



**HAL**  
open science

## Tilt in Online Poker: Development of a short version of the Online Poker Tilt Scale

Axelle Moreau, Emeline Chauchard, Alexandre Hamel, Lou Penthier, Isabelle Giroux, Serge Sévigny

### ► To cite this version:

Axelle Moreau, Emeline Chauchard, Alexandre Hamel, Lou Penthier, Isabelle Giroux, et al.. Tilt in Online Poker: Development of a short version of the Online Poker Tilt Scale. *Journal of Gambling Issues*, 2020, 44, 10.4309/jgi.2020.44.3 . hal-04534277

**HAL Id: hal-04534277**

**<https://hal.science/hal-04534277>**

Submitted on 3 Jul 2024

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

## Tilt in Online Poker: Development of a Short Version of the Online Poker Tilt Scale

Axelle Moreau,<sup>1,2</sup> Emeline Chauchard,<sup>3</sup> Alexandre Hamel,<sup>1</sup> Lou Penthier,<sup>3</sup>  
Isabelle Giroux,<sup>1,2</sup> & Serge Sévigny<sup>4</sup>

<sup>1</sup> Université Laval – École de Psychologie, Québec, Québec, Canada

<sup>2</sup> Institut Universitaire sur les Dépendances, Montréal, Québec, Canada

<sup>3</sup> Université de Nantes, Laboratoire de Psychologie des Pays de la Loire Nantes,  
France

<sup>4</sup> Université Laval – Fondements et Pratiques en Éducation, Québec, Québec,  
Canada

### Abstract

Tilt in poker is a phenomenon characterized by a loss of control. Tilt could be a risk factor for the development of problematic gambling in poker. To monitor the frequency of tilt episodes during online poker sessions, the Online Poker Tilt Scale (OPTS) was created within the French population. The aim of this study was to develop a short version of this scale, one that was faster to complete, and therefore more appropriate for the online poker player population, which was characterized by an impulsive personality and low survey participation rate. The short version is composed of nine items split into two factors (cognitive regulation and emotional regulation). The OPTS-9 version displayed good psychometric qualities and its scores were strongly correlated with those of the original version. Moreover, this shorter version allows rebalancing of the scale's factorial structure, which facilitates interpretation of the results. This revised scale will measure the relative frequency of tilt episodes and allow to appropriately study the links between problem gambling and tilt episodes. This shortened 9-item version could be included in future experimental studies, as well as in prevention and treatment programs.

**Keywords:** Tilt scale, Online poker, Internet Gambling, Loss of control, gambling behavior

### Résumé

L'inclinaison (tilt) au jeu de poker est un phénomène caractérisé par une perte de contrôle. Elle pourrait être un facteur de risque pour le développement d'un jeu

pathologique au poker. Pour suivre la fréquence des épisodes d'inclinaison pendant les séances de poker en ligne, l'échelle *Online Poker Tilt Scale* (OPTS) a été créée au sein de la population française. Le but de cette étude était de développer une version courte de cette échelle, plus rapide à remplir, donc plus appropriée pour la population de joueurs de poker en ligne qui se caractérise par une personnalité impulsive et un faible taux de participation à des sondages. La version courte est composée de neuf éléments répartis en deux facteurs (régulation cognitive et régulation émotionnelle). La version OPTS-9 présente de bonnes qualités psychométriques et ses pointages sont fortement corrélés avec les pointages de la version originale. De plus, cette version courte permet de rééquilibrer la structure factorielle de l'échelle, ce qui facilite l'interprétation des résultats. Cette échelle révisée mesurera la fréquence relative des épisodes d'inclinaison et permettra d'étudier de façon adéquate les liens entre le jeu pathologique et les épisodes d'inclinaison. Cette version raccourcie à neuf éléments pourrait être incluse dans les futures études expérimentales, ainsi que dans les programmes de prévention et de traitement.

---

## Introduction

Poker is one of the most popular gambling activities in the world (Dufour et al., 2019, 2020; Kairouz, Nadeau, & Robillard, 2014). Despite a decrease in the rate of players in the last few years, online poker is still exceptionally popular, and has become a market representing millions of dollars (Costes & Eroukmanoff, 2018; Fiedler & Wilcke, 2012). In 2012, 66% of Quebecers gambled money on at least one game of chance (Kairouz et al., 2014). More than 2% of gamblers had played online games during the previous year, and of these gamblers, 57.8% played online poker. Within the online gambler population, 23% presented a risk of developing a either (1) psychopathology related to their gambling, (2) pathological gambling itself, or (3) both. (Kairouz et al., 2014). In France, online gambling has been regulated since 2010, and, according to a report published by the French Gambling Observatory (Observatoire Des Jeux), online gambling accounts for 10% of the money spent by French gamblers (Costes & Eroukmanoff, 2018). Two million persons, or 7.3% of the French gambling population, play online (Costes, Eroukmanoff, Richard, & Tovar, 2015). Of those who declared gambling online in the last 12 months, 9.4% could be categorized as moderate risk gamblers and 13% as probable pathological gamblers (Costes & Eroukmanoff, 2018). The proportion of problematic gambling has increased since the last study in 2012 (+6.6%) (Costes & Eroukmanoff, 2018). According to the French Gambling Observatory, online poker accounts for 20% of online gambling activities, 14.5% of the French online poker population are moderate risk gamblers, and 15.6% of that population are problematic gamblers (Costes & Eroukmanoff, 2018).

The skill component differentiates poker from other games of chance (Barrault, Untas, & Varescon, 2014; Biolcati, Passini, & Griffiths, 2014; Bjerg, 2010; Fiedler &

Rock, 2009; Laakasuo, Palomäki, & Salmela, 2015; Moreau, Delieuvin, Chauchard, & Chabrol, 2015). Poker is a game that requires technical aspects that are tied to the game's structure. It demands, as well, both emotional regulation and complex decision-making abilities (Barrault et al., 2014; Biolcati et al., 2014; Bjerg, 2010). Emotional regulation helps the players to stay in control and focused on their strategies without being emotionally overworked by both the pitfalls of the game and other participants' behaviors (Schiavella, Pelagatti, Westin, Lepore, & Cherubini, 2018). However, by studying forums and discussions between online poker players, the recurrent occurrence of the term *tilt* was noticed (Browne, 1989; Moreau et al., 2015; Palomäki, Laakasuo, & Salmela, 2013).

*Tilt* is defined by a sudden and uncontrolled change in gambling behavior (loss of control over the game) induced by frustration—a shift which, in turn, affects behavioral, emotional and cognitive processes. Players' ability to make rational decisions is now compromised because they are overcome by strong negative emotions (sadness, guilt), experience more irrational beliefs (“I can gain back the money I lost,” “my turn will come”) and live dissociative experiences, resulting in a loss of money in most cases (Barrault et al., 2014; Browne, 1989; Moreau et al., 2015; Palomäki et al., 2013; Palomäki, Laakasuo, & Salmela, 2014). Tilt happens to all players, novices or experienced, in control or at risk (Laakasuo et al., 2015; Moreau, Delieuvin, Chabrol, & Chauchard, 2017; Palomäki et al., 2013, 2014). Yet poker players need to remain in control of themselves all the way through the game if they want to make more appropriate decisions (Biolcati et al., 2014; Caballero, Ownby, Rey, & Clauson, 2016; Meyer, von Meduna, Brosowski, & Hayer, 2013). This dilemma is the reason why many books, Internet websites, and even paid coaching programs address how to overcome tilt (Moreau et al., 2017). Browne (1989), was the first to describe the tilt phenomenon among table poker players. He suggested the idea that the problematic practice of poker could be linked to a greater frequency of tilt. Hence, tilt shares many characteristics with pathological gambling, and could also be a gateway to this disorder (Browne, 1989; Moreau et al., 2015; Palomäki et al., 2014). It is important to study the tilt phenomenon in order to understand its implications for the development and maintenance of problem gambling, and also to provide solutions for players experiencing tilt.

To understand this phenomenon better, two studies have previously been carried out: a qualitative study in 2015 defined and deepened the understanding of the phenomenon (Moreau et al., 2015), and a second study in 2017 developed a tilt measurement scale using a large cohort (Moreau et al., 2017): the Online Poker Tilt Scale (OPTS) measures the relative frequency of tilt episodes in an online poker player sample. This tool measures the characteristics of tilt, as determined by the 2015 study, without specifically referring to tilt. These tilt episode characteristics are described by the players as dissociation, loss of control, attempt at self-control, frustration, focus alteration, irritability, anger, sadness, risk-taking, desire to win, and aggressive acting out (Moreau et al., 2015). The scale consists of items measuring the relative frequency of occurrence of these different aspects of online poker tilt. The higher the total scale (or subscale) score is, the more frequently the player has

undergone tilt manifestations. Hence, the frequency of occurrence of tilt can in fact be assessed in players who are not aware that the tool is designed to measure tilt episodes. To date, this scale has been validated using a 17-item version of a French sample (Moreau et al., 2017).

The main disadvantage of this tool is the time necessary for administration. Indeed, the OPTS consists of 17 items, which, if combined with other scales, could make it a lengthy process to complete. Furthermore, the online poker community is particularly prone to sensation seeking, and is also poorly inclined to participate in studies (Bonnaire & Barrault, 2018; Moreau, Chabrol, & Chauchard, 2016). One of the main factors that seem to influence the participation of players is the time needed to complete an online form. Indeed, Moreau et al. (2017) reported that questionnaires lasting more than ten minutes were associated with high attrition rate. To conduct an online study with low attrition rates, researchers find it necessary to adapt research protocols in ways that they can lower, as much as possible, administration time. To do so, we need to use the shortest existing questionnaires, and limit our evaluations to the most necessary variables to maximize the chances of obtaining a complete questionnaire and a large sample size (Moreau et al., 2017). In this context, an instrument such as the OPTS, developed specifically for the poker players population, must be as short as possible. The goal of this study was to develop an exploratory shorter French version of the OPTS scale adapted specifically to this population, to enable a deeper examination of possible relations between tilt episodic frequency and online poker problem gambling.

## Method

### Participants

To take part in the study, participants had to be 18 years of age or over, speak French fluently, have used an online poker account for more than a year, and have played online poker at least once in the past year. A total of 618 individuals completed our online questionnaires. We excluded 327 questionnaires from our sample, which accounted for 53% of the recorded answers. Of these 327, 61 had inconsistencies (suspicious response patterns). Another 266 of the 327 were incomplete: for each of the nine-page questionnaires, a considerable amount of data were absent—that is, far more than 10%—past the third page of each document. The final sample consisted of 291 online poker players, of which 46% ( $n = 133$ ) were presented with the French version of the questionnaire, and 54% ( $n = 158$ ) were exposed to the French-Canadian (Quebec) version of the questionnaire.

### Materials

Our online questionnaires collected socio-demographic data on age, gender and level of education as well as poker related information such as game frequency, length of poker sessions and other gambling activities. The questionnaires also comprised three questions to test the consistency of the participants' answers (e.g., please check

“completely agree” on this item). Both questionnaires comprised the measurement scales listed below.

**Online Poker Tilt Scale (OPTS).** We used a self-administered questionnaire to measure the frequency of tilt episodes associated with online poker. It was developed using semi-structured interviews and then validated using a French sample of poker players (Moreau et al., 2017). Through 17 items, the scale assesses ten identified characteristics of tilt episodes: dissociation, loss of control, attempt at self-control, frustration, focus alteration, irritability and anger, sadness, risk-taking, desire to win, and aggressive acting out. The Online Poker Tilt Scale comprises two factors: “emotional and behavioral tilt” and “cognitive tilt,” which respectively include items 2, 3, 4, 5, 6, 7, 8, 9, 11, 15, 16, 17, and 1, 10, 12, 13, 14. Each item was rated on a 5-point Likert-like scale (*never, rarely, sometimes, often, and almost always*). Three scores can be computed from participant responses, specifically the sum of (1) the items measuring emotional and behavioral tilt, (2) the items measuring cognitive tilt, and (3) all items on the OPTS.

**Severity of Tilting Scale.** Two items from the Palomäki, Laakasuo, and Salmela study in 2014 were used to measure perceived frequency of tilting episodes. The question, “According to you, how many times have you tilted in the last 6 months?” was rated on a 7-point Likert scale ranging from 0 to more than 10 times, and the item “Tilting has been a problem for me in the past 6 months” was rated on a 7-point Likert scale ranging from 1, “completely disagree,” to 7, “completely agree.”

**The Problem Gambling Severity Index (PGSI).** The Problem Gambling Severity Index (PGSI) is a 9-item questionnaire used to measure the severity of problem gambling (Ferris & Wynne, 2001). It was developed in Canada to provide information on the prevalence of gambling habits in the general population. The PGSI also serves to characterize many sub-types of players, from those with no problem gambling to those with pathological gambling. The scale consists of 9 items rated on a 4-point Likert-like scale (0: never, 1: sometimes, 2: most of the time, 3: almost always). The total PGSI scores range from 0 to 27. A score of 0 indicates non-problematic gambling and a score equal to or higher than 8 indicates a gambling problem. In this study, we modified the phrasing of the items by specifying “when you play online poker...”, and we used the revised thresholds suggested by Currie, Hodgins, and Casey (2012) for the “low risk” (score of 1–4) and “moderate risk” (5–7) categories. Cronbach’s alpha coefficient was .80.

## Procedure

Two versions of the questionnaire were created using LimeSurvey software, one version for the French survey, and the other for the French-Canadian survey. They included the same questions, but were adapted to each socio-cultural context (educational system, vocabulary, etc.). The estimated time required for players to complete them was 12 minutes. Both questionnaires were available online from March 2018 to May 2018 via social media (Facebook), as well as different French

and Canadian online poker site forums (Princepoker, Wam-poker, Pokerstratemy, etc.). At the beginning of the questionnaire, all participants agreed to give their informed consent and anonymity was ensured. The chance to win one of the five \$100 gift cards was offered to Canadian participants as an inducement. The link for the inscription to the lottery draw was accessible from the last page of the questionnaire and led to an independent questionnaire. Such a feature was employed to maintain the anonymity of the answers. This study was approved in Canada (approval number: 2017-109 A-1/05-03-2018) and in France (approval number: CERNI-Université Fédérale de Toulouse-2017-037), as well as by the Commission Nationale de l'Informatique et des Libertés (CNIL, declaration StX2149122r).

### **Statistical analysis**

To reduce the scale size, we performed exploratory factor analysis on the 17 original items using principal component analysis with varimax rotation. Only factors with eigenvalues greater than 1.0 were retained. Items were assigned to a factor if they loaded greater than 0.45 on that factor (Tabachnick & Fidell, 2012). The original scale, based on 10 themes from a qualitative study, was reduced to only one item per theme. For each theme, the item with the highest saturation was kept in the model. An exploratory factor analysis of the short version of the OPTS was then conducted. Internal consistency was assessed using Cronbach's alpha, and to achieve accuracy we also computed the Omega index recommended to replace Cronbach's alpha because it is more representative of the scale properties (McNeish, 2018). To test for convergent validity, we realized correlations and mean comparisons to compare scores of problematic and non-problematic gamblers on the OPTS-9.

## **Results**

### **Descriptive statistics**

The final sample consisted of 291 participants, of which 270 were men (93%) and the mean age was 33.8 years ( $SD = 10.6$ ). Concerning gambling behavior, 77% ( $n = 224$ ) had a controlled gambling practice, 13.5% ( $n = 39$ ) were at moderate risk, and 9.6% ( $n = 28$ ) were probable problem gamblers according to cut-off scores proposed by Currie et al. (2012). Additional descriptive statistics are available in Table 1.

### **Item Suppression**

The factor analysis shows a two-factor solution, with  $KMO = .90$ , and a significant Bartlett test ( $p > .001$ ). This model explained 47% of the variance. The factor matrix and the items associated with each theme are presented in Table 2. We had to suppress the only item from the "autoregulation attempt" because it saturated on the two factors, which in turn forced the exclusion of this theme from the scale. This analysis allowed us to select 9 items creating the OPTS-9.

Table 1  
*Descriptive statistics of the online poker players sample (n = 291)*

Variables	Number of Participants	%
Socio-professional category		
Student	55	28.5
Full time employee	180	61.5
Unemployed	24	8
Other	33	11
Online poker playing frequency		
More than once a day	47	16
Once a day	65	22
2 or 3 times a week	99	34
Once a week	35	12
Twice a month	23	8
Less than once a month	21	7
Length of playing sessions		
Less than 30 minutes	18	6
Between 30 minutes and 1 hour	20	6.5
Between 1 hour and 2 hours	75	25.5
Between 2 hours and 3 hours	62	21
Between 3 hours and 4 hours	40	13.5
More than 4 hours	76	26

### Exploratory analyses for OPTS-9 version

The factor analysis for the nine-item version revealed a two-factor solution. This explained 57.5% of the variance, more than the 50% recommended for a meaningful factor solution. The Bartlett test was significant ( $p < .001$ ) (Floyd & Widaman, 1995), with a KMO = .85. The factorial matrix of the short version is shown in Table 3. We obtained a two-factor solution. The first factor set of items was oriented towards cognitive regulation and this factor we named the *cognitive regulation factor*. The second factor set of items was oriented towards emotion regulation and this factor we named *emotional regulation factor*.

### Internal Consistency

The Cronbach's alpha coefficient for internal consistency was 0.84 for the entire scale, 0.72 for the emotional regulation factor, and 0.82 for the cognitive regulation factor. The Omega score was also high, at 0.904 for the entire scale.

### Correlation

The two items of the Severity of tilting scale (perceived frequency of tilt, and tilt problem), the OPTS original total score, and the PGSI score were significantly correlated with the OPTS-9 total and subscale scores, with coefficients ranging between .34 and .96 (see Table 4).



Table 2  
 Themes associated to each item of the OPTS and factor matrix after Varimax rotation

Themes	Original version items	Factorial structure	
Dissociation	1. I don't feel like myself (14)	.620	
Loss of control	2. I feel as if I am losing control (4)	.670	
	3R. I play without thinking about the consequences (10)	.630	
Attempt at self-control	4R. I unsuccessfully try to calm down (17)	.485	.427
Frustration	5. I feel frustrated (bad luck, other players' behaviour, etc.) (6)	.657	.696
	6R. It feels like I've got no control over the game anymore (15)		
Focus alteration	7. My decisions are no longer rational (13)	.748	.190
	8R. I am less focused (1)		
Irritability/anger	9. I get angry (2)		.597
Negative mood	10. I have negative thoughts (7)		.592
Risk-taking	11R. I take more risks (11)	.740	
	12. I act without thinking (12)	.763	
Desire to win	13. My desire to win is stronger than my reason (3)	.698	
	14R. I think I should stop playing but I don't manage to do so (16)	.553	
Actions	15. I click faster and hit the keyboard harder (8)		.678
	16R. I shout and insult other people (9)		.677
	17R. I throw objects around or attack my mouse (5)		.650

Note. R after an item number means that the item was removed (example: 3R.).

Table 3  
 Factor matrix of the two-factor version of the OPTS-9 after Varimax rotation

Item (Item number in the original version)	Loadings	
	Cognitive regulation	Emotional regulation
Cognitive regulation factor items		
1. I act without thinking (12)	.790	
2. My decisions are no longer rational (13)	.788	
3. My desire to win is stronger than my reason (3)	.728	
4. I don't feel like myself (14)	.646	
5. I feel as if I am losing control (4)	.666	
Emotional regulation factor items		
1. I feel frustrated (bad luck, other players' behaviour, etc.) (6)		.792
2. I have negative thoughts (7)		.730
3. I become angry (2)		.661
4. I throw objects around or attack my mouse (8)		.608

Table 4  
*Pearson's correlations for the whole population (n = 291)*

	1	2	3	4	5	6	7
1. Number of tilt episodes	1						
2. Tilt was a problem	.46***	1					
3. OPTS-9 cognitive	.34***	.45***	1				
4. OPTS-9 emotional	.37***	.38***	.54***	1			
5. OPTS-9 total	.40***	.48***	.91***	.84***	1		
6. PGSI	.32***	.41***	.58***	.34***	.54***	1	
7. Original OPTS	.40***	.49***	.89***	.80***	.96***	.56***	1

Table 5  
*One-way analysis of variance (ANOVA) to examine differences between PGSI groups scores (n=291)*

Variables	Problem gamblers (PGSI > 8) (n= 28)	Moderate risk gamblers (PGSI 5–7) (n= 39)	Low risk gamblers (PGSI 0–4) (n= 224)	F (df= 2)
Number of tilt episodes (last 6 months)	3.8 <sup>a</sup> (2.1)	3.5 <sup>b</sup> (2)	2.2 <sup>ba</sup> (1.9)	15.0***
Tilt was a problem	3.3 <sup>a</sup> (1.8)	2.6 <sup>b</sup> (1.6)	1.5 <sup>ab</sup> (1.5)	21.3***
Original OPTS Total	31.4 <sup>a</sup> (9.7)	22.1 <sup>b</sup> (7.3)	15.6 <sup>ab</sup> (7.9)	54.3***
OPTS-9 – emotional	7.8 <sup>a</sup> (3.3)	6.5 <sup>b</sup> (2.7)	5.1 <sup>ab</sup> (2.5)	16.6***
OPTS-9 – cognitive	10.7 <sup>ab</sup> (3.3)	5.9 <sup>ac</sup> (3.1)	4.1 <sup>bc</sup> (2.9)	62.5***
OPTS-9 – Total	18.5 <sup>ab</sup> (5.6)	13.0 <sup>ac</sup> (4.6)	9.3 <sup>bc</sup> (4.7)	50.5***

\*\*\* $p < .001$ .

PGSI: Problem gambling severity index cut-off (Currie et al., 2012)

OPTS: Online Poker Tilt Scale

<sup>abc</sup> Same subscripts indicate significantly different means. No-subscripts indicate non-significant differences (Tuckey post-hoc test). *df* = degrees of freedom

### Mean score comparison between groups

Problem gamblers (score > 8 on PGSI,  $n = 28$ ) and moderate risk gamblers (score 4–7,  $n = 39$ ) had significantly higher scores than low risk gamblers on the two tilt factors and the total score of the OPTS-9 (see Table 5).

### Discussion

The main goal of this study was to develop an exploratory shorter French version of the Online Poker Tilt Scale (OPTS). Our analyses resulted in a version of the OPTS containing nine items, composed of two factors of 4–5 items each. The scale's structure is adaptable to French and French-Canada (Quebec) poker player populations. In total, eight items were removed from the full OPTS scale. The short version

includes nine of the ten themes of the original version (Moreau et al., 2017), and these themes predominantly focused on regulation, the central characteristic of tilt. The nine themes structure seems congruent with the central description of the tilt phenomenon, in which the lack of regulation is more than a simple characteristic (Browne, 1989; Moreau et al., 2015; Palomäki et al., 2013, 2014).

The first factor, containing five items, is about cognitive regulation and its consequences on the decision-making process of the player during tilt, illustrated by items such as “I act without thinking” or “My decisions are no longer rational.” Three of the five items were already included in the “Cognitive” factor of the original version, but we also identified two items which were in the “Emotional and Behavioral” factor of the original version: Item 3 (“My desire to win is stronger than my reason”) and item 4 (“I feel as if I am losing control”). This modification seems more adapted to the meaning of these items, which comprises more cognitive than real behavior or emotions.

The second factor focuses on emotional regulation and the associated actions, with items such as “I feel frustrated” or “I have negative thoughts.” The same four items were already included in the “Emotional and Behavioral” factor of the original version, which included 12 items. Of these 12 items, half of them we removed, and two more we discarded from the second factor.

Regarding the instrument validity, the results indicate an almost perfect correlation (.96) between the original OPTS scores and the OPTS-9 scores. The OPTS-9 correlates moderately with the perceived frequency of tilt ( $r = .40$ ) and the item “was tilt a problem for you in the last 6 months?” ( $r = .48$ ). These results are satisfying because the absence of a strong correlation could mean that some players are not able to adequately distinguish the occurrence of tilt episodes and could tend to underestimate the frequency of tilt. There is also a strong correlation between the OPTS and the PGSI, which is consistent with the literature, as tilt shares characteristics with problem gambling (Moreau et al., 2015). This finding is supported by group comparisons between low-risk, moderate risk and problem gamblers: players presenting a gambling problem are tilting more often than players having controlled behavior (Laakasuo et al., 2015; Palomäki et al., 2014). These findings are consistent with the literature and indicate a good convergent validity.

While the global score evaluated the tilt frequency, the two identified factors illustrate two complementary aspects that are integral parts of online poker tilt: cognitive regulation and emotional regulation. In addition, these two factors now present a similar number of items (4 to 5 items), as opposed the number in the original version, in which the factor “emotional and behavioral” included 12 items, and the “cognitive” factor included only five items. This imbalance between factors complicated the interpretation of results because the “emotional and behavioral” factor enjoyed a weight much higher than the “cognitive” factor in the scale’s total score. It was also difficult to mutually compare the scores obtained for each factor. This new more balanced structure seems to satisfy the measurement of the relative

frequency of tilt episodes in online poker players. Even though the structure of the new scale is similar to the original one, this shorter exploratory version, once confirmed, could allow researchers and clinicians to measure tilt, not in terms of cognitive, emotional or behavioral manifestations, but rather as a loss of emotional or cognitive regulation abilities, one which leads to consequences on the player's behavior. In addition, this distinction seems appropriate for studying emotional and cognitive aspects in a distinct manner, which may lead to different research questions in the future. It may facilitate the exploration of hypotheses as to how a tilt episode unfolds over a specific timeframe. For instance, do cognitive and emotional consequences of tilt appear at the same time or does one precede the other? Do they diminish at the same time? Which aspects of tilt allows players to become aware that they are having a tilt episode?

Recent studies indicated that, as compared to other gambling activities, poker maintains a higher rate of problem gamblers than do those activities, and that playing poker online constitutes an additional risk factor to poker itself (Dufour et al., 2019; Kairouz, Nadeau, & Paradis, 2011; Kairouz, Paradis, & Nadeau, 2012; Moreau et al., 2016). The OPTS-9 allows for further exploration of the links between tilt and problematic online poker playing, and we expect that this new exploratory short version, once confirmed, will contribute to improving the participation of the players in surveys. In the present study, many online poker players completed only the first three pages out of the nine-page instruments, leaving the other pages with too many unanswered items, resulting in a 43% attrition rate. This limitation shows how important it is to restrict as much as possible the number of items to improve the rate of completion. This short version may be more suitable to develop communication on tilt and risk prevention programs for online poker players. By specifically not naming the phenomenon of tilt in the items, the OPTS-9 could be used to help players become conscious of loss of control episodes. Indeed, it is possible to compare the occurrence rate of the tilt perceived by the player to the frequency assessed by the OPTS. Poker players could improve their ability to perceive tilt and its frequency while using the OPTS-9. Moreover, the ability to evaluate the occurrence of tilt episode is related to the score of excessive gambling (Moreau, Sévigny, Giroux, & Chauchard, 2019). In fact, according to the players, the only adequate reaction to tilt is to identify it, and to stop playing. Future research will be necessary to validate the OPTS-9 in other populations, particularly in English-speaking populations. Finally, to be validated, the OPTS needs replication studies to validate the factor structure in French and other languages.

### **Limitations**

This study collected data from a cohort of online poker players that agreed to participate. Because of the high dropout rate, it is possible that those who dropped out maintained different personal characteristics from those who choose to continue. This limits the generalization of the present results to online poker players willing to participate in poker studies. The overall characteristics of the present sample (age, professional situation, gender) are similar to those reported in other studies

made on the poker players population (Barrault & Varescon, 2013a, 2013b; Hopley, Dempse, & Nicki, 2012; LaPlante, Kleschinsky, LaBrie, Nelson, & Shaffer, 2009; McCormack & Griffiths, 2011; Meyer et al., 2013; Zaman, Geurden, De Cock, De Schutter, & Vanden Abeele, 2014). A second limitation is related to the under-representation of female players with a low playing frequency, in the French sample in particular, where half of the female participants played at least once a day. Studies focused on female samples should be considered to overcome this limitation (Kairouz, Paradis, & Monson, 2016). Finally, research on tilt is still in its embryonic stage and, at this point, it is difficult to identify an OPTS-9 cut-off score from which a player would be considered as having tilted too much, or as having a tilt problem. Future studies might help overcome this limitation.

## Conclusion

Tilt in poker may be a gateway for problem gambling (Browne, 1989; Moreau et al., 2015, 2017). This exploratory shorter questionnaire, composed of nine items divided into two factors, when validated by confirmatory factor analysis, could improve the measurement of the relative frequency of tilt episodes, and deepen research on the relations between problem gambling and tilt episodes. The OPTS-9 could also be useful for therapists, who could, for example, better target their intervention among excessive poker players, on emotional and cognitive regulation, adapted to the needs of each specific client.

## References

- Barrault, S., Untas, A., & Varescon, I. (2014). Special features of poker. *International Gambling Studies, 14*, 492–504. <https://doi.org/10.1080/14459795.2014.968184>
- Barrault, S., & Varescon, I. (2013a). Cognitive distortions, anxiety, and depression among regular and pathological gambling online poker players. *Cyberpsychology, Behavior, and Social Networking, 16*, 183–188. <https://doi.org/10.1089/cyber.2012.0150>
- Barrault, S., & Varescon, I. (2013b). Impulsive sensation seeking and gambling practice among a sample of online poker players: Comparison between non pathological, problem and pathological gamblers. *Personality and Individual Differences, 55*, 502–507. <https://doi.org/10.1016/j.paid.2013.04.022>
- Biolcati, R., Passini, S., & Griffiths, M. D. (2014). All-in and bad beat: Professional poker players and pathological gambling. *International Journal of Mental Health and Addiction, 13*. <https://doi.org/10.1007/s11469-014-9506-1>
- Bjerg, O. (2010). Problem gambling in poker: Money, rationality and control in a skill-based social game. *International Gambling Studies, 10*, 239–254. <https://doi.org/10.1080/14459795.2010.520330>

- Bonnaire, C., & Barrault, S. (2018). Are online poker problem gamblers sensation seekers? *Psychiatry Research*, *264*, 310–315. <https://doi.org/10.1016/j.psychres.2018.03.024>
- Browne, B. R. (1989). Going on tilt: Frequent poker players and control. *Journal of Gambling Behavior*, *5*, 3–21. <https://doi.org/10.1007/BF01022134>
- Caballero, J., Ownby, R. L., Rey, J. A., & Clauson, K. A. (2016). Cognitive and performance enhancing medication use to improve performance in poker. *Journal of Gambling Studies*, *32*, 835–45. <https://doi.org/10.1007/s10899-015-9576-4>
- Costes, J.-M., & Eroukmanoff, V. (2018). *Les pratiques de jeux d'argent sur Internet en France en 2017* (N° 9). Observatoire des jeux.
- Costes, J.-M., Eroukmanoff, V., Richard, J.-B., & Tovar, M.-L. (2015). *Les jeux d'argent et de hasard en France en 2014* (N° 6; Notes de l'ODJ). Observatoire des jeux.
- Currie, S. R., Hodgins, D. C., & Casey, D. M. (2012). Validity of the Problem Gambling Severity Index interpretive categories. *Journal of Gambling Studies*, *29*, 311–327. <https://doi.org/10.1007/s10899-012-9300-6>
- Dufour, M., Morvannou, A., Brunelle, N., Kairouz, S., Laverdière, É., Nadeau, L., Berbiche, D., & Roy, É. (2019). Gambling problem trajectories and associated individuals risk factors: A three-year follow-up study among poker players. *Journal of Gambling Studies*, *36*, 355–371. <https://doi.org/10.1007/s10899-019-09831-6>
- Dufour, M., Morvannou, A., Laverdière, É., Brunelle, N., Kairouz, S., Nolin, M.-A., Nadeau, L., Dussault, F., & Berbiche, D. (2020). Once online poker, always online poker? Poker modality trajectories over two years. *Addictive Behaviors Reports*, *11*. <https://doi.org/10.1016/j.abrep.2020.100251>
- Ferris, J., & Wynne, H. (2001). *The Canadian Problem Gambling Index: Final report*. Ottawa, ON: Canadian Centre on Substance Abuse.
- Fiedler, I. C., & Rock, J.-P. (2009). Quantifying skill in games: Theory and empirical evidence for poker. *Gaming Law Review and Economics*, *13*, 50–57. <https://doi.org/10.1089/glr.2008.13106>
- Fiedler, I. C., & Wilcke, A.-C. (2012). Online poker in the European Union. *Gaming Law Review and Economics*, *16*, 21–26. <https://doi.org/10.1089/glr.2011.1616>
- Floyd, F. J., & Widaman, K. F. (1995). Factor analysis in the development and refinement of clinical assessment instruments. *Psychological Assessment*, *7*, 286–299. <https://doi.org/10.1037/1040-3590.7.3.286>

Hopley, A. A. B., Dempsey, K., & Nicki, R. (2012). Texas Hold'em online poker: A further examination. *International Journal of Mental Health and Addiction, 10*, 563–572. <https://doi.org/10.1007/s11469-011-9353-2>

Kairouz, S., Nadeau, L., & Paradis, C. (2011). *Portrait of gambling in Quebec: Prevalence, incidence and trajectories over four years*. Montreal, PQ: Université de Montréal; Quebec, PQ: Fonds de recherche, Société et culture. <http://prism.ucalgary.ca/handle/1880/48548>

Kairouz, S., Nadeau, L., & Robillard, C. (2014). *Enquête ENHJEU-Québec. Portrait du jeu au Québec: Prévalence, incidence et trajectoires sur quatre ans* (Rapport préparé pour le Fonds de recherche sur la société et la culture). Montréal, QC: Concordia University Research Chair on Gambling. <https://lejeudoitresterunjeu.lotoquebec.com/dam/jcr:7182870e-c223-4d1b-8858-7fda6d26e4c5/enquete-enhjeu-quebec-avril2014.pdf>

Kairouz, S., Paradis, C., & Monson, E. (2016). Gender, gambling settings and gambling behaviours among undergraduate poker players. *International Gambling Studies, 16*, 85–97. <https://doi.org/10.1080/14459795.2016.1147590>

Kairouz, S., Paradis, C., & Nadeau, L. (2012). Are online gamblers more at risk than offline gamblers? *Cyberpsychology, Behavior, and Social Networking, 15*, 175–180. <https://doi.org/10.1089/cyber.2011.0260>

Laakasuo, M., Palomäki, J., & Salmela, M. (2015). Poker players with experience and skill are not “ill”: Exposing a discrepancy in measures of problem gambling. *Journal of Gambling and Commercial Gaming Research, 1*. <https://doi.org/10.17536/jgcgr.2016.001>

LaPlante, D. A., Kleschinsky, J. H., LaBrie, R. A., Nelson, S. E., & Shaffer, H. J. (2009). Sitting at the virtual poker table: A prospective epidemiological study of actual Internet poker gambling behavior. *Computers in Human Behavior, 25*, 711–717. <https://doi.org/10.1016/j.chb.2008.12.027>

McCormack, A., & Griffiths, M. D. (2011). What differentiates professional poker players from recreational poker players? A qualitative interview study. *International Journal of Mental Health and Addiction, 10*, 243–257. <https://doi.org/10.1007/s11469-011-9312-y>

McNeish, D. (2018). Thanks Coefficient Alpha, we'll take it from here. *Psychological Methods, 23*, 412–433. <https://doi.org/10.1037/met0000144>

Meyer, G., von Meduna, M., Brosowski, T., & Hayer, T. (2013). Is poker a game of skill or chance? A quasi-experimental study. *Journal of Gambling Studies, 29*, 535–550. <https://doi.org/10.1007/s10899-012-9327-8>

Moreau, A., Chabrol, H., & Chauchard, E. (2016). Psychopathology of online poker players: Review of literature. *Journal of Behavioral Addictions*, *5*, 155–168 <https://doi.org/10.1556/2006.5.2016.035>

Moreau, A., Delieuvin, J., Chabrol, H., & Chauchard, E. (2017). Online Poker Tilt Scale (OPTS)?: Creation and validation of a tilt assessment in a French population. *International Gambling Studies*, *2*, 1–14. <https://doi.org/10.1080/14459795.2017.1321680>

Moreau, A., Delieuvin, J., Chauchard, E., & Chabrol, H. (2015). Le TILT au Poker en ligne: Un comportement pathologique transitoire? *Alcoologie et addictologie*, *37*, 245–252.

Moreau, A., Sévigny, S., Giroux, I., & Chauchard, E. (2019). Ability to discriminate online poker tilt episodes: A new way to prevent excessive gambling? *Journal of Gambling Studies*, *36*, 699–711. <https://doi.org/10.1007/s10899-019-09903-7>

Palomäki, J., Laakasuo, M., & Salmela, M. (2013). “This is just so unfair!”: A qualitative analysis of loss-induced emotions and tilting in on-line poker. *International Gambling Studies*, *13*, 255–270. <https://doi.org/10.1080/14459795.2013.780631>

Palomäki, J., Laakasuo, M., & Salmela, M. (2014). Losing more by losing it: Poker experience, sensitivity to losses and tilting severity. *Journal of Gambling Studies*, *30*, 187–200. <https://doi.org/10.1007/s10899-012-9339-4>

Schiavella, M., Pelagatti, M., Westin, J., Lepore, G., & Cherubini, P. (2018). Profiling online poker players: Are executive functions correlated with poker ability and problem gambling? *Journal of Gambling Studies*, *34*, 823–851. <https://doi.org/10.1007/s10899-017-9741-z>

Tabachnick, B. G., & Fidell, L. S. (2012) *Using multivariate statistics* (6th ed.). Boston, MA: Pearson Education.

Zaman, B., Geurden, K., De Cock, R., De Schutter, B., & Vanden Abeele, V. (2014). Motivation profiles of online poker players and the role of interface preferences: A laddering study among amateur and (semi-) professionals. *Computers in Human Behavior*, *39*, 154–164. <https://doi.org/10.1016/j.chb.2014.07.009>

\*\*\*\*\*

Submitted May 27, 2020; accepted June 1, 2020. This article was peer reviewed. All URLs were available at the time of submission.

For correspondence: Axelle Moreau, Ph.D., Institut universitaire sur les dépendances, 950 Rue De Louvain Est, H2M 2E8, Montréal, Québec, Canada.  
E-mail: [axelle.moreau.ccsmtl@ssss.gouv.qc.ca](mailto:axelle.moreau.ccsmtl@ssss.gouv.qc.ca)



Competing interests: Funding for this study was provided by Paris Mutuel Urbain (PMU) and Institut universitaire sur les dépendances (IUD). PMU and IUD had no role in the study design, collection, analysis or interpretation of the data, writing the manuscript, or the decision to submit the paper for publication.

Ethics approval: This study was been approved in Quebec by CERUL, the ethical committee of Université Laval (Québec) (application number : 2017-109 A-1/ 05-03-2018), in France by the Toulouse University ethical committee (application number : CERNI-Université fédérale de Toulouse- 2017-037/ oct 2017), and by the Conseil National Information et Liberté (CNIL, déclaration StX2149122r).

Acknowledgements: Moreau received funding from Paris Mutuel Urbain (PMU) and Institut universitaire sur les dépendances (IUD).