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Impulsivity and Intrusive Thoughts: Related Manifestations of Self-Control Difficulties?

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Abstract Impulsive behaviors and intrusive thoughts are prominent in psychopathology. Two studies were conducted to explore their relationships. In Study 1, 250 participants completed the UPPS Impulsive Behavior Scale and the Thought Control Ability Questionnaire (TCAQ). In Study 2 involving a sample of 97 female students, the relations between impulsivity and different types of thought control difficulties were examined. Both negative urgency and lack of perseverance were significantly related to the tendency to experience intrusive thoughts as measured by the TCAQ, the Penn State Worry Questionnaire, the obsessing subscale of the Obsessive–Compulsive Inventory-Revised, and an intrusion subscale of the White Bear Suppression Inventory. Regression analyses revealed that negative urgency and lack of perseverance independently contributed to worries and thought control difficulties and that negative urgency was the strongest predictor of all types of intrusions. On the basis of these findings, the authors discuss cognitive processes and content that may be related the different facets of impulsivity.

Keywords Impulsivity · Thought suppression · Intrusion · Worry · Self-control

Introduction

Self-control can broadly be defined as the ability to regulate one's thoughts, emotions, impulses, and behavior (Baumeister and Vohs 2007). Difficulties with self-control are a typical feature of individuals showing a high level of impulsivity (Whiteside and Lynam 2001). These difficulties comprise cognitive distractibility, emotional instability, and behavior that is poorly conceived, prematurely expressed, unduly risky, or inappropriate to the situation and often resulting in undesirable outcomes (Daruna and Barnes 1993; Evenden 1999). Impulsivity-driven self-regulation problems have been associated with a wide range of problematic behaviors and pathological states, such as borderline personality disorder (Miller et al. 2003; Whiteside and Lynam 2001; Whiteside et al. 2005), risky behaviors (Cyders et al. 2007; Miller et al. 2003; Smith et al. 2007), craving for alcohol (Cyders et al. 2007) and tobacco (Billieux et al. 2007), and obsessive–compulsive disorder (OCD) (Ettelt et al. 2007; Li and Chen 2007).

Intrusive thoughts are also typically viewed as an expression of lack in self-control (Baumeister and Vohs 2007). Intrusions can be defined in terms of processes (unintended, difficult to control, often interrupting the ongoing activity) and content (generally associated with negative affect) (Clark and Purdon 1995). For example, even if worries and obsessions share some similarities, these two types of unwanted intrusive thoughts may be distinguished both in terms of processes (e.g., when compared with worries, obsessions are more spontaneous, quick and unwanted) and content (e.g., when compared with obsessions, worries are more ego-syntonic and related to everyday life concerns) (Clark and Rhyno 2005; Julien et al. 2007; Langlois et al. 2000; Turner et al. 1992; Wells and Morrison 1994). The experience of unwanted intrusive

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thoughts represents a common thread running through a large number of psychopathological states, for example, anxiety disorders (e.g., generalized anxiety disorder, specific phobia, OCD, post-traumatic stress disorder), insomnia, and some forms of depression and psychotic states (Clark and Rhyno 2005; Julien et al. 2007; Nolen-Hoeksema 2000; Rassin 2005).

Despite the evident commonalities between impulsivity and intrusive thoughts, their mutual relations have rarely been examined in previous research, and the few studies that have done so produced somewhat equivocal evidence. Nagtegaal and Rassin (2004), for example, examined the relations between impulsivity, thought suppression and intrusions in a Dutch student sample. In order to capture a wide range of impulsivity-related traits, these authors used three different measures: a preliminary version of the 11th revision of the Barratt Impulsiveness Scale (BIS-11a, Barratt 1994), the clinical scale Hypomania from the Minnesota Multiphasic Personality Inventory-2 (MMPI-2, Butcher et al. 1989), and three subscales (impulsiveness, risk-taking, and sensation-seeking) from the Eysenck Personality Profiler (EPP, Eysenck et al. 1996). Thought suppression and intrusions were evaluated by means of the Dutch version of the White Bear Suppression Inventory (WBSI, Wegner and Zanakos 1994), which falls into a “thought suppression” and an “unwanted intrusive thoughts” subscale (Muris et al. 1996; Rassin 2003). Contrary to expectations, the authors did not find any significant relations between the different measures of impulsivity, thought suppression, and intrusions.

More recently, Aidman and Kollaras-Mitsinikos (2006) conducted a study with a sample of outpatients from a trauma unit and found a positive correlation between the impulsiveness score of the I₇ Impulsiveness–Venturesomeness–Empathy questionnaire (Eysenck et al. 1985) and post-traumatic stress intrusion symptoms but not avoidance symptoms as measured by the Impact of Event Scale (Horowitz et al. 1979). In a study involving OCD patients, Ettelt et al. (2007) also obtained evidence for a link between impulsivity and specific types of intrusive thoughts: Cognitive impulsiveness, as measured by the latest version of the BIS-11 (Patton et al. 1995), turned out to be positively correlated with aggressive thoughts, aggressive impulses, and checking symptoms as assessed by the Padua Inventory (Sanavio 1988). Finally, in a study involving a large non-clinical sample of adolescents, Li and Chen (2007) found that the Maudsley Obsessive–Compulsive Inventory (Hodgson and Rachman 1977) factor “doubt and intrusive thoughts” correlated positively with the Chinese BIS-11 factor “lack of perseverance and self-control”, whereas the factors “inability to plan and look ahead” and “novelty-seeking and acting without thinking” were unrelated to the occurrence of intrusive thoughts. When conducting separate

analyses for men and women, it turned out that the association between lack of perseverance and intrusive thoughts only held for the former.

One reason for the complexity of the overall picture of results certainly resides in the fact that the umbrella term of “impulsivity” refers to various facets of personality and processes that are distinctly related to intrusive thoughts. A further complication arises from the fact that the mentioned studies all employed traditional measures of impulsivity, which capture the different facets of this construct in partly inconsistent ways. In an attempt to develop a comprehensive model of impulsivity that allows to overcome inconsistencies between existing approaches, Whiteside and Lynam (2001) devised the UPPS Impulsive Behavior Scale which measures four dimensions of impulsivity: (1) negative urgency, defined as the tendency to act rashly, especially in situations of intense negative affect; (2) premeditation, defined as the tendency to plan and to consider the consequences of an act before engaging in it; (3) perseverance, defined as the ability to remain focused on a task that may be boring or difficult; and (4) sensation seeking, defined as the tendency to enjoy and pursue activities that are exciting, and openness to trying new experiences.

Using the UPPS approach to impulsivity, recent studies have provided some evidence for links between negative urgency, lack of perseverance, and intrusive thoughts. In an adolescent sample, d’Acromont and Van der Linden (2007) showed that inappropriate emotion regulation strategies such as rumination and self-blame were correlated with negative urgency. In an investigation of sleep disturbances in a student population, Schmidt et al. (2008b) found that negative urgency and lack of perseverance were related to insomnia severity. Critically, however, only negative urgency was associated with the frequency of intrusive thoughts and images during the presleep period. A mediation analysis revealed that the effect of negative urgency on insomnia severity was partially mediated by the experience of intrusions when trying to fall asleep. These results have been replicated with bedtime counterfactual thoughts such as regrets, shame or guilt (Schmidt and Van der Linden 2009). In another study (Schmidt et al. 2010), both lack of perseverance and negative urgency related to the thought-control strategies of worry and thought suppression, which mediated the effects of these two facets of impulsivity on sleep problems. More directly related to the present study, an investigation of obsessive and compulsive tendencies in a student population (Zermatten and Van der Linden 2008) found that both negative urgency and lack of perseverance were linked to obsessive thoughts. Finally, in yet another study, lower perseverance was related to higher proneness toward mind-wandering as assessed by the number of prompted task-unrelated thoughts during a 9-min task (Gay et al. 2008b).

Here we report the results of two studies that were conducted to more precisely explore the relations between the different facets of impulsivity and clinically relevant forms of intrusive thoughts. In light of the previously reviewed literature, our general hypothesis was that two facets of impulsivity, namely, negative urgency and lack of perseverance, would be specifically related to clinically relevant forms of intrusive thoughts. Both impulsivity (e.g., Gay et al. 2008b) and intrusive thoughts (e.g., Friedman and Miyake 2004) are hypothesized to reflect poor executive control (e.g., weak inhibition). A better understanding of the relations between impulsivity and intrusions is of particular interest given the great number of psychopathological states that include one or both of these aspects of self-control problems. More precisely, it is important to better understand the degree to which impulsive behavior may entail intrusive thoughts about one's own lack of control, and, conversely, the degree to which intrusions may fuel impulsive behavior.

Study 1

The first study sought to explore the relations between the different facets of impulsivity and perceived ability to control unwanted, intrusive thoughts. To this end, the UPPS Impulsive Behavior Scale (Whiteside and Lynam 2001) and the Thought Control Ability Questionnaire (TCAQ, Luciano et al. 2005) were administered to a student sample. The TCAQ has a clear and valid one-dimensional structure and captures previously neglected aspects of mental control that are involved in a number of psychopathological symptoms.

Method

Participants

Two hundred and fifty first-year students (168 women and 81 men, one participant did not report gender) from the Faculties of Economics and Social Sciences and of Psychology and Educational Sciences at the University of Geneva completed the questionnaires described hereafter. Their mean age was 23.52 years ($SD = 5.82$; range = 16–49; 4 participants did not report their age).

Measures

UPPS Impulsive Behavior Scale (Whiteside and Lynam 2001; French Version: Van der Linden et al. 2006)

This questionnaire contains 45 items that are rated on a 4-point Likert scale ranging from 1 (*agree strongly*) to 4

(*disagree strongly*). The UPPS comprises four subscales corresponding to the four distinct, yet related, facets of impulsivity as defined by Whiteside and Lynam: (1) negative urgency (12 items; e.g., “When I feel rejected, I will often say things I later regret”); (2) lack of premeditation (11 items; e.g., “I usually make up my mind through careful reasoning”); (3) lack of perseverance (10 items; e.g., “I finish what I start”); and (4) sensation seeking (12 items; e.g., “I’ll try anything once”). For each facet, higher scores indicate a higher level of impulsivity.

Thought Control Ability Questionnaire (TCAQ, Luciano et al. 2005; French Version: Gay et al. 2008a)

This one-dimensional questionnaire contains 25 items (e.g., “It is very easy for me to stop having certain thoughts”; “I manage to have control over my thoughts even when under stress”). They are answered on a 5-point Likert scale ranging from A (*strongly disagree* = 1) to E (*strongly agree* = 5). Higher scores reflect better perceived control over thoughts and emotions. The French version of the TCAQ (which possesses good internal consistency, high reliability, and fits with a one-dimensional model of thought control ability) consists of only 23 items because two original items that capture “action control” (rather than thought control) proved psychometrically problematic.

Results

Cronbach's alpha coefficients were .82 for negative urgency, .85 for lack of premeditation, .83 for lack of perseverance, .84 for sensation seeking, and .91 for the TCAQ. Pearson correlations between the four facets of impulsivity and perceived thought control ability are reported in Table 1, for both genders combined, as well as for each of them separately. When considering the whole sample ($N = 250$), thought control ability was, as predicted, negatively related to two facets of impulsivity, namely, negative urgency and lack of perseverance: The coefficients indicate a large correlation for negative urgency and a smaller but significant correlation for lack of perseverance. Unexpectedly, sensation seeking was positively related to thought control ability. In contrast, lack of premeditation was not related to mental control ability. These results corroborate previous findings suggesting that impulsivity is associated with difficulties in controlling unwanted, intrusive thoughts (e.g., Aidman and Kollaras-Mitsinikos 2006; Li and Chen 2007; Schmidt et al. 2008b; Schmidt and Van der Linden 2009). More specifically, our findings indicate, in accord with Schmidt et al. (2010), that two facets of impulsivity (negative urgency and lack of perseverance) are associated with thought-control difficulties, whereas this is

Table 1 Pearson's correlations between the TCAQ and UPPS scales

		Facets of impulsivity			
		Urgency	Lack of premeditation	Lack of perseverance	Sensation seeking
TCAQ	All ($N = 250$)	-.53 ^a (-.61 -.43)	.03 (-.10 .15)	-.20 ^a (-.32 -.08)	.27 ^a (.15 .38)
TCAQ	Males ($n = 81$)	-.49 ^a (-.64 -.31)	.05 (-.17 .27)	-.13 (-.34 .09)	.19 (-.03 .39)
TCAQ	Females ($n = 168$)	-.51 ^a (-.61 -.39)	.05 (-.10 .20)	-.28 ^a (-.42 -.14)	.20 ^a (.05 .34)

Note. TCAQ = Thought Control Ability Questionnaire

^a 0 Not included in the 95% confidence interval

not the case of the two other facets of impulsivity (lack of premeditation and sensation seeking). In fact, sensation seeking seems to be related to better thought-control ability.

Separate analyses for men ($n = 81$) and women ($n = 168$) revealed that for the former, only negative urgency was related to thought-control ability; for the latter, all three mentioned relations remained significant, the link with lack of perseverance being even stronger than it was in the whole sample. Thus, contrary to the results obtained by Li and Chen (2007) showing that the relation between lack of perseverance and intrusive thoughts only held for men, the association between thought-control ability and lack of perseverance was significant only for women. This difference may be due to age differences (Li and Cheng's participants were 17 years old), cultural differences, or the use of different questionnaires to assess impulsivity and intrusive thoughts. Specifically, lack of perseverance as assessed by the UPPS may be more closely related to intrusive thoughts in women because women have generally been found to be more concerned about their performance (e.g., Huan et al. 2008) and may therefore experience more intrusions about unfinished tasks than do men. Alternatively, the difference between men and women in our study may be due to the different size of the subsamples (81 men vs. 168 women).

In sum, the findings from Study 1 suggest that negative urgency and, to a lesser degree, lack of perseverance are associated with difficulties in controlling unwanted, intrusive thoughts. Furthermore, the results indicate that the ties between lack of perseverance and thought-control ability are closer for women than for men.

Study 2

The aim of the second study was to better understand the relationships between different forms of intrusive thoughts (e.g., presence of worries, obsessions), suppression attempts, and the four facets of impulsivity. Obsessions are often viewed as an extreme variant of unwanted intrusive thoughts. When compared with the more ubiquitous experience of worrying, which essentially involves anxious

repetitive thoughts about possible future threats, obsessions have been described as being more frequent, interfering, distressing and uncontrollable, as well as eliciting stronger resistance and more feelings of guilt (Clark and Rhyno 2005). Interestingly, in a direct comparison of these two types of intrusions in a student sample, Wells and Morrison (1994) reported that worries and obsessions did not differ in the extent to which they were resisted, in the degree of intrusiveness, or in perceived uncontrollability. However, when compared with worries, obsessions were rated as being shorter in duration, more involuntary, involving predominantly imagery rather than verbal material and, astonishingly, a less pronounced compulsion to act. Langlois et al. (2000) also found that worries and obsessions elicited the same degree of resistance and that, by comparison, obsessions were of shorter duration, more unwanted, less interfering, and more often experienced as images rather than in verbal form. Moreover, obsessions were comparatively more egodystonic and less frequent. However, when frequency was controlled for, obsessions and worries did not differ in terms of intrusiveness, attention/distraction, control, resistance, and disapproval.

According to Whiteside and Lynam (2001, p. 685), negative urgency refers to weak self-control in the sense of difficulties in resisting things we do not want to do (related to impulsiveness as defined by Costa and McCrae 1992), whereas lack of perseverance reflects weak self-control in the sense of difficulties in doing things we really want to do (related to auto-discipline as defined by Costa and McCrae). This difference informed our hypotheses regarding the relations between impulsivity and different types of intrusive thoughts. Specifically, we surmised that the egodystonic nature of obsessions, which clearly distinguishes them from worries (e.g., Langlois et al. 2000), would relate to problems of “resisting to do unwanted things” behind the construct of negative urgency. In contrast, we predicted that worries would relate to both negative urgency (worries about unwanted outcomes) and lack of perseverance (worries about unattained outcomes). Finally, in view of previous findings relating thought suppression to worry and obsession (for reviews, see Rassin 2005; Wenzlaff and Wegner 2000) but not to self-report

measures of impulsivity (Nagtegaal and Rassin 2004), thought suppression tendencies were also included in this second study to examine the links between this mental control technique, the four facets of impulsivity, and the different measures of intrusive thoughts.

Only women took part in the second study because we wanted to control for gender effects and because the relations between lack of perseverance and unwanted intrusive thoughts may be closer in women than they are in men. Indeed, men and women have been shown to differ in terms of unwanted intrusive thoughts (e.g., Gay et al. 2008a; Nolen-Hoeksema and Corte 2007) and impulsivity (e.g., Billieux et al. 2008; Schmidt et al. 2008a; Van der Linden et al. 2006; Waldeck and Miller 1997).

Method

Participants

Ninety-seven women enrolled in the first year of psychology at the University of Geneva, aged 17–43 ($M = 21.38$; $SD = 4.28$; one woman did not indicate her age), completed the questionnaires described hereafter.

Measures

TCAQ and UPPS

These two questionnaires were described earlier.

Penn State Worry Questionnaire (PSWQ, Meyer et al. 1990; French Version: Gosselin et al. 2001)

This one-dimensional questionnaire contains 16 items assessing proneness to (pathological) worry. Answers are given on a 5-point Likert scale ranging from 1 (*not at all typical of me*) to 5 (*very typical of me*). Higher scores indicate higher trait worry.

The Obsessive–Compulsive Inventory—Revised (OCI-R, Foa et al. 2002; French Version: Zermatten et al. 2006)

This questionnaire contains 18 items assessing the severity of different OCD symptoms. The OCI-R is composed of six subscales, each containing three items and showing good psychometric properties in clinical and non-clinical samples. Only the total score and the subscale score for “Obsessing” are reported here. Participants are asked to indicate on a 5-point Likert scale ranging from 0 (*not at all*) to 4 (*extremely*) to what extent the experience described in each statement has bothered or distressed them

during the past month. Higher scores reflect more pronounced OCD symptoms.

White Bear Suppression Inventory (WBSI, Wegner and Zanakos 1994; French Version: Schmidt et al. 2009a)

This questionnaire contains 15 items (e.g., “There are things I prefer not to think about”; “My thoughts frequently return to one idea”) that were originally developed to evaluate chronic thought suppression. However, a recent review article including a validation study on a French version of the WBSI (Schmidt et al. 2009a) has clearly suggested that this instrument captures two distinct dimensions: suppression proneness and intrusion susceptibility. In the present study, we report suppression and intrusion subscale scores as suggested by several authors, as well as the total score for the sake of comparison with previous studies. The French WBSI comprises 6 items for each dimension. Answers are given on a 5-point Likert scale ranging from A (*strongly disagree*) to E (*strongly agree*). Higher scores on the suppression factor indicate more suppression efforts, and higher scores on the intrusion factor indicate more intrusive thoughts.

Results

Correlation Analyses

Mean scores, standard deviations, Cronbach’s alpha coefficients and correlations for all variables are reported in Table 2. As expected, two facets of impulsivity, namely, negative urgency and lack of perseverance, were significantly related to all variables assessing thought-control difficulties (TCAQ, WBSI Intrusion, PSWQ, and OCI-R Obsessing). In contrast, lack of premeditation was not associated with any of these variables. A closer look at the results revealed that negative urgency and lack of perseverance were similarly related to worry, but that the correlation coefficients for negative urgency and the other variables (TCAQ, WBSI Intrusion, and OCI-R Obsession) were about twice as high as the corresponding indices for lack of perseverance. Using the method for comparing correlations described by Meng et al. (1992), only the correlation between WBSI Intrusion and negative urgency tested against the correlation between WBSI Intrusion and lack of perseverance reached significance ($Z = 2.30$, $P < .05$). The correlation with the TCAQ was marginally higher for negative urgency than it was for lack of perseverance ($Z = 1.96$, $P = .05$), and the corresponding difference for obsessions also reached marginal significance ($Z = 1.86$, $P = .06$). Sensation seeking was negatively related to worry, but it was not significantly related to

Table 2 Pearson's correlations, means, and standard deviations for main variables of study 2

	UPPS			WBSI			PSWQ			OCI-R			TCAQ		
	1	2	3	4	5	6	7	8	9	10	11				
1. Urgency	-	.22 ^a (.03 .41)	.34 ^a (.15 .50)	.04 (-.17 .23)	.28 ^a (.09 .46)	.47 ^a (.30 .61)	.02 (-.18 .22)	.32 ^a (.13 .49)	.30 ^a (.11 .47)	.47 ^a (.30 .61)	.47 ^a (.30 .61)	.47 ^a (.30 .61)	.47 ^a (.30 .61)	.47 ^a (.30 .61)	.47 ^a (.30 .61)
2. LackPREM		-	.34 ^a (.15 .51)	.27 ^a (.07 .44)	-.13 (-.33 .07)	-.09 (-.29 .11)	-.14 (-.33 .06)	-.14 (-.33 .06)	-.31 ^a (-.48 -.12)	-.05 (-.25 .15)	-.05 (-.25 .15)	-.05 (-.25 .15)	-.05 (-.25 .15)	-.05 (-.25 .15)	-.05 (-.25 .15)
3. LackPERS			-	-.09 (-.28 .12)	.16 (-.04 .35)	.22 ^a (.03 .41)	.05 (-.15 .25)	.28 ^a (.08 .45)	-.03 (-.23 .17)	.27 ^a (.08 .45)	.27 ^a (.08 .45)	.27 ^a (.08 .45)	.27 ^a (.08 .45)	.27 ^a (.08 .45)	.27 ^a (.08 .45)
4. SenSeek				-	-.21 ^a (-.40 -.01)	-.13 (-.32 .07)	-.24 ^a (-.42 -.04)	-.34 ^a (-.50 -.15)	-.18 (-.37 .02)	-.12 (-.31 .09)	-.12 (-.31 .09)	-.12 (-.31 .09)	-.12 (-.31 .09)	-.12 (-.31 .09)	-.12 (-.31 .09)
5. Total score					-	.86 ^a (.80 .90)	.87 ^a (.81 .91)	.52 ^a (.36 .65)	.40 ^a (.22 .56)	.55 ^a (.40 .68)	.55 ^a (.40 .68)	.55 ^a (.40 .68)	.55 ^a (.40 .68)	.55 ^a (.40 .68)	.55 ^a (.40 .68)
6. Intrusions						-	.49 ^a (.32 .63)	.60 ^a (.45 .71)	.44 ^a (.26 .59)	.68 ^a (.55 .77)	.68 ^a (.55 .77)	.68 ^a (.55 .77)	.68 ^a (.55 .77)	.68 ^a (.55 .77)	.68 ^a (.55 .77)
7. Suppression							-	.30 ^a (.11 .47)	.25 ^a (.06 .43)	.28 ^a (.09 .46)	.28 ^a (.09 .46)	.28 ^a (.09 .46)	.28 ^a (.09 .46)	.28 ^a (.09 .46)	.28 ^a (.09 .46)
8. Worry								-	.43 ^a (.25 .58)	.56 ^a (.40 .68)	.56 ^a (.40 .68)	.56 ^a (.40 .68)	.56 ^a (.40 .68)	.56 ^a (.40 .68)	.56 ^a (.40 .68)
9. Total score									-	.68 ^a (.56 .77)	.68 ^a (.56 .77)	.68 ^a (.56 .77)	.68 ^a (.56 .77)	.68 ^a (.56 .77)	.68 ^a (.56 .77)
10. Obsessing										-	-	-	-	-	-
11. Thought control ability															
Mean	29.35	21.57	19.46	29.80	41.30	21.82	19.48	49.23	19.40	3.91	67.38	67.38	67.38	67.38	67.38
SD	6.30	5.31	4.47	6.93	8.77	5.03	5.13	10.57	10.36	2.65	15.07	15.07	15.07	15.07	15.07
α	.84	.88	.80	.82	.85	.81	.80	.90	.87	.80	.92	.92	.92	.92	.92

Note. LackPREM, lack of premeditation; LackPERS, lack of perseverance; SenSeek, sensation seeking; TCAQ, Thought Control Ability Questionnaire; WBSI, White Bear Suppression Inventory; PSWQ, Penn State Worry Questionnaire; OCI-R, Obsessive-Compulsive Inventory—Revised

^a 0 Not included in the 95% confidence interval

thought-control ability as it had been in the first study. However, higher sensation seeking was associated with fewer suppression attempts. Suppression proneness was also related to all intrusive thought variables. Finally, the TCAQ and the WBSI-intrusion correlated in comparable ways with obsessions and worry.

Regression Analyses

Multiple regression analyses were computed to find out which facets of impulsivity best predicted the different kinds of thought control difficulties. In five different analyses, the four facets of impulsivity were entered as predictors of (1) the TCAQ, (2) the PSWQ, (3) the Obsessing subscale of the OCI-R, (4) the Intrusion subscale of the WBSI, and (5) the Suppression subscale of the WBSI (Table 3). No multicollinearity problems were found since the variance inflation factors varied from 1.123 to 1.281.

Lack of perseverance and negative urgency independently predicted TCAQ thought-control ability and PSWQ worries. However, negative urgency was the best predictor

of all measures assessing intrusive thoughts, and lack of perseverance was only a marginal predictor of OCI obsessions and did not predict WBSI intrusions, suggesting that negative urgency is more closely related to these types of unwanted intrusive thoughts. Interestingly, the two other facets of impulsivity showed opposite relations with intrusive thoughts: Lack of premeditation predicted fewer worries, obsessions, and intrusions. In a similar vein, sensation seeking predicted fewer worries, and marginally fewer thought suppression attempts. Finally, the adjusted *R*-square revealed that among the instruments assessing intrusive thoughts, the TCAQ showed the highest percentage of variance that could be explained by impulsivity.

General Discussion

Astonishingly, the relations between two realms of self-control difficulties, impulsivity and intrusive thoughts, have received little attention in previous research. The present study attempted to clarify these relations in light of

Table 3 Standardized and non-standardized regression coefficients for the four subscales of impulsivity regressed on each scale assessing thought control difficulties

Dependent variables	Predictor variables	<i>B</i>	SE <i>B</i>	β	<i>t</i>	<i>P</i>	Adjusted <i>R</i> ²
TCAQ	(Intercept)	101.26	9.19	–	11.02	<.001	.32
	Urgency	–1.18	.22	–.49	–5.47	<.001	
	LackPREM	.21	.27	.07	.78	.44	
	LackPERS	–.65	.32	–.19	–2.01	<.05	
	SenSeek	.29	.19	.13	1.51	.13	
PSWQ (worry)	(Intercept)	45.51	6.76	–	6.73	<.001	.25
	Urgency	.51	.16	.30	3.21	<.01	
	LackPREM	–.42	.20	–.21	–2.09	<.05	
	LackPERS	.52	.24	.22	2.22	<.05	
	SenSeek	–.42	.14	–.27	–2.93	<.01	
OCI-R obsessing	(Intercept)	–.96	1.70	–	–.56	.58	.25
	Urgency	.19	.04	.45	4.78	<.001	
	LackPREM	–.10	.05	–.20	–2.01	<.05	
	LackPERS	.11	.06	.19	1.86	.07	
	SenSeek	–.02	.04	–.06	–.66	.51	
WBSI-intrusion	(Intercept)	13.86	3.21	–	4.32	<.001	.25
	Urgency	.38	.08	.48	5.06	<.001	
	LackPREM	–.21	.09	–.23	–2.27	<.05	
	LackPERS	.15	.11	.14	1.36	.18	
	SenSeek	–.05	.07	–.07	–.77	.44	
WBSI-suppression	(Intercept)	24.19	3.73	–	6.48	<.001	.03
	Urgency	.03	.09	.04	.34	.73	
	LackPREM	–.11	.11	–.11	–.99	.32	
	LackPERS	.07	.13	.06	.51	.61	
	SenSeek	–.15	.08	–.21	–1.93	.06	

Note. See Table 2 for abbreviations

a recently proposed comprehensive conceptualization of impulsivity (Whiteside and Lynam 2001). The main findings were that two facets of impulsivity, lack of perseverance and especially negative urgency, were associated with a wide range of measures of intrusive thoughts, whereas lack of premeditation and sensation seeking were not. Regression analyses revealed that the two facets of impulsivity independently predicted worries (as assessed by the PSWQ) and general thought control difficulties (as assessed by the TCAQ), whereas negative urgency showed comparatively stronger associations with intrusive thoughts (as assessed by the WBSI) and obsessions (as assessed by the subscale of the OCI-R). In contrast, higher scores on the two other facets of impulsivity, lack of premeditation and sensation seeking, did not generally predict any mental self-control problems, except for a few cases where they predicted *lower* levels of intrusions. These results suggest that some facets of impulsivity may weaken thought-control ability, whereas others may be neutral or at least less dysfunctional for thought control.

The present study may help to figure out why intrusive thoughts show comparatively closer ties with negative urgency and may help to disentangle the self-control difficulties related to negative urgency versus lack of perseverance. Correlation analyses revealed that negative urgency and lack of perseverance were similarly related to worries, but that the links between negative urgency and the other variables assessing intrusive thoughts (TCAQ, WBSI Intrusion, and OCI-R Obsession) were about twice as high as the corresponding indices for lack of perseverance. In multiple regression analyses, the effects of negative urgency and lack of perseverance on general thought control ability and worries were independent, whereas negative urgency was the only facet to predict obsessions and WBSI intrusions. Negative urgency may be more closely related to OCI-R obsessions because the items of this OCI-R subscale essentially assess unwanted, egodystonic, unpleasant, unhealthy, and uncontrollable thoughts. A detailed content analysis—not reported in the results section for brevity—also revealed that negative urgency showed particularly high correlations with WBSI intrusion items that evaluate crowded thoughts (always returning to one idea) and racing thoughts (rapidly succeeding ideas) (for the phenomenology of crowded and racing thoughts, see Piguet et al. 2009). In contrast, the PSWQ may capture intrusions associated with lack of perseverance such as everyday worries related to “time pressure” and (un)completed tasks.

Interestingly, within the TCAQ, negative urgency correlated more strongly with items assessing self-control in emotional situations and with items capturing longer duration of intrusive cognitions. Given the above mentioned differences between obsessions and worries (Clark and

Rhyno 2005; Julien et al. 2007; Langlois et al. 2000; Turner et al. 1992; Wells and Morrison 1994), negative urgency may relate to characteristics of obsessions such as intrusions that are more unwanted, egodystonic, and more image-like. Moreover, negative urgency may relate to characteristics of worries such as higher frequency and longer duration, accompanied by a more pronounced compulsion to act. Our finding that negative urgency was more closely associated with obsessions than with worries may be tentatively explained by the fact that rash behavior entails obsession-like counterfactual thoughts about one’s own behavior (cf. Schmidt and Van der Linden 2009), whereas worries might be only one among several factors that are susceptible to unleash rash behavior. Regarding lack of perseverance, it may relate to obsessions that are shorter and easier to control and to worries that are more distracting and egosyntonic. To sum up, negative urgency may relate to longer and emotional unwanted intrusive thoughts that can be described as egodystonic, racing, crowded, and more difficult to control or even “hi-jacking” the control of action. In contrast, lack of perseverance may be more related to transient worries, everyday concerns, mindwandering, and distractive thoughts.

The mentioned relations between impulsivity and intrusive thoughts may also be revealing as to the mechanisms that underlie negative urgency and lack of perseverance. It has recently been shown (Gay et al. 2008b) that negative urgency relates to difficulties in inhibiting prepotent responses, whereas lack of perseverance reflects the lack of a different inhibitory mechanism termed “capacity to resist proactive interference” or to resist intrusions of no longer pertinent information in memory (cf., Bechara and Van der Linden 2005; Friedman and Miyake 2004). It is thus conceivable that negative urgency reflects a weakness in inhibition of a dominant and automatized schema involving emotions, thoughts, and action. This schema may be the result of an old habit of obsessing, worrying, and self-blaming and may manifest itself in highly emotional, disturbing and long-lasting intrusions.

In contrast, lack of perseverance, reflecting a weakness in filtering out (ignoring) information that is irrelevant for a long or difficult activity at hand, should be associated with more subtle thought control failures, such as comparatively spontaneous and short thoughts that may often go unnoticed (e.g., transient worries, memories, concerns, day-dreaming or mind-wandering) and may typically emerge in boring, long or difficult tasks. As to the question of awareness of these cognitions, it has recently been shown that lack of perseverance predicts a higher number of prompted task-unrelated thoughts (Gay et al. 2008b), suggesting that they may occur without conscious awareness that the mind has drifted (cf., Smallwood and Schooler 2006; see also Sayette et al. 2009).

For the other two facets of impulsivity, lack of premeditation and sensation seeking tended to be negatively related to intrusive thoughts. This important finding may help disentangle distinct “deficits in conscientiousness” (i.e., problems with organization, persistence, control, and motivation in goal-directed behavior, Costa and McCrae 1992) that underlie lack of premeditation and lack of perseverance (Cyders and Smith 2007; Cyders et al. 2007). Put differently, individuals with “deficits in conscientiousness” may experience fewer intrusive thoughts if they show little premeditation or more intrusions if they show little perseverance. It may be speculated that high levels of premeditation share characteristics with obsessive compulsive symptoms, such as a strong sense of responsibility or anticipation of all possible negative outcomes (Zermatten and Van der Linden 2008), which could explain why a higher frequency of unwanted intrusive thoughts was associated with low impulsivity as assessed by this facet.

As for sensation seeking, higher scores were associated with fewer thought suppression attempts, an avoidance- and escape-oriented strategy to deal with intrusive thoughts (Rassin 2005). This result is consistent with previous research suggesting that low levels of sensation seeking are related to avoidance behavior (Lissek et al. 2005), whereas high levels are related to approach or appetitive behavior (Cloniger et al. 1996). Thus, sensation seeking, especially if not associated with high levels of urgency and lack of perseverance, may buffer against anxiety (see also Miller et al. 2003) and dysfunctional avoidance behavior such as thought suppression (see Rassin 2005). In motivational terms, sensation seeking may promote self-control because it directs individuals toward approaching a desired state instead of avoiding an undesired state (cf. Wenzlaff and Wegner 2000).

The finding is also in line with the positive correlation between sensation seeking and the use of cognitive distraction in response to intrusive thoughts at bedtime (Schmidt et al. 2009b). However, in contrast to this previous study, no relation was found between suppression and negative urgency or perseverance, which could indicate that these two facets of impulsivity only relate to suppression attempts before sleep and/or only to a more aggressive form of thought suppression as assessed by the Thought Control Questionnaire Insomnia-Revised (TCQI-R; Ree et al. 2005; Schmidt et al. 2009b).

With regard to the question of the direction of causality between impulsive behaviors and intrusive thoughts, two alternative views have been proposed: It is conceivable that intrusive thoughts facilitate impulsive behaviors (e.g., Li and Chen 2007; Selby et al. 2008), but there is also evidence suggesting that impulsive behaviors fuel intrusive thoughts, for instance counterfactual thoughts (Schmidt and Van der Linden 2009). In support of the first view,

Li and Chen (2007, p. 135) interpreted the correlation between lack of perseverance and obsessions by proposing that “men who have frequent doubts and thought intrusions tend not to be able to sustain attention on a current activity”. In a similar vein, Selby et al. (2008) proposed that intense rumination may elicit impulsive behaviors, such as binge-eating, which would help divert attention away from the ruminative thoughts. However, these authors also considered a circular view to understand relationships between rumination and negative urgency: “Rumination may lead to a dysregulated behavior (such as a binge episode), but then subsequent rumination on the evaluations of that behavior (e.g., feelings of shame) may result in another emotional cascade and subsequent dysregulated behavior (such as purging)” (p. 609). Clearly, longitudinal studies are needed to elucidate the interplay between impulsive behaviors and intrusive thoughts.

Some limitations of the present study should also be emphasized. First, the use of questionnaires and the correlational nature of the present study preclude any causal inferences about the relations between impulsive behaviors and intrusive thoughts. Second, the relative small sample size of the second study, which comprised only women, and the general character of the measure of obsessive thoughts should be taken into account. Future studies should distinguish between different forms of obsessions, such as obsessive doubts, thinking, impulses/urges, fears, and images (cf., Turner et al. 1992). Moreover, the relations between impulsivity and other types of unwanted intrusive thoughts call for exploration: for example, the links between impulsivity and different forms of rumination (e.g., angry vs. depressive rumination), reflections, spontaneous thoughts, negative automatic cognitions, and memories. Finally, the role of negative affectivity and positive urgency warrant further examination. Negative affectivity should be given particular attention in future studies because this construct might partially account for the relations between negative urgency, worries and obsessions.

Studies involving clinical samples seem particularly warranted because a wide range of psychopathological states have been associated with intrusive thoughts and impulsivity. For example, therapeutic interventions focusing on perceived thought-control ability might diminish both impulsive behaviors and the distress caused by mental intrusions. Alternatively, interventions might aim to restrain urgent behavior and strengthen perseverance, thereby reducing the number of intrusive thoughts and counterfactual emotions such as shame, guilt, and regret (Schmidt and Van der Linden 2009). Such interventions might involve different techniques that have been shown to be beneficial to self-control, such as mindfulness, meditation, or training on certain laboratory tasks. Mindfulness has been shown to reduce rumination (Brown and Ryan 2003) and to improve

sustained attention (Schmertz et al. 2009), which could be particularly useful for individuals with high levels of negative urgency and lack perseverance. Moreover, both meditation (Moore and Malinowski 2009) and specific training tasks (Persson and Reuter-Lorenz 2008) may improve interference control, which could also be helpful for impulsive individuals because negative urgency and lack of perseverance relate to distinct types of interference control difficulties (Gay et al. 2008b, 2010).

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