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ADULT ADHD: An Explorative Inquiry into Assessment, Executive Function, QoL, Comorbid Psychopathy, and Practical Application

Manuel Angel Ramirez

Bank Street College of Education, mramirez@bankstreet.edu

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ADULT ADHD: An Explorative Inquiry into Assessment, Executive Function, QoL,
Comorbid Psychopathy, and Practical Application

By
Manuel Angel Ramirez

Mentor:
Nilda Bayron-Resnick

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By Manuel Angel Ramirez

Abstract:

Attention Deficit Hyperactivity Disorder (ADHD) is neurodevelopmental disorder characterized by a pattern of behavior present in multiple settings that can result in performance issues in social, educational and work settings. Although ADHD is prevalent in children, research has proven that the disorder lasts into adulthood. The current body of literature has also suggested that ADHD symptoms are related to specific impairments with executive functions. This paper will introduce ADHD and provide background information on the disorder. It will also examine current literature on assessment, executive function (EF), feasibility of EF measures, quality of life (QoL) as it pertains to adults with ADHD and explore practical ways to use assessment data. Lastly, this paper will take a look at what future research can further investigate in order to provide a more robust body of literature that looks at the basic executive functions associated with ADHD, assessments that may be of utility outside of the lens for a diagnostician, and the implications that available treatment options have on the improvement of deficits and impairments related to ADHD.

Table of Contents

Introduction	4
Literature Review	7
Assessment of ADHD in Adults	23
Feasibility/ Utility of Executive Function Measures in ADHD Diagnosis	27
How Executive can be defined Meaningfully to Adults with ADHD	31
Quality of Life (QoL) of Adults with ADHD/ Adult ADHD	37
Long-term Psychological Implications/ Susceptibility to other Psychological Disorders	42
Practical Applications to Encompassing Information Across Contexts: Child to Adult; Adult	46
Conclusion	50
References	52

“A diagnosis of ADHD will mean different things to different people. The impact of receiving a diagnosis can be profound” (Surman, 2013, p. 42).

Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder defined by impairing levels of inattention, disorganization, and/or hyperactivity-impulsivity that prevails into adulthood, often with the evolution of symptoms or the manifestation of symptoms in other facets of life that affect Quality of Life (QoL). As a child ADHD impacts an individual in educational attainment, behavior regulation, and most often social cognition. These areas of deficit or challenge for children may be remedied by pharmacological intervention, talk therapy and modified or augmented instruction coupled by accommodations to provide access to developmentally appropriate instruction, experiences, and opportunities; i.e. friendship formation, interpersonal relationship development, academic instruction/ content instruction, metacognition, among other areas applicable to a child’s life. Although these management techniques, interventions, and supports do not remove the disorder, they afford children the ability to learn coping techniques, strategies to leverage strengths, and skills to work through challenges that present themselves over the child’s lifespan.

However, educational attainment and social cognition aren’t always the most impacted parts of Adult ADHD. Typically, adults with an ADHD diagnosis are impacted in their overall QoL This may appear as an inability to secure employment for extended periods of time (more than 6 months to a year), disorganization, poor planning, difficulties with educational attainment/ advancement (when applicable), and challenges

with personal relationships, among other executive dysfunctions. Moreover, the existing body of literature around Adult ADHD suggests that executive function deficits may correlate to overall QoL or Adult ADHD Quality of Life (AAQoL). Although the manifestation of symptoms for an individual may vary from child to adult, there is strong evidence that suggests that executive function (EF) deficits may be significantly impacted by ADHD, while there is also evidence that suggests the relationship between the two are incongruous to one another. Furthermore, there is research that confirms an individual may have an executive dysfunction and not have ADHD, and vice versa have ADHD and no executive dysfunction.

As research in assessment prescribes different measures of assessing for an ADHD diagnosis, particularly in adults, it is crucial to develop an understanding of a comprehensive manner that not only delineates between ADHD symptomatology and other psychological disorders, but also accounts for comorbidity and/or the presentation of other psychological dilemmas. More specifically, measures should help to predict for long-term outcomes and best practices for treatment should be indicative of alternatives to medication and those individuals who use other coping strategies that can affect other parts of their health; i.e. excessive alcohol and/or drug use, hypersexuality, etc., among others that relate to an individual's manifestation of symptoms and impairment. Overall, this paper seeks to understand the assessment of ADHD in adults, the feasibility/ utility of EF measures to ascertain an ADHD diagnosis, how EF can be defined meaningfully to adults with ADHD, the QoL of adults with ADHD/ Adult ADHD, the potential long-term psychological implications/ susceptibility to other psychological disorders, and ultimately

propose practical approaches to encompassing all the information provided to be applicable across contexts: child to adult; adult.

Literature Review

ADHD in Adolescents and Young Adults, Execution Function, and Assessment

Introduction

Attention-deficit/hyperactivity disorder (ADHD) is a neurodevelopmental disorder defined by impairing levels of inattention, disorganization, and/or hyperactivity-impulsivity (American Psychiatric Association [APA], 2013). ADHD affects approximately 5.9% to 7.1% of children and adolescents (Willcutt, 2012 c.f. DuPaul, Reid, Anastopoulos, & Power, 2014, p. 209) though there are reports that indicate about 9.5% of children are diagnosed with ADHD (Pastor et al., 2015). ADHD is diagnosed based on an individual's presentation of symptoms that fall under one of two domains: inattention and hyperactivity-impulsivity. However, there is a third subtype that can classify individuals who present with the disorder which is the manifestation of symptoms that fall under both the inattentive and hyperactive diagnostic criteria—combined subtype. According to Ranby and colleagues (2012), subtypes of ADHD by the presence of symptoms in the domains previously mentioned are as follows: predominantly inattentive type, predominantly hyperactive-impulsive type, and combined type.

The Diagnostic and Statistical Manual of Mental Disorders 5th Edition (DSM-5) asserted that inattention and disorganization entail the inability to stay on task, appearance or observation of not listening, and losing materials to a degree inconsistent with age or developmental level. According to the DSM-5, inattention manifests behaviorally in ADHD as wandering off task, lacking persistence, having difficulty sustaining focus, and being disorganized and is not due to defiance or lack of

comprehension (American Psychiatric Association [APA], 2013). Conversely, hyperactivity-impulsivity entails overactivity, fidgeting, inability to stay seated, interfering with or interrupting other people's activities, and lack of patience or an inability to wait/ delay to an excessive extent for age or developmental level. The diagnostic features for hyperactivity and impulsivity are outlined as follows:

“[*hyperactivity*—] excessive motor activity (such as a child running about) when it is not appropriate, or excessive fidgeting, tapping, or talkativeness [, and *impulsivity*—] hasty actions that occur in the moment without forethought and that have high potential for harm to the individual (e.g., darting into the street without looking)” (American Psychiatric Association [APA], 2013).

In order to substantiate symptoms in individuals believed to have ADHD, a confirmed pattern of behaviors indicative of ADHD symptoms across settings needs to be established by consulting with informants who have seen said individual in those settings (American Psychiatric Association [APA], 2013). This process needs to be done in a comprehensive manner to accurately diagnose an individual with the disorder. Current comprehensive diagnostic assessment of ADHD, particularly in children, involves multiple respondents (e.g., teachers, parents) and multiple measures (e.g., diagnostic interview, behavior rating scales, direct observations of classroom behavior) to determine whether a student's behavior and functioning meet DSM-5 criteria for ADHD (Anastopoulos & Shelton, 2001; Barkley, 2014; DuPaul & Stoner, 2014 c.f. DuPaul, Reid, Anastopoulos, Power, 2014, p. 410). The penultimate diagnosis for ADHD according to the DSM-5 of either ADHD subtype requires the persistence of six or more of the outlined symptoms for at least 6 months “to a degree that is inconsistent with

developmental level and that negatively impacts directly on social and academic/occupational activities” (American Psychiatric Association [APA], 2013, p. 59-60). Adults who are diagnosed with ADHD and may not have been formally been diagnosed prior would be administered the Conner’s Adult ADHD Rating Scale-Self Report or Adult ADHD Self-Report Scale (ASRS); occasionally the Adult ADHD QoL Scale (AAQoL); a structured clinical interview implementing DSM-V criteria; and potentially a clinician-reported global measure of ADHD symptoms, assessed by Clinical Global Impressions-ADHD Severity (CGI-ADHD-S).

The diagnoses range in severity from mild to severe and depending on the prevalence of symptoms and/or the overlap in symptomology from one disorder to another, comorbid diagnoses may be suspected, so differential diagnoses need be appropriately vetted and verified as a means to appropriately diagnose a child under one of the three subtypes of ADHD. Although it is of ample importance to understand differential diagnosis, symptoms related to ADHD may overlap significantly with other disorders, to a degree that is far from the scope of this paper, so the focus will be to understand ADHD, executive functions and how they relate to and impact ADHD, assessment, and how ADHD impacts the quality of life (QoL) of adolescents and young adults with the disorder.

Adult ADHD and QoL

As adults differ from children and are often thought to be more reliable because of cognitive development, it is often the case that they are diagnosed with ADHD through self-report measures, semi-structured interviews, rating scales, among other rating scales that were developed to identify symptoms in adults. According to Matza and colleagues

(2007), several measures are available for assessment, including diagnostic interviews, brief screening instruments, and self report scales; however, research and existing literature prescribe that these measures are indicative of assessing symptoms rather than the overall impact of ADHD. The measures typically used to assess were designed to identify symptoms as persistence of the disorder into adulthood varies widely. Moreover, children who have been previously diagnosed are often provided an ADHD diagnosis based on a series of surveys, scales, and report measures, among other measures and when done in a comprehensive manner, a multimethod approach.

However, research has shown that ADHD persists into adulthood and research indicates that long-term follow-up studies have found that roughly one-third to two-thirds of children with ADHD continue to have some symptoms as adults (Matza et al., 2007). Existing research asserted that a diagnosis is dependent on diagnostic criteria, methods, and materials used to follow and assess samples of children previously diagnosed with the disorder. Conversely, when an adult has not been previously diagnosed in childhood, assessment tends to shift to account for aspects of life that may be impacted outside of academic attainment, inclusive only when applicable to the life of the adult.

As the needs of adults versus the needs of children shift with age it is imperative to indicate the kinds of assessments as well as the outcomes that can result from previous intervention or lack thereof. Research has suggested a growing need for the development and validity of outcome measures to be used in the population of adults with ADHD. Measures that assess for symptoms don't assess for the impact of ADHD and therefore, lack the ability or simply do not capture the effects of ADHD on adults' health related quality of life (HRQL) (Matza et al., 2007). According to researchers HRQL is a broad

construct representing the patient's/ client's subjective perception of the impact of health status, including disease and treatment, on physical, psychological, and social functioning. Additionally, in adults, ADHD symptoms are associated with impairments in multiple domains that are considered to be key aspects of HRQL, including work performance, social functioning, educational attainment (if so desired), emotional adjustment, and marital adjustment. In order to account for the impact, the Adult attention-deficit/ hyperactivity disorder quality of life scale (AAQoL) was developed, to be considered a disease specific quality of life measure.

The AAQoL consists of 29 potential items, assessing five hypothesized ADHD-related quality of life "areas of impact": productivity, daily activities, psychological health, physical health and relationships. The measure functions in the following: for each item, respondents are asked to evaluate the degree or frequency with which they find each QoL issue troublesome or problematic, using a five-point Likert-like response scale, 'Not at all/Never' (1) to 'Extremely/Very Often' (5) (Brod et al., 2006). In a study by Matza and colleagues (2007), researchers found that although further research is warranted for a deeper understanding into AAQoL and its ability to adapt to change/interpret change, the AAQoL is a useful patient-reported outcome measure for use in samples of adults with ADHD, as previous research suggested. As the tool has been suggested to possess strong psychometric properties, this instrument is likely to be useful in both research and clinical practice. AAQoL may be used to identify domains of greatest importance to individual patients so that these domains can be followed as one way to monitor treatment progress and inform management of the disorder, so that individual goals and treatments align (Matza et al., 2007).

Research has highlighted and suggested that as ADHD symptoms evolve and persist into adulthood to an extent that impacts QoL, focus of assessment should target both QoL and the manifestation of symptoms. Quintero and colleagues (2017) contested, some ADHD core symptoms tend to decline over time, and they may manifest in different forms as patients adjust their social and personal environment to the symptomatology. However, researchers noted that ADHD will affect--to a greater or lesser extent--many aspects of the adult's life regardless of the degree of symptom remission. Quintero and colleagues (2017) also highlighted that there are multiple developmental pathways that individuals with ADHD may encounter through their respective lifespans and this can be impacted by diagnosis and treatment during childhood, as they influence the course of patients' life, which in turn leads to a broad range of clinical profiles in adult patients. As this is the case, the aspect of complexity and the evolution of symptoms have proved it rather difficult to discern whether functional impairments correlate with or are a result of underlying ADHD. Some authors have highlighted the need to clarify ADHD symptoms beyond inattention and hyperactivity, and even propose consideration of the multiple developmental pathways and the neuropathological heterogeneity of ADHD in adults. Quintero et al. (2017) underscored this notion by affirming that QoL assessment may be considered a measure of the ADHD long-term outcomes, which encompasses the impact of both executive and emotional dysfunctions associated with the disorder.

Furthermore, Stern and colleagues (2017) contended that persons with ADHD may be significantly impaired in their capacity to manage and utilize their abilities for many important tasks of daily life: Adult ADHD causes considerable hardship, often

characterized by academic, occupational, and/or emotional impairment and dysfunction within the family and society. In the most current literature, researchers examined the relationship between EF neuropsychological and ecological measures commonly used in clinical practices in conjunction with measures of HRQL in adults with ADHD, and whether EF measures provide a unique prediction of explained variance of HRQL, beyond that accounted for ADHD symptomatology (Stern et al., 2017). Results yielded from the study explained that there appeared to be greater deficit in the metacognitive components of executive function in adults with ADHD. Researchers also proposed that other results ascertained by the study strengthen the ecological validity of the EF rating scales and their utility in linking EF deficits with real-world implications in adults with ADHD. Stern and colleagues (2017) indicated that EF measures may offer a unique and robust perspective to HRQL, as they found correlations with EF measure and AAQoL when examining the prediction of EF measures and their relationship with AAQoL.

Executive Function (EF) and ADHD

There is evidence that suggests and supports that specific executive functions (EF) play a role in the lives of individuals with ADHD. There are essentially three basic types of executive function: updating, inhibition, and shifting. Updating is associated with working memory and refers to the ability to keep information active, accessible and shielded from distractions. Inhibition is regarded as the ability to deliberately inhibit dominant and/or automatic responses when necessary. Shifting, also known as task switching, is the ability to shift back and forth between multiple tasks or mental sets (Hofmann et al. 2012). A notable distinction to discuss further in subsequent sections is that adults are more likely to be willing to tolerate to a greater or lesser extent the

academic and behavioral difficulties that children often experience; however, in adulthood, these same difficulties may cost people jobs and relationships.

A large number of studies have documented that many youth with ADHD experience deficits in aspects of EF, such as working memory, response inhibition, planning and organization, and sustained attention (e.g., Hinshaw et al. 2007; Pennington and Ozonoff 1996; Seidman et al. 2000; Thorell 2007 c.f. Langberg 2013). Although there is certainly no consensus for an operationalized definition of EF (Jurado and Rosselli 2007 c.f. Langberg 2013), it is clear that EF represents a broad range of abilities, such as behavioral inhibition, shifting, and emotional control, problems in initiation, working memory, managing current and future-oriented task demands, materials organization, and self-monitoring (Barkley 1997 c.f. Langberg 2013).

It is important to note that there is some debate regarding whether components of EF (e.g., planning/organization) are conceptually distinct from ADHD symptom dimensions (Toplak et al. 2012 c.f. Langberg 2013). This is important to note because there is evidence that suggests that ADHD symptoms of inattention are more strongly associated with EF than symptoms of hyperactivity/impulsivity and that the two constructs are indeed conceptually distinct (Willcutt et al. 2005 c.f. Langberg 2013). Researchers suggest that it is necessary to examine precisely which facets of EF are most closely aligned with ADHD diagnosis to accurately assess for the disorder and if necessary, provide intervention strategies and/or treatment/management plans.

Working memory operations, which is also referred to as updating, an executive function that deals with ADHD, involves several self-regulatory mechanisms: active representation of self-regulatory goals and standards, top-down control of attention

toward goal-relevant information and away from attention-grabbing stimuli, shielding of goals and standards from interference, suppression of ruminative thoughts, and down-regulation of unwanted affect, desires and cravings (Hofmann et al. 2012). Task-switching, also referred to as mental shifting or shifting, another executive function that is often impaired or compromised, is the ability to flexibly switch between different means replacing the same self-regulatory goal, also known as “means-shifting” and as it has already been stated the ability to switch between multiple goals, also known as “goal-shifting/balancing” (Hofmann et al. 2012). Behavioral inhibition, often referred to as inhibition, is the ability to successfully and actively inhibit or override behavioral habits, those of which are considered bad and impulses that are incompatible with an individual’s specific goal (Hofmann et al. 2012). Impulsivity, the failure to resist an impulse/unwanted drive, is a core feature of several psychiatric disorders, including ADHD (Barkley, 1997; Nigg 2010). Stahl and colleagues (2013) classified the ability to shield information from any distractions as the ability of interference control, which falls under inhibition or inhibitory control and goes hand in hand with impulsivity.

In sum, the three basic executive functions associated with ADHD are working memory/updating, tasking switching/shifting, and behavioral inhibition. These executive functions are closely linked to ADHD because each function is associated with a form of cognition that is often hindered because of the inattention or hyperactivity-impulsivity deficit that stems from ADHD. As stated above, working memory/updating deals with the active representation of self-regulatory goals and standards; without an active representation of such goal-related information, self-regulation is considered directionless and bound to fail unless individuals have fully habitualized, automatic self-regulatory

routines at their disposal (Baumeister and Heatherton 1996; Fishbach and Shah 2006; Gollwitzer and Brandstatter 1997 c.f. Hofmann 2012), which can be very difficult for someone with ADHD inattentive and/or hyperactivity/impulsivity type. In the same vein, tasking switching/shifting and the ability to shift between goals is impacted by one's inability to sustain focus for a significant period of time that would allow an individual with ADHD to successfully achieve the set goals and in essence move on or shift to another goal. Additionally, behavioral inhibition is associated with ADHD because the ability or inability to inhibit or override specific habits or impulses is a key deficit in ADHD hyperactivity/impulsivity type as has already been iterated.

Checklists/Inventories/Assessments

Several checklists currently exist to measure and eventually diagnose ADHD in individuals, in this case children. Some include, but are not limited to the following measures:

- *ADHD Rating Scale-IV*—obtains parents' rating for the frequency of noted symptoms on the checklist, consisting of 2 subscales: inattention (9 items) and hyperactivity-impulsivity (9 items), completed independently by the parent and scored thereafter by a clinician.
- *Conners' Rating Scale-Revised & Conners' Teaching/Parent Rating Scale-Revised*—evaluates problem behaviors, ADHD, and comorbid disorders as reported by teachers, parents (or other caregivers), and adolescents. Considered the standard for attention and behavior assessment in children and adolescents, although research by Deb and colleagues (2008) contended that when it comes to distinguishing between children with an intellectual disability (ID) with and without ADHD, the scales do not

- correlate with one another and require the development of an ADHD screening instrument specifically for children with ID to yield reliable report data.
- *Vanderbilt ADHD Diagnostic Rating Scale (MADRS)*—obtains both teacher and parent reported ratings that look into the following behaviors and have a corresponding **never** or **very often** rating choice with others in between: *inattention, hyperactivity/impulsivity, combined subtype, oppositional defiant and conduct disorders, anxiety or depression symptoms*
 - *Swanson, Nolan and Pelham Teacher and Parent Rating Scale (SNAP)*—measures attention deficit hyperactivity disorder (ADHD) and oppositional defiant disorder (ODD) in children and young adults by having parents score items found on the scale with a 0-3 scaling system (0-“not at all”/3-“very much”) on items like, but not limited to: *often has difficulty organizing tasks and activities, often restless or overactive, has difficulty getting started on classroom assignments, often has difficulty awaiting turn, etc.*

**The noted measures are mentioned to highlight the many different inventories of assessment that adhere to a checklist protocol. However, Holmes and colleagues (2010) argued, ADHD diagnoses are often heavily based upon symptoms assessed by behavioral checklists—these can lack diagnostic utility, despite how psychometrically sound the measures of assessment are represented to be (p. 37). **

Assessment and ADHD encompass a variety of checklist protocols and potentially informative testing of impairment and functioning. Many of the key concerns with regard to assessment and determining an ADHD diagnosis is whether differential diagnosis has been effectively and appropriately vetted, and if developmental variation has been

assessed as typical or appropriate. Some of the challenges that were presented in the above noted texts were time constraints, feasibility, reliability, and validity of assessments. Authors who explained assessment protocol for ADHD asserted that the psychometric properties of the current most commonly used assessments, Connors Rating Scale, Child Behavior Checklist (CBCL), ADHD Rating Scale, Child and Adolescent Functional Assessment, among a few others meet the expectations for reliability and validity to be used in assessment, diagnosis and treatment. However, many of the challenges of relying upon report measures, interviews and the like is understanding the diagnosis beyond the symptoms prescribed by the DSM in its current version (DSM-V) and previous versions, as it outlines this neurodevelopmental disorder. Moreover, authors and clinicians contended the need to consider development and epidemiology, as well as the psychosocial impact and comorbidity that often accompanies ADHD. The idea behind epidemiological consideration is that there is variation—parent reports versus teacher reports with regard to prevalence of symptoms, frequency of reported symptoms between younger and older children as well as between boys and girls, and the influence of ethnic diversity. Additionally, research indicates that the onset of symptoms can also varies across development and understanding when symptoms first arose in comparison to when symptoms caused problems/challenges, a distinction to further comprehend the manifestation of symptoms and its presence in the child's life. Conversely, some clinicians contend that focusing on symptoms as prescribed by the DSM-V and targeting them as socially valid constructs for intervention are not necessarily the most feasible as they argue that beyond their indicators for potential ADHD diagnosis, they do not target functional impairment. To that end, many clinicians asserted that the main focus of

assessment in ADHD should be impairment and adaptive skills, and how targeting these components can address the domains needed to create comprehensive treatment plans and monitor effectiveness and utility of prescribed intervention/management plans. Overall, the main theme that arose from the research conducted was that when assessing for ADHD the goal should be purposeful and intended to justify a diagnosis and whether there is an alternative explanation for the presence of symptoms; furthermore, assessments should include and incorporate a multimethod approach: clinical interviews, rating scales, psychological testing and observational testing, so that a comprehensive review of all that impacts a child thought to have ADHD is gathered and informed plan can be put in place. Relying on one assessment or another isn't sufficient to map out the disorder as it is outlined by the DSM-V.

Current best practices for assessment of ADHD include utilizing a multi-method approach, integrating clinical interviews, behavior rating scales, observational recording/reporting and pertinent psychological testing in order to determine the degree of impairment and academic challenge, as impaired functioning is required for ADHD diagnosis. Best practices may include utilizing commonly used batteries of assessments, such as the Connors Rating Scale, ADHD Rating Scale, the BASC and CBCL, as well as psychological testing inclusive of, but not limited to the Stroop Word-Color Test, a timed test measuring the ability to suppress or inhibit automatic responses; Wisconsin Card Sort Test, a test measuring adult frontal lobe or executive dysfunction; and Continuous Performance Tests, which can often vary in visual, auditory, number, and character sequence. Some other forms of assessment may be used that integrate features of whole assessments to get a more holistic view of the child in question. Conducting clinical

interviews and collecting objective information, such as through a Functional Behavior Assessment, can add to the comprehensive manner in which data is collected in order to come to an appropriate determination of an ADHD diagnosis. Adaptive behavior assessments are also considered best practices, and since many of the current or most commonly used measures of assessment have been clinically approved with regards to reliability and validity, in addition to being reviewed for their psychometric feasibility, measures for adaptive behavior, such as the Vineland Adaptive Behavior Inventory may be appropriate for use in determining deficit/challenge and strength in areas of life functioning affected by ADHD. Best practices also include, if not what guides the evaluation, conducting an assessment that works hard to rule out the possibility that presenting complaints of ADHD symptoms are either variants of typical development or are better associated/correlated to other diagnostic entities, accounting for the potential of comorbidity and differential diagnosis (Barkley, 2006).

Many of the aforementioned measures of assessment would be appropriate in the area of special education, as the assessments described seek to understand the degree of functional impairment, presentation of symptoms, and manifestation of behaviors indicative of ADHD. A more thorough understanding of functional impairment as well as difficulty with adaptive behavior can be informative to constructed intervention plans that can be provided to a child with an ADHD diagnosis on his/her IEP or on a 504 plan. Using these types of assessment in accompaniment to clinical interviews and behavior rating scales can more appropriately inform the need of accommodations or modifications in the classroom. Variations of the assessments that target particular skills, such as in the psychological testing can elaborate on adaptive behavior scales and

inventories in a more clinical and practical form, so that the results of such assessments can be applicable in special education settings.

Holmes and colleagues (2010), discussed the feasibility and constructive nature of using tasks designed to look at the executive functions in children with ADHD and underscoring the notion that cognitive assessments provide excellent degrees of discrimination between children who do and do not have a diagnosis of ADHD (p. 41). Holmes and colleagues (2010) utilized four tests of the Delis–Kaplan Executive Function System (D-KEFS). The study focused on using the following assessments: *Trail-Making test* to assess abilities to shift attention between mental sets, and consisted of a number of different conditions to account for other varying abilities thought to be impacted by ADHD; *Color-Word Inference Test* to assess for cognitive inhibition of a prepotent response, which was carried out in a variety of conditions to account for the basic processes needed to carry out the task; *Card Sort Test* to measure the initiation of problem-solving behavior and conceptual learning as well as the ability to inhibit and control previous responses to engage in flexible thinking when problem solving; and the *Tower Test* to measure planning, rule learning, and the ability to inhibit an impulse response.

The Delis-Kaplan Executive Function System (D-KEFS) test battery is a described as a standardized tool with high construct validity consisting of verbal and visuo-spatial short-term memory (STM) tests, and verbal and visuo-spatial working memory tests that tap into both the central executive and the appropriate domain specific stores of the Baddeley and Hitch model of working memory (Holmes et al., 2010, p. 38). Baddeley and Hitch formerly proposed a three-component model to working memory in

their research, which is the model that is being described by Holmes and colleagues (2010). The findings of the overall study by Holmes and colleagues (2010) indicated that cognitive measures, such as the few listed above can be used with high degrees of accuracy to help identify children who are likely to have ADHD. Inclusion of such measures in clinical assessments would go some way towards alleviating concerns about the reliance upon behavior checklists in the diagnosis of ADHD and would also contribute to the recognized need for multi-method assessments in identifying ADHD (Pineda et al., 2007 c.f. Holmes et al., 2010, p. 42). This form of assessment can extend further past the items of a checklist and fully explore the behaviors and symptoms, as well as assess the underlying neuropsychological mechanisms thought to be impaired in individuals with ADHD (Holmes et al., 2010).

Assessment of ADHD in adults

The assessment ADHD in adults most often encompasses the use of self-report measures, semi-structured interviews, rating scales, and other rating scales—typically checklists prescribed by the DSM-V (current DSM). These interviews focus on the presence of symptoms in a client (evaluee) and primarily target the assessment of symptoms, not necessarily the impact symptoms have on the individual being assessed, which is important as Quality of Life (QoL) is influenced by the impact of symptoms. Existing literature prescribes the use of several measures and affirm that the measures available for assessment of ADHD in adults relies mostly on diagnostic interviews, brief screening instruments, and self-report scales (Matza et al., 2007). The design of instruments and assessments tools focused on the prevalence of systems as the persistence of ADHD into adulthood varies; however, a growing body of literature has confirmed that ADHD persists into adulthood and research indicates that long-term follow-up studies of individuals with ADHD, those of whom have been diagnosed with the neurodevelopmental disorder in childhood, found that roughly one-third to two-thirds of children with ADHD continue to have some symptoms as adults. Furthermore, when assessment of ADHD in individuals who have not been previously diagnosed in childhood transpires, it is often skewed or shifted to account for those factors of life that are impacted outside of the scope of academic attainment, which when diagnosing children is the primary focus as the central idea is that intervention or management approaches are tailored to bridge academic achievement gaps that may exist due to the presence/ impact of the the disorder.

With this in mind, the question becomes, what are considered appropriate measures/ tools of assessment of ADHD for individuals in adulthood? This becomes the question as academic achievement is focused upon heavily with a great deal of emphasis in childhood, but when individuals reach adulthood, academic achievement outcomes may not be appropriate as these goals/ outcomes may not be congruent to the path or QoL in relation to the individual with ADHD. Systemically, it is more feasible to categorically quantify the disorder in childhood, as the measures used are often targeted to achieving a desired common outcome—academic achievement, work readiness skills, and access to equitable instruction. However, as stated previously, when assessing individuals for ADHD in adulthood, the focus is more prominently geared to the ways in which their lives outside of academia are impacted, which may interfere with QoL, depending on the goals of the individual. Many researchers argue that it is crucial to develop and/or implement a multiple developmental pathway when looking into the manifestation of symptoms, as well as encompassing this idea of a neuropathological heterogeneity of ADHD in adults (Quintero et al., 2017). Researchers contend that developing a type of model that integrates executive function impairments brought upon by the presence of ADHD as well as executive and emotional dysfunctions associated with the disorder may bridge gaps in understanding that exist in the complexity that is QoL in adults with ADHD/ Adult ADHD.

Stern and colleagues (2017) contended that persons with ADHD may be significantly impaired in their capacity to manage and utilize their abilities for many important tasks of daily life: Adult ADHD causes considerable hardship, often characterized by academic, occupational, and/or emotional impairment and dysfunction

within the family and society. Understanding the degree to which impairment in occupational and emotional domains impact the lives of adults with ADHD may better assist in monitoring treatment progress and informing management strategies/ techniques that would benefit the individual, so that goals and treatments of the disorder align and are specific to the individual in question. In particular, assessment that explores the implications of the impact that the disorder has on interpersonal/ intrapersonal relationships can assist in practical application of management techniques for individuals struggling with familial and societal relationships. A potential consideration of the disorder is that some of the core symptoms tend to decline over time, and they may manifest in different forms as individuals adjust their social and personal environment to the symptomatology, and although this is supported in the literature, there is research that extends this idea and posits that ADHD will affect to a greater or lesser extent many of the aspects of the adult's life regardless of symptom remission or extinction. Moreover, as outcomes from childhood to adulthood shift, it is worth mentioning that symptoms that have previously impacted a diagnosed adult in childhood, may not be as instrumental or necessary for functionality or QoL and therefore not indicative of symptom remission or extinction, but rather lack of need or necessity for functionality in adulthood.

Research has suggested a growing need for the development and validity of outcome measures to be used in the population of adults with ADHD. Measures that assess for symptoms don't assess for the impact of ADHD and therefore, lack the ability or simply do not capture the effects of ADHD on adults' health related quality of life (HRQL) (Matza et al., 2007). According to researchers HRQL is a broad construct representing the patient's/ client's subjective perception of the impact of health status,

including disease and treatment, on physical, psychological, and social functioning. Additionally, in adults, ADHD symptoms are associated with impairments in multiple domains that are considered to be key aspects of HRQL, including work performance, social functioning, educational attainment (if so desired), emotional adjustment, and marital adjustment (Matza et al. 2007). Assessment of components outside of the domain of academic outcomes is integral to the assessment of ADHD in adults without a previously confirmed diagnosis as it can contribute to ascertaining a diagnosis that is more consistent with the impact to which the diagnosis affects the life of the adult with ADHD. A multimethod approach similar to the approach taken with children, but specific to the life experiences that adults face should be taken into account for the presence of symptoms, their manifestation, and the ways they impact other aspects of life.

Feasibility/ Utility of Executive Function Measures in ADHD Diagnosis

Existing research has looked at EF and its role in ADHD diagnosis. The literature highlights in length the speculation of symptoms impairing executive functioning in individuals with ADHD, but also discussing executive function deficits that contribute to the manifestation of symptoms. Current literature speculates whether one is synonymous with the other, while other literature and researchers argue that the relationship is not significant enough to be considered causal or relational for that matter. However, whether the literature is in direct support of a causal relationship, there is a correlation between deficits that exist in individuals with ADHD and executive function impairment. As such, it would be feasible to investigate the degree to which executive function impairment is impacted in individuals, such as adults with ADHD. There are essentially three basic types of executive function: updating, inhibition, and shifting. These particular functions are often considered impaired functions in individuals presenting with deficits related to ADHD and are indicative of core symptoms that manifest as a result of the disorder. Moreover, there is evidence in research that suggests and supports the claim that specific executive functions play a role in the lives of individuals with ADHD. In particular, current and past research explain that many youth with ADHD experience deficits in aspects of EF, such as working memory, response inhibition, planning and organization, and sustained attention (e.g., Hinshaw et al. 2007; Pennington and Ozonoff 1996; Seidman et al. 2000; Thorell 2007 c.f. Langberg 2013). And, in consideration of the fact that one-two thirds of children continue to present with symptoms in adulthood, it can be assumed that the deficits in EF experienced by children diagnosed with ADHD prevail into adulthood.

Another consideration to account for is that there are multiple developmental pathways that individuals with ADHD may encounter through their respective lifespans and this can be impacted further in adulthood depending on diagnosis and treatment during childhood, as these factors influence the course of patients' lives, which in turn contributes to the broad range of clinical profiles in adult patients. With this in mind, it is important to continue to explore the utility of EF testing in individuals being assessed for ADHD. Current literature on the matter explored the relationship between EF neuropsychological and ecological measures commonly used in clinical practices in conjunction with measures of HRQL in adults with ADHD. Such measures seek to understand the depths to which the impairments caused by deficits are brought on by the onset of ADHD impact EF. The use of ecological measures delves deeper into ascertaining data that can be used to inform management techniques/ strategies provided to adults with ADHD. However, because the scope of this paper seeks to better understand the relationship between ADHD and EF, ecological measures are merely referenced to explain the work of prior research and account for the work done in literature. Additionally, environmental factors or aspects relational to the immediate environment of an individual are often extraneous/ external variables that cannot be controlled but may serve to comprehensively inform management and treatment options.

According to Surman (2013), when evaluating ADHD, a clinician should also assess a person's ability to organize themselves beyond ability to control attention and impulse so that appropriate supports may be established. Moreover, Surman (2013) and other researchers proposed that executive function deficits beyond the core traits of ADHD predict additional burden in daily life and indicate need for specialized supports.

Research supports the assessment of executive function in adults, as the literature reported that children and adolescents with ADHD demonstrate deficits in executive functioning (i.e. memory, attention, planning, shifting, and inhibition) across multiple neuropsychological tasks, and as ADHD does not fade with age, the likelihood of dysfunction occurring in adulthood or prevailing throughout the lifespan is probable. According to Toplak and colleagues (2009) there is some overlap between ADHD symptom scales and the Behavior Rating Inventory of Executive Function (BRIEF), which highlight the appropriateness of utilizing EF scales or measures of assessment to inform ADHD diagnosis.

Furthermore, researchers have prompted that executive function measures to assess EF, using neuropsychological tests, which target discrete tasks considered representative of EF have been suggested to be of particular utility in ADHD testing (Epstein & Weiss, 2012). Of those tests, researchers have noted the following as feasible and of valid utility:

- *Continuous Performance Test*—measures sustained and selective attention and impulsivity
- *Stroop task*—measures reaction time and cognitive flexibility
- *Trail Making Test*—measures visual attention and task switching (shifting)
- *Verbal fluency Test*—measures short-term memory
- *Wechsler Adult Intelligence Scale*—assesses for general cognitive function, working memory, and processing speed)
- *Stop-signal test*—measures inhibitory control

- *Paced Auditory Serial Addition Test*—measures working memory, sustained and divided attention, and processing speed

(Strauss, Sherman, & Spreen, 2006; Dubois, Andrade, & Levy, 2008; & Logan, Schachar, & Tannock, 1997 c.f. Epstein & Weiss, 2012).

Additionally, measures such as the Barkley Deficits in Executive Functioning Scale (BDEFS) and the Delis-Kaplan Executive Function System (D-KEFS) have been considered of reasonable utility in identifying dysfunction. In particular, BDEFS evaluates what researchers have indicated as multiple dimensions of adult executive functioning in daily life, including time management, organization and problem solving, self-restraint, self-motivation, and emotional self-regulation (Barkley, 2011). The promise of EF testing in the diagnosis of individuals—adults for ADHD is endearing as many EF measures, such as the BDEFS have been developed to measure EF exclusively in adults—separating the EFs of adults and that of children. Using EF measures, Kessler and colleagues (2010) found and identified EF deficits in 78% of patients who met full childhood and adult ADHD criteria. EF and mood regulation are considerably salient features—impairments in ADHD (Surman et al., 2011; Barkley, 2010). Overall, it is feasible to use executive function testing for ADHD diagnosis in adults who have not been previously diagnosed in childhood or adolescence and in those individuals, who have reached adulthood and were previously diagnosed in childhood.

How Executive can be defined Meaningfully to Adults with ADHD

Although there is certainly no consensus for an operationalized definition of EF (Jurado and Rosselli 2007 c.f. Langberg 2013), it is clear that EF represents a broad range of abilities, such as behavioral inhibition, shifting, and emotional control, problems in initiation, working memory, managing current and future-oriented task demands, materials organization, and self-monitoring (Barkley 1997 c.f. Langberg 2013). As is the case with many adults with ADHD, what is meaningful to one individual differs between individuals. In this aspect of ADHD diagnosed clients, defining executive function and/or occupational functioning can prove to be of the utmost utility when prescribing treatment options and/or management techniques. Barkley and Murphy (2010) contended, “ADHD is associated with deficits in executive functioning (EF). ADHD in adults is associated with impairments in major life activities, particularly occupational functioning” (p. 157). As children move into adulthood, they are tasked with a variety of complex occupations with which they have not previously faced and thus, experience challenges in adulthood they are not necessarily equipped to address; however, this varies as challenges presented to them may have resulted from lack of exposure to different occupations or lack of need to prepare for potential challenges with occupation.

A growing body of evidence in literature suggests that attention deficit hyperactivity disorder (ADHD) consists of more than just its primary diagnostic symptoms of inattention, impulsiveness, and hyperactivity (American Psychiatric Association, 2013). Researchers and theorists have argued that symptoms of deficient executive functioning (EF) may also be involved in the disorder (Barkley & Murphy, 2010). There is increasing evidence indicating that adult ADHD is associated with

various problems in occupational functioning and that adults with ADHD also appear to have more dysfunctional career beliefs, more decision-making confusion, and greater work-related anxiety and external conflicts regarding their careers (Barkley & Murphy, 2010; Painter, Prevatt, & Welles, 2008 as cited in Barkley and Murphy, 2010).

Additionally, clinic-referred adults diagnosed with ADHD (without a childhood diagnosis) have been found to be more likely to be unemployed, to have been fired from employment, to have impulsively quit a job, to use more sick leave, to have applied for or be on disability pensions, to have changed jobs impulsively more often, and to have more chronic employment problems (Halmoy, Fasmer, Gillberg, & Haavik, 2009).

Barkley and Murphy (2010), in their study, affirmed that EF deficits make a significant contribution to the occupational problems of adults—varying in function and on the severity of their ADHD symptoms. Researchers thus concluded that deficits in EF associated with ADHD are in part contributed to workplace problems documented through self-report measures and interviews in the study and in past studies of adults with ADHD and in children with ADHD followed to adulthood (Barkley and Murphy (2010). Furthermore, the constructs evaluated by executive functioning tests are apparently not those assessed by EF ratings or by direct evaluations of EF in daily life (Alderman, Burgess, Knight, & Henman, 2003). A particular component of EF and the ways in which it influences adult occupational functioning, as academic attainment is not always a factor for each individual, is the ways in which executive functioning deficits impact the life of individuals with ADHD. However, meaningfully defining executive functioning for adults is variable, since the definition for executive function is quite ambiguous and there is little or no consensus among researchers (Castellanos et al., 2006). Another

contributing factor for defining EF meaningfully is the discrepancy that exists in how EF is measured, particularly in adults—most EF tasks are complex, involving multiple cognitive processes, some of which are supposedly reflecting the EF intended for measurement and assessment (assessing for a particular executive function of interest, but still assessing non-target EF, disinterest) (Castellanos et al., 2006).

It is important to note, since EF is a multifaceted concept in it of itself, it would not necessarily be the most appropriate to define for adults, but rather to consider or factor into the ways in which EF impacts occupations of adults, occupation defined with regard to job or profession, but also occupation defined as any activity on which time is spent by a person. The idea of EF and occupation can often be considered incongruous to each other, and although not synonymous to one another, both play an integral role in the lives of individuals with ADHD, despite the degree to which one experiences severity of symptoms. In other words, EF and occupation play a significant role in the lives of individuals with ADHD, in particular adults, as EF and occupation factor into the lives of each individual differently and depend heavily on the profile of each person. Barkley and Murphy (2010) put forth that of all the domains of major life activities to be influenced by EF, adult occupational functioning would be one of the higher tiered aspects of life imposed by ADHD and EF deficits. Researchers highlighted that adult occupational functioning would be one of those major domains, as the emphasis on the need for cross-temporal organization, maintenance of behavior, and problem-solving towards goals is often required for adequate performance on tasks and in work/ career occupations, at least this is the contention when understanding of an EF framework or construct aligns with the notion that EF involves cross-temporal organization, maintenance of behavior and

problem solving towards goals. Furthermore, researchers contended that effective performance at work/ on tasks for which time is spent requires capacity for self-management relative to time (time management), self-organization planning and problem solving, self-activation (task-initiation), and self-motivation (proactive behavior) to sustain the pursuit of larger delayed consequences—outcomes (delayed gratification) over smaller more immediate ones (deferred gratification), among other activities, those of which are presumed to be facilitated by EFs—governed by the ability or inability of an EF (Barkley and Murphy, 2010).

Another notable consideration when defining EF and/or occupational functioning in adults is establishing a clear delineation between behavioral functioning and learning as it relates to executive functioning and ultimately ADHD. In adulthood, the daily demands on executive function tend to increase owing to increasing responsibilities and diminishing parental support. As such, the negative impact of deficits in cognitive and executive function in adults with ADHD is not unexpected (Boonstra et al., 2005; Hervey, Epstein, & Curry, 2004). Comprehensively understanding the underlying influence of particular executive functioning in behavior and learning can prove to be useful in developing a meaningful definition for EF in the lives of adults—one in which speaks to the adult and what's important to him/her. Executive function (EF) behavioral categories include: impulse control, flexibility, emotional control, working memory, planning/prioritizing, self-monitoring, task initiation, and organization. Each category is subsequently defined:

- **impulse control**—the ability to stop and think before acting

- **flexibility**—the ability to change strategies or revise plans when conditions change
- **emotional control**—the ability to manage feelings by thinking about goals
- **working memory**—the ability to hold information in mind and use it to complete a task
- **planning/prioritizing**—the ability to create steps to reach a goal and to make decisions about what to focus on
- **self-monitoring**—the ability to monitor and evaluate your performance
- **task initiation**—the ability to recognize when it is time to get started on something and begin without procrastinating
- **organization**—the ability to create and maintain systems to keep track of information or materials

According to the descriptive guide developed by the National Center for Learning Disabilities (NCLD), EF is a set of mental processes that helps us connect past experience with present action (Understood Team, 2013). The noted functions elicit different behavioral responses dependent on the severity of dysfunction in the EF and the depth to which it imposes on one's functionality. Additionally, as progress in executive function is developmental and varies from individual to individual, deficits and challenges present in childhood that go unaddressed can manifest with more imposition and degree of deficit in adulthood. As was previously stated, the level of difficulty in executive function may also diminish in individuals who no longer need the EF for adequate functionality in their respective lives and/ or awaken in individuals who have not previously encountered a need for functional use of an executive function.

Although the aforementioned functions are indeed behavioral categories of executive functioning, there are five areas in particular that really can deter an individual's success—academic achievement or job attainment and maintenance. Success often depends on the ability to plan, organize, prioritize tasks, materials and information, separate main ideas from details, think flexibly, memorize content and monitor progress. In other words, faculty with organizing, prioritizing, shifting/thinking flexibly, accessing working memory, and self-monitoring/ self-checking is crucial for adults with ADHD to understand, so that they can figure out how they access these areas and potentially how they may require support in using strategies to access these areas for overall QoL. Overall, defining EF meaningfully in adulthood, heavily depends on the faculties required for adequate functionality and for attainment of an individual's goals, which is often primarily dependent on occupation—job/ career or time spent on a particular action/activity, and to that end, a comprehensive analysis of an individual with ADHD, in this case an adult, is needed in order to thoroughly vet options for success and attainment of goals—co-constructed or client created.

Quality of Life (QoL) of Adults with ADHD/ Adult ADHD

QoL for adults with ADHD or individuals with Adult ADHD becomes especially important when thinking about the ways in which an individual perceives one's life and how he/she may thrive in said life. QoL in adults with ADHD is often measured in correspondence to assessments that seek to understand the perceptions individuals with ADHD have on different aspects of life. In current literature, researchers define HRQL as a broad construct representing the patient's/ client's subjective perception of the impact of health status, including disease and treatment, on physical, psychological, and social functioning. In particular, for adults, ADHD symptoms are associated with impairments in multiple domains that are considered key aspects of HRQL; including work performance, social functioning, educational attainment (if so desired), emotional adjustment, and marital adjustment. Per prior reference, QoL is often a key component of assessment when assessing adult with ADHD to better grasp the ways in which they report how they perceive aspects of life pertinent to their respective lives. Although this may be the case, it may be useful to also use these measures when assessing individuals for ADHD as a means to attain further insight into how one's perception and QoL intersect with the deficits that are present with the diagnosis in comparison to those whose assessment yield an ADHD diagnosis.

Similar to the ways in which academic outcomes are used to measure deficit/ impairment in children suspected of having ADHD, QoL and HRQL is measured to assess the impact of deficit/ impairment in adults with ADHD. As treatment, prior diagnosis, and intervention or lack thereof play a role into the developmental pathway of a person with ADHD, the profile of each adult with an ADHD diagnosis may differ, thus

the QoL of said client will vary. As a result, measures of assessment to treat ADHD in adults has been a bit of a controversial topic in existing literature and among proponents who affirmed that ADHD diagnosis and treatment of QoL as well as perceptions of QoL often require a multi-dimensional process and multi-method approach. The literature suggests that patients (individuals with ADHD) exhibit impaired functioning, QoL, adaptive skills, and executive function that often persist throughout their lives. Most often, these areas of dysfunction are the problems that leads patients to seek treatment (Epstein & Weiss, 2012). Researchers contended that although ADHD symptoms are a core aspect of diagnosis, focusing on symptom improvement as a treatment outcome is insufficient, because symptoms represent only part of the outcome, similar to that of assessment measures that only look for the presence of symptoms and not the ways in which manifestation of symptoms impacts and individual with ADHD.

Some researchers suggest that people with ADHD develop maladaptive and counterproductive coping strategies (e.g. blaming, avoidance, and resignation) owing to high level of stress levels and/ or inadequate social support structures—this is reinforced if the adult has not had supports in place prior to diagnosis and/or in childhood (Kubik, 2010; Young et al., 2005). To that end, adults may be particularly susceptible or vulnerable to adaptive dysfunction as a result of many years of living with ADHD and the repeated reinforcement of negative thoughts and beliefs, further contributing to maladaptive coping strategies pertinent to specific aspects of an individual's life (Epstein & Weiss, 2012) and thus significantly impacting both perception of and overall QoL in adults with ADHD. Available data on QoL and adults with ADHD suggests that diagnosed adults have significantly lower self-ratings of QoL compared with those

individuals without ADHD across global, social, and occupational domains (Brown & Landgraf, 2010; Chao et al., 2008). This is congruent with what the literature has found, as existing research affirmed that people with ADHD exhibit impairment in behavioral, academic, and social functioning. As these particular impairments persist into adult, QoL and self-reported perceptions with reference to particular areas that shape each individual's life (familial adjustment, marital adjustment, social functioning, academic achievement, among other areas) were reported to be poorer or lower in comparison to those individuals without an ADHD diagnosis, including those who self-reported. Furthermore, studies in adults demonstrate the chronicity of these impairments that adults with ADHD experience and confirmed the need for integration of QoL measures, but also further understanding of the ways symptoms impact adults and ultimately impose on their overall life (Epstein & Weiss, 2012).

Current literature considers the way that adaptive behaviors in adults with ADHD shape the QoL of these adults and explores the reasonability to further investigate ways to provide support for these individuals, as relatively few studies have measured adaptive life skills in ADHD. Adaptive behaviors and the ability to meet the demands of one's environment as well as to manage routine tasks of self-care plays a significant role in the lives of individuals. Epstein and Weiss (2012) explained adaptive functioning as the ability to interact with society and to care for oneself. Moreover, researched noted that despite the fact that adaptive life skills are outcomes that might be expected to be responsive to medication, current studies suggested that this is an area that is often severely impacted and treatment resistant, and therefore significant in its overall contribution to an individual's QoL. According to Agarwal and colleagues (2012), it is

imperative to note the distinction between health-related QoL and overall QoL. This distinction may be considerably informative as Weiss and colleagues (2010) mentioned that ADHD-specific QoL measure may be more sensitive than multidimensional measures—wide ranging and broad, some of which may not be pertinent to the concerns for QoL in adults with ADHD. Researchers affirmed that, “health-related QoL comprises disease and treatment related aspects of the individual, such as pain, limitations in motor ability, energy level, or mood” (Agarwal et al., 2012, p. 11). Moreover, researchers confirmed that overall QoL, additionally encompasses non-medical aspects of a person’s life, which can include, but is not always limited to: satisfaction with social, educational, and occupational functioning (Agarwal et al., 2012). Furthermore, researchers found that QoL instruments that assess QoL in individuals with ADHD have been developed with the specific aim to objectively measure overall QoL in this population. These instruments were designed with the specific intent in assisting clinicians in identifying appropriate treatment aims/ targets, facilitating future research, and improving the well-being and functioning of adults with ADHD—meeting the needs of this population, while actively contributing to the literature (Brod et al., 2006).

Per the available literature on the topic of QoL and ADHD, there is a limited number of studies that have utilized QoL measures to investigate the specific effects of ADHD on QoL in adults. Current literature on the subject showed that individuals with ADHD suffer to a greater extent, anxiety, depression, and increased sleepiness in comparison to individuals without ADHD (Chao et al., 2008). Moreover, Agarwal and colleagues (2012) addressed the consensus that appears to be prevalent in individuals with ADHD—patients with adult ADHD have lower QoL than non-ADHD patients. A

notable mention in this research is the following: “While decreased QoL scores in the adult ADHD population reflect an inferior sense of subjective well-being, they do not explain what [exactly] leads to or causes adults with ADHD to feel this way” (Agarwal et al., 2012, p. 14). The contention here is that understanding the negative impact of ADHD on QoL is important, but the potential for thoroughly and comprehensively understanding these particular factors can also prove to be appropriate treatment goals, and/or adequate outcome measures. Ultimately, since ADHD is so multifaceted, it is not only important to utilize QoL measures/ scales that permit objective evaluation and implication for treatment, but to also expand the scope of the way perceptions of ADHD and symptomatology are subjectively shaped—encompassing life aspects that integrate areas of life that are meaningful, such as self-esteem, environment, social supports, sexual health, and safety/ security, among other physical, psychological and social functioning components in an effort to provide a holistic sense of individuals’ lives.

Long-term Psychological Implications/ Susceptibility to other Psychological Disorders

All too often, in cases of ADHD diagnosis, treatment and management, as well as support systems play a pivotal role into the ways in which adults with ADHD cope and/or manage manifestation of symptoms and the deficits that follow. Current research discussed that ADHD often coexists with other psychological disorders, phrased in the literature as comorbid disorders, and this can make an accurate diagnosis of ADHD that much more confounding, particularly when deciding treatment plans and measurable outcomes of symptom improvement and/or overall QoL (Agarwal et al., 2012).

Individuals whom have to deal with a remarkable number of severe ADHD symptoms, in most cases, result in the emergence of comorbidities related to mood, anxiety, bipolar disorders, personality disorders, antisocial behavior, and substance abuse disorders—particularly common in adults with ADHD (Adler & Cohen, 2004; Fayyad et al., 2007). According to research regarding comorbid disorders and ADHD, ADHD often coexists with bipolar disorder and in the instances that this is the case, many ADHD symptoms may be confounded or mistakenly attributed to the disorder and/or overlooked entirely, which presents concerns as treatment may exacerbate symptoms or dictate symptoms remission (Sentissi, Navarro, & De Oliveira, 2008).

Overlap in symptomatology and prescriptive pharmacological intervention can significantly influence the ways in which long-term effects of psychological disorders may shape the lives of diagnosed individuals; moreover, this may also influence susceptibility to coping mechanisms that may adversely affects the lives of diagnosed adults—addiction, hypersexuality, excessive alcoholism and self-medication, among

other concerning coping mechanisms. Reid and colleagues (2011), found that individuals who tend to fall under the inattentive subtype of ADHD and have a diminished sense of self-worth are more strongly associated with hypersexual behavior, with impulsivity playing a rather small role. Additionally, researchers indicated that “such findings are consistent results noted among other addiction populations, such as patients with chemical dependency, and provide evidence that patients diagnosed with ADHD may turn to various sources (e.g. drugs, sex, or gambling) to self-medicate the negative effects associated with their disorder” (Reid et al., 2011). Among those psychological disorders that overlap in symptomatology: ADHD and anxiety disorders, such as generalized anxiety disorder (GAD) overlap (Bloemsma, et al., 2012). According to existing criteria and research, although both disorders may be comorbid disorders, understanding the distinction between externalizing and internalizing symptoms of each is necessary to clarify any obscurities that remain present when ascertaining diagnosis. Additionally, in spite of potential obscurities surrounding the nature of the comorbidity or differentiation of one disorder from the other, research has suggested that comorbid anxiety impacts upon the manifestation of ADHD (Bloemsma et al., 2012).

As previously mentioned under QoL and ADHD, studies show that individuals with ADHD are at a greater risk of depression and social maladjustment/ dysfunction (dependent on the severity of symptoms. Other studies, such as research by Kessler et al. (2010), noted that understanding executive function deficits or dysfunction can shed light on potential long-term outcomes and psychological implications. To highlight, authors indicated that although currently necessary as diagnostic criteria, inattention is not necessarily specific to ADHD, as it is more significantly correlated/ associated to other

psychological (mental) disorders (Kessler et al., 2010). Distinguishing between dysfunction imposed by ADHD and other disorders can assist in predicting long term outcomes, but also suggesting treatment that will improve overall QoL, despite improvement of symptoms. Additionally, current literature extended the view that differential diagnosis is a considerable course of action in order to provide a well-vetted diagnosis and course of treatment.

Furthermore, research and data collected in the diagnosis of ADHD also informed that behavioral and/or conduct disorders are likely to co-occur and depending on the severity of symptoms may or may not escalate to disorders, such as oppositional defiant disorder, which may deter the progression and QoL of individuals with ADHD. However, it is important to note, if only briefly, that long-term psychological implications or susceptibility to other psychological disorder should be comprehensively and appropriately assessed and taken into account when evaluating for an ADHD diagnosis as many other factors may be at play, i.e. self-regulatory challenges, organizational challenges, and comorbidity influence. According to Surman (2013), “it is [imperative] to understand that anything that compromises ability to compensate for ADHD, produces symptoms similar to those of ADHD, or creates mental distraction [within and outside the scope of ADHD] will exacerbate symptom severity” (p. 38). As such, holistic evaluation and identifying whether strengths or challenges persist do to variables not accounted for or influenced by ADHD can be quite discerning as environment, responsibility, and social roles can create struggles that align more with learning style/preference (optimal state of arousal) or challenges with abilities not necessarily indicative of ADHD. Unfortunately, the study of how treatment of ADHD can improve symptoms of comorbid

disorders associated with ADHD and a further look into the ways in which successful treatment for comorbid conditions has yet to be fully vetted/ investigated. Investigating and thoroughly ruling out/ disqualifying other conditions through differential diagnosis may contribute to discovering the depths to which deficits or impairments in particular areas, such as self-regulatory problems, emotion regulation, and organization (to name a few) are congruent to ADHD and delineating between broader symptoms and core symptoms of ADHD.

Practical Applications to Encompassing Information Across Contexts: Child to Adult; Adult

Information attained through assessments and data gathered through tools and applicable measures can help to provide a robust overview of the clinical profile for a diagnosed individual. Keeping in mind the presence of several factors that may contribute to the effectiveness of implementable management techniques is key to providing enriching experiences that are adequate for individual adults with ADHD. Thoughtfully understanding how assessments measure symptoms, but also the ways in which symptoms impact QoL is integral to improving the lives of adults with ADHD. Identifying the dysfunction that exists in adults with ADHD and figuring out the ways in which it imposes upon occupation are necessary for the fulfillment of goals either co-constructed or self-initiated by adults with ADHD.

As mentioned above, there are several components with regards to EF that impact or are impacted by ADHD, so delineating between which are being impacted and which are functioning adequately can assist in the supports that can be provided to an adult with ADHD. For instance, if an individual struggles with focusing or sustaining attention, it would behoove onlookers or outside parties to thoughtfully consider word choice and precision of language when engaging with individuals who present with a struggle in this domain. All too often adults with ADHD, especially those of whom were not diagnosed in childhood, struggle with self-advocacy or disclosing “impairment” to others without ADHD. This may be partial to the fact that in college/ university settings the need for self-disclosure is what grants you access to supports and accommodations, but when an unwieldy professor or administrator is not open to collaborative partnerships, feelings of resentment surface. Not necessarily resentment towards the imposed party, but rather

towards oneself, for not fitting into this particular mold that one is expected to fit into in order to achieve desired goals. Conversely, when outside of the academic setting, an individual may be resistant to self-disclosing one's ADHD status as feelings of being scrutinized for not performing tasks in similar fashion to colleagues can surface.

One of the main discrepancies that make it most difficult for someone to share their challenges with hopes of being understood is the stigma. ADHD has been a stigmatized disorder that is too frequently referred to in passing by individuals who may not have a clue about the kind of neurodevelopmental impairment that impedes one's life. In its acronym form, to say "I have ADHD" or "I'm so ADD" seems harmless, but it is quite the opposite—it's foolhardy and insensitive. If consideration were taken into account and replacement of those frivolously used statements were changed to "I have a neurodevelopmental disorder" or "I'm such a neurodevelopmental disorder" the seriousness behind the impact of the disorder itself may be seen for the imposition that it is. Becoming informed about QoL can help to bridge gaps in understanding the impairments and dysfunction caused by the deficits brought on by the disorder in order to address maladaptive behaviors and therefore serve as an entry point to develop supports structures that can may improve the lives of adults with ADHD.

One of the main questions that educators and everyone alike can ask themselves is: what is meaningful to me? How may that look different to someone else? How much more different may that be from someone who not only has an impairment, but also feels impaired from asking for help? What does this meaningful aspect of life look like? How can it be respected and genuinely factored into treatment options? As we all know, situations vary, and circumstances aren't always the most ideal, but a little understanding

and some flexible thinking can go a very long way. If an adult is overwhelmed by the prospects of assignments, deadlines, and upcoming exams, it may be best to set up pacing calendar or making responsibilities more manageable by breaking them up into smaller parts—bite-size. Responsive as opposed to reactive behavior can also provide an open channel of communication between parties who feel impaired and parties who aren't. Helping an adult see that their challenge, difficulty, or problem isn't just a "them problem" can create positive rapport from which meaningful outcomes can be produced.

Creating an equitable space for adults can also help to enhance quality of life and allow adults to feel as though what they have to offer is being honored and thought of as useful. Although certain dysfunctions are apparent when adults are faced with the challenges of ADHD, there are areas of which they thrive that can be tapped into as a wellspring of resources. When working memory challenges impede the life of an adult with ADHD, it may be beneficial to create memories or routines that can be internalized, so that working memory challenges aren't always an imposition—checklists and schedules that aren't visually overwhelming may also assist in this area. Another notable mention is that when ADHD is associated with non-EF neuropsychological deficits, such as challenges with motivation or an energetic pool of arousal, it may be feasible to create an adult appropriate reward system. Token economies and reinforcement are frequently associated with children, but as research has shown, difficulties in childhood don't fade with age, so some of the supports that are extended to children may also be extended to adults—if the situation warrants it.

It may be extremely beneficial to distinguish between impairments/ deficits and behaviors in response to said deficits. There's a difference. As is the case with children,

there is a common reliance on addressing the behavior as opposed to the antecedent or the challenge that is inciting the behavior. Adults encounter these challenges just the same, it just looks different from that of a child, and may subsequently impact an adult more than a child, as it may cause an adult his/her occupation or relationships. Creating a space that is optimal for an adult to progress and make meaningful gains is integral to the overall well-being of a human being. When you feel like you can succeed, you are more likely to succeed. However, understanding and patience with respect to the noted suggestions cannot go unstressed; in order to genuinely support an adult with ADHD who is experiencing a wide range in severity of symptoms, one must learn to distinguish between expectation and ability. In the words of Russell Barkley (1997), “ADHD is not a disorder of knowing what to do, but one of doing what one knows” (p. 8). Although there is an impairment that exists or a dysfunction that prevails, it does not negate that possibility of capability or competence, it merely illustrates an entry point for learning that requires flexibility and strategy on the behalf of the educator or overseeing party—supervisor, administrator, etc.

Ultimately, understanding the other components of ADHD that can be overlooked, can truly reshape and clarify any misunderstandings that may exist. ADHD is a multidimensional disorder that quite often impacts the life of an individual by way of comorbid disorder. However, one very important aspect to keep in mind always is that support and implementation of supports and strategies that target impairments or dysfunction brought on by ADHD are necessary and should not be overshadowed by other disorders that may be co-occurring, as research has confirmed that improvement in symptoms or in deficits attributed to ADHD can also assist in improvement of

impairments associated with comorbid conditions. All in all, a willingness to fully vet how the manifestation of symptoms imposes on the life of an adult with ADHD, rather than assuming that someone has ADHD based on a few behaviors that can be indicative of something else, can be the difference between equity and inequity.

Conclusion

As a future educator in a larger community of educators, I feel that it is part of my responsibility to not only see students as growing learners, but also as future adults. It dawned on me that it is frequent the case: in the midst of teaching young minds, we can lose sight of the adults that our young students will eventually become. Understanding this and keeping this at the core of my teaching can help to serve as a reminder—a reminder that the same patience and understanding that I afford to my learners is the same understanding that I can extend to adults with learning variations. I mention this aspect because even though children and young minds need compassion and thoughtful effort, this does not stop just because they become adults—if anything, adults require the same supports, so that they may tackle new challenges and obstacles with the same resilience they did as a children.

Future research into adults with ADHD should focus on the utility of using EF measures in order to inform treatment options. The direction of the literature should align with QoL assessments, practical tasks that can measure skills in relation to executive function, and management techniques for comorbid conditions, with an emphasis on treating both conditions/ disorders and not prioritizing one over the other. Researchers should explore the realm of the dysfunction as it pertains to the subtypes—considering the aspects of EF and how they associate with inattention, hyperactivity, and combined subtypes.

In the words of Frederick Douglass, “it is easier to build [prepare] strong children than it is to fix broken men,” however, keeping in mind that strong children become prepared adults, how we perceive brokenness or impairment shapes the way in which we view whole beings. When we opt into viewing the whole person, broken parts can be pieced together, and those small pieces can help to give us a fuller understanding of the bigger picture.

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