# Post-Traumatic Stress Disorder, problem gambling and metacognition

**Invited Paper**

Word count (all sections included): 3,512

Date of 1st submission: 12/01/2015

Maria Paola Boldrini a, Gabriele Caselli a,b,c,\* and Marcantonio M. Spada b

a Studi Cognitivi, Modena, Italy

b School of Applied Sciences, London South Bank University, London, UK

c Sigmund Freud University, Milan, Italy

\* Correspondence should be addressed to: Gabriele Caselli, Studi Cognitivi, Cognitive Psychotherapy School, Viale Giardini 472/L, 41100 Modena, Italy, e-mail g.caselli@studicognitivi.net.

**Abstract**

Over the last twenty years metacognitive theory has been applied to the conceptualization and treatment of psychological distress (Wells, 2009). In this paper we consider the evidence linking Post-Traumatic Stress Disorder and problem gambling. This is followed by an overview of the role of metacognition in psychopathology and its specific application to the conceptualisation and treatment of Post-Traumatic Stress Disorder. We then proceed to discuss the possible role of metacognition in the relationship between Post-Traumatic Stress Disorder and problem gambling, and conclude by considering the clinical implications of metacognitive therapy for the transdiagnostic treatment of these co-occuring conditions.

Key words: metacognition; metacognitive therapy; Post-Traumatic Stress Disorder; problem gambling; comorbidity.

**1. The relationship between Post-Traumatic Stress Disorders and problem gambling**

Problem gambling has been conceptualised as an addictive behaviour that exists on a continuum representing a range of severity (Potenza, 2006) with Gambling Disorder having recently been inserted in the category of addictive disorders in the DSM-5 (APA; 2013). A wide research base has suggested that problem gambling is associated with co-occurring psychiatric problems including mood, anxiety, personality and substance use disorders (e.g. Crockford & el-Guebaly, 1998; Petry, Stinson & Grant, 2005) and is primarily driven by cognitive-emotional regulation motives (e.g. Getty et al. 2000; Stewart & Zack, 2008).

Post-Traumatic Stress Disorder (PTSD) is an emotional disorder believed to have a specific functional interplay with problem gambling, with individuals with psychopathology resulting from trauma using gambling as a way to escape from negative affect (e.g., Ledgerwood & Petry 2006). There is a growing literature to suggest that PTSD is present among as many as 34% of treatment seeking individuals with a problem gambling (range 12.5–34%; Ledgerwood & Milosevic, 2013; Ledgerwood and Petry 2006; McCormick, Taber & Kruedelbach, 1989; Specker, Carlson, Edmonson, Johnson & Marcotte, 1996). PTSD has also been found to be associated with problem gambling severity, co-occurring psychiatric disorders, dissociative experiences and impulsivity in this population (Ledgerwood & Petry 2006; McCormick, Taber & Kruedelbach, 1989; Najavits, Meyer, Johnson & Korn, 2011).

Although factors that explain the co-occurrence of PTSD and problem gambling are not well understood, personality traits that are common to, and elevated, in both presentations may clarify their frequent association. Negative emotionality (i.e., the tendency to experience negative emotions), for example, is elevated in problem gambling (e.g., Blanco, Ibáñez, Blanco-Jerez, Baca-Garcia, & Sáiz-Ruiz, 2001) and in individuals with PTSD (e.g., Miller, Greif & Smith, 2003), and has been implicated as a risk factor for the development of both problem gambling (Dickerson & Baron 2000; Hand, 1998) and PTSD (Breslau & Schultz, 2013). Additionally, impulsivity (i.e., the failure to resist an urge) is frequently increased in problem gambling (e.g., Ledgerwood, Alessi, Phoenix & Petry, 2009) and in some individuals with PTSD (Miller, Greif & Smith, 2003), and has been considered a relevant personality trait in etiological theories of problem gambling (Blaszczynski, Steel & McConaghy, 1997) and ‘externalizing’ subtypes of PTSD (e.g., Miller et al. 2003). Ledgerwood and Milosevic (2013) have also observed that problem gamblers with histories of PTSD show greater difficulty in multiple areas than do those without lifetime PTSD. These individuals have more lifetime and current co-occurring psychiatric disorders including mood, anxiety, and substance use disorders. They have more negative emotionality reflecting a greater propensity toward such affective states as fear, worry, sadness, guilt, anger and other distressing emotions that are often considered to be risk factors for depression or other psychopathology (Harkness, Tellegen & Waller, 1995). These findings sustain the hypothesis that individuals with PTSD and problem gambling histories may be using gambling to regulate distressing, internal affective states.

**2. Metacognition in psychopathology**

Metacognition is defined as any knowledge or cognitive processes that are involved in the appraisal, monitoring or control of cognition (Flavell, 1979). Over the last twenty years there has been a growing research base linking metacognition to the understanding of psychological distress (Wells & Matthews, 1994; 1996; Wells, 2000; 2009: 2013) with a multi-process model, the Self-Regulatory Executive Function (S-REF) model, introduced to represent dysfunctional metacognition in psychological distress. The S-REF model possesses three interacting levels. The first level consists of a stimulus-driven processing network which operates outside conscious awareness and gives rise to products which intrude into consciousness. The second level consists of the S-REF, an online, voluntary and conscious processing system aimed at maintaining cognitive self-regulation in response to intrusions. The goal of S-REF processing is to reduce discrepancies between desired and current states of the self. Under adaptive conditions, S-REF activity is of short duration in that the individual selects coping strategies that deal effectively with the discrepancy. However, in psychological distress the individual is unable to resolve the discrepancy and S-REF based processing becomes persistent. The initiation and cessation of S-REF activity is influenced by automatic processing (e.g. an intrusion related to body symptoms) and by the third level in the model: metacognitive knowledge, specifically metacognitive beliefs. Metacognitive beliefs are conceptualised as information about cognition that is positive and negative in content (e.g. “Worrying will help me cope” and “Some thoughts are dangerous”). Wells and Matthews (1994; 1996) argue that a particular thinking style, the Cognitive Attentional Syndrome (CAS), is central to psychological disorder. The CAS consists of a variety of coping styles including extended thinking (e.g. desire thinking, rumination and worry), monitoring for threat, thought suppression and avoidance, that have paradoxical effects for self-regulation and discrepancy reduction. According to the S-REF model, the CAS is problematic because it causes negative thoughts and emotions to persist, leading to failures to modify dysfunctional metacognitive beliefs and stably resolve self-discrepancies.

 The S-REF model has led to the development of disorder-specific formulations and treatments for PTSD (Wells, 2000; Wells & Sembi, 2004a; 2004b) and, more recently, addictive behaviours (Spada, Caselli, Nikčević & Wells, 2015; Spada, Caselli & Wells, 2012; 2013; Spada & Wells, 2009). One of the main and novel features of the S-REF model is the identification of common or transdiagnostic processes and structures that can help to conceptualise the interplay between different symptomatic framework like PTSD and problem gambling.

**3. The metacognitive model and treatment of PTSD**

The metacognitive model of PTSD (Wells, 2000; Wells, Sembi 2004a; 2004b) proposes that effective emotional processing of trauma-related experiences consists of two basic elements: (1) the strengthening of a cognitive configuration or plan that can guide thinking and behaviour in future potential encounters with trauma; and (2) the flexible control over processing so that low level trauma-related processing can be reduced and cognition re-tuned to the normal threat-free environment. This normal Reflexive Adaptation Process (RAP) is initiated by lower-level processing activity and can be disrupted by several CAS components: (1) the occurrence of worry or rumination following trauma; (2) attentional strategies of threat monitoring; (3) beliefs that lead to the negative interpretation of symptoms; and (4) coping through cognitive, emotional or situational avoidance. Indeed, according to metacognitive theory, components of the CAS, such as as perseverative thinking in the form of worry or rumination, are fundamental in disrupting adaptation following stress and contributing to the development of PTSD symptoms (Butler, Wells & Dewick, 1995; Wells & Papageorgiou, 1995).

For patients suffering from PTSD, the problem with perseverative thinking is that it anchors attention on threat and it uses up executive processing resources so that individuals have difficulty using flexible control and returning thinking to its normal free status. Moreover, this dominance of negative verbal activity reduces the resources available for running imaginal simulations, which normally present an effective way of strengthening plans. Imaginal mental simulation is a good vehicle for plan development, because it presents complex cause-effect and stimulus action sequences over a time course. Imagery is capable of combining information with behaviour (i.e., motor control programs), which are the basis of plans for cognition and action. The problem with attentional strategies such as threat monitoring is that they fix attention on threat-related information leading to a sense of recurrent threat, thereby maintaining activation of anxiety programmes and strengthening metacognitive strategies of threat detection. The individual becomes a skilled ‘‘threat-detector’’ tuning into unlikely threat and failing to re-tune to the normal threat-free environment. In addition, problems with avoidant strategies, such as attempting to suppress thoughts, prevent the running of simulations and interfere with the biasing and tuning of cognition by intrusions.

This theoretical approach implies that it may not be necessary to modify patients’cognitions about the trauma, memories of trauma, or facilitate habituation to trauma memories. It suggests that it will be helpful to enable the patient to activate a more adaptive style of thinking and behaving in response to intrusive symptoms that ‘‘unlocks’’ barriers to the natural in-built adaptation processes (the RAP). This can be achieved by implementing strategies for dealing with intrusive symptoms that enable patients to break free of the constraints and problems of locked-in self-processing in the form of perseverative thinking, threat monitoring, and maladaptive self-control.

The metacognitive model also suggests that treatment should target the CAS (worry, rumination, threat-monitoring) and metacognitive beliefs rather than focusing on the contents of trauma memory or using PE(Prolonged exposure) and reliving. This treatment guides the client to bring the CAS under flexible control so that threat-modes of processing subside. Preliminary evidence from controlled case series, an uncontrolled trial, a two randomized controlled trials support the potential efficacy of MCT in treating PTSD (Wells & Colbear 2012; Wells & Sembi 2004a; Wells, Welford, Fraser, King, Mendel, Wisely, et al., 2008; Wells, Walton, Lovell & Proctor, 2014). Moreover, training of flexible attention control using specific metacognitive therapy (MCT) techniques can ameliorate trauma-related intrusive thoughts (Nassif & Wells, 2014).

**4. The possible role of metacognition in the relationship between PTSD and problem gambing**

The symptoms of PTSD can be extremely distressing and the individual sufferer may turn, as discussed in the first section of this paper, to a variety of addictive behaviours, including gambling, in an attempt to cope and self-regulate. A question which remains unanswered is whether metacognition could be involved in the functional interplay between PTSD and problem gambling?

There probable answer to this question is affermative. Gambling and gambling-related perseverative thinking, conceptualised as aspects of the CAS aimed at controlling negative internal states, may conceivably produce a paradoxical effect of hindering RAP in PTSD (e.g. Spada, Giustina, Rolandi, Fernie & Caselli, 2014). Let’s take the example of gambling related perseverative thinking, in the form of desire thinking. Desire thinking is conceptualised as a voluntary cognitive process that orients an individual towards images, information and memories of subjectively positive, target-related experiences (Caselli & Spada, 2010, 2011, 2013). It appears to have two broad domains (Caselli & Spada, 2011: 2013): verbal perseveration and imaginal prefiguration. Verbal perseveration concerns the repetitive engagement in verbal thoughts about a desired target and imaginal prefiguration refers to the tendency to prefigure images about desire-related content and experiences. Research has indicated that desire thinking is present across addictive behaviours (e.g. Caselli, Ferla, Mezzaluna, Rovetto & Spada, 2012; Caselli, Nikčević, Fiore, Mezzaluna, & Spada, 2012; Caselli, Soliani & Spada, 2013; Caselli & Spada, 2015) with recent research demonstrating it is an independent predictor of gambling when controlling for age, gender, education, negative affect and craving (Fernie, Caselli, Giustina, Donato, Marcotriggiani & Spada, 2014). Once activated desire thinking allows for a shifting of attention onto the elaboration of a desired target, providing an immediate anticipation of pleasant states and relief from emotional distress (for example intrusive thoughts in PTSD). However, in the medium to longer term, the perseveration of desire thinking brings to an escalation of emotional distress because attentional resources become locked onto salient intrusions and the perceived sense of deprivation is heightened, as the desired target is repeatedly imagined but not achieved (Caselli & Spada, 2011). This, in turn, increases the probability of engaging in the addictive behaviour (gambling) as a means to attain relief from this mode of processing and is likely to worsen trigger emotional states or cognitions (PTSD). In support of this view metacognitive beliefs (as discussed earlier, information relating to cognitive experiences and ways to control such experiences) have been shown to play a role in sustaining the use of gambling and gambling-related perseverative thinking (Lindberg, Fernie & Spada, 2011; Spada, Giustina, Rolandi, Fernie & Caselli, 2014) particulary in the regulation of negative cognition and affect, typically present in PTSD.

**5. Concluding cosiderations**

In conclusion, the importance of understanding the role of PTSD and trauma in problem gambling should not be overlooked. The few studies available show that a sizeable minority of lifetime problem gamblers meet diagnostic criteria for lifetime PTSD, and that these individuals experience greater co-occurring psychopathology, greater negative emotionality and are more apt to use gambling as a way to cope with distressing emotions. It is recommended that mental health workers who treat individuals with trauma histories assess these individuals for concurrent problem gambling.

Findings from the literature on metacognition in psychopathology indicate that physiological reactivity to trauma-related stimuli may be extinguished more efficiently through MCT than with exposure methods. This result is consistent with the idea that the cognitive-affective system can self-correct if the CAS and dysfunctional metacognitive beliefs are modified. In addition, recent studies have suggested that MCT is particularly effective for PTSD and given the generic and transdiagnostic features of the S-REF model it should be readily possible to concetpualise and treat disorder in comorbidity as is the case with problem gambling. For example, in the case of individual with PTSD and problem gambling, the symptoms spectrum for both disorders, which may include gambling-specfic desire thinking may be conceptualized as a component of the CAS that hinders the RAP necessary to overcome PTSD. Moreover, the use of a generic or transdiagnostic model has the advantage to provide a simple, standard and synthethic treatment programme which does not need to focus on disorder-specific content but can identify common mechanisms that drive the whole dynamic self-regulatory process. For example, techniques like Detached Mindfulness, which involves encouraging the patient to observe their urge, images, memories and thoughts without trying to control or change them, would feature prominently and can be easily transferred to both gambling related urges and trauma related intrusive thoughts or memories. Future studies are thus called upon, to examine more closely the applicability of MCT in the treatment of complex traumas co-occuring with problem gambling and the application of a trandiagnostic metacognitive perspective (Wells, 2009) to individuals with these co-occorring presentations.

**References**

American Psychiatric Association(2013). *Diagnostic and Statistical Manual of Mental Disorders*

*(5th edn)*. Washington DC, USA: American Psychiatric Association.

Blanco, C., Ibáñez, A., Blanco-Jerez, C., Baca-Garcia, E. & Sáiz-Ruiz, J. (2001). Plasma testosterone and

pathological gambling. *Psychiatry Research, 105*, 117-121.

Blaszczynski, A., Steel, Z. & McConaghy, N. (1997). Impulsivity in pathological gambling: The

antisocial impulsivist. *Addiction, 92*, 75-87.

Breslau, N. & Schultz, L. (2013). Neuroticism and post-traumatic stress disorder: a prospective

invetigation. *Psychological Medicine, 43*, 1697-1702.

Butler, G., Wells, A. & Dewick, H. (1995). Differential effects of worry and imagery after exposure

to a stressful stimulus: a pilot study. *Behavioural and Cognitive Psychotherapy,  2*3, 45–56.

Caselli, G., Ferla, M., Mezzaluna, C., Rovetto, F. & Spada, M. M. (2012). Desire thinking across

the continuum of drinking behaviour. *European Addiction Research, 18*, 64-69.

Caselli, G., Nikčević, A., Fiore, F., Mezzaluna, C. & Spada, M. M. (2012). Desire thinking across

the continuum of nicotine dependence, *Addiction Research and Theory, 20*, 382-88.

Caselli, G., Soliani, M. & Spada, M. M. (2013). The effect of desire thinking on craving: an

experimental investigation. *Psychology of Addictive Behaviours, 27*, 301-6.

Caselli, G. & Spada, M. M. (2010). Metacognitions in desire thinking: a preliminary investigation.

*Behavioural and Cognitive Psychotherapy, 38*, 629-637.

Caselli, G. & Spada, M. M. (2011). The Desire Thinking Questionnaire: Development and

psychometric properties. *Addictive Behaviors, 36*, 1061-1067.

Caselli, G. & Spada, M. M. (2013). The Metacognitions about Desire Thinking Questionnaire:

Development and psychometric properties. *Journal of Clinical Psychology, 69*, 1284-98.

Caselli, G. & Spada, M. M. (2015). Desire thinking: What is it and what drives it? *Addictive*

*Behaviors*. *Special issue on Cognition in Addictive Behaviors, published May 2015.*

Crockford, D. N. & el-Guebaly, N. (1998). Psychiatric Comorbidity in Pathological Gambling – A Critical Review. *Canadian Journal of Psychiatry, 43*, 43-50.

Dickerson, M. & Baron, E. (2000). Contemporary issues and future directions for research into

pathological gambling. *Addiction, 95*, 1145–1159.

Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist, 34,* 906-911.

Fernie, B.A., Caselli, G., Giustina, L., Donato, G., Marcotriggiani, A. & Spada, M.M. (2014).

Desire Thinking as a predictor of gambling. *Addictive Behaviours, 39*, 793-796.

Getty, H. A., Watson, J. & Frisch, G. R. (2000). A comparison of depression and styles of coping

in male and female GA members and controls. *Journal of Gambling Studies, 16*, 377–391.

Hand, I. (1998). Pathological gambling: A negative state model and its implications for behavioral

treatments. *CNS Spectrum, 3*, 58-71.

Harkness, A. R., Tellegen, A. & Waller, N. (1995). Differential convergence of self-report and

informant data for multidimensional personality questionnaire traits: Implications for the construct of negative emotionality. *Journal of Personality Assessment, 64*, 185–204.

Ledgerwood, D. M., Alessi, S. M., Phoenix, N. & Petry, N. M. (2009). Behavioral assessment of

impulsivity in pathological gamblers with and without substance use disorder histories versus healthy controls. *Drug and Alcohol Dependence, 105*, 89-96.

Ledgerwood, D. M. & Petry, N. M. (2006). Post traumatic stress disorder symptoms in treatment

seeking pathological gamblers. *Journal of Traumatic Stress, 19*, 411–416.

Ledgerwood D. M. & Milosevic, A. (2013). Clinical and Personality Characteristics Associated

with Post Traumatic Stress Disorder in Problem and Pathological Gamblers Recruited from

the Community. Journal of Gambling Studies, online in Nov. 2013, Springer Science+Business Media New York,

Lindberg, A., Fernie, B. A. & Spada, M. M. (2011). Metacognitions in problem gambling.

*Journal of Gambling Studies, 27*, 73-81.

McCormick, R. A., Taber, J. I. & Kruedelbach, N. (1989). The relationship between attributional

style and post-traumatic stress disorder in addicted patients. *Journal of Traumatic Stress, 2*, 477-487.

Miller, M. W., Greif, J. L. & Smith, A. A. (2003). Multidimensional personality questionnaire

profiles of veterans with traumatic combat exposure: Externalizing and internalizing

subtypes. *Psychological Assessment, 15*, 205-215.

Najavits, L. M., Meyer, T., Johnson, K. M. & Korn, D. (2011). Pathological gambling and

posttraumatic stress disorder: A study of the co-morbidity versus each alone. *Journal of Gambling Studies, 27*, 663-683.

Petry, N. M., Stinson, F. S. & Grant, B. F. (2005). Comorbidity of DSM-IV pathological gambling

and other psychiatric disorders: Results from the National Epidemiological Survey on Alcohol and Related Conditions. *Journal of Clinical Psychiatry, 66*, 564-574.

Potenza, M. (2006). Should addictive disorders include non-substance- related conditions? *Addiction, 101,* 142–151.

Spada, M. M., Caselli, G., Nikčević, A. V. & Wells, A. (2015). Metacognition in addictive

behaviors. *Special issue on Cognition in Addictive Behaviors, published May 2015.*

Spada, M. M., Caselli, G. & Wells, A. (2012). The metacognitive therapy approach to problem

drinking. In S. Hayes & M. Levin (Eds.), *Mindfulness and Acceptance for Addictive Behaviors: Applying Contextual CBT to Substance Abuse and Behavioral Addictions*. New York, USA: New Harbringer

Spada, M. M., Caselli, G. & Wells, A. (2013). A Triphasic Metacognitive Formulation of Problem

Drinking. *Clinical Psychology & Psychotherapy, 20*, 494-500.

Spada, M. M., Giustina, L., Rolandi, S., Fernie, B. A. & Caselli, G. (2014). Profiling

 metacognition in gambling disorder. *Behavioural and Cognitive Psychotherapy,*

 *published electronically 15th April*.

Spada, M. M., & Wells, A. (2009). A metacognitive model of problem drinking. *Clinical*

*Psychology and Psychotherapy, 16*, 383-393.

Specker, S. M., Carlson, G. A., Edmonson, K. M., Johnson, P. E. & Marcotte, M. (1996).

Psychopathology in pathological gamblers seeking treatment. *Journal of Gambling Studies, 12*, 67-81.

Stewart, S. H. & Zack, M. (2008). Development and psychometric evaluation of a three-

dimensional Gambling Motives Questionnaire. *Addiction, 103*, 1110-1117.

Wells, A. (2000). *Emotional Disorders and Metacognition: Innovative Cognitive Therapy*.

Chichester, UK: Wiley.

Wells, A. (2009). *Metacognitive Therapy for Anxiety and Depression*. New York, USA: Guilford

Press.

Wells, A. (2013). Advances in Metacognitive Therapy. *International Journal of Cognitive*

*Therapy, 6*, 186-201.

Wells, A. & Colbear, J. S. (2012). Treating posttraumatic stress disorder with metacognitive

therapy: A preliminary controlled trial. *Journal of Clinical Psychology, 68*, 373-381.

Wells, A. & Matthews, G. (1994). *Attention and Emotion: A Clinical Perspective*. Hove, UK: Lawrence Erlbaum Associates.

Wells, A. & Matthews, G. (1996). Modelling cognition in emotional disorder: The S-REF model. *Behaviour Research and Therapy, 34,* 881-888.

Wells, A. & Papageorgiou, C. (1995). Worry and the incubation of intrusive images following

stress. *Behaviour Research and Therapy, 33*, 579-583.

Wells, A. & Sembi, S. (2004a). Metacognitive-focused therapy for PTSD: A preliminary

investigation of a new brief treatment. *Journal of Behavior Therapy and Experimental Psychiatry, 35*, 307-318.

Wells, A. & Sembi, S. (2004b). Metacognitive-focused therapy for PTSD: A core treatment

manual. *Cognitive and Behavioral Practice, 11*, 365-377.

# Wells, A., Walton, D., Lovell, K. & Proctor, D. (2014). Metacognitive Therapy versus prolonged

# exposure in adults with chronic Post-traumatic Stress Disorder: A parallel randomized controlled trial. *Cognitive Therapy and Research, published electronically August 10 2014.*

Wells, A., Welford, M., Fraser, J., King, P., Mendel, E., Wisely, J., et al. (2008). Chronic PTSD

treated with metacognitive therapy: An open trial. *Cognitive and Behavioral Practice, 15*,

85-92.