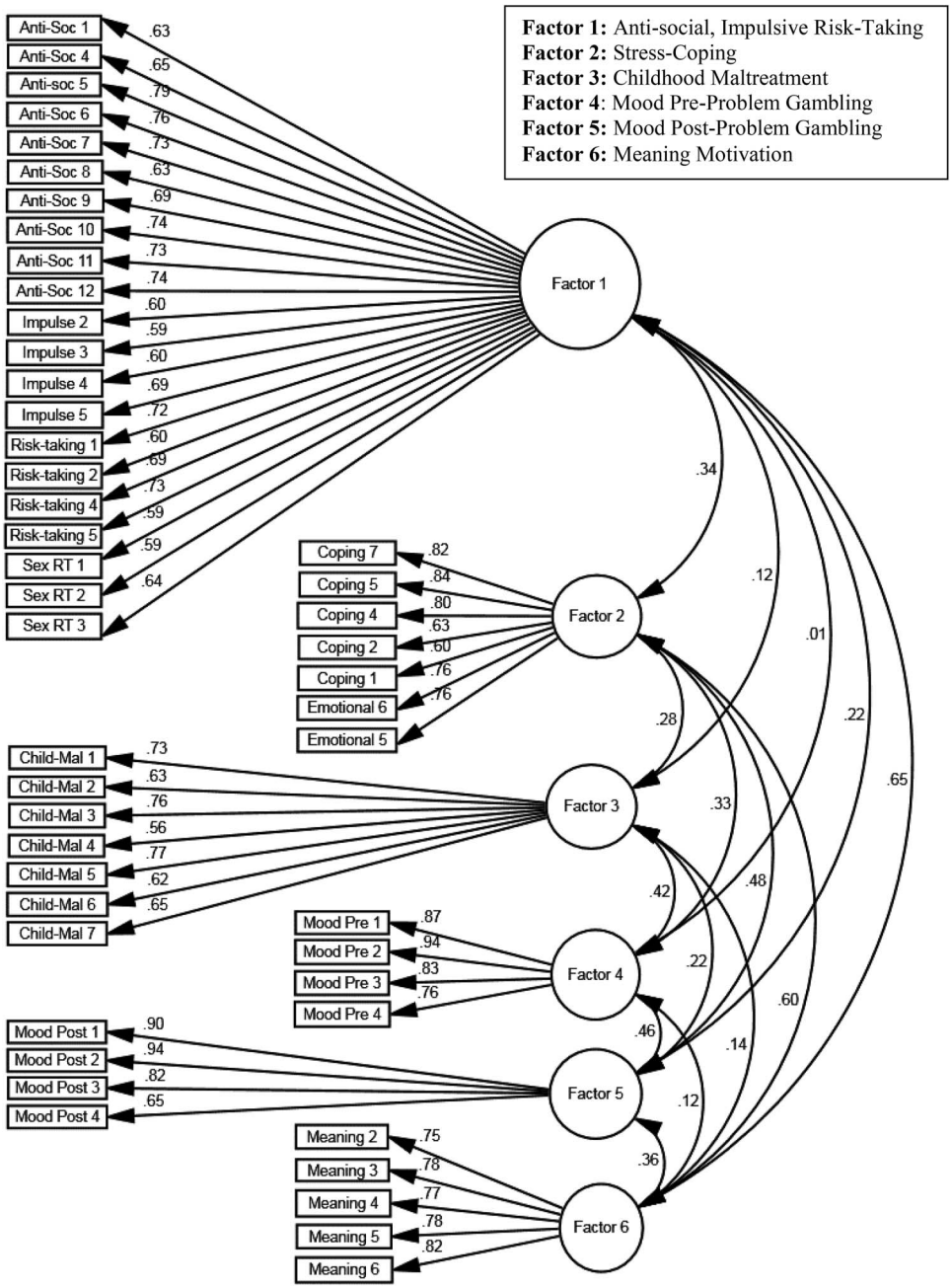

Figure 1. Path representation of the proposed six-factor model (N = 426). Anti-Soc = Antisocial; Impulse = Impulsive; Sex RT = Sexual Risk-Taking; Child-Mal = Childhood Maltreatment; Pre- = Preproblem Gambling; Post- = Postproblem Gambling.

In contrast, women were overrepresented in Cluster 2, $\chi^2(1, n = 483) = 27.05$, $p = .0001$. PGSI mean scores in this sample were significantly lower for Cluster 1, compared to Clusters 2 and 3, $F(2, 207) = 77.29$, $p = .0001$. There were no significant differences between PGSI scores in Clusters 2 and 3. The resulting scoring rubric, based on the variables that best differentiated among groups in our study, correctly classified 86.1% of participants in our data, $\chi^2(4, N = 1{,}176) = 1{,}504.67$, $p < .0001$. The final instrument, scoring sheet, and scoring instructions can be found in the appendix.

Discussion

The present study suggests that the Gambling Pathways Questionnaire (GPQ) demonstrated high internal consistency reliability as well as satisfactory content and construct validity for assessing

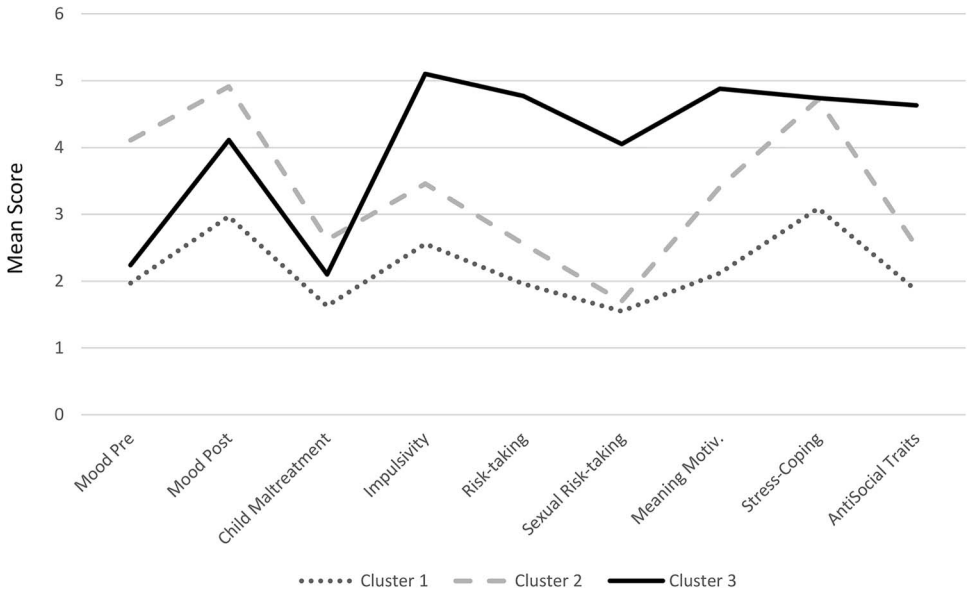

Figure 2. Graph of K-clustering means results (N = 1,176). Pre- = Pre-Problem-Gambling; Post- = Post-Problem-Gambling; Motiv. = Motivation.

the etiological risk factors for problem gambling by subtype in a treatment-seeking population. The resulting instrument provides general confirmatory support for the three-factor structure of the Pathways Model, which describes behaviorally conditioned, emotionally vulnerable, and antisocial impulsivist subtypes of problem gamblers. Consistent with the model, the mean PGSI score of Cluster 1, which correlates to Pathway 1, was significantly lower than that of Cluster 2 (Pathways 2) and Cluster 3 (Pathway 3); men were overrepresented in Cluster 3, and women in Cluster 2. Cross-cultural replication studies are needed to determine whether these findings are consistent across populations or an artifact of this study population. The findings suggest, however, that the model should be revised to reflect three distinct pathways, in contrast to the original model, which suggested Pathway 3 is a subset of Pathway 2, and to account for slightly different factors within each pathway. For example, although ADHD features and substance misuse may be indicative of problem gamblers in general, this study found they are not predictive of any particular subgroup as asserted by the model. Analyses for those modifications are beyond the scope of this article and will be undertaken in a future study.

Inherent limitations in collecting data on a large number of items and constructs in a treatment-seeking population of gamblers, combined with the use of items that are not measured by validated instruments elsewhere, precluded assessment for concurrent validity in addition to construct and content validity. The

Table 3
Final Cluster Centers From the K-Means Cluster Analysis (N = 1,176)

Variable	Cluster 1: Behaviorally Conditioned	Cluster 2: Emotionally Vulnerable	Cluster 3: Antisocial Impulsive Risk Taker
n (%)	486 (41.32)	483 (41.07)	207 (17.60)
Subscale score (*M*)			
Antisocial Traits	1.86	2.52	4.63
Impulsivity	2.56	3.46	5.10
Risk-Taking	1.96	2.56	4.77
Sexual Risk-Taking	1.55	1.70	4.05
Stress-Coping	3.09	4.72	4.74
Child Maltreatment	1.63	2.62	2.10
Mood Pre-Problem-Gambling	1.97	4.11	2.24
Mood Post-Problem-Gambling	2.97	4.91	4.11
Meaning Motivation	2.12	3.41	4.88
PGSI score: *M* (*SD*)	15.21* (5.25)	19.20 (5.22)	18.77 (5.22)
Gender: % (*n*)			
Male	64.95** (315)	48.13 (232)	74.40* (154)
Female	35.05 (170)	51.87* (250)	25.60 (53)

Note. PGSI = Problem Gambling Severity Index.
* $p < .001$. ** $p = .02$.

study was also limited by the need to engage participants in three international locations with similar assessment and treatment protocols in order to obtain the necessary sample size to adequately test the items.

Overall, the GPQ should greatly aid clinicians in screening gamblers for risk factors to guide individual, targeted treatment planning that is critical to promoting sustained recovery. The instrument has several specific strengths. First, it will clearly identify risk levels and subgroup membership for the most important etiological variables among problem gamblers. This will allow clinicians to individualize treatment protocols by addressing not only gambling-related behaviors and cognitions but also those factors that may underlie the development of gambling problems and precipitate relapse. In addition, the instrument is limited to subtyping only, facilitating use of the GPQ along with existing intake batteries to assess problem severity, demographic variables, and gambling behavior. As such, it is also a relatively brief instrument, considering the factors assessed, and should add only about 10 min to intake protocols. Finally, despite the complexity of the model, the scoring rubric was designed to allow clinicians to utilize it with ease. Future projects will involve translating the instrument into additional languages and developing a fully online version that is automatically scored and provides feedback for clinicians.

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(*Appendix follows*)

Appendix

Gambling Pathways Questionnaire (GPQ)

The following statements refer to your views about gambling and beliefs about yourself and your life. Please check ONE box that best reflects how much you agree or disagree with each statement ☑

	Strongly DISAGREE 1	2	3	4	5	Strongly AGREE 6
1. I gamble mainly to relieve tension, to "blow off steam."	☐	☐	☐	☐	☐	☐
2. I like doing or saying crazy things just to shock others.	☐	☐	☐	☐	☐	☐
3. Gambling gives me purpose in life.	☐	☐	☐	☐	☐	☐
4. I often say mean and hurtful things when I'm angry.	☐	☐	☐	☐	☐	☐
5. When I gamble, I can forget my responsibilities for a while.	☐	☐	☐	☐	☐	☐
6. If I want sex, I am willing to pay for it.	☐	☐	☐	☐	☐	☐
7. A big win at gambling would give my life meaning.	☐	☐	☐	☐	☐	☐
8. I'll often take a dare, even if it's dangerous.	☐	☐	☐	☐	☐	☐
9. I frequently buy things on impulse, even if I can't afford them.	☐	☐	☐	☐	☐	☐
10. When I'm angry, I always feel better if I can hit or throw something.	☐	☐	☐	☐	☐	☐
11. If I won at gambling, I wouldn't' feel like such a failure.	☐	☐	☐	☐	☐	☐
12. I am often impatient when standing in line or waiting for other people.	☐	☐	☐	☐	☐	☐
13. I only follow the rules if I think I could get caught.	☐	☐	☐	☐	☐	☐
14. I gamble mainly to cope with the stress and pressures of life.	☐	☐	☐	☐	☐	☐

The next series of statements refer to feelings and behaviors you experienced *before* and *after* gambling became a problem for you. The questions will repeat, but you may have different answers, depending on the time frame. Please check ONE box for each statement ☑.

"BEFORE gambling became a problem for me…"	Strongly DISAGREE 1	2	3	4	5	Strongly AGREE 6
15. I often felt panicky.	☐	☐	☐	☐	☐	☐
16. I often felt tense and nervous.	☐	☐	☐	☐	☐	☐
17. I worried a lot.	☐	☐	☐	☐	☐	☐
18. I often felt sad and down for periods of time (lasting at least two weeks).	☐	☐	☐	☐	☐	☐

(*Appendix continues*)

"SINCE gambling became a problem for me…"	**Strongly DISAGREE** 1	2	3	4	5	**Strongly AGREE** 6
19. I often feel panicky.	☐	☐	☐	☐	☐	☐
20. I often feel tense and nervous.	☐	☐	☐	☐	☐	☐
21. I worry a lot.	☐	☐	☐	☐	☐	☐
22. I often feel sad and down for periods of time (lasting at least two weeks).	☐	☐	☐	☐	☐	☐

Next, we would like to ask you about things you experienced as a *child or teenager*. Please check ONE box that best reflects to what extent you disagree or agree with each statement ☑.

"As a child or teenager, I was…"	**Strongly DISAGREE** 1	2	3	4	5	**Strongly AGREE** 6
23. Hit, punched, or kicked at home.	☐	☐	☐	☐	☐	☐
24. Frequently teased or bullied at school.	☐	☐	☐	☐	☐	☐
25. Often called hurtful names like "worthless," "no good," or "stupid."	☐	☐	☐	☐	☐	☐
26. Subjected to unwanted or inappropriate sexual contact.	☐	☐	☐	☐	☐	☐
27. Abandoned emotionally or ignored by my caregivers.	☐	☐	☐	☐	☐	☐
28. Often left at home alone or without proper clothing, food, heat or other necessities.	☐	☐	☐	☐	☐	☐
29. Exposed to (witnessed) physical violence against someone else.	☐	☐	☐	☐	☐	☐

Finally, a few more questions about your views on gambling and beliefs about yourself and your life. Please check ONE box that best reflects how much you disagree or agree with each statement ☑.

	Strongly DISAGREE 1	2	3	4	5	**Strongly AGREE** 6
30. The only time I feel important is when I'm gambling.	☐	☐	☐	☐	☐	☐
31. I will pick up someone just for sex.	☐	☐	☐	☐	☐	☐
32. Since childhood, I've always been prone to get in trouble.	☐	☐	☐	☐	☐	☐
33. I would bet on anything just for the excitement.	☐	☐	☐	☐	☐	☐
34. I gamble to distract myself from problems.	☐	☐	☐	☐	☐	☐
35. If necessary, I'll do illegal things unrelated to gambling.	☐	☐	☐	☐	☐	☐

(*Appendix continues*)

	Strongly DISAGREE 1	2	3	4	5	Strongly AGREE 6
36. People who know me would say my behavior is unpredictable and inconsistent.	☐	☐	☐	☐	☐	☐
37. If only I could win at gambling, I wouldn't feel so powerless over my life.	☐	☐	☐	☐	☐	☐
38. I often get into physical fights with other people.	☐	☐	☐	☐	☐	☐
39. If something feels good, I'll do it regardless of the consequences.	☐	☐	☐	☐	☐	☐
40. Gambling helps me forget bad memories in my life.	☐	☐	☐	☐	☐	☐
41. Sometimes my temper explodes for no good reason.	☐	☐	☐	☐	☐	☐
42. I've been known to have unprotected sex with someone I don't know well.	☐	☐	☐	☐	☐	☐
43. Gambling helps me avoid dealing with difficult situations and/or people in my life.	☐	☐	☐	☐	☐	☐
44. It's OK to lie to gain an advantage.	☐	☐	☐	☐	☐	☐
45. Gambling numbs me out so I don't feel bad emotions.	☐	☐	☐	☐	☐	☐
46. I often manipulate others to get what I want.	☐	☐	☐	☐	☐	☐
47. I often say or do things without stopping to think.	☐	☐	☐	☐	☐	☐
48. If someone tells me not to do something, I'll want to do it even more.	☐	☐	☐	☐	☐	☐

(*Appendix continues*)

INSTRUCTIONS

How to Score the GPQ:

Scoring the GPQ is based on sum totals of high/medium/low responses to instrument's nine sub-scales:

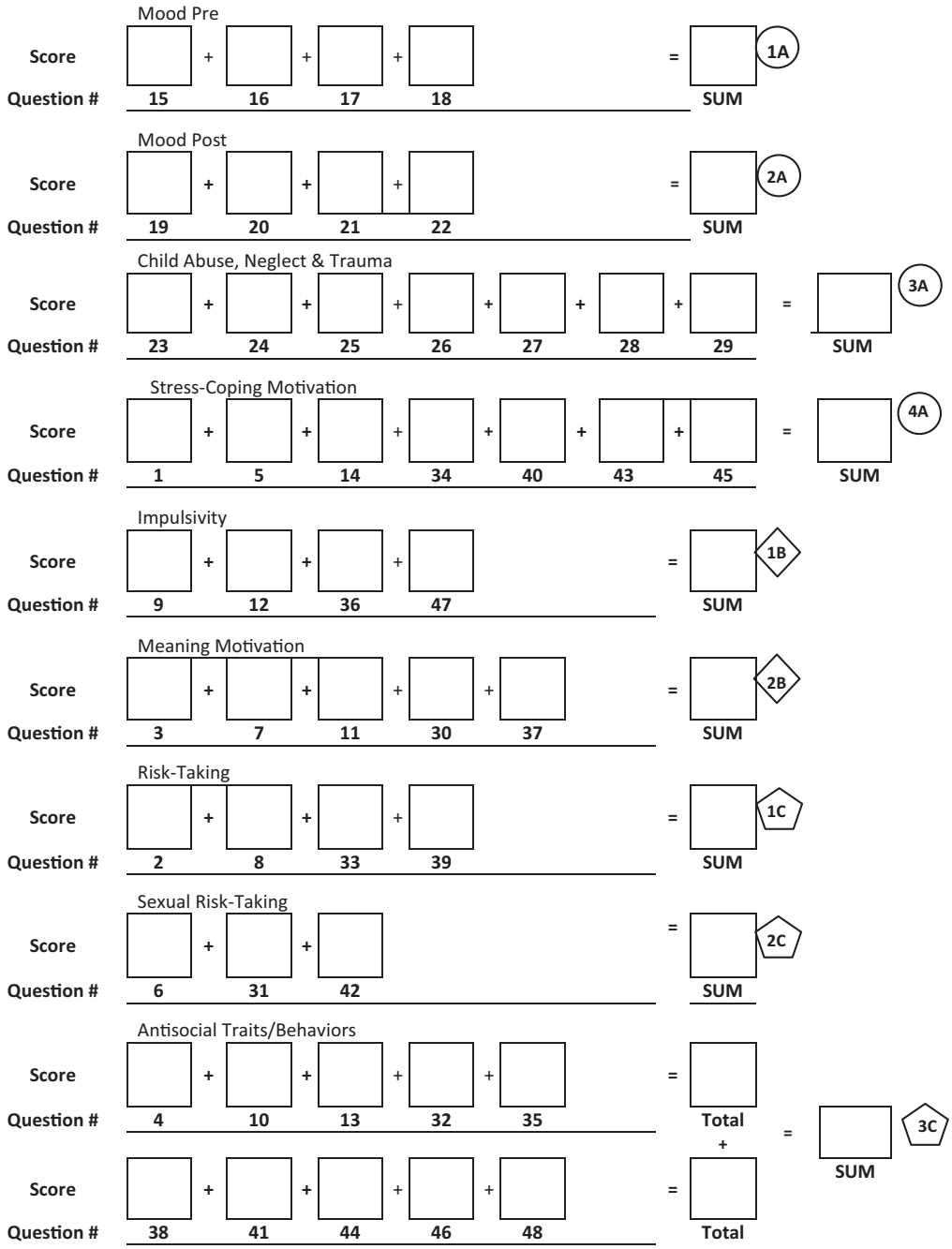
1. Transfer item responses into the spaces provided by sub-scale. For example, if the client marked "4" on question 10, put "4" in that box and add all numbers in that subscale at the end).
2. Total each sub-scale and place the sum in the "SUM" box.
3. Compare sum totals for each specified sub-scale to the threshold numbers provided and ADD or SUBTRACT as directed to identify the number of conditions met for each pathway. If conditions are met for BOTH Pathways 2 and 3, assign client to Pathway 3. If ONLY conditions for Pathway 2 are met, assign client to Pathway 2. If NEITHER conditions for Pathways 2 or 3 are met, assign client to Pathway 1.
4. Compare your client's sum totals for all subscales to the low/medium/high ranges provided to determine which etiological factors are most important for treatment.

How to Use the GPQ:

The GPQ is a stand-alone instrument for sub-typing problem gamblers based on etiological factors. It is intended to assist clinicians in better individualizing client treatment plans. The GPQ should be used in conjunction with a clinical measure of problem severity; the measure was developed using the Problem Gambling Severity Index (PGSI) of the Canadian Problem Gambling Index (Ferris & Wynne, 2001). The GPQ provides a clinical snap-shot of the most likely origins of gambling problems, however, it is not an exhaustive test battery. In addition, the GPQ is designed to differentiate among subtypes not to identify all client risk factors. For that reason, we recommend that clinicians supplement the GPQ with other instruments that explore single risk factors of interest in greater depth. We also recommend that clinicians conduct in-depth evaluations on any risk factors in the "high" range on this questionnaire.

(*Appendix continues*)

Pathways Scoring Sheet



(*Appendix continues*)

Trait Severity Scales

Mood Pre & Mood Post (1A & 2A)		Child Abuse, Neglect & Trauma (3A)	
Low	0-8	Low	0-14
Medium	9-14	Medium	15-22
High	≥15	High	≥23
Stress-Coping Motivation (4A)		**Impulsivity (1B)**	
Low	0-19	Low	0-8
Medium	19-36	Medium	9-18
High	≥37	High	≥19
Meaning Motivation (2B)		**Risk Taking (1C)**	
Low	0-11	Low	0-8
Medium	12-18	Medium	9-18
High	≥19	High	≥19
Sexual Risk-Taking (2C)		**Antisocial Traits/Behaviors (3C)**	
Low	0-4	Low	0-18
Medium	5-10	Medium	19-36
High	≥11	High	≥37

Pathway Scoring:

The number in (1A) is greater than or equal to **12, ADD 1** _____

*The number in (2A) is greater than or equal to **18, ADD 1*** _____

*The number in (3A) is greater than or equal to **18, ADD 1*** _____

*The number in (4A) is greater than or equal to **35, ADD 1*** _____

*The number in (1B) is greater than or equal to **18, ADD 1*** _____

*The number in (2B) is greater than or equal to **22, ADD 1*** _____

TOTAL ☐

If TOTAL (1A+2A+3A+4A+1B+2B) equals 3 or more, then conditions for Pathway 2 have been met.

Conditions for Pathway 2 met?

Yes ☐ **No** ☐

The number in (1B) is greater than or equal to ***18, ADD 1*** _____

The number in (2B) is greater than or equal to ***22, ADD 1*** _____

The number in (1C) is greater than or equal to ***15, ADD 1*** _____

The number in (2C) is greater than or equal to ***9, ADD 1*** _____

The number in (3C) is greater than or equal to ***30, ADD 1*** _____

Sub-Total: _____

The number in (1A) is greater than or equal to ***12***,

SUBTRACT 1 from **Sub-Total** _____

TOTAL ☐

If TOTAL (1B+2B+1C+2C+3C MINUS 1A) equals 2 or more, then conditions for Pathway 3 have been met.

Conditions for Pathway 3 met?

Yes ☐ **No** ☐

If BOTH conditions for Pathways 2 and 3 are met, assign to Pathway 3.
If NETHER conditions for Pathway 2 or 3 are met, assign to Pathway 1.

Final Pathway: Pathway 1 ☐ **Pathway 2** ☐ **Pathway 3** ☐

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