

Clinical Profiles as a Function of Level and Type of Impulsivity in a Sample Group of At-risk and Pathological Gamblers Seeking Treatment

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Abstract Level and type of impulsivity are essential variables to be taken into consideration during the initial evaluation of a pathological gambler. The aim of this study was to measure the score for 4 impulsivity-related traits (Urgency, (lack of) Premeditation, (lack of) Perseverance and Sensation seeking) in a sample group of at-risk and pathological gamblers, and to highlight any links with certain elements of clinical data. The UPPS Impulsive Behaviour Scale was administered to 84 problem gamblers seeking treatment. The severity of gambling disorders was evaluated using the diagnostic criteria of the DSM-IV. Psychiatric and addictive comorbidities were also explored. The results indicated that the score for the Urgency facet had a positive correlation with the severity of gambling disorders. It appeared that participants displayed different clinical profiles according to the level and type of impulsivity. Several of the UPPS scales were identified as risk factors for mood disorders, risk of suicide, alcohol use disorders, and Attention Deficit/Hyperactivity Disorder (ADHD). The results confirm both the complexity of the multi-dimensional concept of impulsivity and the reason why the UPPS is of interest for a more in-depth study of the subject.

Keywords Pathological gambling · Gambling disorders · Impulsivity · UPPS · Suicide · ADHD

Introduction

Pathological gambling, defined as the maladaptive, persistent and repeated practice of gambling, is characterized by a loss of control and by the apparition of numerous harmful

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consequences. Although many authors believe that it is an addictive disorder, it is still classed as an “impulse control disorder” in the DSM-IV (American Psychiatric Association 1994). It is therefore essential that the variable of level of impulsivity be taken into consideration during the initial evaluation of a pathological gambler, in order to determine the therapeutic care they should receive. The collective assessment recently carried out on gambling, under the aegis of the National Institute of Health and Medical Research in France, identified around forty studies focusing on the links between gambling problems and impulsivity (Expertise Collective 2008). The vast majority of these works revealed a significantly higher level of impulsivity among pathological gamblers compared to control subjects and a positive correlation between level of impulsivity and severity of the disorder. In addition, level of impulsivity also seemed to be linked to a sub-type that is particular to pathological gamblers, known as “antisocial impulsivist” (Blaszczynski and Nower 2002). These so called “antisocial impulsivist” gamblers had poorer prognosis. Finally, greater impulsivity increased the risk of abandoning psychotherapy and reduced its efficacy.

But how do we define impulsivity? This question has given rise to several studies, each proposing a new concept, or a new method of evaluation, without coming to a consensus on the definition. One innovative point of view on impulsivity emerged during the last decade, through work initiated by Whiteside and Lynam (2001). These researchers attempted to identify and separate the distinct facets of personality that have often been confused with, or linked to, the generic term of “impulsivity” by using a set of tools generally used to measure impulsivity (including parts or all of the following: EASI-III Impulsivity Scales; Dickman’s Functional and Dysfunctional Impulsivity Scales; Barratt Impulsiveness Scale-11; I-7 Impulsiveness Questionnaire; Personality Research Form Impulsivity Scale; Multidimensional Personality Questionnaire; Temperament and Character Inventory; Sensation Seeking Scale), and by referring to the theoretical model of personality called the Five Factor Model (McCrae and Costa 1990). Their study, based on factor analyses allowed them to isolate 4 dimensions that the authors had not considered such as “variations of impulsivity, but rather discrete psychological processes that lead to impulsive-like behaviours”, and that testified to the “difficulty in finding a single definition for the four factors identified” in the study. The “item selection” step allowed them to retain 45 criteria to develop an original instrument, the UPPS Impulsive Behaviour Scale, which explores these 4 facets (Whiteside and Lynam 2001).

The first facet, Urgency, refers to the “tendency to experience strong impulses, frequently under conditions of negative affects”; the second, (lack of) Premeditation, refers to the “tendency to think and reflect on the consequences of an act before engaging in that act”. The authors specified that “this facet is the best and the most widely represented among the previous impulsivity measures”. The third facet, (lack of) Perseverance, refers to the “ability to complete projects and to work under conditions that require resistance to distracting stimuli”; and finally the fourth, Sensation seeking, refers to the “tendency to enjoy and pursue activities that are exciting and an openness to trying new experiences that may or may not be dangerous” (Whiteside and Lynam 2001).

Whiteside and colleagues continued to work towards validating the UPPS questionnaire by studying a population of subjects suffering from problems characterized by a high level of impulsivity (such as borderline personality disorder, pathological gambling, alcohol abuse with low or high antisocial personality disorder scores) as well as control subjects (Whiteside et al. 2005). Simultaneous regression analysis showed that Urgency was the most consistent predictor of the four psychopathology measures, and multiple regression analyses (controlling for comorbidities) showed that Urgency was a significant, unique

predictor of pathological gambling. To our knowledge, it is the only study that has been carried out among pathological gamblers. It should be noted that the size of this subgroup was small ($N = 29$). Based on studies conducted on a community sample, Billieux and colleagues confirmed the crucial role of the Urgency dimension, which appeared to be the strongest predictor for problematic use of the mobile phone (Billieux et al. 2008a, b), compulsive buying tendencies (Billieux et al. 2008a, b) and tobacco cravings (Billieux et al. 2007). Cyders and Smith (2008b) completed the study of this model, placing particular emphasis on Urgency, which they believe plays an essential role in most addictive behaviour, such as pathological gambling and bulimia nervosa. They differentiated between positive and negative Urgency, which “refer to individual differences in the disposition to engage in rash action when experiencing extreme positive and negative affects, respectively”. These authors showed that, in a population of students who were evaluated three times, “positive urgency, lack of planning and sensation seeking each correlated with gambling behaviour and risky behaviour at both time 1 and time 3 [...] Only positive urgency uniquely predicted increased gambling behaviour” (Cyders and Smith 2008a). However, as the authors themselves noted, the evaluation did not permit them to measure pathological gambling prevalence among the participants, nor to verify whether results of the study were influenced by the severity of the disorder. Also, the sample was mostly made up of females, whereas pathological gambling mostly affects men. Nevertheless, it revealed interesting perspectives in terms of prevention and intervention. Thus, the authors recommended the development of interventions to help individuals to avoid rash actions when experiencing intense negative, but also positive affects.

The studies mentioned above illustrate the clinical, prognostic and therapeutic advantage of a detailed analysis of impulsivity, such as that offered through the UPPS Impulsivity Behaviour Scale questionnaire. Consequently, the goal of this study was to assess the type and level of impulsivity according to the UPPS, in at-risk and pathological gamblers, and to highlight links with certain elements of clinical data.

In particular, we wanted to verify if the four distinct facets described by Whiteside and Lynam could be specific risk factors for disorders commonly associated with pathological gambling (particularly mood and anxiety disorders and substance use disorders). Despite the wealth of literature about the links between addictive disorders and Attention Deficit/Hyperactivity Disorder (ADHD), there is still very little data about “pathological gambling-ADHD” comorbidity. Yet, pathological gambling and ADHD share an essential characteristic, “impulsivity”, which suggests a close relationship between the two disorders (Derevensky et al. 2007; Grall-Bronnec et al. 2011). We therefore decided to explore this comorbidity. To our knowledge, no study has really interested in this topic.

Materials and Methods

Participants

Since September 2008, a thorough assessment has been systematically carried out on all patients who were going to be treated for gambling disorders in our department (Addictions Care Centre) prior to their first medical consultation. The objective of this assessment was primarily to assist the psychiatrist with the task of comprehensive data collection. Moreover, each subject was asked whether his/her personal data could be used anonymously for the sake of research.

This study was conducted with a sample group of consecutive at-risk and pathological gamblers seeking treatment between April 2009 and September 2010. The main criterion for inclusion was being an “at-risk gambler” or a “pathological gambler”. Exclusion criteria included cognitive impairment and difficulties in reading and writing French.

All participants underwent a structured interview (about comorbidities and gambling characteristics) with a training psychologist and completed self-report questionnaires (see below). To shorten the duration of the assessment at the centre, the patients received the questionnaires beforehand by post and were asked to complete them at home. If the questionnaires were not completed on the day of the evaluation, the subjects were asked to complete them immediately upon arrival at the centre. Finally, if they refused, they were asked to complete them at home, and give them to the psychiatrist at the first medical appointment. Despite several attempts, we were not able to obtain all the completed self-questionnaires for all the subjects.

This study was approved by the local Research Ethics Committee, and all subjects provided written informed consent (no patients refused to give consent).

Measures

Pathological Gambling Section in the DSM-IV (American Psychiatric Association 1994)

Clinical assessment (about gambling habits, clinical course, assessment of negative consequences, etc.), and the use of a check list based on the pathological gambling section in the DSM-IV, allowed us to include participants in the study.

We also used the DSM-IV in a categorical approach in order to obtain three categories of problem gamblers, according to the cut-off points proposed by Toce-Gertsein and colleagues (Toce-Gerststein et al. 2003): “at-risk gamblers” (3–4 criteria), “pathological gamblers” (5–7 criteria) and “severe pathological gamblers” (8–10 criteria). Then, we added the positive DSM-IV criteria to get a severity score, in a dimensional approach.

UPPS Impulsive Behaviour Scale (UPPS) (Van der Linden et al. 2006; Whiteside et al. 2005)

The UPPS is a 45-item self-questionnaire developed by Whiteside et al., which aims to measure four distinct pathways to impulsive behaviour: Urgency (“tendency to engage in impulsive behaviours under conditions of negative affects”), (lack of) Premeditation (“difficulty in thinking and reflecting on the consequences of an act before engaging in that act”), (lack of) Perseverance (“individual’s inability to remain focused on a task that may be boring or difficult”) and Sensation seeking (“tendency to enjoy and pursue activities that are exciting and openness to trying new experiences that may or may not be dangerous”) (Whiteside et al. 2005).

Mini International Neuropsychiatric Interview (MINI) (Lecrubier et al. 1997)

The fifth version of this structured diagnostic interview allowed us to explore the main axis-I psychiatric disorders (and antisocial personality disorder) of the DSM-IV quickly and in a standardized way. The MINI also explores the current risk of suicide, by asking the patient about current suicide ideation/attempt (i.e during the past month) and about lifetime suicide attempt.

Wender-Utah Rating Scale-Child (WURS-C) (Caci et al. 2010; Ward et al. 1993)

This self-report questionnaire is a tool that has been validated for a retrospective evaluation in the adult of ADHD in childhood. Its specificity (89.1%) is good, which limits the risk of providing wrong diagnosis. It is designed to assess ADHD symptoms, represented by 25 items on 5-point Likert scales. The authors believed that a score greater than or equal to 46/100 would allow for the diagnosis to be made.

Adult ADHD Self-report Scale (ASRS-v1.1) (Caci et al. 2009; Kessler et al. 2005)

This self-report scale of adult ADHD is based on the 18 diagnostic criteria of the DSM-IV-TR (American Psychiatric Association 2000), scored according to their frequency. We used the ASRS-v1.1 screener, which consists of six out of these 18 questions that were selected based on stepwise logistic regression to optimize concordance with the clinical classification (Kessler et al. 2005). According to the ASRS-v1.1 Symptom Checklist instructions, if the participant exceeds the set thresholds for four or more of the scale items, then he has symptoms that are highly consistent with ADHD.

Some authors have identified the ASRS-v1.1 screener as a simple, useful screening tool that has an acceptable validity for the identification of ADHD among addicted patients (Daigre et al. 2009). In particular, the sensitivity (87.5%) and negative predictive value (95.7%) are good, what is expected of a screening tool.

Gambling Habits

In the structured interview, we were able to identify the medium used for gambling (on or off line) and the favourite type of game for each subject. Lottery games, slot machines, scratch cards, etc. were thus classified under “*pure chance games*”; sports or horse-race betting and black jack under “*chance games with pseudo-skills*”; and finally, poker (including Texas Hold'em poker) under “*chance games with elements of skill*” (Boutin 2010).

Statistical Analysis

A descriptive analysis of the clinical data on the subjects was carried out. The links between the scores for the different facets of the UPPS and the severity of gambling in its categorical approach were studied by means of single-factor variance analysis (factor: “gambling severity” with three modalities: at-risk gamblers, pathological gamblers and severe pathological gamblers). The links between the scores for the different facets of the UPPS and the severity of gambling in its dimensional approach were studied by means of the Pearson’s correlation coefficient invalidity test. Finally, the links between the scores for the different facets of the UPPS and the existence of psychiatric and addiction comorbidities were studied using Student’s tests. Multivariate logistic regressions were applied to identify scores of the UPPS that were independently associated with each psychiatric or addictive comorbidity. Scores of the UPPS and demographics variables with p -values < 0.25 in the univariate analysis were included as explicative variables. Backward selection was applied and variables associated with each dependant variable ($p < 0.05$ criterion) were retained in the multivariate final models.

The conditions for validity were verified for all of the tests used. The degree of significance was 0.05. The statistical analysis was carried out with SAS 9.1 and R statistical software (SAS Institute, Inc.).

Results

Overall Description of the Population

A total of 84 subjects, aged 19–74 (mean = 41.8, Standard Deviations = 13.5), took part in this study. 85.7% of the participants were male and 53.6% of them were high school graduates.

Most participants were “off line” gamblers (70.2%), with a preference for “chance games with pseudo-skills” (44.0%). “Pure chance games” and “chance games with elements of skill” accounted for 40.5 and 15.5% of the sample respectively.

Clinical Characteristics of the Subjects

Severity of Gambling Disorders

According to the categorical approach, 15.5% of individuals in our sample were “at-risk gamblers”, 47.6% were “pathological gamblers” and 36.9% were “severe pathological gamblers”. The average number of diagnostic criteria present for “pathological gambling” according to the DSM-IV was 6.6/10 (SD = 1.9).

For the remainder of our statistical analyses, we had 82 MINIs (97.6%), 76 WURS and ASRS-v1.1 questionnaires (90.5%), and 74 UPPS questionnaires (88.1%) available to use.

Impulsivity

With regard to the type of impulsivity, the average scores were 34.6/48 (SD = 6.4) for the Urgency facet, 24.5/44 (SD = 4.9) for the (lack of) Premeditation facet, 21.1/40 (SD = 3.8) for the (lack of) Perseverance facet and 27.9/48 (SD = 7.8) for the Sensation seeking facet (N = 74).

We found no link between the mean score of the 4 facets and the gender. However, a negative correlation appeared between the (lack of) Perseverance dimension and the age ($r = -0.23, p < 0.05$).

Psychiatric and Addictive Comorbidities

We found mood disorders (current and/or past) in 42.7% of the subjects. Current risk of suicide was reported by 39% of subjects (among the 32 participants who were at risk for suicide, 16 had previously attempted suicide at least once). Anxiety disorders (current and/or past) affected 32.9% of subjects (N = 82).

At the time of evaluation or in the past, 52.4% of subjects had a nicotine dependence, 41.5% had an alcohol abuse or dependence and 29.3% had an abuse or dependence on another psychoactive substance (N = 82).

Twenty subjects (26.3%) had a history of ADHD: for 15.8% of the sample group, this was ADHD in childhood (WURS score ≥ 46 and ASRS-v1.1 screening test negative), and

for 10.5% of the sample group, ADHD probably persisted into adulthood (WURS score ≥ 46 and ASRS-v1.1 screening test positive) ($N = 76$).

Lastly, antisocial personality disorder was found in 4.9% of the subjects ($N = 82$).

Impulsivity and Severity of Gambling Disorders

We did not bring to light any statistically significant difference between the three groups of gamblers with regard to their average score on the (lack of) Premeditation, (lack of) Perseverance and Sensation seeking facets of the UPPS. Nevertheless, our study showed a significant difference between the mean score on the Urgency facet of the 3 groups (“at-risk gamblers”: 30.6/48; “pathological gamblers”: 34.1/48; “severe pathological gamblers”: 37/48, $p < 0.05$).

This result was confirmed when we considered the diagnostic criteria of the DSM-IV in a dimensional approach. Thus, the scores for the Urgency, (lack of) Premeditation, (lack of) Perseverance and Sensation seeking facets have a positive correlation with the severity of the disorder, evaluated by the number of diagnostic criteria present, as mentioned in the pathological gambling section of the DSM-IV. The results are presented in Table 1.

Impulsivity and Psychiatric and Addictive Comorbidities

We compared the average score of the Urgency, (lack of) Premeditation, (lack of) Perseverance and Sensation seeking facets, according to the presence or absence of psychiatric and addictive comorbidities found in our sample group. The results are shown in Table 2.

After the multivariate analysis, we confirmed that high scores on certain facets of the UPPS were risk factors for certain comorbidities. Thus, some results of the univariate analysis were mitigated. For example, the risk of suicide was better explained by the (lack of) Premeditation associated with age, as the only Urgency. The results are shown in Table 3.

Discussion

Our results confirmed those of numerous studies regarding the frequency of psychiatric and addictive comorbidities among at-risk and pathological gamblers, *a fortiori* when they are starting to undergo treatment, since asking for help may, indeed, be motivated by an intercurrent psychiatric disorder (Bland et al. 1993; Cunningham-Williams et al. 1998;

Table 1 Correlations between the scores of the four facets of the UPPS impulsivity behaviour scale and the severity of gambling disorders according to the number of diagnostic criteria present in the pathological gambling section of the DSM-IV ($N = 74$)

| | Severity of gambling disorders | |
|-------------------------|--------------------------------|-----------------|
| | Correlation coefficient | <i>p</i> -value |
| Urgency | 0.31 | 0.0057 |
| (lack of) Premeditation | 0.25 | 0.0261 |
| (lack of) Perseverance | 0.26 | 0.0233 |
| Sensation seeking | 0.23 | 0.0414 |

Table 2 Comparison of the average scores of at-risk and pathological gamblers on the 4 facets of the UPPS according to the presence or absence of psychiatric or addictive comorbidities, established according to MINI, WURS-C and ASRS-v.1.1 (N = 72 or 74)

| | Mood disorders, (current/past) | | Risk of suicide (current) | | Anxiety disorders, (current/past) | | Tobacco dependence, (current/past) | | Alcohol use disorders, (current/past) | | Other SUD, (current/past) | | ADHD in childhood | | ADHD persistent at adulthood | | Antisocial personality disorder | |
|-------------------------|--------------------------------|--------------|---------------------------|--------------|-----------------------------------|--------|------------------------------------|--------|---------------------------------------|---------------|---------------------------|--------|-------------------|----------------------------|------------------------------|---------------|---------------------------------|--------|
| | Absence | p | Absence | p | Absence | p | Absence | p | Absence | p | Absence | p | Absence | p | Absence | p | Absence | p |
| Urgency (/48) | 33.0** | 0.009 | 33.3* | 0.026 | 33.9 | 0.1422 | 33.3 | 0.1329 | 33.7 | 0.1748 | 34.4 | 0.7327 | 32.7*** | 2.39e⁻⁰⁶ | 33.9** | 0.0086 | 34.4 | 0.16 |
| Mean | 36.9 | | 36.6 | | 36.2 | | 35.6 | | 35.8 | | 35.0 | | 39.5 | | 40.1 | | 39.7 | |
| (lack of) | 24.3 | 0.4846 | 23.72 | 0.0538 | 24.5 | 0.7878 | 23.4 | 0.0505 | 24.0 | 0.2215 | 24.0 | 0.0780 | 24.4 | 0.563 | 24.2 | 0.0994 | 24.6 | 0.547 |
| Premeditation (/44) | 25.1 | | 6.0 | | 24.9 | | 25.7 | | 25.4 | | 26.2 | | 25.1 | | 27.3 | | 26.3 | |
| Mean | 20.5 | 0.1193 | 20.7 | 0.3215 | 20.9 | 0.63 | 20.2 | 0.0869 | 20.0** | 0.0074 | 21.0 | 0.7685 | 20.6 | 0.0614 | 20.6*** | 0.0004 | 21.0 | 0.2349 |
| Perseverance (/40) | 21.9 | | 21.6 | | 21.4 | | 21.8 | | 22.4 | | 21.3 | | 22.5 | | 25.4 | | 23.7 | |
| Mean | 27.3 | 0.4369 | 27.7 | 0.7798 | 27.3 | 0.3494 | 27.4 | 0.7191 | 26.9 | 0.2157 | 27.0 | 0.1058 | 27.0 | 0.1112 | 27.6 | 0.4461 | 27.7 | 0.1875 |
| Sensation seeking (/48) | 28.9 | | 28.2 | | 29.2 | | 28.1 | | 29.2 | | 30.1 | | 30.3 | | 29.9 | | 33.7 | |
| Mean | | | | | | | | | | | | | | | | | | |

Bold values mean that the differences are significant

p p-value, * p-value < 0.05, ** p-value < 0.01, *** p-value < 0.001

SUD substance use disorder

Table 3 Multivariate logistic regression to explain presence of psychiatric or addictive comorbidities depending on the 4 facets of the UPPS and demographics variables (N = 72 or 74)

| | OR | IC _{95%} (OR) | p-value |
|---|------|------------------------|---------|
| Mood disorders (current or past) | | | |
| Urgency (/48) | 1.11 | [1.02; 1.21] | 0.0137 |
| Risk of suicide (current) | | | |
| (lack of) Premeditation (/44) | 1.14 | [1.02; 1.27] | 0.0260 |
| Age | 1.05 | [1.01; 1.09] | 0.0360 |
| Alcohol use disorders (current or past) | | | |
| (lack of) Perseverance (/40) | 1.21 | [1.04; 1.40] | 0.0128 |
| ADHD in childhood | | | |
| Urgency (/48) | 1.23 | [1.10; 1.37] | 0.0003 |
| ADHD persistent at adulthood | | | |
| (lack of) Perseverance (/40) | 1.50 | [1.12; 1.99] | 0.0058 |

OR odds ratio, IC_{95%} 95% confidence interval

Grall-Bronnec et al. 2010; Hollander et al. 2000; Kruegelbach et al. 2006; Lesieur and Rosenthal 1991; Petry et al. 2005).

Although this involves well-established data, we would, nevertheless, like to emphasize two points that are clinically closely linked to the dimension of impulsivity. On the one hand, it seemed important to highlight the frequency of the current risk of suicide. Even though the gamblers are often not currently depressed, suicide sometimes represents the only way out they can envisage in the face of the existential impasse to which gambling has led them. Those subjects scored higher on the Urgency dimension.

On the other hand, the study confirmed the frequency of ADHD in childhood, with probable persistence into adult life for many subjects. The study of the links between ADHD and pathological gambling has been the subject of only a few specific works to date (Carlton et al. 1987; Derevensky et al. 2007; Rugle and Melamed 1993; Specker et al. 1995). The results of a recent longitudinal study confirmed that those subjects suffering from ADHD in childhood which persisted through to early adulthood, had a greater risk of suffering from gambling problems (Breyer et al. 2009). There are similarities to other addictive disorders and in this sense this affirms the conceptual interest of the grounding of pathological gambling in the nosographic framework of addictions, as provided for in the DSM-V. The presence of key symptoms of addictive disorders, such as recurrent failure to control the gambling and continuation of gambling despite significant harmful consequences, constitutes the first evidence for this change (Goodman and Thase 2009). Another rationale for moving pathological gambling under a new classification titled “Addiction and Related Disorders” is that pathological gambling and other addictive disorders share an underlying biopsychological process (with genetically and environmentally factors of vulnerability, neurobiological impairments, lifetime comorbidity, psychological characteristics, same forms of treatment, etc.) (Goodman 2008; Institute for Research on Gambling Disorders 2010). It has since been well established that the existence of ADHD in childhood is a major risk factor for initiation into the potentially dangerous consumption of psychoactive substances in adolescence and for the development of substance use disorder (Barkley et al. 2004; Biederman et al. 1997). In a previous work, we concluded that the association “ADHD-gambling disorders” therefore appeared to be not only frequent, but also linked to factors that are known to worsen the prognosis (Grall-Bronnec et al. 2011).

Regarding the impulsivity-related traits, Urgency seemed to be the one for which average scores were closest to the maximum value. According to Whiteside et al. (2005), “high scorers also have difficulty resisting cravings and temptations”, which is particularly common in addictive disorders, such as pathological gambling. Clinicians regularly reported that their patients with severe gambling problems had much greater difficulty resisting the strong desire to gamble and they reported having intense cravings. The craving often explains the continuation of the gambling behaviour despite significant harmful consequences. The average score for each of the facets in our sample group was always below that presented in the sole study that has been published to date on the use of the UPPS among pathological gamblers, and was quite close to that of the control subjects (Whiteside et al. 2005). This article did not provide enough information to enable us to explore this difference. In particular, the authors provided neither the average age of the pathological gamblers nor the severity of the disorder. They did, however, state that Urgency seems to be the component of impulsivity that most allowed them to differentiate normal functioning from pathological functioning.

Moreover, our results indicated that the average score on the Urgency facet was linked to the severity of pathological gambling (in a categorical approach), confirming the results of Whiteside et al. (2005). The works of Billieux et al. (2007, 2008a, b) indicated that this dimension was also correlated to tobacco craving and compulsive buying [as were the (lack of) Perseverance and (lack of) Premeditation facets]. Regarding the works on compulsive buying, Billieux et al. (2008a, b) added that Urgency was the only predictive factor for a tendency towards compulsive buying. Pathological gambling and compulsive buying are two forms of behavioural addiction; it is therefore logical that the impulsivity profiles should be similar, beyond the obvious clinical similarities. The four facets of the impulsivity were also correlated to severity of gambling disorders (in a dimensional approach), but the strength of association was only medium for the Urgency dimension, confirming its role.

One original finding of our work was that the impulsivity profile of at-risk and pathological gamblers from our sample group varied according to the associated psychiatric and addictive disorders.

High scores on the Urgency facet on the one hand, and on the (lack of) Perseverance on the other hand, constituted risk factors for having a history of ADHD in childhood, and ADHD probably persisting into adulthood respectively. Some authors made the assumption that the UPPS facets could potentially differentiate between predominately inattentive [i.e. (lack of) Perseverance] and predominately hyperactive [i.e. Sensation seeking and (lack of) Premeditation] subtypes of ADHD (Whiteside and Lynam 2001). Our results could be explained by the natural evolution of ADHD over time, due to a progressive decrease of hyperactive and impulsive symptoms, with the predominately inattentive subtype of ADHD becoming the more common type in adulthood. (Lack of) Perseverance is, in effect, defined as the “individual’s inability to remain focused on a task that may be boring or difficult”. Thus, a study that appeared in 2003 concluded that (lack of) Perseverance was the sole predictive factor of attention disorders in childhood. It was based on a community sample of young adults, assessed retrospectively, and who showed no comorbidity with pathological gambling (Miller et al. 2003). For many authors, pathological gambling and ADHD may share several neuro-cognitive anomalies, such as impulsivity, lack of inhibition, attention deficit, changes in executive functions, decision-making difficulties, and even disruptions to the processes of reward and punishment (Breyer et al. 2009; Cardinal et al. 2004; Rugle and Melamed 1993; van Holst et al. 2010). Pathological gamblers show neuropsychological impairment in “Reflection-impulsivity” and “Risky decision-making”,

as witnessed by deficits in tasks linked to ventromedial prefrontal cortical dysfunction (Lawrence et al. 2009).

The definition of Urgency (“tendency to engage in impulsive behaviours under conditions of negative affects”) makes its association with mood disorders and risk of suicide understandable (Whiteside et al. 2005). This dimension, described as an intersection between two concepts (impulsivity and the negative affects) could then be understood as a defence mechanism, allowing the individual to deal with depressive affects (even if this adaptive strategy is not very effective) rather than as a stable personality trait. In our sample of at-risk and pathological gamblers, a high score on the Urgency facet constituted a risk factor for having mood disorders, while a high score on (lack of) Premeditation with increasing age constituted a risk factor of making a suicide attempt. We can assume that this reflects a dysfunction in the decision making process. In the short term, a suicide attempt may appear to be the only way to escape the negative consequences of gambling disorders (in particular, having financial loss, lying to the family, etc.), without considering the sometimes irreversible nature of the act. In a previous study, Yen and colleagues aimed to examine whether specific facets of impulsivity could predict suicidal behaviour. They concluded that only (lack of) Premeditation was significantly associated with suicide attempt status while controlling for negative affectivity and covariates (gender, childhood sexual abuse, etc.) (Yen et al. 2009). Another study, with the objective to investigate the implication of impulsivity-related traits in suicide, distinguished subjects who had attempted suicide from those who had only considered suicide. The results indicated that both attempters and ideators-only exhibited high urgency, while only attempters exhibited poor premeditation (Klonsky and May 2010). The size of the group of gamblers with current risk of suicide didn’t allow us to differentiate between those who had a history of suicide attempt ($N = 126$) and those who only had suicide ideation ($N = 16$).

Univariate analyses revealed that the subjects who present gambling disorders as well as substance use disorders seemed not to have the same impulsivity profile: gamblers with alcohol use disorders had significantly higher scores on (lack of) Perseverance; gamblers with tobacco dependence tended to have higher scores on (lack of) Premeditation and (lack of) Perseverance; and finally, gamblers with substance use disorders (excluding tobacco and alcohol) tended to score higher on (lack of) Premeditation. It was difficult to interpret these results because participants often reported multiple substance use disorders. Only lack of perseverance was identified as a risk factor for having alcohol use disorders (current or past). Some studies have evaluated impulsivity in addicts using UPPS. Miller et al. (2003) concluded that the lack of premeditation was a major predictive factor for use of tobacco, alcohol and drugs. Billieux et al. (2007) indicated that “urgency was positively correlated with relief from nicotine withdrawal or negative affects”, and that this facet was the sole predictive factor for tobacco craving. These results indicated that the involvement of each impulsivity-related trait in the development of a substance use disorder is complex.

The main limitation of this study lies in its cross-sectional nature, which prevents the establishment of any causal links between the different variables. One might also criticize the retrospective nature of the ADHD assessment in childhood. The bias of memory can lead to false positives as well as false negatives. Also, the diagnosis of ADHD in adulthood is merely suspected, in so far as the ASRS-v1.1 screener is only a screening tool and not a diagnostic tool. In addition, current and past comorbidities were treated in the same way. It would probably be interesting to differentiate them. Finally, we lacked certain elements of data, mostly regarding the self-report questionnaires.

Nevertheless, the strength of our study consists in its originality in comparing the UPPS facet scales with the comorbidity profile of at-risk and pathological gamblers seeking

treatment. The results, as well as the limitations of this work, encourage us to continue working towards improving our assessment procedures (particularly remote re-assessments) and further increasing our sample size in order to explore the links between the facets of impulsivity and gambling disorders (distinguishing lifetime from current disorders, or inattentive from hyperactive subtypes of ADHD). Our goal is to attain a better understanding of the psychological mechanisms that determine gambling disorders, with a view to identifying gamblers who are at higher risk of developing a specific comorbidity (for example, mood disorder or substance use disorder) or of attempting to take their own life. Another implication is to target therapeutic approaches through prior definition of the profiles of pathological gamblers. Evaluating impulsivity with this questionnaire would allow us to investigate the reason for a particular behaviour. Gambling for stimulation or excitement (high score on the Sensation seeking facet) is not the same thing as gambling to numb oneself or to avoid feeling negative emotions (high score on the Urgency facet). It is essential for the clinician to consider these differences and to adapt the therapeutic strategies accordingly. For the first group, certain authors therefore recommend interventions designed to redirect thrill-seeking into more appropriate venues (Cyders and Smith 2008b), and for the second group, Dialectical Behaviour Therapy for borderline Personality Disorder (Cyders and Smith 2008b; Linehan 1993; Whiteside et al. 2005) might be recommended. Blaszczynski and Nower (2002) thus insisted on the interest of cognitive behavioural therapies that aim to control impulsivity for the subtype of “antisocial impulsivist” pathological gamblers. The therapeutic approach consisted in developing even more specific programs according to the prevalent facets of impulsivity and the comorbidities present.

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