

Constructive Thinking Skills and Impulsivity Dimensions in Conduct and Substance Use Disorders: Differences and Relationships in an Adolescents' Sample

Sébastien Urben · Maya Suter · Sandrine Pihet ·
Claudio Straccia · Philippe Stéphan

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Abstract Impact of conduct disorder (CD) and substance use disorder (SUD) on constructive thinking skills and impulsivity was explored. 71 offending adolescents were assessed for CD and SUD. Furthermore, the constructive thinking inventory, the immediate and delayed memory tasks and the UPPS impulsive behaviour scale were administered. Results showed that youths with CD, independently from SUD, presented higher personality impulsivity (urgency) and altered constructive thinking skills (categorical thinking and personal superstitious thinking). Furthermore, trait-impulsivity explained variation in constructive thinking skills. The implications of these results were discussed.

Keywords Adolescent offenders · Impulsivity · Constructive thinking skills · Conduct disorders · Substance use disorders

Introduction

In everyday life, each individual is confronted with a great number of small problems that have to be solved. They are defined as daily hassles, and are considered as a stress factor [1, 2]. There are, however, important individual differences in how such situations are handled and which amount of stress they induce. According to Katz and Epstein [3], constructive thinking is a concept that permits us to clarify this particular skill. Constructive thinking could be defined as the ability to think in a way that allows us to solve everyday difficulties with minimal stress [3]. More specifically, constructive thinking refers to the experiential system, including automatic thinking and the reaction on a pre-conscious level which is considered to be highly related to emotions [4]. Constructive thinking is therefore also defined as a coping disposition related positively to adaptation in

S. Urben (✉) · M. Suter · S. Pihet · C. Straccia · P. Stéphan
University Service of Child and Adolescent Psychiatry, Department of Psychiatry, University Hospital
Center and University of Lausanne, Lausanne, Switzerland
e-mail: Sebastien.Urben@chuv.ch

many life domains, as well as general well-being [5, 6]. Thus, according to Epstein [4], efficient constructive thinking permits to diminish the subjective experience of stress.

In particular, coping as a general concept is considered as the link between specific stressful events and the way people react, primarily focused on the cognitive and behavioral activities and secondly on the emotions generated by these activities [7]. This definition of coping reflects the idea that coping is an active and rational process. However, cognitive-experiential self-theory [4, 8] postulates that what people are experiencing in everyday life derives from two cognitive systems, experiential-intuitive and rational-analytical [9]. From an information-processing standpoint, this theory of personality postulates that when a new or a stressful event occurs, coping is first manifested at the experiential system [10]. This level is considered to be preconscious, holistic, automatic, affective and resistant to change. In that way, new experiences are automatically associated with similar experiences from the past (schemata from emotional past experience). Rational coping (at a conscious level) is associated with intellectual capacity; it is analytical, relatively affect-free, intentional and integrates logical social rules [8]. These two cognitive systems operate similarly and contribute together to a behavioral action linked to specific stimuli [9]. Therefore, according to these authors, it is necessary to take into account the experiential level and not only focus on rational coping. This understanding of coping has provided the theoretical background for the constructive thinking inventory [CTI; 5, 11]. The CTI contains items that describe constructive or counterproductive thoughts referring to everyday situations. These measures enable to have a better understanding of the automatic thinking [4], reflecting the underlying thinking pattern, where coping takes its offspring.

In this context, adolescents are recognized to be at high risk of demonstrating extreme reactions to stress, resulting from important changes in their life at a psychological, physiological and behavioral level [12, 13]. The impact of stress is however individually moderated and specific attention is needed to understand how adolescents deal with stressors [14]. From this perspective, several studies show that deficiencies in coping abilities, can lead to behavioral and emotional problems, such as negative mood states or substance abuse [15–17]. Likewise, it seems that offending adolescents, adolescents with an antisocial behavior, or abusing substances represent a particularly vulnerable group with regards to coping with stress [14, 18, 19]. From this perspective, several studies reported deficient constructive thinking in adolescents with conduct disorder (CD) or substance use disorder (SUD). Indeed, results highlight a global difficulty in handling stressful situations and a tendency to think in a rather polarized and rigid manner, which in turn diminishes their ability to devise efficient strategies of handling stressful situations. Furthermore, these adolescents are more likely to think in a negative way about themselves and about others, and they also have a tendency to dwell upon unpleasant experiences in the past [10, 15, 18, 20].

Moreover, one core feature of adolescents with CD or SUD is to present a higher degree of impulsivity [21–23]. However, despite the growing body evidence of high comorbidity rates ranging from 50 to 70 % [24], previous studies have failed to consider CD and SUD simultaneously. To our knowledge, the few studies that considered this dual diagnosis focusing on impulsivity, suggested that this dual diagnosis -alcohol- or cannabis-CD interaction increase levels of impulsivity among adolescents [25]. However, the impact of CD-SUD interaction on impulsivity was not confirmed by other studies [26]. Despite their contradictory results, these researches have opened an interesting path of investigation. Furthermore, most of the studies investigating deficits in CD-SUD have used control groups consisting of community adolescents, recognized for much lower prevalence of psychiatric disorders and higher school achievement than their offending or SUD peers,

among other potentially confounding factors. This design might be responsible for part or all of the observed differences between the groups.

More specifically, impulsivity could be separated into at least the behavioral control approach and the personality approach [27]. On one side, the *behavioral control approach* which considers impulsivity as a lack of behavioral control observed in *behavioral disinhibition* [27]. According to Gray, Owen [28] there are two systems that provide behavioral inhibition and activation: the behavioral inhibition system (BIS) and the behavioral activation system (BAS). The former permits individuals to inhibit their behavioral response when they face punishment, frustrating non-reward cues or novelty, whereas the latter activates behaviour when the individuals are confronted with cues for reward, allowing the avoidance of punishment. From this perspective, impulsivity can be considered as an imbalance between the BIS and the BAS, the BAS being dominant and leading the individuals to fail to modify their responses and to ignore punishment cues. Consequently, impulsivity can be measured as a poor behavioral self-control response style. For example, within the behavioral control approach, the immediate and delayed memory Tasks [IMT/DMT; 29] was specifically developed to assess impulsive response style.

On the other side, the *personality approach* considers impulsivity as a dimension of personality (a trait). Indeed, impulsivity is a construct that has been included in almost every major theory of personality [30]. Consequently, several different rating scales have been developed, mainly based on introspection and self-report. These instruments aim to identify different dimension such as acting without thinking, being impatient, or channelling impulses into action [27]. More specifically, Whiteside and Lynam [31] used the Five-Factor Model of personality [32] as a framework for their own conceptualization to define four distinct but related factors assessing different aspects of impulsivity. These are labelled Urgency, (lack of) Premeditation, (lack of) Perseverance and Sensation Seeking (UPPS). The items representing these four factors were brought into a self-reported questionnaire: the UPPS impulsive behaviour scale [31]. In particular, urgency may be defined as the tendency to behave impulsively in the context of negative affect. Premeditation refers to thinking about the consequences of an act before engaging in that act. Perseverance is the ability to remain focused on a task that may be boring or difficult. Sensation seeking is firstly a tendency to enjoy and pursue activities that are exciting and secondly an openness to try new experiences.

Furthermore, in accordance with previous studies in related domains of constructive thinking (i.e. coping and emotion regulation), we could hypothesize that impulsivity dimensions (behavioral and trait) may be related to constructive thinking skills. Indeed, indirect evidences were provided by Krause-Utz et al. [33] who reported a stress-dependent increase state of impulsivity in adult women presenting borderline personality disorders compared to women not presenting borderline personality disorders with or without co-occurring attention-deficit/hyperactivity disorders. In another study, in both community adult samples and adult patients presenting anxiety or mood disorders, Weitzman et al. [34] reported that distress intolerance state and lack of access to different emotion regulation strategies are strongly related to urgency dimension (i.e. acting impulsively under negative affects). Nevertheless, the specific role of impulsivity in constructive thinking skills in a period of development marked by a high reactivity to stress and in a particularly high impulsivity state, namely adolescent patients with CD and/or SUD, has never been tested.

The Present Study

Regarding the lack of investigation about constructive thinking skills and its relationship with impulsivity in the literature, we conducted this exploratory study. Indeed, to the best of our knowledge, no studies have explored the main influence and the interaction of CD and SUD diagnoses on the different dimensions of constructive thinking abilities as well as the behavioral and personality dimensions of impulsivity. Secondly, the study aimed to explore the importance of the different impulsivity dimensions as explaining factors of constructive thinking as it also has never been tested previously in the population presenting CD and/or SUD.

Method

Ethical Consideration

Formal permission was obtained from the recruitment centres and the Juvenile Court (holders of the legal responsibility for the adolescents). In addition, written informed consent was obtained from each participant after providing them with a complete description of the study. The procedure was approved by the local university ethics committee.

Participants

71 adolescent males aged from 12 to 18 years were recruited in institutions for juvenile offenders and leisure centres. The exclusion criteria was: lifetime presence of psychotic disorders, insufficient reasoning ability assessed using the Raven Matrices test [35]. The conduct disorder (CD) dimension was assessed with the Pedersen questionnaire for CD [36], the same way it was successfully done in Pihet et al. [37]. The questionnaire has a cut-off allowing us to discriminate between youths with or without CD. In addition, the French short version of the Mini International Neuropsychiatric Interview, M.I.N.I [38], a structured diagnostic interview for the standardized investigation of Axis I diagnosis of DSM-IV [American Psychiatric Association, 39], was used to assess substance/alcohol dependency, as well as mood disorders (depression), self-injury and suicide attempts. In particular, regarding the SUD diagnosis, 56.7 % presented alcohol abuse and 43.7 % other drugs abuse, mainly cannabis. No differences were observed between the CD and non CD groups in these substance abuse rates, $\chi^2(1) = 1.87$ $p > .10$. In purpose of readability, four groups combining CD and SUD dimensions were composed to present the socio-demographic data in Table 1: (1) Adolescents presenting both diagnoses: CD and SUD (CD-SUD), (2) Adolescents presenting CD but not SUD (CD no SUD), (3) Adolescents presenting a SUD but not a CD (SUD no CD) and (4) Adolescents presenting neither CD nor SUD (no CD no SUD). 2 (CD or not CD) \times 2 (SUD or not SUD) analyses of variances (ANOVA) were computed on the age which revealed no differences. Chi square tests exploring the differences between CD, SUD or CDxSUD differences in the other sociodemographic data revealed a significant impact of SUD on depression rates ($\chi^2(1) = 11.92$, $p \leq .001$) and a CDxSUD effect on the suicide attempts rates ($\chi^2(1) = 6.65$, $p \leq .01$). Thus, these variables will be included as covariates in the subsequent analyses.

Table 1 Mean (and standard deviation) or percentage of the socio-demographic data of the diagnosis groups

	CD-SUD	CD no SUD	SUD no CD	No CD no SUD
	30	7	20	14
Age	15.8 (1.3)	16.9 (1.7)	15.7 (1.1)	15.7 (1.2)
Nationality: Swiss	43.3 %	42.9 %	70.0 %	42.9 %
Rates of depression	71.4 %	42.9 %	65.0 %	14.3 %
Suicide attempts	10.0 %	28.6 %	30.0 %	0 %
Self-injury	23.3 %	28.6 %	42.1 %	21.4 %

Measures

Daily Stress Coping

The constructive thinking inventory (CTI) includes 108 items [5]. It is scored on a five-point scale ranging from 1 (definitely false) to 5 (definitely true) reflecting both constructive and destructive automatic thoughts. In this study, a French version of the CTI [40] was used. It comprises of a global factor, *global constructive thinking* (Cronbach's $\alpha = 0.746$) considered as the main factor and six subscales: (a) *Emotional coping* (Cronbach's $\alpha = 0.808$): ability to not be too sensitive about disapproval, and to not take things too personally. People with a high emotional coping avoid negative thinking and experience therefore less distress. (b) *Behavioral coping* (Cronbach's $\alpha = 0.598$): a high score on this subscale refers to an active, optimistic and efficient approach to problem solving, resulting from a general capacity to focus energy on an instrumental behavior, facilitating action. (c) *Personal superstitious thinking* (Cronbach's $\alpha = 0.655$) refers to people that have strong personal beliefs, for instance not daring to talk about something they wish very strongly, because this could prevent it from happening. High scores on this scale can induce helplessness, depression and pessimism. (d) *Categorical thinking* (Cronbach's $\alpha = 0.606$) refers to people who believe in an extremely rigid way, which induces a tendency to be intolerant and judging. (e) *Esoteric thinking* (Cronbach's $\alpha = 0.820$): a high score on this subscale induces that most decisions are based upon intuitive impressions, and that there is an important absence of critical thinking.¹ (f) *Naive optimism* (Cronbach's $\alpha = 0.734$) refers to a tendency of gross optimistic over-generalization, including simplistic and stereotypical beliefs. All Cronbach's α reported are computed from the current sample.

Behavioral Impulsivity

The immediate and delayed memory tasks [IMT/DMT; 29] was used to measure attention and impulsive response style. The IMT/DMT is based on the continuous performance task, a computerized task in which the individual is asked to compare a given number with one presented previously and to click on the mouse button if the two numbers are identical. The IMT/DMT is composed of two conditions: the immediate memory task and the delayed memory task. Both conditions feature a series of five-digit numbers (e.g. 16752) displayed on a computer screen. The series of numbers presented is generated randomly. In the

¹ This subscale only appears in 2001 in the CTI manual (Epstein, 2001).

immediate memory task, the subject is asked to compare the five-digit number displayed on the screen with the one previously shown. The delayed memory task is similar to the Immediate one, except that a distracter (also a five-digit number: 12345) is presented three times in a row between the numbers to compare. The IMT and the DMT are presented alternately—the IMT first—in 2.5-min testing blocks that are repeated twice per testing session. There is a 30-second rest period between each testing block; therefore the test lasts 11.5 min. Two types of stimuli are considered: on the one hand, target stimuli, which are identical to the previous stimulus and to which the subject is supposed to respond; and on the other hand, catch stimuli, which are numbers differing by only one digit from the target stimulus.

The measures taken into account are the proportion of commission errors to correct detections, called *ratio*, which is considered as the primary dependent measure of an impulsive response to the tasks. It has the advantage of accounting for individual differences in attention or general performance ability [41]. Indeed, the correct detections rate, which represents the proportion of target stimuli that were clicked (in other words, the number of good answers) is considered to be a measure of sustained attention. The commission errors rate which is the proportion of catch stimuli that the subject clicked are considered as impulsive responses, because it is assumed that they result from a precipitated and incomplete processing of the stimulus.

Trait-Impulsivity

The UPPS impulsive behaviour scale is a self-report questionnaire that was developed by Whiteside and Lynam [31]. In this study, the French version of the UPPS [42] was used. The self-report is composed of 45 items, scored on a four-point scale ranging from 1 (total disagreement) to 4 (total agreement). Whiteside and Lynam [31] defined four distinct but related factors assessing different aspects of the concept. These were labelled Urgency (Cronbach's $\alpha = 0.759$), (lack of) Premeditation (Cronbach's $\alpha = 0.779$), (lack of) Perseverance (Cronbach's $\alpha = 0.771$) and Sensation Seeking (Cronbach's $\alpha = 0.760$). All Cronbach's α reported are computed from the current sample.

Data Analyses

Data were explored and revealed only one outlier for the Naive Optimism score of the CTI. Thus, this unique score was suppressed for the analyses. In addition, skewness and kurtosis were explored and Kolmogorov tests were performed revealing that the data suit normal distribution allowing for parametric testing.

First, we assessed the differences related to CD or SUD on the CTI and impulsivity dimensions. To do so, we computed 2 (CD or no CD) \times 2 (SUD or no SUD) analyses of variances (ANOVA) with the suicide attempts and depression rates as covariate (ANCOVA) as we reported differences above, on the CTI scores as well as on the behavioral- and trait-impulsivity scores.

Then, to explore which impulsivity dimension might explain daily stress coping, we computed hierarchical linear regression analyses on the scores of the CTI with the CD, SUD, suicide attempts and depression at the first step, and impulsivity (behavioral and trait) at the second step. First, we will report the whole analyses for the global constructive thinking score to illustrate in details the analyses. Then, for the subscores, we will report only the results of the second step as well as the R^2 changes as we are mainly interested in the relationship between impulsivity and CTI, after controlling for the factor at step 1.

Results

CD and SUD Differences

The Table 2 sums up the descriptive data of the measures.

The ANCOVA conducted on the CTI scores revealed only significant main effects of CD on the personal superstitious thinking score ($F(1, 68) = 4.76, p < .05$, partial $\eta^2 = .069$) and on Categorical Thinking score ($F(1, 68) = 4.552, p < .05$, partial $\eta^2 = .079$). The adolescents with CD reported higher scores than the youths without CD. The ANCOVA conducted on the UPPS scores revealed a significant main effect of CD on the Urgency score ($F(1, 68) = 10.15, p \leq .01$; partial $\eta^2 = .139$). Youths with CD present higher scores than youths without CD. The ANCOVA conducted on the IMT/DMT scores did not reveal any significant effect.

Hierarchical Regression Analyses

To illustrate the hierarchical regression analyses done on the CTI scores we reported in Table 3 the two-step model for the global constructive thinking score.

For the subsequent analyses on the subscores of the CTI we reported only the significant results of the hierarchical regression analyses. The emotional coping ($F(10, 66) = 2.48, p < .05, R^2$ change = 0.124, by lack of perseveration, $\beta = -0.310, p = .037$), behavioral coping ($F(10, 66) = 3.62, p \leq .001, R^2$ change = 0.361, by lack of perseveration, $\beta = -0.483, p < .001$), personal superstitious thinking ($F(10, 66) = 2.58, p < .05, R^2$ change = 0.124, by DMT ratio $\beta = 0.315, p = .019$), esoteric thinking ($F(10, 66) = 2.77, p < .01, R^2$ change = 0.190, by sensation seeking, $\beta = 0.388, p = .003$) are explained by the step 2 of the model.

Discussion

This study focused on the constructive thinking skills and impulsivity dimensions that discriminate adolescents with diagnoses of CD and/or SUD in comparison with high risk adolescents without CD or SUD. Due to its use of a high risk control group, our findings highlight finer differences compared with studies that used control groups consisting of adolescents from the general population. The results of the present study tend to show that specific patterns of constructive thinking and impulsivity dimensions are associated differently with diagnosis of CD and/or SUD. In addition, we explored the importance of impulsivity dimensions (trait and behavioral) on daily stress coping in such a high-risk group of adolescents.

Interestingly, adolescents with a CD diagnosis showed higher categorical thinking, more specifically a black-and-white thinking style and a personal superstitious thinking style. These results indicate a particular rigid thinking style, as well as a strong personal and formal superstitious belief. According to Epstein and Meier [5], these two dimensions refer to two core processes important to develop an accurate model of the world. Indeed, it allows an interpretation of the reality taking into account cognitive differentiation and veridical interpretation. Thus, if these two processes are weakened, active coping becomes non-adaptive and inefficient. So, adolescents with CD diagnosis, independently of SUD diagnoses, seem to be affected by emotionally stressful situations and their incapacity to manage these situations could be responsible for maladjustments. In particular, these

Table 2 Descriptive data

Dimensions	Measure	Scores	Groups			
			CD-SUD	CD no SUD	SUD no CD	No CD no SUD
Constructive thinking	CTI	Global constructive thinking	89.8 (13.6)	94.9 (10.4)	95.7 (10.4)	92.9 (10.4)
		Emotional coping	77.1 (14.6)	80.1 (11.5)	80.1 (12.1)	83.7 (10.4)
		Behavioral coping	46.3 (6.6)	48.4 (4.7)	48.7 (6.7)	45.4 (6.6)
		Personal superstitious thinking	22.2 (5.3)	21.1 (4.6)	18.5 (4.7)	19.1 (5.0)
		Categorical thinking	51.7 (8.3)	49.6 (5.8)	44.5 (7.6)	47.5 (5.6)
Behavioral impulsivity	IMT/DMT	Esoteric thinking	31.9 (11.9)	26.0 (6.8)	29.2 (7.2)	27.5 (8.2)
		Naive optimism	47.1 (9.4)	48.9 (6.4)	46.2 (7.6)	47.0 (8.4)
		IMT ratio	59.1 (19.8)	54.9 (24.0)	55.2 (24.0)	54.9 (14.4)
		DMT ratio	68.5 (35.7)	60.6 (29.5)	57.1 (29.5)	59.4 (30.3)
Trait-impulsivity	UPPS	Urgency	35.0 (5.7)	36.1 (4.0)	31.2 (5.8)	29.9 (4.5)
		Lack of premeditation	26.0 (5.6)	26.6 (5.7)	25.7 (6.1)	25.9 (3.7)
		Lack of perseveration	23.3 (5.0)	22.6 (2.1)	21.6 (4.6)	21.4 (4.8)
		Sensation seeking	37.1 (6.3)	36.3 (7.0)	39.0 (4.9)	35.6 (6.0)

Data are expressed in mean (standard deviation)

Table 3 Results of the hierarchical regression on the global constructive thinking skills

Step	Predictors	R^2	B	$SE B$	β	t	p
Step 1	CD	0.094	-2.39	1.34	-0.23	-1.78	0.080
	SUD		-0.66	1.58	-0.06	-0.42	0.678
	Depression rates		0.12	3.11	0.01	0.04	0.970
	Suicide attempts		-5.55	3.68	-0.20	-1.51	0.136
Step 2	CD	0.268	-1.09	1.40	-0.10	-0.78	0.439
	SUD		-0.74	1.55	-0.06	-0.48	0.635
	Depression rates		0.53	3.10	0.03	0.17	0.864
	Suicide attempts		-5.18	3.59	-0.18	-1.44	0.155
	Premeditation		0.19	0.27	0.10	0.69	0.494
	Sensation		0.13	0.24	0.07	0.54	0.593
	Urgency		-0.27	0.28	-0.14	-0.98	0.333
	Perseveration		-0.87	0.34	-0.38	-2.53	0.014
	IMT Ratio		0.06	0.08	0.10	0.72	0.472
	DMT Ratio		-0.03	0.05	-0.07	-0.52	0.607

adolescents seems to be characterized by a tendency to think in a rather polarized and rigid manner and to base their interpretation of the world on strong superstitious beliefs, which in turn diminishes their ability to devise efficient strategies of handling stressful situations. More generally, according to the cognitive-experiential self-theory [4, 8], one analyses pathway is the experiential-intuitive which is considered to be preconscious, holistic, automatic, affective and resistant to change. Within this context, new experiences are automatically associated with similar experiences from the past (schemata from emotional past experience). Taking together with our results, it seems that CD as a more deep influence on such mechanisms influencing the interaction with the surrounding social world. In contrast, SUD when controlled for CD influence did not seem to have so a deep impact on experiential system.

Additionally, adolescents with CD diagnoses showed higher urgency traits (i.e. tendency to frequently experience strong impulses under conditions of negative affect). The role of impulsivity on this specific diagnosis has already been supported by previous studies [21–23]. Thus, our study revealed that the main influencing factors is the presence or not of CD and not essentially an additional SUD diagnosis also on impulsive personality trait. This confirm the lack of impact of CD-SUD interaction on impulsivity observed by another study [26].

Regarding the role of impulsivity in daily stress management, we observed that impulsivity in this personality as well as behavioral aspects is closely related to constructive thinking skills. These results were expected as it is consistent with previous studies examining this link in other psychopathologies [33, 34]. However, what we add to this knowledge is which subtypes of constructive thinking skills are related to specific dimensions of impulsivity in adolescents with CD and/or SUD. In particular, results showed that perseveration style referring to an individual's ability to remain focused on a task help the individual to cope daily difficulties without experiencing too much stress (constructive thinking skill). More specifically, the ability to remain focused on a task (perseveration) conducted to an active, optimistic and efficient approach to problem

solving, resulting from a general capacity to focus energy in a goal-oriented behavior (behavioral coping) as well as make the individual not too sensitive about disapproval in such the individual will take things not too personally (emotional coping). Furthermore, the tendency to enjoy and pursue activities that are exciting or an openness to try new experiences that may or may not be dangerous (sensation seeking) lead to decisions based upon intuitive impressions and absence of critical thinking (esoteric thinking). Finally, behavioral impulsivity or a lack of sustained attention (i.e. poor behavioral self-control responses) makes the people to adopt strong personal beliefs (personal superstitious thinking), for instance not daring to talk about something they wish very strongly, because this could prevent it from happening. Such attitude could lead to helplessness, depression or pessimism. Thus, one could observe that the different dimensions of impulsivity in its behavioral and personality dimensions are closely related to the skills that allow us to face daily problems without experiencing too much stress.

Some limitations of our study need to be considered. Firstly, the cross-sectional design of the study precludes ascertaining as to whether the observed deficits are antecedents of CD and SUD or are concomitants, as well as clarifying the causal relations between impulsivity and coping. Secondly, attention deficit with/without hyperactivity disorder (ADHD), which is known to have high comorbidity rates with CD [43], and to be more frequent in youths with a dual diagnosis of SUD and CD than in youths with a single diagnosis [44], have not been controlled in the present study. Thirdly, the present study was conducted in a sample composed exclusively of boys, which hampers the generalization of its findings to girls, as it has been evidenced that gender is differently associated to CD and/or SUD [45]. Fourthly, the use of a self-report questionnaire to define the CD is a limitation. Further studies might use diagnostic semi-structured interview like the Kiddie-SADS-Present and Lifetime Version [46] to provide a better measure of the CD diagnosis.

To sum up, we reported that a CD diagnosis, independently from SUD, is associated with higher tendency to experience strong impulses and a black-and-white style as well as a superstitious thinking. Thus, adolescents with CD diagnoses seem to have a particularly dysfunctional coping style to face daily stress which could be related to an impulsive personality-trait as we observed that personality-trait impulsivity (mainly perseveration) is associated with the ability to face daily difficulties without experiencing too much stress.

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Conflict of interest Authors have no conflicts of interest.

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Sébastien Urben, Ph.D is at the head of “Adolescent” sector at the Unit Research of the University Service of Child and Adolescent Psychiatry, Centre Hospitalier Universitaire Vaudois (CHUV), Lausanne, Switzerland.

Maya Suter, M.Sc is a Ph.D student at the Unit Research of the University Service of Child and Adolescent Psychiatry, Centre Hospitalier Universitaire Vaudois (CHUV), Lausanne, Switzerland.

Sandrine Pihet, Ph.D is now professor at the School of Nursing, University of Applied Sciences and Art of Western Switzerland, Fribourg, Switzerland.

Claudi Straccia, Ph.D is now working at the Geneva University.

Philippe Stéphan, M.D, P.D is a senior psychiatrist in the head of several units of the University Service of Child and Adolescent Psychiatry, Centre Hospitalier Universitaire Vaudois (CHUV), Lausanne, Switzerland.