ADHD and the Criminal Justice System

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By

Robert Francis Eme

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INTRODUCTION

Despite the continuing controversies surrounding Attention-Deficit/Hyperactivity Disorder (ADHD) and periodic media flare-ups which portray ADHD with derision, ridicule, and stigmatization (Barkley, 2017; Hinshaw, 2018; Hinshaw & Ellison, 2016), voluminous research has incontrovertibly established that ADHD is a valid disorder, i.e., a constellation of symptoms caused by impairments in a set of psychological abilities that results in an increased risk for adverse outcomes in multiple areas of life (Barkley, 2015a; Faraone et al., 2015; Nigg, 2016, 2017a; Thapar & Cooper, 2016). This explains why all major medical and psychological associations and government health agencies recognize ADHD as a valid disorder. These agencies include: *American Academy of Child and Adolescent Psychiatry, American Academy of Pediatrics, American Medical Association, American Psychiatric Association, American Psychological Association,* and *U.S. Surgeon General.* One of the adverse outcomes is increased risk for criminal behavior. An astounding 25% of young male adults who are incarcerated in the United States (U.S.), the United Kingdom, and other Western countries have ADHD (Eme & Young, 2017; Young et al., 2015). This represents an approximate three to fourfold greater prevalence of ADHD than exists in the general young adult population (Kessler et al., 2006; Thomas et al., 2015). However, as Dr. Susan Young, one of the foremost authorities in the assessment and treatment of individuals with ADHD in the criminal justice system noted, "in all the research I have conducted in this field, very few have ever been diagnosed with ADHD" (Young, 2017).[1] In addition, many prisoners with ADHD are misdiagnosed because they are presenting to prison healthcare for mood problems or distress that is not recognized as ADHD (Young, 2014). This neglect is all the more egregious given that treatment of individuals with ADHD with stimulant medication can result in a 31% reduction in their criminal behavior (Lichtenstein et al., 2012) and a 43% reduction in violent crime in offenders after release from prison (Chang, Lichtenstein, Langstrom, Larrson, & Fazel, 2016a). Hence, the identification and appropriate

[1] Dr. Young is a clinical senior lecturer in forensic clinical psychology in the Centre for Mental Health, Imperial College London.

management of individuals with ADHD in the criminal justice system is a very promising intervention for reducing the staggering recidivism rate such that within three years of release about two-thirds of offenders are rearrested (Durose, Cooper, & Snyder, 2014).

A tremendous amount of research has been published on ADHD with more than 10,000 studies dating from medical descriptions in 1775 (Barkley, 2015a). An additional 800-1000 studies are added annually, making ADHD the most widely studied disorder affecting children (Barkley, 2015a; Nigg, 2017a). Despite this voluminous literature, this is the first current book written for professionals in the criminal justice system to help them better understand and work with people who have ADHD. It will provide criminal justice professionals with what they need to know about ADHD based on the best of current science. Findings that are especially relevant to understanding how ADHD increases risk for criminal behavior will be highlighted. These findings will be illustrated by vignettes of individuals with ADHD, including those involved in the criminal justice system, in order to provide the reader a deeper understanding of the disorder.[2]

Lastly, the book will focus on males for two reasons. First, until very recently, almost all research on ADHD was conducted exclusively with male samples (Hinshaw, 2018; Owens, Cardoos, & Hinshaw, 2015). Second, as with ADHD, most research on crime is conducted on males since "The fundamental correlate of crime is sex" (DeLisi & Vaughn, p.20) as "Women are always and everywhere less likely than men to commit criminal acts" (Fox, 2017, p.1). For instance, in the U.S., males account for 89.3% of all prisoners and 90% of the homicides (DuRose et al., 2014; Fox, 2017). This sex difference is even more extreme for serious lifelong forms of criminal behavior in which the male-female ratio is in the range of 15-20:1 (DeLisi & Vaugh, 2016). Thus, given this massive sex difference in criminal behavior, it is almost inevitable that research conducted on any risk factor for criminal behavior will be conducted primarily on males.

[2] Many of the examples of those in the criminal justice system are based upon the experiences of Patrick Hurley who is an adult with ADHD with extensive experience in law enforcement and corrections work. He worked as a law enforcement officer for 17 years and as an adult probation/parole officer for 5 years. These experiences provided him with an invaluable perspective on how ADHD can present in a criminal justice setting.

CHAPTER ONE

NATURE OF ADHD

Mental health disorders are defined as a constellation of symptoms and symptom related-distress to the person and/or impairment in one or more important domains of functioning (American Psychiatric Association [APA], 2013). ADHD is the diagnosis given to individuals in the Diagnostic and Statistical Manual of Mental Disorders-5 [DSM-5] (APA, 2013) who present with extreme, impairing symptoms of inattention, impulsivity, and hyperactivity. The diagnosis of ADHD in the DSM-5 is broadly equivalent to the diagnosis of "hyperkinetic disorder" in the World Health Organization's international classification of Diseases 10th edition that is predominantly used in Europe (Thapar & Cooper, 2016). The symptoms producing impairment must occur across more than one setting (e.g., home and school) and must onset by age 12. Although ADHD is typically conceptualized as a disorder of childhood, it is now clear from numerous studies that have followed-up individuals diagnosed with childhood ADHD into late adolescence and young adulthood (as will subsequently be discussed) that the majority of such individuals continue to have impairing symptoms (Asherson, Butelaar, Faraone, & Rohde, 2016; Barkley, 2016a; Hechtman, 2017; Hinshaw, 2018; Thapar & Cooper, 2016). This finding is of special importance for those working in the criminal justice system as many may still believe, as was not uncommon in the recent past, that ADHD is exclusively a disorder of childhood that is outgrown (Hechtman, 2017). In the DSM-5, ADHD is placed in the category of neurodevelopmental disorders. The term *neurodevelopmental* refers to a broad group of disabilities involving some form of disruption of brain development as seen in disorders such as Autism Spectrum Disorder and Intellectual Disability (Thapar, Cooper, & Rutter, 2017). The placement in this category represents a change from previous versions of the DSM in which ADHD was placed in the disruptive behaviors section (Beauchaine & Klein, 2017). The reason for the change was based on (a) evidence for abnormal brain functioning paralleling the aberrant brain functioning in the other neurodevelopmental disorders, and (b) hope that classifying ADHD as a neurodevelopmental

disorder would lead to an early diagnosis (Beauchaine & Klein, 2017). Unfortunately, especially for the purposes of this book, this change obscures the causal connections of ADHD to the subsequent development of increasingly severe antisocial behaviors across development (Beauchaine, Zisner, & Sauder, 2017a).

Another alteration from the previous DSM-IV version was to change *subtypes* to presentations because of the recognition that although the diagnosis of ADHD itself is quite stable over time, the assigned presentation is relatively unstable, fluctuating over development (Beauchaine & Klein, 2017; Rooney & Pfiffner, 2018). The three main "presentations" of ADHD in the DSM-5 are: predominantly hyperactive-impulsive, predominantly inattentive (most common presentation of ADHD in community settings, Willcutt, 2012), and the combined form when criteria are met for both inattentive and hyperactive/impulsive symptoms (most common presentations in clinic samples, Willcutt, 2012). Although ADHD, along with all other conditions in the DSM-5, is considered as a diagnostic category (i.e., the disorder is either present or not), there is a broad consensus that ADHD, as well as nearly all forms of psychopathology, is best conceptualized scientifically in dimensional rather than categorical terms (Ahmad & Hinshaw, 2016; Faraone et al., 2015; Hinshaw, 2018; Nigg, 2017; Thapar & Cooper, 2016). Namely, the presentations of ADHD are best understood as representing two distinct, albeit highly-related dimensions of inattention-disorganization and hyperactivity-impulsivity on which individuals differ (Ahmad & Hinshaw, 2016; Faraone et al., 2015; Nigg, 2017a,b; Thapar & Cooper, 2016).[1] Those who are at the extreme end of the dimension, i.e., who are highly inattentive-disorganized and/or hyperactive-impulsive with accompanying impairments have ADHD. In other words, it is the degree to which people with ADHD have trouble sitting still, paying attention, or controlling impulsive behavior that distinguishes them from people without the disorder. Thus, although defining ADHD categorically (DSM-5) is useful given that clinical decisions tend to be categorical in nature (i.e., the individual either does or does not have a disorder that requires treatment),

[1] These two dimensions of behavior are almost uniformly found when symptoms of ADHD as rated by parents and teachers are factor-analyzed (Roberts et al., 2015). Factor analysis is a statistical technique used by researches to provide insight into the psychological dimensions (factors) that may account for the relationship among variables in a given data set (McGill & Dombrowski, 2017). In the case of ADHD, numerous factor analyses of the multitude of various symptoms have found that they are manifestations of only two psychological dimensions: attention-disorganization and hyperactivity-impulsivity.

like many medical disorders such as hypertension or diabetes, as well as most mental disorders, ADHD is best understood scientifically as an extreme expression of symptoms (Beauchaine & Klein, 2017; Hinshaw, 2018; Thapar & Cooper, 2016). Also in common with medical disorders, there is an inherent arbitrariness in the assigning of diagnostic thresholds for mental disorders because of the lack of an objective cut-point that defines the diagnostic threshold (Clark, Cuthbert, Lewis-Fernandez, Narrow, & Reed, 2017; Thapar & Cooper, 2016). Thus, many individuals whose ADHD symptoms are just below the cut-point (threshold) for a categorical DSM-5 diagnosis still have symptoms that are sufficiently extreme on either of the inattentive/disorganized or hyperactive/impulsive dimensions to cause significant impairment (Thapar & Cooper, 2016). The DSM recognizes this by providing for subthreshold presentations through the use of NOS (not otherwise specified) diagnoses for many mental disorders, including ADHD (Clark et al., 2017).

In conclusion, ADHD is a clinical disorder marked by developmentally extreme and impairing symptoms of inattention-disorganization and hyperactivity-impulsivity and accompanying impairments in life functioning. The specific manifestations of these symptoms will be discussed along with examples of how the symptoms can increase risk for criminal offending or may be exhibited in criminal justice settings.

Inattention-Disorganization

Attention can be broadly understood as the ability to filter the vast amount of information than surrounds us and to focus on one piece or source of information (Nigg, 2006; 2017a,b). It is multifaceted and mediated by different cognitive processes linked to different brain networks that support the control of attention (Nigg, 2016, 2017b; Posner, Rothbart, & Voelker, 2016). In addition, attention can also be influenced by emotion and motivational processes such level of interest or reward (Nigg, 2006; 2017b). Failure of one or more of these processes can result in impairments in attention. Individuals who are impaired on this dimension have difficulty focusing attention, sustaining the focus, and shifting the focus which can contribute to problems with organization, prioritizing tasks, and time management (Brown, 2013). This can be seen in problems of keeping track of plans, items and time; important items are misplaced or lost (e.g., keys, phones); offices, desks specific rooms in homes can be a messy disaster; there are failures to plan ahead; tardiness for meetings or appointments is common; fees are not paid on time, etc. (Hinshaw & Ellison, 2016; Ramsay, 2015). Interestingly, poor time

management may not simply be a function of inattention-disorganization. It may also be due to an inherent, poor sense of time (Nigg, 2017a).

The key diagnostic symptoms of attention-disorganization as detailed in the DSM-5 are presented below. If 6 or more of these symptoms, or 5 or more for those 17 years or older are occurring frequently (i.e., beyond what is considered to be normal)[2] and have persisted for at least 6 months with resultant impairment in functioning, then the individual can be diagnosed with ADHD with a predominantly inattentive presentation (ADHD-PI) or ADHD combined presentation (ADHD-C) if criteria are also met for symptoms of hyperactivity-impulsivity. Diagnostic criteria also specify that impairment from the symptoms must be present in two or more settings (e.g., home, school, work), and cannot be better explained by the presence of another mental disorder. A major limitation of this symptom list is that because it was originally developed for children and adolescents, it may not be sensitive to adult ADHD symptom manifestation (Roberts, Milich, & Barkley, 2015). In an attempt to overcome this limitation, DSM-5 provides examples of how the symptoms might be expressed in late adolescence and adulthood. Although the majority of people who have ADHD have ADHD-PI, most who get diagnosed have ADHD-C since their disruptive, annoying behavior makes it more likely that a parent, teacher, spouse, etc. will notice and/or be affected by the behavior which can result in a referral to a mental health professional (Hinshaw & Ellison, 2016).

The specific DSM-5 symptoms and examples of how these symptoms may be expressed in childhood and late adolescence and adulthood are drawn from the ADHD Child Evaluation diagnostic interview schedule (Young, 2015), examples from the DSM-5, and Ramsay (2015). The child examples will focus on school functioning since it is in a structured setting that the symptoms and impairments tend to be most evident.

- *Does not give close attention to details or makes careless mistakes*
  - **Child:** They may hand in incomplete work and/or poorly presented work that looks rushed and contains many errors. On test papers, children may skip questions and/or not think to

[2] Obviously, a determination of what is "normal" can be a rather subjective judgement. This subjectivity can be substantially overcome through the use of a well-normed rating scales such as the *Connors Rating Scale for Children* (3rd ed.) [Connors, 2008] and the *Barkley Adult ADHD Rating Scale-IV* (Barkley, 2011). Scales such as these enable the diagnostician to compare the behavior of the individual with others of his/her own age and thus to determine how atypical the behavior is.

check whether there are more questions on the other side of the paper. Children may find tasks that require a lot of detail particularly stressful and time consuming.
    - **Adult:** They overlook or miss details, work is inaccurate.
- *Has difficulty in sustaining attention on tasks or play activities*
    - **Child:** They may find tasks that are repetitive and/or require sustained mental effort notably difficult compared to their peers. For example the child may complain and/or struggle with essay based tasks. Teachers may comment that the child needs frequent reminders and redirection to return to the task. The child may state the task is boring and seem to lack the motivation to reach the end, becoming irritable, frustrated and/or disruptive. By contrast, they may struggle less (or not at all) with tasks they enjoy.
    - **Adult:** They have difficulty remaining focused during lectures, conversations, or lengthy reading.
- *Does not seem to listen when directly spoken to*
    - **Child:** Teachers may comment that the child is not listening in class. They may comment that the child requires instructions to be repeated many times and/or broken down into small steps in order to successfully complete a task. Teachers may move the child to sit at the front of the class or next to an assistant. Some teachers may misperceive the child's presentation to be defiant behavior.
    - **Adult:** Their mind seems elsewhere, even in the absence of any obvious distraction.
- *Does not follow through on instructions and does not finish schoolwork, chores, or duties in the workplace*
    - **Child:** They may have difficulty following and remembering instructions, leading to incomplete tasks and unmet goals. For example, the child may be observed to start a practical activity but forget or miss out steps or go off-task and leave it prematurely. Children may receive warnings or detentions for oppositional behavior due to incomplete classwork and homework.
    - **Adult:** They start a task but quickly lose focus, are easily sidetracked.
- *Has trouble organizing task or activities*
    - **Child:** They may miss deadlines as they have not organized or planned their work efficiently. They may appear to be generally messy and untidy (in their appearance and with their

belongings). When the timetable becomes more complicated during the transition to secondary school, children may frequently turn up late for lessons and become stressed by the higher expectation of autonomy. They may leave things behind at home, such as their bus pass, locker key, snack box, sports kit and homework.
    - **Adult:** They have difficulty managing sequential tasks, difficulty keeping materials and belongings in order. Their work is messy, disorganized. They have poor time management, fail to meet deadlines.
- *Avoids, dislikes, or is reluctant to do tasks that need sustained mental effort*
    - **Child:** They may try to avoid specific lessons that they find particularly intensive and require mental effort, such as math, writing and essays. During lessons, the child may protest or lack effort and become frustrated and irritable. They may become restless and/or oppositional.
    - **Adult:** They have difficulty preparing reports, completing forms, reviewing lengthy papers. They procrastinate, tasks are put off until the last minute, need the pressure of deadlines to motivate them. They are aware of task priority but avoid working on it and escape into pleasurable distractions.
- *Loses things needed for tasks or activities*
    - **Child:** They may lose or misplace their school bag, books, school uniform, bus pass and sports kit. The child may often be checking lost property at school to search for lost clothing, pencil cases and school books. Teachers report the child often attends lessons without the equipment or materials required for lessons.
    - **Adult:** They lose tools, wallets, keys, eyeglasses, paperwork, mobile telephones.
- *Easily distracted*
    - **Child:** They may appear to be more distracted by their surroundings than their peers. They may be distracted by noise and activity in the classroom, as well as noise and activity from outside such as children in the playground or any outside sports. Teachers may report that they go off-task because they chatter to peers, or are seen to be daydreaming and require prompting to return to the task. It may be reported that they work better one-to-one or in small groups.

  - **Adult:** They are distracted by unrelated thoughts, excessive mind-wandering with multiple unrelated thoughts, jump from one topic to another. They have a difficult time reengaging in a task once focus has been disrupted.
- *Forgetful in daily activities*
  - **Child:** They may regularly forget their timetable and/or leave items at home that they need for class. They may forget to collect all their belongings as they move from classroom to classroom. The child may forget when their homework is due and fail to hand it in on time, even if it has been completed. They may forget to attend meetings and appointments, or even detentions, despite knowing the consequence.
  - **Adult:** They fail to return calls, pay bills, keep appointments

Of all the symptoms of inattention-disorganization, *often easily distracted* and *difficulty sustaining attention* are core symptoms across all age groups (Martel, Levinson, Langer, & Nigg, 2016). Therefore, these two symptoms should be especially focused on in the assessment of inattention. The following vignettes provide examples of *distractibility, disorganization* and *difficulty sustaining attention*.

Distractibility

Imagine that you are sitting in a sixth-grade classroom. The teacher is introducing a new chapter in your social studies book. As she begins to read, all you hear is "the ancient Egyptians" because a passing car catches your eye. It's the same color as your Dad's car. It reminds you of the trip you took the day he brought the new car home. A "breaking-in" drive he had called it.

You hear a few more of the teacher's words, "...pyramids as burial...." You recall a movie you saw with pyramids. "King Tut and thieves," she continues. You imagine all the tunnels inside one of the mammoth structures. You see yourself trapped and hear the blocks sliding as they block the exit.

Again, you hear the teacher's voice, "...took hundreds of years...," and you see a calendar with pages flying off into space. Space brings the image of the solar system spinning and asteroids just missing each other.

"...Paying attention?" You realize the teacher is talking to you. In fact, she is standing right beside you, and the class is snickering. Your mind is

snapped cruelly back to the classroom. You hadn't realized you'd been so far away.

Tom Cradit (2017)

Disorganization

I am horribly disorganized, both at work and at home. I have a tremendously difficult time completing the tasks before me without succumbing to major tangential distractions. I find it nearly impossible to do simple things I know are necessary, from getting to places on time to completing ordinary tasks. My marriage gets strained to near breaking point at times due to my inability to maintain a conversation or project reliably. When I do find something that piques by interest, all else will get pushed aside to make room for it.

Young male adult (Attention, April, 2004)

Sustained attention

If I wasn't deeply interested in a subject, I couldn't concentrate on it at all—those dreadful algebra classes, those Bunsen burners, the mystifying and now deservedly extinct slide rule! Late in each semester, when it became obvious to me that I had no idea what I was supposed to have learned, I'd attend some makeup classes and try desperately to pay attention. As the teacher rattled on, I would grind my teeth, twirl the tops of my socks around my index finger—once I poked myself repeatedly through my pocket with a pin—anything to keep my mind engaged. But it was impossible: a leaf would fall outside the open window, or I'd notice the pattern of the veins on a girl's hand, or a shout from the playground would trigger a set of irresistible associations that carried me back to another day.

Tim Page (2007)

Variability in Sustained Attention

As previously discussed, motivational processes such as level of interest and reward can influence attention. This helps explain the aspect of ADHD that is perhaps least understood by the general public, and what one of the leading experts on ADHD, Thomas Brown (2017), suggests is the "central mystery" of ADHD (p.1). Namely, depending upon the situation, there can be tremendous variation in sustained attention (Roberts et al., 2015). This perplexing feature of ADHD is captured by Nigg (2006) in his authoritative book on the causes of ADHD when he poses the question... "Why can Mary play video games for 2 hours without interruption, when she cannot focus on her homework for 5 minutes (p.

74)?" As the DSM-5 notes, ADHD symptoms may be minimal or absent when the individual is receiving frequent rewards for appropriate behavior, is under close supervision, is in a novel setting, or is engaged in especially interesting activities. Indeed, in situations that the individual finds especially interesting such as playing video games, they may be able to hyperfocus (Hinshaw, 2018). This tremendous variation in sustained attention has prompted Nora Volkow, the director of the National Institute of Drug Abuse in the U.S., to view ADHD as an *interest disorder* (Hinshaw & Ellison, 2016). However, it cannot be emphasized enough that this tremendous variation in sustained attention is not a defect of will power or laziness, but has a strong biological basis that will be addressed in the chapter on causes. It is not due to *won't* but to *can't.* As Tim Page declared in the prior vignette, he truly "couldn't concentrate at all."

Possible Second Attention Disorder

Strong evidence has been accumulating for a set of symptoms distinct from, yet highly related to the inattentive symptoms of ADHD-PI that are possibly indicative of second attention disorder typically termed *Sluggish Cognitive Tempo* (SCT) in the literature (Barkley, 2015b; 2016; Becker, 2017; Becker et al., 2017).[3] Symptoms include "lost in a fog," "stares blankly into space," "daydreams" and have been associated with academic and social impairments, anxiety and depression (Becker et al., 2016; Saez, Servera, Becker, & Burns, 2018). Thus, those with ADHD-PI appear to be a mixed group with perhaps 50% having SCT (Roberts et al., 2015). The following vignette provides an illustration of SCT.

> *For as long as I can remember, I have been a "day-dreamer," sluggish, hypoactive, passive, and most of all, confused. My confusion usually set in because I would be spacing out during the teachers' directions or lecture, so I never knew what I should be doing. High school was especially hard for me, because I honestly do not think I learned anything at all. I always felt lost and academically inadequate, because I did not understand why I never knew what I was doing, and I could never explain what was happening inside my head. I though what I was experiencing was normal until I met with a doctor who prescribed me medication to help with my sluggish, space-cadet symptoms. I started medication my second semester of college and that is when learning became something fascinating and stimulating rather than a burden I was fighting off. I truly believe that I even have an advantage over people who do not take medication, because I*

[3] Barkley (2015b) prefers the designation *Concentration Deficit Disorder* as more accurate and less stigmatizing than SCT.

can focus longer, harder, and remember more information than most people I encounter.

Young male adult (author's case)

Hyperactive-Impulsive

Impulsivity can generally be understood as a "predisposition for rapid, but often premature actions without appropriate foresight" (Dalley & Robbins, 2017, p. 18). Like attention, this broad definition should not be interpreted to mean that impulsivity is a unitary construct. It is multifaceted with different components that underlie different forms of impulsive behavior which are mediated by different psychological processes and brain networks (Cross, Copping, & Campbell, 2011; Dalley & Robbins, 2017; Sharma, Markson, & Clark, 2014). For example, Sharma and colleagues argue for four distinct impulsigenic traits, two of which are most relevant to understanding how ADHD increases risk for criminal offending. One is "sensation-seeking" which can be defined as the seeking of varied, novel, complex, and intense sensations and experiences, and the willingness to take physical, social, legal, and financial risks for the sake of such experiences (Zuckerman, 2007). Sensation seekers do not seek risk for its own sake but are looking for novel and intense sensations and experiences. In their search, however, they are more willing than others to tolerate risk and therefore more likely to enter into risky situations than low sensation seekers (Zuckerman, 2007). The other trait is "disinhibition vs. constraint/ conscientiousness" which reflects impulsive behaviors that arise from lack of planning, or failure to persist in the face of challenges and is strongly related to antisocial behaviors (Sharma et al., 2014). It closely echoes the description in the DSM-5 which specifies that impulsivity is demonstrated by "hasty actions that occur in the moment without forethought and have a high potential for harm to the individual…a desire for immediate rewards or an inability to delay gratification…and/or making important decisions without consideration of long term consequences" (APA, 2013, p. 60). It is this impulsigenic trait that is employed in the theory of Beauchaine and colleagues linking ADHD to criminal behavior (Beauchaine et al., 2017a; Beauchaine, Hinshaw, & Pang, 2010; Beauchaine & McNulty, 2013; Neuhaus & Beauchaine, 2017), and therefore the trait that will be emphasized in this book. The specific DSM-5 symptoms of hyperactivity-impulsivity and examples of how these symptoms might be expressed in childhood and late adolescence and adulthood are based upon the ADHD Child Evaluation diagnostic interview schedule (Young, 2015), examples

from the DSM-5, Barkley's ADHD diagnostic criteria (Roberts et al., 2015) for adults, and other sources.

- *Fidget with or taps hands or feet, or squirms in seat*
  - **Child:** Teachers may comment that the child is fidgety and restless in class, irrespective of the topic or activity, and that their fidgeting disturbs other children. The child may shuffle about in their seat, kick their legs, rock back on their chair, fiddle with items on the table, and/or doodle on their books. The child may be perceived as clumsy because they often fall over or knock over items.
  - **Adult:** Overt large motor hyperactivity is replaced with an internal sense of physical and mental restlessness. They exhibit an inability to relax. **"**You're drumming your fingers, tapping your feet, humming a song, whistling, looking there, stretching, doodling…" (Hallowell & Ratey, 2005, p.6).
- *Leaves seat situations when staying seated is expected*
  - **Child:** Despite frequent reminders and redirection, the child may struggle to stay seated. The child may swing back on their chair or leave their seat and sit on the floor. When engaged in floor work, the child may roll about on the floor and disrupt peers. The child may find excuses to get up and move around, such as to go to the toilet, to go and talk to someone, or to look at something. The child may be unable to modify their behavior, even when redirected or reprimanded.
  - **Adult:** They leave their seat in the office, other workplace, or in other situations that require remaining in place.
- *Runs about or climbs when not appropriate*
  - **Child:** They may appear restless and eager for break time and physical activities when they can engage in boisterous play and climbing activities. They may need time to calm down when returning to the classroom. The child may be reprimanded for running in corridors. On class trips they may need additional supervision to ensure they stay with the group or walk safely. Older children may appear more restless and fidgety than overtly active.
  - **Adult:** Their overt hyperactivity exhibited in childhood diminishes and is replaced by an inner restlessness.
- *Unable to play or undertake leisure activities quietly*
  - **Child:** They may talk or shout when it's quiet time or during activities that require concentration. They may ask lots of

questions, talk over others, and distract their peers. Reminders to be quiet and/or reprimands don't seem to help. Given the choice, the child may avoid quiet activities, preferring to choose physically active or noisy ones.
    - **Adult:** They have difficulty relaxing, feel restless, search for high stimulation.
- *"On the go," acts as if "driven by a motor"*
    - **Child:** The child may be a whirlwind, running, climbing, and moving aimlessly between activities. The child may appear to be always on the go. At the end of the day the child may not seem to be tired but instead presents as irritable or overwhelmed. The child may favor anticipated break times and physical activities rather than class work. Given the choice, extra-curricular activities involve physical activities rather than less active pursuits.
    - **Adult:** They must constantly being doing something, are unability to relax, do not fully engage, e.g., always on electronic device, even in the company of others.
- *Talks excessively*
    - **Child:** They may chatter to peers in class, even when they have been asked to work quietly or during tests. They may not respond to reminders or reprimands.
    - **Adult:** They may dominate conversations, talk over others, and give tangential responses to questions.
- *Blurts out answers before a question has been finished*
    - **Child:** They may be frequently reminded or reprimanded for talking in lessons. The child may seem to dominate the class by frequently calling out or talking over others. The child may have difficulty waiting for their turn to speak and/or answer questions.
    - **Adult:** They may struggle to follow the 'turn-taking' rules of conversation but instead seem motivated to say immediately what is on their mind (even if this is unrelated to the topic of conversation). They may seem to be impatient for others to finish speaking. They may finish other people's sentences for them.
- *Has difficulty waiting his or her turn*
    - **Child:** They may be reprimanded for queue jumping and/or not taking turns in class activities or when playing with friends. The child may appear to be oppositional and/or become distressed or

agitated, even for activities that require a short wait and/or waiting for a desired activity
    - **Adult:** They tend to be highly impatient waiting in lines, traffic, etc. In a car they may have only one gear: fast forward.

- *Interrupts or intrudes on others*
    - **Child:** Teachers may notice that the child tends to interrupt others, speak out in assembly, use things that do not belong to them, and/or appear to monopolize and take over the personal space and time of others (both children and staff).
    - **Adult:** They tend to be over-talkative, interrupting, speaking too loudly.

The following vignettes provide more elaborate examples of the core symptoms of hyperactivity and impulsivity.

Hyperactivity

Essentially, I feel like I need to be in constant motion or I will explode! Overall, it seems my energy level is sometimes inexhaustible. I avoid activities that require me to be quiet. When I participate in activities that do require me to be quiet, it seems like a death sentence to me. I have always been a talker. I can talk about absolutely nothing, with anyone, forever! I have been a chatterbox ever since I was about five. You would think by now I would have run out of things to say. –

Young adult male (author's case)

My parents say that I was hyperactive from the day I could walk. I really didn't spend much time crawling. I guess I thought it was too slow. Once I started walking, I got into everything. I'd take stuff out of drawers, closets, cabinets, etc., throw the stuff on the floor, and then move on to the next thing that caught by eye.

When I got a little older, I loved climbing trees. When I wasn't climbing, I was running. My parents had to restrain me in parking lots or street corners, as I would have run out into traffic.

Young adult male (author's case)

Impulsivity

I was only nine years old but, boy, do I remember the incident. My father and his friend came back from skin diving and left their spears at the front of the caravan. I grabbed my dad's Hawaiian sling to show cousin Lachlan

how it worked, shooting it vertically about ten meters into the air. I repeated this a number of times, until a strong gust of wind blew the spear onto the power lines. It short-circuited the two wires. This happened all in a blink of an eye.

The power pole that Lachlan and I were standing under exploded, with sparks flying everywhere. The current then flowed through all the other poles, blowing them up one after the other in a circle around the caravan park. Every power line connected between the poles fell to the ground, just missing tents and caravans.

People came running to see what had happened. I don't know how it was that no one was killed or injured. The only wires that did not fall were the two with the aluminum spear still lying across them. A State Electricity Commission team arrived to repair the damage.

Young adult male (Polis, 2003, p. 34)

Many of us with ADHD crave high-stimulus situations. In my case, I love casinos and horse races. Obviously, a craving for high stimulation can get a person into trouble, which is why ADHD is prevalent among criminals and self-destructive risk-takers.

Hallowell & Ratey (2005, p. 25)

Emotional Impulsivity

From the first medical description of ADHD in 1775, and for 193 years thereafter, deficiencies in emotional dysregulation manifested in symptoms of impulsive emotion and poor control of emotion were viewed as central to ADHD (Barkley, 2015c, 2016b). Then, "inexplicably" (Barkley, 2016a, p. 249) these symptoms were dropped for the second edition of the DSM in 1968 and subsequent versions, being relegated to the status of commonly occurring associated symptoms, not core symptoms. However, in the past 2 decades, Russell Barkley (2015c, 2016b) has been contending that symptoms of emotional impulsivity are core symptoms of ADHD. "Those with ADHD will be as impulsive with their primary emotions as they are with their motor or behavior responses because they are essentially a single unitary action: Action and emotion are united in the response" (Barkley, 2015c, p. 88). Emotional impulsivity is manifested in low frustration tolerance, impatience, quickness to anger, and being easily excited to emotional reactions more generally. Barkley's position has received support from a recent meta-analysis of 77 studies, including more than 32,000 youth, which provided evidence for the central role of emotion dysregulation problems in ADHD (Graziano & Garcia, 2016). Adults with ADHD-C also frequently exhibit symptoms of emotional

dysregulation (Adler et al., 2016; Asherson et al., 2016). Karalunas and colleagues (2014), in a study of 437 community-recruited children with and without ADHD, have proposed three novel subtypes of childhood ADHD using temperamental dimensions. In the subtype labeled *irritability,* children in addition to symptoms of impulsivity and attentional dyscontrol exhibited extreme levels of negative emotionality, anger, and poor soothability. Similarly, Petrovic and Castellanos (2016) have proposed an emotional type of ADHD which lies intermediate on a gradient of clinical conditions without an inherent emotional component such as ADHD-PI to conditions of extreme emotional instability such as bipolar disorder. Thus, "the link between ADHD and emotion-related dysfunction is increasingly well-established" (Musser & Nigg, 2017, p. 1).

However, Barkley's position is by no means universally endorsed. For example, Theodore Beauchaine (2015), while acknowledging that symptoms of emotional impulsivity are common among those with ADHD (the position of DSM-5), views these symptoms not as core symptoms but as symptoms arising primarily from deficient socialization practices in families of children with ADHD. These practices can be partly influenced by behavioral impulsivity in the case of ADHD. Thus, emotional impulsivity rather than being a symptom intrinsic to ADHD is acquired "through negative reinforcement processes that occur thousands of times across development in at risk families and peer groups, and through recurrent stress that occurs early in life" (Beauchaine (2015, p. 883).

Although it is neither within the scope of this book nor the competence of the author to resolve the controversy, perhaps Joel Nigg, one of the pre-eminent research scientists in ADHD, has it right when he reported the following in a personal communication (2/22/2018) to the author. "I don't exactly agree with Russ or Ted's formulation. I am increasingly thinking in terms of breakdowns in the self-regulation system(s) that manifest as very different forms of ADHD—some of these forms have major problems in emotion regulation; but others do not. So to challenge Russ, I would say we have kids with ADHD without emotion regulation problems, and some who do—that means emotion regulation is extremely important in ADHD, but not inevitably a major feature. To challenge Ted, I would say what do you do with the child who is emotionally dysregulated and difficult to manage from birth and never regulates, and never can be managed, no matter how skilled the parental socialization. And why are socialization practices in ADHD families often perfectly normal" (communication was excerpted and abbreviated).

It would seem that one key to the resolution of the controversy would be to determine the age of onset of emotional dysregulation symptoms.

The Beauchaine position would suggest that such symptoms typically do not occur in individuals with ADHD until childhood or later. However, if the Barkley formulation is correct, or the Nigg modification that at least for some children emotional dysregulation is a core feature, then the age onset should be seen as early as preschool. Evidence supporting an early manifestation of emotional dysregulation comes from studies in which it is clear that that an accurate diagnosis of ADHD can be made in this age period (Lahey et al. 2016) and that preschool children can manifest signs of emotional dysregulation such as abnormal irritability (Wakschlag et al., 2018). Additional evidence comes from a longitudinal study of 161 children aged 3-4 years (96 diagnosed with ADHD) which found that negative emotionality/anger diagnosed in preschool predicted ADHD symptom severity at age 7 (Rabinovitz, O'Neill, Rajendram, & Halperin, 2016). Also, a recent large-scale analyzing 1713 individuals with ADHD and 1529 controls, Hoogman and colleagues (2017) found reduced volume in brain regions involved in emotional regulation in individuals with ADHD which they interpreted as supporting the inclusion of emotional regulation as a core symptom of ADHD. As Lugo-Candelas and Posner (2017, p. 267) noted, this finding if replicated by future studies, is of "enormous consequence to our conceptualization of the disorder…. as it will require the neuroscience field to decide whether ADHD should continue to be understood as a purely cognitive disorder, or should also be examined through the lens of a mood disorder."

In conclusion, this issue is not simply an arid academic dispute but is of "enormous consequence" especially for the role ADHD plays as a risk factor for criminal behavior. It is widely accepted that problems with emotional dysregulation confer significant risk not only for a wide range of psychopathology in general (Beauchaine, 2015; McLaughlin, 2017) but for aggressive and criminal behavior in particular (DeLisi & Vaughn, 2014; Garofalo & Wright, 2017). If indeed emotional impulsivity is a core feature for some individuals with ADHD on a par with behavioral impulsivity, then the risk ADHD poses for criminal behavior for these individuals is greatly increased. Thus, given the widespread consensus that symptoms of emotional dysregulation are prevalent in ADHD throughout the life span and are major contributors to impairments (Shaw, Stringaris, Nigg, & Leibenluft, 2014), emotional dysregulation (whether intrinsic to ADHD or acquired) markedly increases the risk ADHD poses for the development of antisocial behavior, as will subsequently be discussed.

Prevalence

Prevalence refers to the proportion of individuals in the general population, or specific populations (e.g., incarcerated individuals), who have a disorder such as ADHD. There is an enormous literature (mostly based on juveniles) attempting to provide reliable general population estimates of ADHD that is based on two major methodologies (Hinshaw, 2018; Hinshaw & Ellison, 2016; Roberts et al., 2015; Sayal, Prasad, Daley, Ford, & Coghill, 2018). The first method identifies *diagnostic prevalence* which refers to the percentage of individuals who report having received a diagnosis from a mental health professional. For example, in the U.S. the most recent data of the prevalence of ADHD in juveniles (aged 2-17) comes from the United States of America National Survey of Children's Health conducted in 2016 in which parents were asked if a "doctor or other health provider ever told you that [child] had attention deficit disorder or attention-deficit/hyperactivity disorder, that is, ADD, or ADHD" (Danielson et al., 2018).[4] The prevalence of ever having received such a diagnosis was 9.4% (12.9% male, 5.6% female). This represents a 41% increase from 2003 (Hinshaw, 2018). The prevalence of a current diagnosis of ADHD was 8.4% overall (11.5% male, 5.1% female). These diagnoses may or may not have been accurate. As with prevalence estimates of most mental disorders (Wolpert & Ford, 2015), estimates based upon this method can result in underreporting or overreporting. Underreporting can occur because parents lack access to qualified mental health practitioners to conduct an evaluation. Overreporting, which is by far the more likely occurrence given the surging rates (i.e., 41% increase from 2003 to 2012 in the U.S.) of diagnostic prevalence among juveniles, can be caused by a number of factors having largely to do with educational practices and policies that have incentivized an ADHD diagnosis (Hinshaw, 2018). An additional factor of no small importance is the use of "cursory diagnostic procedures in many locales" (Hinshaw & Ellison, 2016, p. 19) which can be as risibly brief as 15 minutes (Hinshaw & Scheffler, 2014). These factors suggest that the 9.4% rate overstates the true prevalence of ADHD (Hinshaw, 2018).

The second method identifies *population prevalence* which refers to the percentage of individuals in a general or specific population who have ADHD. This method has two components. First, a sample of individuals is drawn from the general population based upon random sampling

[4] Children in the US with ADHD are most commonly diagnosed by pediatricians or other primary care physicians (53%) [Danielson et al., 2018].

techniques that ensure that the individuals are representative of the population in question. Second, for juveniles, parent and/or teacher rating scales are used to identify ADHD symptoms. In addition to such measures, trained interviewers conduct clinical interviews for ADHD symptoms (Roberts et al., 2015). For adults, the method typically relies exclusively on a clinical interview without any input from collateral informants who might know the individual quite well such as a parent, spouse, close friend, etc. Although international prevalence rates for juveniles vary widely from region to region, the results of numerous studies suggest that there is little variation in true prevalence once differences in measurement factors are taken into account. Systematic reviews indicate that population prevalence globally is between 5% and 7%, with males approximately 2½ times more likely than girls to have ADHD (Nigg, 2017a; Hinshaw, 2018; Polanczyk, Willcutt, Salum, Kieling, & Rohde, 2014; Sayal, Prasad, Ford, & Coghill, 2018; Thomas, Sanders, Doust, Beller, & Glasziou, 2015; Willcutt, 2012). This global rate, which is based upon standardized diagnostic procedures rather than cursory assessments, has not changed in the past three decades (Polanczyk et al., 2014). Similarly, in the U.S., although diagnostic prevalence of youth ADHD has increased in the past two decades, ADHD-related symptoms have not (Safer, 2018). Thus, there does not appear to have been any actual large increase in the true prevalence of ADHD comparable to the increased rates based upon diagnostic prevalence of ADHD (Hinshaw, 2018).

For adults, the most current population prevalence study of ADHD in the U.S. used a nationally representative sample of 3,199 18-44-year old adults who were initially screened for ADHD using a lay-administered diagnostic interview followed by blinded clinical interviews for those who screened positive by doctoral-level psychologists (Kessler et al., 2006). The study reported a current prevalence of ADHD of 4.4% (3.2% female, 5.4% male) which is relatively similar to the global prevalence of adult ADHD (Roberts et al., 2015). However, this prevalence is most likely an underestimate for several reasons.

First, and most importantly, in contrast to studies of child population prevalence of ADHD, in studies of ADHD population prevalence in adults there was no input from collateral informants. The importance of collateral informants cannot be overestimated since exclusive reliance on self-report can lead to a vast underreporting of ADHD symptom severity in young adults (Barkley, 2016; Molina & Sibley, 2014). For example, the Milwaukee longitudinal study of child clinic cases of ADHD (n=158) who were followed up into young adulthood (age 21) found only 4% who were diagnosed with ADHD in childhood reported enough current symptoms to

qualify for a DSM-IV diagnosis of ADHD (Barkley, Murphy, & Fischer, 2008). However, use of parent report on the same criteria found that a "whopping 10 times more still met criteria for the disorder" (i.e., 46%) (Barkley, 2016, p. 7). The reliability of the parent-report over the adult self-report in providing an estimate of current ADHD symptoms was supported by its far greater association with various concurrent measures of impairment (Barkley et al., 2008). Similarly, in the most recent follow-up (age 25) of the landmark Multimodal Treatment Study of children with ADHD (MTA),[5] there was a vast discrepancy between self and parent-reported ADHD symptoms, with parent-reported symptoms being 40-137% higher than self-report (depending upon the number of factors used to classify cases) and correlating well with functional outcomes (Roy & Hechtman, 2017; Sibley et al., 2017).

Second, the prevalence rate was based on the older DSM-IV rather than the more sensitive DSM-5 criteria. This has been shown to underestimate the prevalence in adolescents and adults. Vande Voort, He, Jameson, and Merikangas (2014) compared the prevalence of DSM-IV versus DSM-5 ADHD in a nationally representative sample of 1,894 participants 12 to 15 years of age in which trained lay interviewers conducted a structured interview with parents. The study found an increase in prevalence from 7.38% to 10.84% (14.10 male; 7.57 female). The children whose onset was between ages of 7 and 12 years were not systematically different in terms of severity and comorbidity when compared to children whose onset occurred before the age of 7 years. A study of adults which pooled the results of two general population surveys in the United States reported a prevalence rate of 8.2% (approximately the same for both males and females) based on DSM-5 criteria (Ustan et al., 2017). This finding is almost double the 4% prevalence reported just over

[5] The MTA is the largest treatment study to date with the most representative, generalizable clinical sample of children with ADHD (McGough, 2016). The initial purpose of the study was to establish specific treatment strategies and to assess the effectiveness of such strategies. To this end, the participants (579 children, 465 males diagnosed with ADHD-C at ages 7-9) were recruited from a variety of sources (e.g., mental health centers, advertisements, pediatric referrals) and randomly assigned to 4 groups: (1) medication management, (2) behavior therapy, (3) medication and behavior therapy, (4) community care, of whom approximately 2/3's were treated with medication. At the study's end at 14 months the subjects returned to various forms of community care. It was also decided to extend the study in terms of various follow-ups with the most recent being at a mean age of 25.

10 years ago by the same group using similar approaches (Kessler et al., 2006; Shaw, Ahn, & Rapoport, 2017).

Third, since the DSM symptoms were based upon childhood manifestations of ADHD presentations, it is unclear whether the symptom set is developmentally appropriate for late adolescents or young adults (Roberts et al., 2015; Sibley & Kuriyan, 2016). Thus, the documented decline of symptoms (especially hyperactivity/impulsivity) may be due to the lack of sensitivity of the DSM criteria rather than a true decline (Roberts et al., 2015). DSM-5 clearly acknowledges this problem and tries to address it by providing descriptions of how the symptoms might be expressed in older teens and adults. However, with the exception of a study of adolescents with ADHD which found that the new descriptors increased by one the total number of ADHD inattentive symptoms endorsed by parents (Sibley & Kuriyan, 2016), the extent to which the descriptors enhance diagnostic accuracy has not been tested (Roberts et al., 2015). Interestingly, Sibley and Kuriyan (2016, p. 184) commented that new DSM-5 descriptors "may partially arrest the noted symptom decline in adolescence." In addition to concerns about the content of the DSM items, it is also questionable whether a cutoff score of five is the best suited to identify an impairing level of ADHD symptoms. Research has shown that a norm-based cutoff[6] score of 4 identifies adults who have functional impairments and therefore the use of a cutoff of 5 will miss adults with impairing ADHD symptoms (Roberts et al., 2015).

In conclusion, the implications for the criminal justice system of the discussion of prevalence are as follows. First, although as with all studies of the prevalence of mental disorders in the general population (Wolpert & Ford, 2015), we do not have a perfectly accurate estimate of the true prevalence of ADHD (juvenile or adult) in the general population, there is no doubt that ADHD is a common problem for males (Nigg, 2017a). Therefore, ADHD is likely to be a common problem among male offenders. Second, and most importantly, if individuals with ADHD in the correctional system are to be accurately identified, it is imperative, if at all possible, to obtain information from collateral informants. Third, the developmental insensitivity of the DSM and ICD symptoms to the manifestations of adult ADHD require that an evaluation for ADHD be conducted by a mental health professional who is well-versed in the common manifestations of adult ADHD that are not captured by the official criteria.

[6] A norm-based cut-off is a cut-off based on the presence of elevated ADHD symptomatology or impairment when compared to control-group norms.

New Understanding of ADHD

The past two decades have brought about a major change in understanding the nature of ADHD (Barkley, 2015d; Brown, 2013; Nigg, 2017b). Whereas previously the focus had been on the symptoms of ADHD, a new deeper and broader understanding has emerged. ADHD is now widely conceptualized as a disorder of self-regulation/self-control[7] (Barkley, 2015d; Brown, 2013; Nigg, 2016, 2017a,b). Indeed, Nigg (2016, p. 593) has declared ADHD to be "paradigmatic of problems in the domain of self-regulation" (SR). SR means the "capacity to optimize our behavior, thinking, and attention, and emotional experience and expression" (Nigg, 2017a, p. 12). It involves not only the ability to control attention, behavior and emotions so that they are adaptive to the situation, but also the ability to activate and persist when needed. There is a consensus that SR involves at least three major components: *alertness/detection, information filtering/accumulation,* and *deliberate control* (Diamond, 2013; Nigg, 2017a,b).

Alertness is the capacity to detect a signal from the environment. For some individuals with ADHD a deficiency in alertness/detection can cause them to seem like they aren't listening or paying attention. They have an underaroused or "sleepy" brain which diminishes their level of alertness (Nigg, 2017a).

Filtering occurs when we need to concentrate to sift through the vast amount of information than surrounds us and to focus on one piece or source of information. There is also another kind of filtering that happens more automatically and all the time (Nigg, 2017b). For example, how are we to process a surprising comment a stranger might make? In an instant, the brain samples the comment and compares it to accumulated information. Individuals with ADHD seem to check and accumulate information more inefficiently or slowly. This slow processing speed is a common finding in ADHD (Willcutt, 2015) which "makes it difficult to rapidly filter incoming information and make good decisions about the appropriate response in many day-to-day situations" (Nigg, 2017b, p. 25).

Deliberately taking control and acting follows upon detection and filtering/accumulation of information (Nigg, 2017b). Deliberate control is

[7] Self-regulation and self-control are typically used interchangeably in the literature, as they will be in this book (Nigg, 2017c). Although these constructs are of central importance in psychology, their discussion is characterized by considerable "conceptual clutter" (Nigg, 2017c, p.362). See Nigg (2017c) for a tour de force effort to provide clarity to the variety of terms under which self-regulation/control are discussed.

enabled by several cognitive functions commonly designated executive functions (EFs) [Nigg, 2017a,b]. These include: *response inhibition* (resisting the temptation to act impulsively), *interference control* (resisting internal or external attentional distraction), *cognitive flexibility* (seeing a problem from two different angles or changing task set in relation to a rule or goal), and *working memory* (maintaining information on line) [Diamond, 2013; Engle, 2018l; Nigg, 2017c]. Attentional control is a critical component of working memory (Baddeley, 2012; Engle, 2018). As Engle (2018) noted in a recent article in which he revisited his earlier work: "I now think that the tasks used to measure working memory capacity largely reflect an ability to maintain information in the maelstrom of divergent thought" (p. 192).

To summarize then, ADHD is best conceptualized as a "global self-regulation disorder" (Nigg, 2017a, p. 17) characterized by multiple deficits in the components of SR (Willcutt, 2015). This conceptualization represents a shift away from attempting to identify a single deficit that is necessary and sufficient to cause ADHD to models that posit several deficits. ADHD symptoms and related impairments are thought to arise from the additive or interactive effect of these deficits (Willcutt, 2015). Since a dysfunction can occur in one or more of the components of SR, this helps explain how variations in ADHD occurs. There are ongoing attempts to parse this variation by identifying distinct neuropsychological subtypes of ADHD (e.g., Roberts, Martel, & Nigg, 2017). In short, ADHD is not a "one-size-fits-all-condition" (Nigg, 2017a, p. 37).

Self-Regulation Deficits and the Link to Criminal Offending

Voluminous research has established that impaired SR is of "almost unparalleled importance to mental health" (Nigg, 2017a, p. 661) and may be the single most important variable in explaining the developmental origins of antisocial behavior (Moffitt, 2012; Moffitt et al., 2011). Numerous studies have shown that impaired SR is linked to juvenile and adult criminal behavior (DeLisi, 2015; DeLisi & Vaughn, 2014; Mohr-Jensen, 2016; Vazsonyi, Milkuska, & Kelley, 2017), and it has been shown to be more important than socioeconomic status or IQ in predicting crime (Poulton, Moffitt, & Silva, 2015). Indeed, the importance of impaired SR theory is such that it has been proclaimed the Tyrannosaurus rex of criminology that is poised to devour criminal justice theorizing (De Lisi, 2011). "In terms of empirical tests of its theoretical ideas, citations, influence on the field, self-control theory is "peerless" (DeLisi, 2011, p.