PSICO
*v. 42,* n. 1, pp. 134-141, jan./mar. 2011

# The development and treatment of impulsivity

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ABSTRACT

Impulsivity is a common factor in many mental disorders, including ADHD, drug addiction, aggressive and self-harm behaviors and childhood obesity. Impulsivity is also a risk factor for treatment dropout. This article aims to present the biological, sociological, and developmental roots of impulsivity and, also, common treatments for extreme impulsivity. We include recent work in the areas of neurodevelopment and emotional regulation.

**Keywords:** impulsivity; treatment; neurodevelopment; emotional regulation.

RESUMO

*O desenvolvimento e tratamento da impulsividade*

Impulsividade é um fator presente em várias desordens psicológicas, incluindo ADHD, drogadição, comportamentos agressivos e automutiladores, e obesidade infantil. Impulsividade também é um fator de risco para o abandono de tratamento. Este artigo tem por objetivo apresentar as raízes da impulsividade do ponto de vista biológico, sociológico e do desenvolvimento humano, bem como as formas de tratamento mais comuns para pessoas com extrema impulsividade. Aqui também se inclui pesquisas das áreas de desenvolvimento neuronal e regulação emocional.

**Palavras-chave:** impulsividade; tratamento; desenvolvimento neuronal; regulação emocional.

RESUMEN

*El desarollo y tratamiento de la impulsividad*

La impulsividad es un factor común en muchas enfermedades de origen mental. Estas enfermedades incluyen ADHD, el vicio de las drogas, la agresividad, conducta autodestructiva y la obesidad en niños. También influye en el abandono de tratamiento. Este artículo enfoca sobre las raíces biológicas y sociológicas de la impulsividad y los tratamientos más comunes para la impulsividad extrema. También va incluido las indagaciones más recientes en los campos del desarrollo neural y la regulación emocional.

**Palabras clave:** impulsividad; tratamiento; desarollo neural; regulación emocional.

## INTRODUCTION

Impulsivity, broadly defined as a lack of ability to delay gratification, has been considered a factor in many mental disorders, including bulimia nervosa, borderline personality disorder, ADHD, pathological gambling, suicidal, aggressive behavior, and self-mutilating behavior (Menzies, 1997; Cyders and Smith, 2008). There has been a well recognized connection between impulsivity and addictive behaviors, and recent research has suggested a genetic link to the impulsivity trait which functions as a risk factor for the later emergence of substance abuse disorders (Verdego-Garcia, 2008). Research with children demonstrates a relationship between impulsivity and externalizing behaviors and obesity (Nederkoorn, Braet, Van Eijs, Tanghe and Jansen, 2006). In a study of male adolescent offenders, impulsivity was the strongest predictor of adolescent psychopathology and conduct problems (Vitacco and Rogers, 2001). Equally important, impulsive clients are more likely to drop out of substance abuse, smoking cessation, and obesity programs than other clients (Krishnan-Sarin et al, 2007; Nederkoorn, Braet, Van Eijs, Tanghe and Janse, 2006).

The purpose of this article is to provide a brief summary of the biological, developmental and

sociological roots of impulsivity and also to provide an overview of interventions aimed at treating extreme levels of impulsivity. Due to the limitation of space it is not possible to include a full discussion of each topic. Our intention is to include the major research in the field and to address more recent perspectives. These include the interplay of genetic and environmental factors in the development of impulsivity and an emerging direction in therapy which treats impulsivity as a dysfunction in emotional regulation.

## IMPULSIVITY: LOOKING FOR A DEFINITION

Among researchers there is little consensus about a definition of impulsivity (Coscina, 1997; Winstanley, Eagle and Robbins, 2006). Some have described impulsivity as an "obscure and difficult construct despite the efforts of some scientists." (Jackson and Wester, 1997, p. 14), and others have suggested just throwing the term out because of its lack of clarity (Cyders and Smith, 2008). There is consensus that impulsivity is a multidimentsional construct, however. The consequence of this is that research on impulsivity may focus on different factors of the trait (Melanko, Leraas, Collins, Fields and Reynolds 2009; Vassileva, Gonzalez, Bechara, There and Martin, 2007; Whiteside and Lynam, 2001). Moreover, one or more of the trait factors may be related to different clinical outcomes; for example; it is hypothesized that different subtypes of ADHD may be linked to specific dimensions of the impulsivity trait (Winstanley, Eagle and Robbins, 2006). In all, caution is necessary in interpreting findings and in making broad conclusions.

Before reviewing the factor structures of impulsivity, it is important to note that impulsivity is not necessarily a negative trait. Eysenck (1993) distinguishes two components of impulsivity: the extraverted impulsivity (venturesomeness) and the psychotic impulsivity (impulsiveness). Extroverted impulsivity implies a decision-making process in which the consequences and risks are taken into account, while psychotic (extreme) impulsivity does not consider the risks of a decision. Likewise, Dickson (cited in Coles, 1997) makes a conceptual difference with the term impulsivity. The concepts of functional and dysfunctional impulsivity both describe the state of acting without forethought; the difference is that in functional impulsivity the act is beneficial or optimal, while in dysfunctional impulsivity the act is a source of trouble or harm to self or others. Indeed, research suggests impulsivity has different correlates in well-functioning as compared to poorly functioning individuals (Cyders and Smith, 2008).

A comparison of studies looking at the factor structure (or components) of impulsivity shows two main components: first, there is a tendency to go for the immediate reward without thoughtful (or any) consideration of long term effect, and second, there is a strong motivation or urge to act. Franken, Strien, Nijs and Muris (2007) present three similar factors as comprising the trait: a) reward-discounting or cognitive impulsiveness (the making of quick cognitive decisions), b) motor-impulsiveness or rapid-response (acting without thinking), and c) non-planning impulsiveness which is shown by poor consideration of the future. In a study designed to examine the factor structure of impulsivity using multiple measures, Whiteside and Lynam (2001) report four factors: a) low perseverance, b) sensation seeking, c) lack of planning, and d) urgency – the propensity to act rashly following negative affect.

This urgency factor, in particular, is consistent with an emerging perspective that a key factor in impulsivity is the failure to regulate negative emotions. Supporting this view, a propensity to rash action while in a negative mood has been linked to bulimic symptoms, drinking alcohol to cope, and compulsive shopping. As Cynders and Smith (2008) write:

> Negative urgency is the best predictor of severity of medical, employment, alcohol, drug, family, social, legal, and psychiatric problems in individuals with substance dependence (p. 809).

Because there is little consensus around the definition of impulsivity there are many measures of impulsivity. Measures fall into two groups: self-report measures and lab-based behavioral approaches. Commonly used self report measures include the Barratt Impulsiveness Scale (Patton, Stanford and Barratt, 1995) and the Eysenck Impulsiveness Questionnaire (Eysenck, Pearson, Easting, and Allsopp, 1985). These measures address the multiple components of impulsivity and are considered to assess impulsivity as a trait. Lab-based behavioral measures, on the other hand, focus on specific components of compulsivity, including the ability to delay gratification by choosing a larger reward in the future over a smaller, immediate reward (Moeller, Barratt, Dougherty, Schmitz, and Swann, 2001). Other behavioral measurements assess the ease with which the subject inhibits a previously learned response, and how quickly a response is evoked, even in error. Given the several and distinct components of the impulsivity trait, it is not uncommon

for researchers to use multiple measures as a hedge against a too limited assessment of the trait.

## BIOLOGICAL ROOTS OF IMPULSIVITY

Currently, there are three major lines of biological research on impulsive behavior. These include differences in particular brain structures, the role of neurotransmitters, particularly serotonin and dopamine (Eysenck, 1995), and the linkage between specific genes and impulsive behavior.

### Brain Structures

Research suggests that specific areas of the brain are linked to impulsive behavior. In particular, differences in the prefrontal cortex are associated with differences in the inability to inhibit actions that may conflict with long term goals. The prefrontal cortex is considered most involved in executive control, including the functions of cognitive control, decision making and planning. Studies of subjects with damage to the prefrontal cortex suggest an increase in impulsive action with the injury (Greene, Heilbrun, Fortune and Nietzel, 2007). A classical example of the effect of injury is the 1848 case of Phineas Gage, a railroad worker who survived an accident in which a long metal rod passed completely through his skull, in the areas of the prefrontal cortex. He survived, and had no major problems with memory, but had a great change in his behavior, including increased rash action and moodiness.

Within the prefrontal cortex, the orbitofrontal cortex (OFC) appears to play a central role in moderating a person's urge to action (Cyders and Smith, 2008). In normally functioning individuals, the OFC functions to moderate the connection between the emotional experience and the impulsive response. It does this "apparently by providing information and a bias toward long-term goal-directed behavior" (Cyders and Smith, 2008, p. 815). In other words, without the OFC on-line, immediate rewards (e.g., gambling, drinking) can be too compelling to resist.

Research with subjects with damage to the OFC and with impulsive-related disorders supports this view. In a study comparing four groups – healthy participants, patients with damage to the OFC, patients with prefrontal cortex lesions but not in the OFC, and subjects with borderline (impulsive) personality disorder – Berlin and colleagues (2005) report that subjects with the injury to the OFC scored higher in impulsivity than people with damage in other areas of the prefrontal cortex; and people with damage in the OFC are as impulsive as the subjects with borderline personality disorder.

### Neurotransmitters

It is important to note, however, that specific areas of the brain function as parts of neural networks, and impulsive behavior is the final outcome of network communication within the brain. Regarding impulsive behavior, it appears that the most important connection involves areas of the prefrontal cortex (including the OFC) and the amygdala (Siegal, 2010). The amygdala, part of the subcortical limbic system, serves a critical function in the processing of emotional information. It attends to sensory input in terms of threat to the self or to one's goals, leading to arousal if either is at risk. Neurotransmitters, particularly serotonin and dopamine, enable two-way communication between areas of the prefrontal cortex and the amygdala. If neural networks are working, a motivation to act rashly based on arousal from the limbic system is inhibited by communication from within the prefrontal cortex.

Consistent with this view, studies demonstrated a connection between low levels of serotonin and increased levels of risky behaviors, including self-mutilation, violence, suicide, loss of self-control, substance abuse, sexual addition, pathological gambling and non-planned aggression (Coscina, 1997). A drawback of the initial studies was the inclusion of participants with one or more mental disorders. Subsequent studies have used participants without a mental disorder or family history of psychiatric problems (Reist, Helmeste, Albers, Chay and Tang, 1996; Walderhaug, Nordvik, Landro, Refum, and Magnusson, 2002). As with the previous research, the findings with non-mental patients demonstrated a correlation between low serotonin and impulsivity. An especially strong study used an experimental double-blind design (Walderhaug et al., 2002). Participants were twenty-four male students between 21 and 29 years. Those in the experimental group were given a mixture of the essential amino acids which lowered serotonin by the rapid depletion of tryptophan. Under the effect of these amino acids, participants took computerized tests of impulsive responsiveness. The results show that the subjects in the group with experimentally induced lowering of 5-HT showed increased levels of impulsivity (Walderhaug et al., 2002).

In contrast to serotonic activity (which facilitates the inhibition of emotion infused urges), the neuro-transmitter dopamine (DA) operates to increase reward-seeking behaviors. Like serotonin, dopamine is involved in the amygdala circuit. High levels of dopamine correlate with rash actions. Most importantly, the serotonin and dopamine systems appear to work together. As Cyders and Smith (2009) write: "Low

levels of 5HT, then imply a failure to inhibit the approach tendencies characteristic of high levels of DA" (p. 18).

### Genetic differences linked to differences in neurotransmitters

There is compelling evidence that the roots of extreme impulsivity are to be found in genetic differences and in early childhood experience of trauma or neglect, and most likely, both (Meyer-Lindenberg et al., 2006). Of particular interest is the x-linked MAOA (monoamine oxidase A) gene. This MAOA gene is important in the enzymatic clearing for serotonin during brain development. Differences in gene expression are termed low expression (MAOA-L) and high expression (MAOA-H). Studies with rats where the MAOA gene was experimentally "knocked out" and with humans who had a naturally occurring "knock-out" of the gene, demonstrated that both groups had a higher than average level of impulsive activity. Research of healthy subjects using MRI assessments showed that those with the low expression of MAOA gene had a highly activated amygdala when emotionally aroused and diminished activity in regulatory prefrontal cortex (Meyer-Lindenberg, et al., 2006). In support of the sex-linked nature of the gene, the authors report that male subjects but not female subjects with the MAOA-L gene expression demonstrated lower inhibition to respond in arousing situations and higher levels of reactivity in a memory task involving a negative event.

### Summary

Researchers in the field conclude that impulsivity is the result of a "synergistic impairment in cognitive and emotional neural regulatory mechanisms" (Meyer-Lindenberg et al., 2006, p. 6272). These neural impairments are likely the result of genetic differences which affect brain functioning and structure. As discussed below, the deleterious impact of these genetic differences on the brain are most likely to emerge under conditions of poor care in the early years and other environments of risk.

## DEVELOPMENTAL ASPECTS

Theory and developmental research have suggested a strong link between poor parenting and children's or adolescents' problems with impulse control. L'Abate (1993), a clinical theorist, proposes that self-destructive behaviors, including impulsivity, are learned at home in the context of family intimacy. He defines intimacy as "the sharing of hurts and of fears of being hurt" (p. 104) and he argues that in these highly emotional and vulnerable moments, the impulsive child has experienced harsh feedback. By reacting negatively to their child's vulnerability, parents increase rather than diminish the child's distress. Emotions are not dealt with in a sympathetic, organized, reflective manner. Instead, the child sees and learns to react without thought when experiencing distress. L'Abate presents two main styles which can generate and further impulsivity. The first is the Abusive/Apathetic style, which is characterized by a context of helplessness and neglect that is linked to physical, substance, sexual and verbal abuses. The second style is the Reactive/Repetitive, which is defined by coercive relationships, revenge, stress, and emotional explosions.

Developmental research over the past twenty-five years has supported this perspective. In a series of studies, Patterson and his colleagues (1989) conducted observations of families with children showing externalizing disorders marked by impulsivity. Patterson concluded that these children are trained by their families to develop these behaviors. Inept parenting, coercive behaviors, physical attacks, harsh discipline, and disrupted parent-child interactions fail to provide a model of organized, reflective emotional responsiveness, and in many cases, the parents reward the child's own coercive behaviors. In contrast, the child's pro-social acts are generally ignored.

A longitudinal study of 79 children and their families reported similar findings (Olson, Bates and Bales, 1990). Olson and colleagues found that punitive control and inconsistent discipline were precursors of impulsivity in boys. On the other hand, a responsive, sensitive, and cognitively enriching parent-child relationship predicted the development of impulse control. Strauss and Mouradian (1998) reported a positive relationship between corporal punishment – spanking on the buttocks, for example – and antisocial behavior and impulsivity in children aged between 2 and 14 years. A recent longitudinal study of the emergence of self-control (which includes elements of impulse control) found that differences in self-control are evident by 4 years and the trait is consolidated by 8-10 years (Vazsonyi and Huang, 2010). Moveover, low levels of self-control were meaningfully related to deviant behaviors. Research with infants and toddlers demonstrates congruent findings. A reciprocal, synchronous relationship in the first years predicted later ability to control impulses (Feldman, Greenbaum and Yirmiya, 1999). A consensus is growing that impulsivity is a personality trait which is established early and which remains relatively stable.

### Neurodevelopment research

Research in the field of brain development suggests a mechanism by which early experience in the family is linked to impulsive behavior (Anda et al., 2006; Perry, 2009). Because brain development is strongly affected by environmental input and because there is an explosive growth in neural connections in the first years, the young brain is most affected by poor parenting, neglect and traumas. Without developmentally attuned experiences, the infant's or child's brain has fewer neurons and connections between neurons; in all, resulting in abnormal neural networks and brain organization (Perry, 2009).

Simply put, the family molds the infant's brain. Infants and toddlers who experience organized, appropriate, and nurturing care will develop an organized brain. When confronted with emotionally arousing events, they will have learned, in interaction with their caregivers, the self-regulating and emotion-regulating skills necessary to cope. On the other hand, infants who experience chaotic, disorganized and/or neglectful parenting, are at risk for developing brains with poorly functioning networks for self-regulation. They will be easily overwhelmed by stress, and they are likely to exhibit a disorganized, impulsive response.

## INTERACTION OF GENES AND ENVIRONMENT

The growing consensus in the field of child maltreatment is that a specific expression of genetic variations can provide a protective influence on children's outcome. In a seminal study, Caspi and colleagues (Caspi et al., 2003) found that child maltreatment was related to depression in early adulthood for participants with a short – but not long – allele of 5-HTTLPR, a serotonin-linked gene. With regard to the development of impulsivity, a study examining the effect of gene variation on the MAOA on maltreated youth found that those with the high expression of the gene did not suffer the expected effects of maltreatment. Those with the low expression of the gene and who were maltreated did have increased levels of impulsive aggression. Gene-environment interaction was also reported in a study of female participants who had experienced childhood stressors (e.g., parental death, divorce, abuse). Based on previous research, it was expected that those with low expression of the genotype (MAOA-uVNTR) would manifest the impulsivity trait. However, the findings indicated that a participant's perception of positive parental care protected against this outcome. There was no effect of parental care for subjects with the high expression allele (Kinnally et al., 2009). It is important to note, however, that the research on gene-environment interaction related to impulsivity is in its infancy.

## SOCIOLOGICAL FACTORS RELATED TO IMPULSIVITY

While most research about impulsivity has focused on the neurological and developmental factors, there has been scarce consideration of the sociological aspects of impulsivity. As Menzies (1997) writes,

> In reviewing the literature, we find virtually no references to the systematic and institutionalized attributes of impulsivity, or to many features of contemporary society that both precipitate impulsive conduct and reward its expression (p. 5).

Fortunately, more research has been conducted in the last few years. A study about impulsivity as a moderator of the relationship between methamphetamine use and sexual risk behavior among HIV-positive men reported a negative correlation between impulsivity and social characteristics such as educational level, income and employment status (Semple, Zians, Grant and Patterson, 2006). Consistent with this finding, a study developed by Matthews and colleagues (Matthews, Flory, Muldoon and Manuck, 2000) examined reasons for the relationship between low socioeconomic status and low serotonergic responsivity in healthy adults. They hypothesized that the link may be explained by the fact that low serotonergic responsivity is related to impulsivity. Supporting their hypothesis, they found that the higher the level of impulsivity the lower the educational level, and the lower the income.

Addressing similar topics, Lynam and colleagues (Lynan et al., 2000) conducted two studies to examine the relationship among impulsivity, neighborhood context, and juvenile offending. The first study involved 868 boys aged between 12 and 13 years. The researchers used 11 different measures of impulsivity – combining the results in a summary measure of impulsivity. The neighborhoods context (Socioeconomic Status/ Poverty) was based on the census data of Pittsburgh, PA, where the research took place. The results showed that the neighborhood context was positively correlated to impulsivity. Teenagers with higher levels of impulsivity lived in poorer neighborhoods, and boys who lived in poorer neighborhoods took part in more types of violent crimes. The second study conducted four years later included boys who scored in the top

and bottom 30% of the measure of impulsivity. There was a new measure of socioeconomic factors however. The participants rated 17 aspects of their neighborhood, such as assaults, drug use, unemployment, etc. Again the results showed that impulsive teenagers living in poorer neighborhoods had a greater risk of delinquency than impulsive boys living in more prosperous neighborhoods. Also significant was the finding that low impulsive boys in poorer neighborhoods were less likely to engage in delinquent acts than their high impulsive counterparts. The researchers suggest that the main reason for this relationship between impulsivity and the socioeconomic context is that poor neighborhoods have lower levels of informal social control, which increases the opportunities for crime. Informal social control would be useful for people with fewer or no internal controls.

## TREATMENT OF IMPULSIVITY

Traditionally, there have been two broad categories of treatment used to address impulsivity: Pharmacologic Treatment and Cognitive Behavioral therapy. Recently other approaches have been introduced; these are grounded in neurodevelopment theory and address the dysfunction in self-regulation and emotional regulation associated with impulsivity.

### Pharmaceutical Therapy

Among the drugs used to treat impulsivity, the most commonly used are anticonvulsants, beta-adrenergic blockers or antagonists, lithium, and antipsychotic agents (Conacher, 1997; Moeller et al., 2001). For the cases in which impulsivity is associated with ADHD, methylphenidate, dextroamphetamine, and pemoline have been prescribed (Fink and McCown, 1993). In addition to these drugs, the selective serotonin reuptake inhibitors (SSRIs) have been recommended for treatment of impulsive aggression in patients with borderline personality disorder (Rinne, Brink, Wouters and Dyck, 2002), for example.

### Cognitive behavioral therapy

The aim of cognitive-behavioral therapy is to change cognitions associated with difficulties in a client's life. To do this, clients carry out targeted behavioral tasks which encourage practice and reflection on problematic behaviors and cognitions. A common approach is to focus on issues involving interpersonal problem solving and social skills. Research on the effectiveness of cognitive behavioral therapy has shown positive results in the areas of social skills for preschool children, psychiatric patients, and drug-dependent clients. Changes in impulsivity have not been assessed specifically (Moeller, 2001).

### Emotional regulation as treatment for impulsivity

A criticism of cognitive therapies is that they assume that the client has the emotional calmness to tap into their higher cognitive functioning (Anda et al., 2006). Since one component of impulsive behavior is the urge to action following negative affect, the argument is that treatment first has to address emotional regulation skills before moving onto the executive, cognitive inhibition strategies. Consistent with this perspective, emotional regulation is a central component of an intervention used with clients with borderline personality disorder – a disorder characterized by impulsivity. A central tenet of the intervention, Dialectic Behavior Therapy (DBT), is that the borderline client overreacts to emotional events in their lives because of early caregiving dysfunctions. They have not been exposed to models of emotional maturity and their lives become chaotic with extreme mood swings and problematic relationships. In DBT, the client works with a therapist to examine events which aroused intense emotions and to reflect on how the emotion was handled. These sessions are reinforced by group therapy sessions where emotional regulation skills are discussed and practiced. The therapy progresses in stages, the first stage lasting a year. DBT increasingly is considered an effective treatment for clients with a borderline diagnosis. In one controlled study, 58 women with borderline disorder were randomly assigned to groups receiving DBT treatment or the usual therapies (addiction intervention and psychiatric services). Subjects in the DBT group had fewer episodes of impulsive self-harm after treatment (Verhuel et al, 2003).

In a similar vein, child neuro-developmentalists address issues of self-regulation. Their interventions with children who have been maltreated or traumatized focus on where brain functioning was first impaired, progressing with treatments congruent with normal brain development. Initial intervention often addresses the self-regulatory functions controlled by the brain stem and diencephalon. Treatment involves "a variety of patterned, repetitive somatosensory activities (which provide these brain areas with the patterned neural activation necessary for reorganization) such as music, movement, yoga (breathing), drumming or therapeutic massage" (Perry 2009, p. 252). For those maltreated in infancy, treatment may include holding and rocking by an emotionally-present caregiver. The goal is to have the "child swimming in a healthy sea of patterned neuronal activity" (Perry, 2010). Their argument is that without

addressing the issues of self and emotional regulation, the child's response to distress and adversity is bound to be reactive and impulsive – leaving little point to pursuing cognitive – behavioral or psychodynamic treatment.

Working primarily with adolescents and adults, Siegel (2010) has outlined another intervention for reactive impulsivity which addresses regulation of emotions. He teaches clients to use meditative attention to focus on their thoughts, feelings, and sensations as they arise in consciousness. In doing so they move from "being the emotion" to becoming a more distant observer of the emotion. Siegel proposes that by doing this regularly, they will build the cortical connections necessary to regulate intense emotions. His intervention is tied to the "mindfulness" tradition of Buddhism which has been shown to be highly effective in reducing anxiety and depression as well as in improving the ability to regulate emotions (Brown, Ryan and Creswell, 2007). Meditative attention has also been linked to brain activity associated with the ability to control impulses. In a study using functional MRIs, subjects looked at negatively arousing pictures. Findings showed that subjects with the highest ratings on meditative attention had lower arousal in the amygdala and more prefrontal (inhibitory) activity than subjects with lower ratings (Creswell, Way, Eisenberger and Lieberman, 2007 cited in Brown, Ryan and Creswell, 2007).

## CONCLUSION

In spite of the absence of a recognized definition of impulsivity, there is broad consensus that there are common factors in the trait: the making of quick cognitive decisions, an urge to act during moments of negative emotion, seeking out immediate gratification, and non-planning impulsiveness which is manifested by a deficient consideration of the future.

The most common roots of impulsivity include brain damage – especially in the prefrontal cortex – low levels of serotonin, and the interaction between genes and environmental factors. These factors include poor neighborhoods with lower levels of informal social control and families marked by neglect, physical, sexual and verbal abuses and coercive relationships.

Treatments for extreme impulsivity include cognitive behavior psychotherapy and pharmacologic treatment. Encouraging work on intervention is coming from the fields of neurodevelopment and emotional regulation. Because impulsivity is common factor in many mental disorders and addictions, and because the trait is a risk factor for treatment dropout, it is important that impulsivity be assessed and addressed from the start of intervention programs whatever the presenting disorder.

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Recebido em: 04/10/2010. Aceito em: 12/01/2011.

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