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How Does Executive Function Deficits Affect Individuals With Autism And What Strategies Can Educators Use That Will Benefit Those Individuals

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How Does Executive Function Deficits Affect Individuals With Autism And What Strategies Can Educators Use That Will Benefit Those Individuals

Abstract

Autism affects 1in 66 children and that comes with a lot of frustration for children and their families. Some families will see the largest difficulty when their child enters the education system. High functioning individuals will have skills that will have educators wondering what is happening to their student who seems to be able to understand and complete the work in a school environment. What is talk about in small amounts is executive functioning and its challenges that occurs with individuals with autism. Executive function is a theory that is broken down into 7 different components that individuals will have challenges with. It's imperative that educators understand executive functioning deficits and then implement strategies that can be used in the classroom and generalized into their home environment. It's important to understand how the components work individually and to make connections between and how they can affect each other. My research enabled me to find what school psychologist do when they need to test for executive functioning using the BRIEF, if the BRIEF is reliable and how the results from the BRIEF inform their implementation of strategies for students with executive functioning deficits. Understanding what executive function theory is and how it effects individuals is the first step in giving them the skills to be successful. Keywords: planning, organization, inhibition, self-monitoring, working memory, set-shifting, and flexibility. As the prevalence of autism rises among the population there is a big push to find what causes autism. There is a number of theories that try to explain what autism is and what the leading causes and deficits are. It is very difficult to read all the research and to filter out what is good research and what is not. There was a theory that has been recently debunked that implied that giving children vaccinations is what causes autism, we now know that is untrue, even though many parents still believe that theory. One theory that has shown some promise, but is not a singular cause is the theory of executive functioning. This is not a new theory but one that I feel is overlooked at times, certainly it is not discussed among the public and is not reported in the news. I know from my research and from interacting with students with autism it is certainly something that needs to be addressed. I know that my daughter certainly has difficulty with some aspects of executive function skills and that it is more likely to be addressed in the schools, but not necessarily identified as executive function deficits. There are a number on components that make up executive functioning that include planning, flexibility, inhibition, generativity, self-monitoring, working memory, and organization. Understanding and knowing what the components are and how they affect individuals with autism, will make it easier to find supports for them. In my research study, I sent out surveys that gathered data regarding an assessment, the Behavior Rating Inventory of Executive Function (BRIEF) that directly assess executive function deficits. It not only identifies what the areas of need are but it also offers suggestions to help individuals be successful. I sent a survey to twelve (12) psychologists in various schools in upstate New York. I have a daughter who was given the BRIEF through her school, upon our request, and it did report back that she had some significant delays in some areas. I have noticed how my daughter has difficulty that can be related to her executive functioning deficits.

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How Does Executive Function Deficits Affect Individuals With Autism And What Strategies Can Educators Use That Will Benefit Those Individuals

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Submitted in partial fulfilment of the requirement for the degree

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Supervised by

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School of Education

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Abstract

Autism affects 1in 66 children and that comes with a lot of frustration for children and their families. Some families will see the largest difficulty when their child enters the education system. High functioning individuals will have skills that will have educators wondering what is happening to their student who seems to be able to understand and complete the work in a school environment. What is talk about in small amounts is executive functioning and its challenges that occurs with individuals with autism. Executive function is a theory that is broken down into 7 different components that individuals will have challenges with. It's imperative that educators understand executive functioning deficits and then implement strategies that can be used in the classroom and generalized into their home environment. It's important to understand how the components work individually and to make connections between and how they can affect each other. My research enabled me to find what school psychologist do when they need to test for executive functioning using the BRIEF, if the BRIEF is reliable and how the results from the BRIEF inform their implementation of strategies for students with executive functioning deficits. Understanding what executive function theory is and how it effects individuals is the first step in giving them the skills to be successful. *Keywords:* planning, organization, inhibition, self-monitoring, working memory, set-shifting, and flexibility.

As the prevalence of autism rises among the population there is a big push to find what causes autism. There is a number of theories that try to explain what autism is and what the leading causes and deficits are. It is very difficult to read all the research and to filter out what is good research and what is not. There was a theory that has been recently debunked that implied

that giving children vaccinations is what causes autism, we now know that is untrue, even though many parents still believe that theory.

One theory that has shown some promise, but is not a singular cause is the theory of executive functioning. This is not a new theory but one that I feel is overlooked at times, certainly it is not discussed among the public and is not reported in the news. I know from my research and from interacting with students with autism it is certainly something that needs to be addressed. I know that my daughter certainly has difficulty with some aspects of executive function skills and that it is more likely to be addressed in the schools, but not necessarily identified as executive function deficits.

There are a number on components that make up executive functioning that include planning, flexibility, inhibition, generativity, self-monitoring, working memory, and organization. Understanding and knowing what the components are and how they affect individuals with autism, will make it easier to find supports for them.

In my research study, I sent out surveys that gathered data regarding an assessment, the Behavior Rating Inventory of Executive Function (BRIEF) that directly assess executive function deficits. It not only identifies what the areas of need are but it also offers suggestions to help individuals be successful. I sent a survey to twelve (12) psychologists in various schools in upstate New York. I have a daughter who was given the BRIEF through her school, upon our request, and it did report back that she had some significant delays in some areas. I have noticed how my daughter has difficulty that can be related to her executive functioning deficits.

Methods

The study will take place through various school districts and schools. I will contact and send questionnaires to school psychologists in suburban areas in Upstate New York. I decided to focus on suburban schools out of convenience and participant availability. I primarily focused my questionnaire for elementary schools and some middle schools. I wanted to know about grades 1-6, but it was also contingent on the psychologists who responded and/or willing to participate.

The participants are psychologists from various school districts in Upstate New York. The majority of them were female. I know the psychologists that I contacted and those who agreed to participate but I do not know which psychologists actually completed the survey.

My role in the study was that of an interviewer, and more indirect in that I sent out surveys, I did not personally interview the participants. I currently have initial certifications in Early Childhood B-2 and Childhood 1-6. I have a Bachelor's of Science in Childhood Education and I am currently working toward a Master's of Science in Special Education.

The purpose of this study was to get a general feel for how school psychologists administer the BRIEF and their experiences with the BRIEF. I wanted to know both the school (giving the BRIEF) and the parent (Reporting results) experience. How school psychologists not only administer the assessment but also how they report their findings to everyone in the students life. My main process of gathering data was through an online survey where I created fifteen (15) questions that I sent to school psychologists in upstate New York.

My procedures for this study started with creating and revising the questions that I wanted to ask. I wanted to try to be as clear as possible about what I wanted to know. After I had my questions and had given them to a peer to review, I then started compiling lists of school psychologists around upstate New York. After I had created a list, I started the process of

composing a letter to ask school psychologists if they would be willing to participate in my

survey. Once I had a list of about fifteen (15) participants willing to participate in my survey I

emailed them the survey link. Once I emailed everyone from the initial list, I repeated this

process over and contacted more school psychologists who might be willing to participate. I

wanted to have approximately 12-15 school psychologists to participate. In all I have 11

completed surveys. I gathered data over the course of 3-4 weeks.

I consider the emails that I sent out as the consent from. I only contacted school

psychologists, therefore there was no need to have parental consent. I had some school

psychologists who wrote back and declined to participate as well as those who did agree to

participate, the majority did not reply. The participants did not sign a formal consent form, only

their response from email. I am not using any names, although I know who agreed to participate,

I do now know who actually completed the survey so anonymity is naturally built into the

survey.

I collected my date through survey completion. I used a survey creator called Qualtrics. It

was suggested from a colleague. I looked at other survey creators but I found Qualtrics was the

easiest to use and would therefore be easier to analyze the data collected.

I analyzed the data by responding to each question individually and trying to find trends

in the results. I found that if I were to do this survey again I would use some of the same

questions but I would also try to be more specific about the BRIEF.

To have a clearer understanding of what executive functioning is and how it can effect

students and individuals with autism we must know what it is. We must also have an

understanding, even a limited understanding, of other theories that look at how autism affects

individuals in the brain, from the perspective of how the brain works and doesn't work instead of how autism happens.

There are multiple theories that look at what Autism is and what area of cognitive processing is affected. Uta Frith's theory looks at the idea of central coherence, Simon Baron-Cohen's theory looks at the idea theory of mind function, and a third theory is executive functioning. I will delve deeper into executive functioning in the pages that follow but it's important to have a basic understanding of Uta Frith's and Simon Baron-Cohen's theories.

Uta Frith's theory of the cognitive dysfunction and the underlying causes of Autism is the theory of central coherence. Central coherence is an individual's ability to integrate information in a global scale while also integrating information in context to give it meaning (Booth, Charlton, Hughes, and Happe, 2003). Uta Frith thinks that individuals with Autism display a weak central coherence because they tend to process information on a parts versus whole or a surface versus gist ability, meaning they process information in a context-independent manner (Booth et al., 2003). This idea is sometimes seen as a style rather than a disability of cognition. It has been noticed that individuals with a weak central coherence can have this be a strength in that they can become very focused on details rather than the whole (Booth et al., 2003). This theory can be related to executive theory in that it has been said that being able to focus on details can cause difficulty in set shifting between the parts and the whole (Booth et al., 2003). Some implication to teachers under this theory are: idiosyncratic focus of attention, imposition of own perspective, preference for the known, inattentiveness to new tasks, difficulty in choosing and prioritizing, difficult in organizing self, materials, experiences, difficulty seeing connections

and generalizing skills and knowledge, and lack of compliance (Cumine, Dunlop, and Stevenson, 2010).

The theory of theory of mind was proposed by Uta Frith and Simon Baron-Cohen in 1985 but Simon Baron-Cohen went on to research it further and in 1990 described it as "Nightblindness" (Cumine et al., 2010). Theory of mind proposes that the deficit lies in an individual's inability to attribute and conceive mental states to themselves and to others (Hill & Frith, 2003). Individuals with autism have generally been described as having difficulty with interpreting emotions and social cues of others and having difficulty in expressing their own emotions, it is likely that theory of mind is an aspect in the cognitive difficulties seen with individuals with autism (Perner, Frith, Leslie, & Leekman, 1989). Simon Baron-Cohen has tested his theory extensively with various tests, the first study he conducted was the false belief test. In this test he shows two dolls named Sally and Ann. Sally has a basket while the Ann has a box. Sally has a marble that she places in her basket, then she leaves. While she is out of the room Ann takes the marble from the basket and places it in the box. When Sally returns to play with the marble, the individual being tested is asked "Where do you think Sally will look for the marble?" (Hill & Frith, 2003). A regular developing child with say that Sally thinks the marble in is the basket where she left it. An individual with theory of mind deficits will say that Sally thinks the marble is in the box. There are other tests that have been conducted that have shown other deficits, implying that there are other difficulties under the umbrella of theory of mind. Individuals with Autism also have shown to have deficits with understanding of pretense, irony, non-literal language, and deception (Hill & Frith, 2003). These concepts have been assessed with story understanding. It is widely accepted that there is an impairment of intuitive understanding, that other people have mental states that may be different, in people with autism (Hill & Frith,

2003). Some difficulties for teachers with students who display "Theory of Mind" impairments include: difficulty in predicting others' behavior, leading to a fear and avoidance of other people, difficulty in reading the intentions of others and understanding the motives behind their behavior, difficulty in explaining their own behavior, difficulty in understanding emotions-their own and those of others-leading to a lack of empathy, difficulty understanding that behavior affects how others think and feel. Leading to a lack of conscience or motivation to please, inability to deceive or to understand deception to name just a few (Cumine et al., 2010).

Executive function encompasses a variety of cognitive processes. The definition of executive function is based on two processes of the brain, automatic and effortful processing (Booth, Charlton, Happe, & Hughes, 2006). An automatic process involves that ability to respond to situations efficiently while an effortful process requires adaptive responses to novel and complex situations that involve a higher-order cognitive process (Booth et al., 2006). Although many researchers have conducted numerous studies and have come up with their own general categories, there are agreed upon components that people with executive function impairments display, these components are generally divided into either three or four categories. Executive function is used as an umbrella term that includes a set of processes (Booth, et al, 2006). The seven individual components are inhibition, set shifting, planning, self-monitoring, generativity, organization, flexibility, and working memory (WM). These seven components are then organized into three to five domains (Akbar, Loomis, Paul, 2012). Akbar et al. (2012) use five domains; these are Inhibition, Set Shifting (which includes flexibility), Organization (planning and self-monitoring are included), Generativity, and Working Memory. Alternatively Booth et al. (2006) have identified three main domains: planning/working knowledge, flexibility, and response selection/inhibition. While the organization of the components that have been

categorized by researchers vary, they do include all seven components. They differ only in how the researchers find commonalities within the seven separate components. Different researchers will also label the components differently, but they are looking at the same impairment(s).

Executive functioning can have an impact on various parts of a child's daily functioning. If we look at each component individually we might begin to see how they can relate to each other and how they can impair an individual's ability across all settings. When we start to look at each individual component we start get a clearer understanding what each one is.

Planning is the ability to monitor one's own action while being able to evaluate changes that may be required (Hill, 2004). One way Goldberg and Landa (2005) found that planning can have an impact is through language and the ability to change behavioral and conversational demands. It can also require the ability to hold social information while trying to process the important features of the conversation while actively participating in the conversation (Goldberg & Landa, 2005). The most widely used method to assess this area is the Tower of London test and maze completion tests. The Tower of London, along with the Tower of Hanoi, requires the individual to move discs from a prearranged order to make a pattern identical to the assessor's pattern in the shortest number of moves (Hill, 2004).

Flexibility is called different names by different people, such as, set-shifting, mental flexibility, or cognitive flexibility (Hill, 2004). This refers to the ability to change direction in thought and in response to situational changes (Dritschel, Goddard, Howlin, Robinson, & Wisley, 2009), Meltzer (2014) also includes the ability to shift approaches and to think flexibly in his definition of flexibility. This skill also requires the individual to switch back and forth between tasks, operations, or mental sets (Chung, Swentosky, & Weyandt, 2014). It has been noted by Hill (2004) that individuals with Autism who display perseveration (a stereotyped

behavior) and difficulties with regulation, that these behaviors have been attributed to difficulties with flexibility. When testing for flexibility researchers tend to use the Wisconsin Card Sorting task (WCST) (Hill, 2004). In this task individuals must sort cards according to a certain criteria. This criteria can change each time or they can change during the task itself. This shows how well the individual can change the task altogether or how well they can alter aspects of the task while continuing with the original task. During this task if an individual perseverates on the task and fails to shift set it is viewed as a difficulty with flexibility. Individuals with autism have shown high perseverative behavior on this task as compared with typically developing individuals (Dritschel et al., 2009).

Inhibition is the ability to process or suppress irrelevant information or impulses while performing a task (Dritschel et al., 2009). The ability to regulate their emotions in and outside of the classroom while being actively engaged is also an aspect in inhibition (Meltzer, 2014). The most common task for inhibition is the Stroop (1935) test, in which individuals are shown cards with a color printed on it but the word is printed in a different color than the word. The individual then has to say the color, not the word (e.g. Blue). The individual would need to reply "red" and not "blue." Researchers have found that individuals with autism and normal control groups have found equal amounts of interference when performing this task (Hill, 2004). Other assessments with different tasks such as the go/no go task have found similar results (Hill, 2004).

Generativity is seen as an inability to generate novel ideas and spontaneous behaviors (Dritschel et al., 2009). Individuals are usually given tests of verbal fluency which require the individual to create as many words as possible in a specific amount of time using a specific criteria (Dritschel et al., 2009). The criteria can be based on a phoneme (e.g. the letter R) or a semantic clue (e.g. the category of animals) (Dritschel et al., 2009). An impairment in

generativity has been proposed to have an effect in other areas of executive functioning (Dritschel et al., 2009).

Self-monitoring is the ability to monitor an individual's own thoughts and actions while also having the ability to correct those thoughts and actions when appropriate (Hill, 2004). It also includes an individual's ability to manage their cognitive processes and keep track of their performance and outcomes (Meltzer, 2014). It is easy to see how this can be useful across all settings in a person's life. As with flexibility, perseveration may be seen in an individual with a deficit in self-monitoring (Hill, 2004). There is no conclusive test for self-monitoring but it has been seen while performing other tasks. It can been seen with error correction, avoidance, and memory for actions (Dritschel et al., 2009). While performing tests of verbal fluency, self-monitoring would be needed to remember what had been said to prevent repetition (Dritschel et al., 2009). Because there is no specific task to assess self-monitoring, further studies are needed that are theory driven. The current tasks being used to assess self-monitoring are new, but not widely known or tested (Hill, 2004).

Working Memory has been found in individuals with autism but no specific task has been created. Meltzer (2014) has defined working memory as the ability to hold information for a short period of time while manipulating the information at the same time. It is generally noticed when the task requires the greatest working memory load (Goldberg & Landa, 2005). When individuals are doing a task with six and eight item problems the researchers have observed errors. They have also noticed errors when individuals made more frequent returns to a location where the individual had already been (Goldberg & Landa, 2005).

The final component that has been identified under the executive function umbrella is organization. Organization is the ability to systemize or sort information (Meltzer, 2014). There

have been some assessments regarding organization. The NEPSY-II animal subtest requires individuals to sort cards into specific categories. (Akbar et al., 2012) This subtest tests the individual's ability to implement and conceptualize specific groupings and categorization rules (Akbar et al., 2012) Until more research has been done with organization skills specifically, it is difficult to see how it directly affects executive functioning. At this point researchers can only refer to the other components and their assessments mentioned above.

The assessments that educators and school psychologists use to test for executive function deficits and how those results are analyzed and interpreted are very different than what researchers would use and how they interpret the data. The questionnaire that school psychologists tend to use and that is considered very reliable is the Behavior Rating Inventory for Executive Function (BRIEF) (Meltzer, 2014). The BRIEF questionnaire is comprised of a parent, a teacher and a self-rating form for students from 11 years old into adulthood (Meltzer, 2014). The BRIEF includes 86 items that assess behaviors related to the core executive function processes (Meltzer, 2014).

Another assessment used is the Metacognition Awareness System or MetaCog. This assessment requires teachers, parents and the students perceptions of how the student is using strategies and his metacognitive awareness, these assessments are then compared between each other (Meltzer, 2014). The primary use for the assessment is to compare the surveys between the three surveys. They are used for students between 9-18 years old and are comprised of five scales that allow for the comparison between the perceptions of the student and the teacher and parent(s) (Meltzer, 2014). The student survey consists of the section, motivation and effort (ME) survey, strategy use survey (STRATUS), and metacognition awareness questionnaire (MAQ). The motivation and effort (ME) survey has 38 items that has the student self-assess their effort

and performance on various academic tasks (Meltzer, 2014). Students rate themselves from 1-5. The strategy use survey (STRATUS) has 40 items that assess the strategy used during math, reading and writing, testing, and studying. This assessment looks at the perceptions of the student on their use of strategies related to some of the executive functions components (Meltzer, 2014). The final section for students is the metacognition awareness questionnaire (MAQ). This questionnaire looks at the students understanding of strategies and how to implement them, there are 18 items in this questionnaire (Meltzer, 2014).

The teacher survey, teacher perceptions of student's effort (TPSE), is the teacher's version of the ME. This assessment has 38 items and rates the teachers perception of the students effort of various academic tasks; it also looks at the students overall use of strategies and performance (Meltzer, 2014). The final survey is the parent survey, parent perception of student effort (PPSE), rates the students behaviors when working and the effort that they apply to academic tasks (Meltzer, 2014). The tasks are identical to the ME and the TPSE. It consists of 38 items.

Now that we have a basic understanding of the various components of executive function and some of the tasks/assessments that researchers and school personnel use to test each component of executive functioning, we can look at how teachers and educators assess students in the educational environment and how teachers can use various strategies to help students with executive function deficits be successful across all settings during the school day. There is controversy surrounding the education of individuals with Autism that revolve around methods of instruction, intensity of the instruction, and the value of early instruction (Olley, 2000). There is no one approach that can be specifically linked to the education or treatment of executive

dysfunction deficits that can be said to be a well-established or efficacious treatment (Olley, 2000). It is best when teachers use multiple strategies that are best suited for the individual child.

There are various theories that researchers have developed that they view is the best direction to take that will help students with Autism be the most successful. Some of these theories are specific to social skills, as it is widely accepted that there is a deficit in this area that is seen in all children with Autism to varying degrees. Some of those theories are the Young Autism Project (1:1 discrete session, instruction moves to settings throughout the day as skills are mastered. Predominately for pre-school aged children (Olley, 2000)), the Claremont Autism Center (based on established research, reduction of inappropriate behaviors, teaching social and communication skills, pre-school aged children, and basic pre-academic concepts (Olley, 2000)), LEAP (taught in an integrated classroom, circle-time, center activities, emphasis on independent play, natural occurring social interaction, pre-school aged (Olley, 2000)), and Pivotal Response Training (consisting of numerous specific skills, curriculum individualized initially based on preferred activities, pre-school aged (Olley, 2000)). While these all deal with the pre-school population they are a good place to start, especially when looking at social skills specifically. I will not go into further detail of these programs.

Montessori is one educational approach that looks at skills a little differently. Some aspects of the Montessori model can be linked to executive functioning deficits. Howell, Sulak, Bagby, Diaz, & Thompson (2013) state that because we live in the 21st century, we expect our students to be able to recall previously learned information, be flexible in their ability to shift their learning style based on the task, and to be able to monitor their learning progress through self-reflection. These skills are easily related to flexibility, planning, and organization, with the ability to be self-reflective, which has been seen in certain components of executive functioning.

Montessori's planning strategies encourage students to have a work plan, understanding what needs to be completed, in what order, and by when. These assignments are teacher-guided in the beginning and then the responsibility is moved to the students as they get older and are more successful with the strategy. The tasks are customized to the student's needs and abilities (Howell et al., 2013). Organization compliments planning in that the student needs to have a clear idea of what materials are needed to complete assignments as well and how the assignments will be presented (Howell et al., 2013). Time management skills encourages students to use their planning skills to effectively manage their time and how much time an assignment may take or how much time a section of an assignment might take. Under the Montessori model all the skills are intended to work together.

Teachers can have the greatest effect on student learning and self-confidence in a classroom. We have to equip our teachers with the best practices that will help them help students who have difficulty with executive function. Carnahan, Hume, Clarke, & Borders (2009) state that the goal for all students is to be able to function independently across all settings and the development of independent skills is an essential curricular goal. What can teachers do to help their students with autism be successful participants in the classroom?

As teachers we can do many thing to create a classroom that is conducive to learning for all students. Students with executive functioning difficulties require more conscious thought and effort. Dawson and Guare (2014) suggest a few principles for guiding and helping students with executive function deficits, they include: teach deficient skills, consider the child's developmental level, move from external to internal, environmental modification and the way adults interact with children, use the child's innate drive to master skills, modify tasks to match

capacity to exert effort, use incentives, provide just enough support, keep supports/supervision in place until mastery or success occurs, and fade supports/supervision gradually.

When teaching skills that are deficient it must be remembered that some children are able to naturally acquire skills and do not need as much help. Individuals with executive function deficits need to be taught those skills and they need to be supervised until they have shown them to be mastered.

It is also important to consider a child's developmental level when teaching skills. Not all eight year olds will develop at the same speed or at the same time as other eight year olds. Because children learn and develop at different speeds that must be considered, especially when executive function deficits come into play (Dawson & Guare, 2014).

Teachers must assess the environment the child is in and what modification can be made to create a space where the child can be focused and ready to learn. Adult interactions are also important, not just that they happen but how they happen. If a student needs to move around, the teacher can have the child "check in," requiring the student to get up and move, the student comes to the teacher for a short interaction that is relevant to the activity the student is engaged in (Dawson & Guare, 2014). The physical space should be organized with specific spaces for materials. Posting classroom rules and expectations helps remind students, utilizing both pictures and words is beneficial for all learners, not just students with difficulties (Deris &Di Carlo, 2013). Positive reinforcement is also another way for teachers to give reminders and cues. Pointing out what they did well provides specific feedback and acknowledgement of their success at gaining new skills (Dawson & Guare, 2014).

Students want to master skills and teachers can use this drive to help them achieve and master skills. Creating routines and schedules help student know what is expected and involving them in problem solving gives students a sense of control (Dawson & Guare, 2014).

When incentives are used it can be as simple as a word of praise or it can be more elaborate such as a point system or gaining a more preferred task (Dawson & Guare, 2014). Incentives give the impression that the effort in learning a new skill and the effort to perform the task seem less aversive (Dawson & Guare, 2014). Once a student performs an undesired task, receiving the incentive after the task is complete also teaches the student to delay gratification, a lesson that is valuable (Dawson & Guare, 2014).

The student must be supported throughout the acquisition of new skills. Teachers must use scaffolding (giving just enough support for success) to give students a sense of accomplishment and independence. Students must feel as though they can do that task on their own (Dawson & Guare, 2014). Support must also be in place until the child achieves mastery of the skill. The child should be able to independently perform the task before support is reduced or faded altogether. Support must be faded slowly and gradually. Students will continually need support when performing a new skill and removing support too soon will set the student up for failure (Dawson & Guare, 2014).

I have looked at some general strategies that can help all students in the classroom, not just those students with executive functioning deficits. Having an understanding and a working knowledge of executive functioning and its components can help educators in creating a class environment that will enable students the greatest opportunity to be successful. Being familiar with the work of Uta Frith's Central Coherence theory, Simon Baron-Cohen's Theory of Mind

theory, but primarily the executive function theory can benefit all students and inform the interaction between every individual in a classroom.

Understanding executive functioning comprises of more than just a singular idea or aspect. Many individuals with Autism will display some aspect of executive functioning, only because there are multiple components: planning, organization, flexibility, inhibition, generativity, self-monitoring, and working memory, and usually more than one at the same time, we begin to notice how some individuals can have difficulties with executive functioning. Not all components have to be present and they don't all have to be a severe deficit to be considered an executive function deficit. As educators we must recognize these individuals and find the best approach or strategy that will help them be successful in an educational environment and eventually in their community. I only covered a few strategies educators can use because every individual will have their own challenges and there needs to be a certain amount of flexibility to quickly asses and change course when appropriate. Understanding that executive function is a function of the brain we also must understand, simply, some of the other theories, Uta Frith's and Simon Baron-Cohen's, that exist and how they may inform our choice of strategy that we use. As teachers, we must also try to educate parents to help them understand what difficulties their children have and why we are using certain strategies in our classroom. Being informed is paramount, for all.

Research Question

Teachers have the enormous task of teaching children from various backgrounds, households, SES, learning styles and educational challenges. The number of students diagnosed with Autism is on the rise and they are being place in general education classrooms more often, teachers now have to be even more aware of the challenges that face these students. How do the

results from the Behavior Rating Inventory for Executive Function (BRIEF) or the

Metacognition Awareness System (MetaCog) assessments inform the general education teacher

and the special education teacher when developing strategies/differentiation in an integrated

classroom for students with executive functioning deficits?

Methods

The study will take place through various school districts and schools. I will contact and

send questionnaires to schools in a suburban area in Upstate New York. I decided to focus on

suburban schools out of both convenience and participant availability. I also focused my

questionnaire on elementary school and some middle schools. I wanted to know about grades 1-6

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not only administer the assessment but also how they report their findings to all the people in the

student's life? My main process of gathering data was through an online survey where I created fifteen (15) questions and I sent to school psychologists in upstate New York.

My procedures for this study started with creating and revising the questions that I wanted to ask. I wanted to try to be as clear as possible about what I wanted to know. After I had my questions and had given them to a peer to review I then started compiling lists of school psychologists around upstate New York. After I had created a list I started the process of composing a letter to ask psychologists if they would be willing to participate in my survey. Once I had a list of about fifteen (15) participants willing to answer my survey I then emailed them the survey link. Once I emailed everyone I repeated this process over to contact more psychologists who would be willing to participate. I wanted to have approximately 12-15, if possible, psychologists to participate. In all I have about 10 completed surveys. I gathered data over the course of 3-4 weeks.

I consider the emails that I sent out as a consent from. I only contacted school psychologists, therefore there was no need to have parental consent. I had some psychologists who wrote back and declined to participate as well as those who did agree to participate. The participants did not sign any consent forms only their response from email, I take that as a signing of consent. I am not using any names, although I know who agreed to participate, I do not know who actually completed the survey so anonymity is naturally built into the survey.

I collected my date through survey completion. I used a survey creator called Qualtrics. It was suggested from a colleague. I looked at other survey creators but I found Qualtrics was easier to use and easier to analyze the data collected.

I analyzed the data by responding the each question individually and trying to find trends in the results. I tried to find if there was anything thing that I might ask differently or what information that would have been more beneficial to know.

Survey Data Results

Question #1

Have you administered the BREIF assessment in the last four years?

I had the majority of the respondents having administered the brief recently. 82% had given the brief recently with only 1% not within the last year. I will make the assumption that they had given the BREIF assessment at their current school with one person having given the BRIEF at two different schools.

The fact that 82% of school psychologists have given the BRIEF within the last four years seems to indicate the schools are seeing more students with educational difficulties that need to be addressed within the school environment. It also implies that executive functioning deficits are being looked at as being a concern and something that can be specifically addressed.

Question #2

What individual inquired about assessing for executive functioning using the BREIF assessment?

There were only 8 people who answered this question and it was primarily divided between the general education teacher and the special education teacher, three (3) and four (4) respectively with only one parent requesting the BRIEF assessment. Although I do not know what prompted the general education or special education teacher to request the assessment I find

it interesting that it was almost even. The parent request is somewhat of an outlier and implies a certain understanding of what assessments can be administered and what difficulties are present in their child, or what the child might be having difficulty with.

Knowing who inquired about administering the BRIEF assessment says a lot about who has noticed a difficulty in a particular student. What I do not know from this question is what prompted the assessment. I would say the general education teacher was observing enough challenges within their classroom to consult with the special education teacher, or another general education teacher about trying to find some strategies that might benefit the student. What is also unknown is whether the student has an IEP.

Question #3

What grade level have you primarily administered the BREIF assessment to?

The majority, 60%, of the respondents work in an elementary school setting or have administered to that population. I had two middle school, 20%, one primary, 10%, and one high school, a 10th grade student. I included primary because some of the school districts have a primary k through 2/3 schools. These results imply that teachers and administrators are noticing difficulties with executive function earlier and are trying to implement strategies that students can use throughout their educational career. Helping students earlier can make big difference as they progress and as the work becomes more difficult in the later grades.

The fact that 60% of the respondents where in elementary schools, it would be safe to say that schools and teachers are seeing challenges earlier. They recognize that when students receive help earlier they are able to progress through school in the later grades with the

possibility of decreased difficulty. When students have strategies already in place, they will have more options available to them as the work gets harder and more is asked of them. It's imperative that students get help/services earlier in their school career to make school less difficult for them, with the hope that they will be able to generalize those skills to situations outside of school.

Question #4

What challenges were encountered from the student when you administered the assessment?

From the nine responses I received five said none and mentioned that they did not give the self-assessment to the student. At the elementary level the brief is not given to the student, the student must be at least 11 years old for the self-assessment. One responded that they decide on a case by case basis if the assessment is appropriate for a student. Another responded that the student reading level was such that the prompts had to be read to the student, while another person noticed that the student, a 10th grader, is not always aware of their strength and weaknesses and they will report that everything is fine. These self-assessment responses compromise the validity of the assessment, which is one concern that I noticed from school psychologists, the BREIF is a rating scale so there is sometimes an over or under reporting of "skills".

Although some of the students had some difficulty with the assessment, it can be assumed that they had difficulty because of their disability. The majority of the time students will have little trouble with the assessment. In addition, students must be eleven years old to self-assess and when the majority of the assessments were given to elementary students it removes

one part of the assessment data. Students who self-asses generally view themselves as doing better than they really are and will sometimes self-asses higher than they truly present. It can be difficult for an eleven year old with challenges to have a strong self-awareness and to be able to see their strengths and weaknesses clearly.

Question #5

How have parents reacted to completing the parent section?

Ten people responded and all but one reported that the parents were fine with filling out the assessment. Some responses included: the parents found it interesting, appropriate, parents found the outcome data helpful in driving intervention between home and school, supportive in wanting to delineate the particular area(s) that may be of concern. Only one person responded that the parents did not mention anything regarding the assessment.

Parents may notice that their children are having difficulty in school and are happy to find some way of getting their children to be successful in school. They may notice how their children are struggling at home and are unsure of how help. With the BRIEF assessment they may see a light that may help guide them in understanding and helping their children succeed. The parent assessment isn't that difficult and it doesn't take that much time to complete. It may give them a small picture of some of the difficulties that may have been overlooked. Having a formal assessment completed through the school can give parents a sense of relief while also giving them some strategies that they may be able to implement at home as well.

Question #6

On average, how long does it take to administer the BRIEF assessment to a student?

Out of the eight people who responded 50% said it took less than 20 minutes while the other 50% said it took between 20 and 40 minutes. This could imply any number of reasons from the age of the child to their ability to understand what is being asked.

The amount of time that is took school psychologists to perform the assessment was reasonable. I would assume that if it took much longer that 40 minutes that, although the BRIEF is a good assessment, something else might be happening with the child. The student may need a different assessment for a more in depth look at the student's abilities. It seems that up to 40 minutes was an average amount of time. This does not include the self-assessment when it was performed. I wonder how long it takes students to fill out the self-assessment section.

Question #7

How soon after you get results to you try to share them with parents, general education teacher, and the special education teacher?

Out of the ten School psychologists who responded 50% said they try to contact everyone involved as soon as possible while the other 50% responded as soon as they can meet with the parents or the team. I assume that they try to share results as soon as possible but there are a number people who have to coordinate schedules to meet, which can take time or mean they have to be met with separately, in particular with the parents.

The fact that school psychologists try to share the results as soon as they can leads me to believe that the sooner that they can share their results the sooner they can start implementing strategies that will help the student in the classroom. I believe that the intention is to inform everyone involved as soon as possible, even if that means that some people are told later than

others. Parents and teachers would be the first people to be notified, if parents want to know, and then the support staff, speech, occupational therapist, and physical therapist, etc.… would be notified as needed. The general education teacher and the special education teacher should be one of the first to be notified because it would enable them to start working right away, the parents would also be important, for obvious reasons. Team meetings would be an ideal time to inform everyone at one time if schedules can be coordinated.

Question #8

After presenting the results of the assessment to school faculty, how soon are strategies developed and implemented?

Ten respondent agreed that is it imperative the try to implement strategies as soon as possible. One responded 2-3 weeks which I will assume it the amount of time they need to develop and to coordinate schedules to implement into the classroom.

It is unanimous that psychologists want to start implementing services as soon as they can. What I don't know from the answers is what does right away mean? If they have results on Monday do they start implementing strategies on Tuesday? I would assume that it takes a few days up to a week, at the earliest, to start new services. It's good that the schools want to start strategies as soon as possible, to start collecting data, and changing routines and strategies early to give the student time to incorporate the strategy, or to see if it doesn't work and start with a different course of action. The idea is to start at the earliest possible time to give the student the greatest amount of time to improve.

Question #9

What are the general number of strategies that are implemented at one time?

Seven psychologists answered this question and six found that 2-3 strategies are implemented at one time. One person said they implement 4-5 strategies. I feel that starting small is easiest and also this would be student based. If the strategy is new to a student having too many strategies at once may make things more stressful and difficult for both the student and teacher.

Starting with only a few strategies is best because implementing too many is stressful for both the teacher, especially if its new to them, and to the student because things might need to be done differently. Also, the teacher and student will have to learn what the strategy is and how to use it so it works effectively and efficiently. If too many strategies are implemented at once it can be very overwhelming for everyone. Teachers need to keep track of them all, especially when tracking data, and students have to learn them all. Teachers will need to be very conscious of how the strategy affects the student both academically and behaviorally.

Question #10

When does the school team re-evaluate strategies currently in place and start implementing new ones?

78% of those who responded said they re-evaluate every 6-7 weeks, which is average with new strategies and RTI interventions. One person said 4-5 weeks and another said 8 weeks or more. I think the 6-7 week time frame is enough time to see if a strategy is working and how it can be changed or disregarded completely. Every district is different and I would assume each case needs different interventions and re-evaluations.

Re-evaluating every 6-8 weeks is the general norm when introducing a new strategy into a student's school day. It gives the student and the teacher time to follow the student's progress but to also give the strategy time to work. The one psychologist who said they re-evaluate 4-5 weeks might be working with a student who has responded, either positively or negatively, to interventions prior very quickly. Although some students may need more or less time I found that it was consistently 6 weeks with some variations to each side. 6-8 weeks is considered the right amount of time for interventions to be shown to be either effective or ineffective.

Question #11

What is the number of executive functioning components that are found to be deficient, on average?

Eight psychologists responded and the results were 50%-50% in the number of components the assessment found. Between 2-3 and 4-5. I think this would be representative of what is normal. Unless there is student who is severely disabled the number is fairly average.

The data shows that student's executive function deficits will range from 2-5 components and that will be tend to be average. What I don't know is the severity of the disability of the student being assessed. Also the students who had 2-3 components could have been older or had strategies already in place. It is also telling that no psychologists had results that were in the severe area, meaning more than six components that were deficit. The results also mean that teachers can implement strategies into their classroom that would benefit the student and be done in a meaningful way. The low number of deficits means that schools can and should work to help their students. The only difficulty that may arise is if there are a number of students in a single

classroom who have different challenges that need to be addressed, that can make the implementation for each student difficult especially if there are different needs.

Question #12

When do you re-evaluate strategies in place?

89% of the respondents answered this question other. Out of the 8 replies four said they re-evaluate every 6-8 weeks. Three mentioned that they re-evaluated on an as needed basis. One mentioned they re-evaluate yearly for special education students while one mentioned every three years to coincide with the CSE re-evaluations. One person said that it depends on the next steps for a student, depending on what they are pursuing (RTI, 504 plan, or CSE).

What I found interesting about the results of this questions is that only half of the respondents said they re-evaluate 6-8 weeks. The previous question showed that re-evaluation occurs between 4-8 weeks. One could make the claim that only half of the psychologists consistently re-evaluate. There is the idea that half of the respondents don't suggest the implementation of new strategies and therefore do not feel it necessary to re-evaluate on a regular basis. The four that re-evaluate might be implementing interventions and therefore need to re-evaluate progress. One could also surmise that re-evaluations are left up to the general education teacher or special education teacher and therefore the psychologist isn't doing the actual re-evaluations, that isn't known and something that I would want to know in further surveys. I would say that if strategies are being implemented then re-evaluations need to be consistent and when they will be re-evaluated needs to be stated. Also a factor is the school district policy for re-evaluating.

Question #13

Do you find teachers resistant to implementing different strategies into their classroom?

It is typical that teachers are not resistant to implementation. 67% felt that teachers were open to additional help for students if they were needed. 33% responded that teachers are receptive but that it can be time consuming, both in general and to effectively track intervention. One responded that they found teachers needed/wanted the interventions to be explicit instruction about the intervention and not generalized. They don't want to have to figure out how to implement the intervention on their own. Teachers also want to know *how* it work for their kids.

Most teachers are open to providing additional help for the student who are struggling. What the results indicate is a need to have the implementation effective and seamless. Teachers have a lot of responsibilities in their classrooms so being able to implement a strategy and be responsible for the tracking of data can make the prospect a little daunting for them. Having help in implementing and tracking would make teachers even more open to additional strategies being implemented into their classrooms. I also found that some teachers appreciate when the strategies are explicit in how they are implemented and how to teach new strategies to students, they don't want to have to understand the strategy on their own or implement them independently. Teachers are open, they just want support in implementing and tracking new strategies.

Question #14

Do you find the BREIF to be an accurate assessment?

Out of the 9 people who answered, seven or 78% thought the BRIEF was an accurate assessment for executive function deficits. Two, 22%, mentioned that because it is a rating scale it is only as reliable as the person doing the rating. One person said that they found it questionable, due to various professionals indicating that the results tend to be overly elevated but thought in daily practice it was a useful tool. One individual who did not take the survey but used the BRIEF, but no longer does said that she found the BRIEF to have a major flaw in that it she found the sample used was not big enough and tended to inflate scores. They also found it not to be a sensitive measure because they found that everyone had significant challenges based on the scores. They did like how it breaks down specific skills related to executive functioning.

Using the BRIEF can be an effective assessment. Although I do not know how long the psychologist had been using the BRIEF to be able to give an accurate response for its usefulness. I think that it is a good tool to use as a baseline for students with executive functioning deficits. I don't think it should be used as an end all be all, but used as a way to identify and address difficulties that some students may be showing in the classroom. One psychologist mentioned that they thought it was flawed and they do not use it. It was determined that it is good for the separation of skills related to executive function and how and what strategies might be beneficial to students.

Question #15

How long have you been a school psychologist or administering the BREIF assessment?

From the nine people who answered only one had been a school psych for more than fifteen years. Two had between 10-15 years of experience, three had 5-10 years and another 3 had less than five years of experience.

I found these answers interesting because of the number of psychologists that were new to working in schools and they might be more open to using the BREIF. The fact that the majority of the psychologist had under 10 years' experience leads me to be believe that they are more willing to use and/or find different assessments for executive function. There is a positive to having less experience in that they might be more willing to seek out new assessments or strategies while someone with more experience may tend to like what they know and are use what they know. There is also the fact that experience has its benefits. The more experienced psychologists will also have seen more student's and have more resources available to them and would likely have made more connections with other schools and professionals. There is benefits to both levels of experience.

Final Thoughts

Executive function deficits can have a large impact on the lives of many children in school as well as in their lives in general. How we understand how executive function works and how each of the components work together can have an effect on how we approach individuals who have executive function challenges. One of the biggest challenges is that we can sometimes think that executive function is related to behavior and that that has the largest impact on an individual's ability to function in an educational setting. While that may be true in school age children, it can and does effect the individual in adulthood as well. The ability to plan an activity and to be flexible, for example, when that plan doesn't happen as they hoped it would can pose great challenges, especially when the individual has autism. If being rigid and feeling as though things must happen in a certain way, being flexible or the inability to be flexible, will affect not only the individual but the people they may be interacting with or are surrounded by.

As teachers we must understand how executive function deficits impact the student in the classroom, not only academically but also behaviorally. When students struggle academically there is a co-relation to how they struggle behaviorally. We must have a basic understanding of the components of executive function that include: planning, flexibility, inhibition, working memory, set shifting, organization, and generativity. Knowing the components and how to help students develop and utilize strategies for any number of these components can help students feel confident and be successful. The components can have a direct effect on each other, so being able to see how they work together and complement each other may alleviate other challenges. We can't expect a general education teacher to well versed on the topic but if they can a strong team who is willing to research and understand how executive function works and how the components work together it can make their job a little easier, especially when working in the classroom.

We know it's impossible for one teacher to be responsible for teaching children and that is especially true for students with disabilities. Arming ourselves with some general understandings of executive functioning can go a long way to creating a classroom environment that is conducive to learning and growing for all students. All students can benefit from strategies that help students with executive functioning deficits and many teachers actively use various strategies already, but now they have a clearer understanding of how the strategies they use work and why they work.

References

Akbar, M., Loomis, R., & Paul, R. (2012). The interplay on language on executive functions

in children with ASD. *Elsevier. (Research in Autism Spectrum Disorders).* 494-501.

Doi:10.1016/j.rasd.2012.09.001.

Booth, R., Charlton, R., Hughes, C., & Happe, F. (2003). Disentangling weak coherence and

executive dysfunction: planning drawing in autism and attention-deficit/hyperactivity

disorder. *Philosophical Transactions: Biological Sciences,* 358 (1430). *Autism: Mind and*

Brain. 387-39.2. DOI:10.1098/rstb.2002.1204

Carnahan, C., R., Hume, K., Clarke, L., & Borders, C. (2009) Using structured work systems to

Promote independence for students with autism spectrum disorders. *TEACHING*

Exceptional Children. Vol. 41, No. 4 6-14.

Chung, H. J., Weyandt, L., L., Swentosky, A. (2014). The physiology of executive functioning.

Handbook of Executive Functioning. 13-27. DOI: 10.1007/978-1-4614-8106-5_2.

Culmine, V., Dunlop, J., & Stevenson, G. (2010). Asperger syndrome. A practical guide for

teachers. *New York.* Routledge.

Dawson, P. & Guare, R. (2014). Intervention to promote executive development in children and

adolescents. *Handbook of Executive Functioning.* 427-443. DOI: 10.1007/978-1-4614-

8106-5_24.

Deris, A., R. & Di Carlo, C., F. (2013). Back to basic: working with young children with autism

in inclusive classrooms. *British Journal of Learning Support. Support for Learning,* 28

(2). *52*

Happe, F., Booth, R., Charlton, R., & Hughes, C. (2006). Executive function deficits in autism

spectrum disorders and attention-deficit/hyperactivity disorder: Examining profiles across

domains and ages. *Elsevier (Brain and cognition).*25-39.

Doi:10.1016/j.bandc.2006.03.004.

Hill, E, L. (2004) Evaluating the theory of executive dysfunction in autism. *Developmental*

Review, 24, 189-233.

Hill, E. & Frith, U. (2003). Understanding autism: insights from the mind and brain.

Philosophical Transaction: Biological Sciences, 358 (1430). *Autsim: Mind and Brain.*

281-289. DOI:10.1098/rstb.2002.1209.

Howell, L., Sulak, T., N., Bagby, N., Diaz, C., & Thompson, L., W. (Spring, 2013) Preparation

for life. How the montessori classroom facilitates the development of executive function

skills. *Montessori Life.* 14-18 -*56.*

Landa, R, J. & Goldberg, M, C. (2005). Language, social, and executive functions in high

Functioning autism: A continuum of performance. *Journal of Autism and Developmental*

Disorders, 35(5) 557-573. DOI: 10.1007/s10803-005-0001-1.

Meltzer, L. (2014). Teaching executive functioning process: promoting metacognition, strategy

use, and effort. *Handbook of Executive Functioning. 445-473.* DOI: 10.1007/978-1-4614-

8106-5_25.

Olley, G., J. (2000) Curriculum for students with autism. *School Psychology Review.* Vol

28, no 4. 595-607

Perner, J., Frith, U., Leslie, A., & Leekam, S. (1989) Exploration of the autistic child's theory of

mind: Knowledge, belief, and communication. *Child Development.* 689-700.

Robinson, S., Goddard, L., Dritschel, B., Wisley, W., & Howlin, P. (2009). Executive functions

In children with autism spectrum disorders. *Elsevier (Brain and Cognition) 71*. 362-368. DOI:10.1016/j.bandc.2009.06.007.

Tannock, R., & Schacher, R. (1996). Executive dysfunction as an underlying mechanism of behavior and language problems in attention deficit hyperactivity disorder. *Language, learning, and behavior disorders.* 128-155.