

The Prevalence of ADHD in American Society: The Influence of Parent-Child and Child-Technology Interactions

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Abstract

Attention Deficit Hyperactivity Disorder (ADHD) is a behavioral disorder that begins in childhood and persists throughout adulthood and is characterized by symptoms of inattention, hyperactivity, and impulsivity. Societal attitudes classify the diagnosis of ADHD differently in establishing what behaviors are deemed acceptable or tolerable in children depending on the particular region or area. American culture provides an important framework for societal perspectives of how ADHD is expressed through behaviors that are considered an abnormal pathology. The purpose of this study is to conduct a literature review of ADHD in various cultures to ascertain why the prevalence of this disorder continues to rise in American society. The hypothesis we assume for the increased rates of ADHD in our society is based on a linkage of events created by effects from a lack of parent-child interactions that lead to an increase in technology use which develops behaviors that mimic ADHD-like traits.

Keywords: ADHD, Technology, Internet, Social Media, Addictions

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Attention deficit hyperactivity disorder (ADHD) has generated an increasing amount of discussion in recent years regarding diagnosis and treatment methods. ADHD is a behavioral disorder that begins in childhood and usually persists into adulthood. This disorder is characterized by symptoms of inattention, hyperactivity, and impulsivity which impair the development of academic achievement, increases family stress, and hinders the development of proper social skills. People with ADHD tend to have lower occupational status, poor social relationships, commit more motor offenses, and develop substance abuse at a rate higher than cohorts without ADHD. The

National Institute of Mental Health (NIMH) describes the condition and its sufferers as leading behaviors associated with symptoms related to inattention, hyperactivity, and impulsivity. These behaviors are often exhibited by most children at particular points in the lifespan development. However, children with ADHD struggle with these behaviors resulting in higher severity and more frequent occurrences.

In the United States, children being treated for this disorder have increased dramatically over the past few decades. In a 10-year period, diagnosis of ADHD in American children has risen from an average of 6.9 percent to 9 percent. It is estimated that one in 20 children are diagnosed with ADHD. Stimulant drugs such as methylphenidate, commonly known as Ritalin, have increased over the last three decades. At least five million children are being treated for ADHD with the use of psychostimulant medication each year (Akinbami, Liu, Paster, and Reuben, 2011). Data gathered on ADHD from around the world shows that the behaviors associated with this disorder are not culture-specific to America, but rather, that the cluster of symptoms associated with the disorder appears universal. More deficiencies in treatment than diagnostic picture can be noted cross-culturally. Additionally, prevalence and incidence rate vary according to culture/nationality sampled. Thus, the American Psychiatric Association (APA), (2013) projects the approximate prevalence rate of ADHD worldwide is at 5 percent.

What could be causing the observed increasing rate of behavioral disorders of young children including ADHD in America? According to the NIMH, the existing literature of studies show an increase in the number of children being diagnosed with ADHD, but the reason for the influx of this particular disorder is still unclear. Thus, the purpose of this study is to conduct a literature review of ADHD in various cultures to ascertain why the prevalence of this disorder continues to rise in American society. The hypothesis we assume for the increased rates of ADHD in our society is based on a linkage of events created by effects from a lack of parent-child interactions that lead to an increase in technology. This overuse of technology as a non-natural social community leads to the development of behaviors that mimic ADHD-like traits. A deficiency in parental involvement leads children to find alternative solutions to manage the absence of affection and quality time. These children focus their attention on media and technological devices as a method of replacement. But social interaction electronically leads to behavioral patterns that are rated as non-focused and lacking in stability when measured in the school setting (i.e., ADHD-like).

Consequently, children's response of replacing media for the absence of parental involvement may develop into various patterns of pathological technology use. With the usage of internet, electronics, and smart technology

advancement, individuals in America spend a great deal of time switching tasks between e-mailing, social networking sites, texting, internet surfing, and playing video games. Side effects of technology create the potential for changes in users' behaviors, cognitions, and emotions. Children and adolescents spend increasingly more time with activities such as video gaming than in the past (Gentile, 2009). This may, in part, be due to the ease of obtaining electronic devices. The constant motion in these games increases the need to use more of our information capacity. Our brains can only obtain a certain amount of information before becoming overloaded, thus affecting attentive skills, focusing, and behavioral responses.

Along with the increased video game usage, Americans spend a great deal of time on computers and the internet. Over the past several decades, technology has been rapidly developing. The way people use computers and access internet has expanded in a variety of ways (File, 2013). We no longer use only our personal computers from home, but we are able to access information from multiple devices. Smartphones have become the most used device in accessing information. The technology of smartphones allows us to not only make phone calls but text message, conduct e-mails, use maps, browse the internet, play games, access social networking sites, download music, and take pictures. File (2013) reported that "Nationally, about 48 percent of individuals 15 years old and above reported using a smartphone." The technology use in the general public is becoming more advanced with the increased availability of electronics to complete tasks more efficiently. With the fast pace of advanced technology, how can the human brain process all of the information without overloading our capacity of cognitive control? Human cognition models suggest that the quality of mental ability is susceptible to capacity-limited stages of information processing. These capacity-limited stages allow a maximum amount of information to be received. When the demands exceed cognitive capacity, mental ability can be easily overloaded. This limits our aptitude to attend to, retain, or respond to environmental information in certain contexts resulting in compromised performance (Roberts, Milich & Fillmore, 2012). Switching from one task to another or doing multiple tasks at one time exceeds cognitive control which results in the compromising of overall attentiveness.

Societal Attitudes towards ADHD

Children today have a vast amount of choices and many times the messages they receive are unclear and inconsistent. Our children today face inconsistency through a variety of sources such as parent, other significant adults, teachers, and the media. Yet they are expected to choose the appropriate response to a number of choices. In making these decisions, children may show evidence of indecision, hesitation, rewording of choice,

and/or rapid but random responding leading parents and teachers to pre-label these children with ADHD. The NIMH connoted that typical normal behaviors in children may be mistaken for ADHD. It is common for children to present with difficulties in concentration and being distracted as well as impulsive actions at one time or another. This does not mean ADHD is not a real problem, but rather we may have forgotten that normal children by nature are more active, less attentive, and more impulsive than adults.

In a study of children in England, the diagnosis of ADHD showed fewer English children labeled with the disorder compared to their American counterparts. Less than one percent of English children are diagnosed as having ADHD while approximately five percent of American children are labeled with this particular disorder. These English children were considered as having exhibited symptoms of ADHD according to American standards (Moon, 2011). Not every child who acts fidgety at times is hyperactive; not every child who would rather be focusing his or her attention on something other than a teachers lecture has ADHD; children who cannot focus on reading or math problems at school because of a problem at home should not be automatically assumed to have ADHD; and not all children who act out due to low self-esteem has ADHD. It seems we Americans are too quick to jump to the label of ADHD versus finding out any other underlying conditions.

Even in adulthood, ADHD is difficult to correctly diagnosis. In a study of adults across seven countries, Brod, Pholman, Lasser, and Hodgkins (2012) found that diagnosing ADHD in adulthood requires a difficult and extensive process of locating the attributes of self-perceived problems. Often times, the symptom manifestations tend to result in self-diagnosis based on assuming that traits are similar to conceptions related through public media and other individuals with the diagnoses. The study consisted of 42 percent of participants who reported other additional mental health diagnoses; therefore, caution should be taken when pre-labeling an individual as a likely candidate of ADHD. We all have tendencies at one time or another to be anxious or depressed, but that does not mean we have a particular disorder. Technology definitely creates distractions in people, but individuals with ADHD suffer a much higher expense for these distracted moments with an enormous range of problems in their lifestyles from job performance to relationship troubles. The public perception of ADHD has a mistaken view about the nature of this disorder.

In the United States, we live in an individualistic culture which sends unclear and inconsistent messages to children regarding appropriate behaviors which leads to children with lower self-control. Vygotsky (1978) discussed the social interaction with the “More Knowledgeable Other.” The interaction of communication between children and the more knowledgeable person in society teaches children how to acquire certain ways of thinking and behaving

which makes up the community's culture. Vygotsky theorized that when adults communicate to their children, the type of communication the child receives becomes a part of his or her cognitions. This internalized process guides the child's actions and behaviors; thus, if we communicate effective self-control over our impulses, possibly fewer children would be labeled with ADHD in American culture. It is important to note that Vygotsky's more knowledgeable member in society does not necessarily have to be a parent or teacher. The more knowledgeable individual could be an older sibling, a peer, and (even in today's society) the media.

Although children may learn certain behaviors or cognitions from parents, which are compatible in the home environment, parents often feel pressured by the schools to test their children for ADHD when those same behaviors and modes of thinking are seen as problematic in the educational setting. They are then encouraged to seek treatment for their offspring, the first response usually being prescribed stimulant medication. There have been extensive studies conducted on ADHD, but our society tends to quickly put labels on young children who may have learned a different cognitive set and performance standard at home, leaving them not behaving to expected norms at school. What our society has forgotten is that beneath a label, there is a child who is troubled, or operating according to discrepant rules.

A child bullied on the playground at school may have to deal with a particular conflicting issue due to teachers that are not adequately supervising the children, and the parental taught appropriate response to being "attached," as well as a possibly different peer learned or media portrayed appropriate response. The child may act out in school leading the child to be further victimized within the school system by being labeled with a disorder. The course could lead to another alteration of his or her thinking and behavior in the form of self-stigma and a medicated developing brain. ADHD descriptive criterion only leads to labels without investigation of the circumstances for the underlying cause of these particular behaviors. The term ADHD is defined in a way that assumes the child's problems exist in his or her biological nature and does not reflect on poor educational programs, family dysfunction, parenting style, or other issues that could cause exhibited symptoms which are not always clearly addressed during the assessment process. ADHD is a quick fix to behavior problems of children through using medications to adjust the behavior to satisfy social norms. Drug treatment only suppresses the symptoms and does not address the primary problem of the child.

Other cultures, which live in more collectivistic manners, tend to show more clear and consistent messages about expectations and consequences for actions leading to fewer behavioral problems in children. Many collectivistic cultures emphasize morality and right action. They are clear and concise with the messages portrayed to children. Individualized school plans are not

acceptable in certain cultures or societies in many Asian countries because children are expected to conform to group education. Korean parents and teachers, in particular, look at children's distractive behaviors in a less than favorable light and as a negative reflection upon themselves. In this country, the authority figures focus more intensely on academic achievement (Moon, 2011). Cultural influence plays an important role on the perspective of ADHD. Parenting styles in other cultures are more child-centered than in the United States. In our Western culture, we tend to focus on the child's problem of inattention or hyperactivity; whereas, other cultures, parents and teachers take responsibility for children's behaviors, which are believed to be moderated by training. In our individualistic culture, whereas social forces may be given some credit for developmental problems, biology and the individual, not society, is considered the locus of the deficit, and thus the focus of treatment.

Although the rate of ADHD is fairly consistent in children worldwide, the rate of diagnosis greatly varies. Even in American society, the rate of diagnosis varies across regions and demographic groups and fluctuates across time. During the years from 1998-2000, the Southern regions had a higher prevalence of ADHD than any other region. In comparison of later years in 2007-2009, the prevalence increased in the Midwest region that showed a similar prevalence rate to the Southern region (Akinbami et.al, 2011). Prevalence in these two regions was higher than in the Northeast and West. Even in Western nations, models for viewing childhood behavior differ across nations, making the assessment of ADHD pathology inconsistent. Hinshaw, Scheffler, Fulton, Aase, Banaschewki, Cheng, ...Weiss (2011) indicated that the country of Brazil "retains a highly psychoanalytic perspective on ADHD, which results in low rates of referral from schools." Along with low referrals for ADHD, other countries such as Israel have lower actual rates of ADHD. Hinshaw et.al. (2011) stated that "the high tolerance for excessive activity in Israeli classrooms makes it difficult to distinguish high activity from pathologic manifestations." Societal attitudes differ based on what is acceptable in the culture. All cultures have different expectations of typical behavior and each culture has specific ideals of tolerance towards active children. In other cultures, tolerance towards ADHD-like behavior is simply seen as an "active child." In more natural environments this type of behavior is generally more acceptable and seen as healthy childhood behavior. For example, hyperactive behavior may be seen as a likely diagnosis for ADHD in the USA and the same behaviors as having conduct disorder in the UK (Faraone, Sergeant, Gillberg, & Biederman, 2003). Behaviors may be diagnosed as disorder A in one culture, as disorder B in another culture, and the same behaviors may be deemed as normal in a third.

Media Addictions

The technical progression of the internet has become an increasing concern in our society due to abnormal patterns of use which reflect addictive behaviors. Internet addiction is a rather new concept in the domain of psychology. Technological advancement, in the last decade, with the use of internet, social networking sites, and video-games has made an enormous impact on the development of children. The implications of the emergence of this paradigm shift in our society raises questions about how and what is important in the consideration of evaluating individuals' behaviors. Recently, in the past few years, questionnaires with specific criteria have been developed from criteria used from substance dependence questionnaires to further establish diagnosis for Internet addictions. The most commonly used questionnaire is the Young's Internet Addiction Scale (Weinstein & Lejoyeux, 2010). This scale has been validated in several countries that include the United Kingdom, the United States, Finland, and Korea. Young people are more likely to exhibit impulse-control behaviors due to internet use. The absence of parental monitoring may increase the adolescent's exposure to the internet. The prolonged use may provide a pathway for emotional and social support creating the potential for psychological problems (Wu, Chen, Han, Meng, Luo, Nydegger, & Wu, 2013). Parent-child conflict and familial dysfunctions may create an impact on children and adolescents that lead them to media sources for support; thus, the increased use of internet and media sources produce abnormal patterns of behavior which may reflect symptoms similar to ADHD-like behaviors.

Internet addictions may be overlooked when assessing individuals for disorders such as ADHD, depression, anxiety, social phobia, etc. Many studies have suggested that ADHD is usually a comorbid disorder with other psychological pathologies or addictions. Internet dependence for some individuals creates a coping mechanism against underlying psychological problems (Weinstein & Lejoyeux, 2010). With ADHD on the rise, there may be a possibility that many young people suffering from internet addiction or technology caused cognitive drift with a serious biological disease.

According to the NIMH, the cause of ADHD is unclear, but many studies suggest that genetics may likely be involved. Similarly to other illnesses, a combination of factors may produce symptoms of ADHD. Environmental factors such as brain injuries, nutrition, and the social environment might contribute to factors associated with ADHD as well as activates genetic predisposition to the disorder. Internet messaging appears to create clinically addictive behaviors. This is likely due to the production of dopamine that activates the reward system in the brain and further exacerbates the need for continual use of the internet to produce those pleasurable feeling states (Lauer, 2004). Adolescents and adults with either disorder of ADHD or

internet dependency prefer the “quick fix” to obtain the pleasure-seeking reward. Children, and even adults, at-risk for internet addictions tend to fit some of the criteria for diagnosis of ADHD. However, if an internet addiction is occurring due to some kind of dysfunction in another area of an individual’s life, the underlying problems cannot be discovered by going through a checklist of criteria for ADHD.

The rise of internet technology has created an epidemic of virtual social experiences. We are connected to the entire world. Social networking sites allow people to interact with each other from almost any country. The internet has shaped our personal lives, our society, and many features of our cultures. The internet has opened the doors to global, social, and professional networking. With the recent and rapid technology advancements of the internet, we must all adapt to this new international information age.

The increased development of portable technological devices such as smartphones have even more drastically shaped our society and changed the daily lives of individuals. These smartphone devices allow people to access the internet from any location, thus providing the opportunity for increased pondering to one’s addictive producing behaviors. Kwon, Lee, Won, Park, Min, Hahn, ...Kim (2012), consider the rapid advancement of smartphone technology to be comparable to most aspects of the Internet. Similarly, to internet addictions, smartphones possess the same dependence-like traits that will cause physical and psychosocial problems. Like internet addictions, individuals may become dependent upon smartphone devices as well as evidencing double addiction or comorbid conditions, and many of them fitting the criteria for ADHD-like behaviors. Individuals reporting problems with concentration and anticipation may have caused their symptoms as a result of smartphone use becoming a crucial tool for eliminating stressors and anxiety in the daily lives of many people. Thus, a vicious cycle may be established when addictions cause a mixed symptom picture which becomes labeled as ADHD.

Consequently, the overuse of smartphones has created adverse effects in the lives of many individuals, leading people to struggles with attention and even to the development of hyperactivity symptoms of ADHD due to withdrawal from smartphone devices. Smartphone withdrawal includes symptoms associated with being impatient, irritable, and intolerable without the device, constantly thinking about the device even while not using it, and becoming irritated when bothered during use of smartphone activity (Kwon et. al., 2012). These withdrawal symptoms may involve some similarity with ADHD criteria such as fidgetiness, restlessness, difficulty controlling behaviors, and acting without regard to consequence. Children and adolescents may become fidgety at school and unable to concentrate on lectures due to waiting or thinking about their smartphone. Also, the individual

experiencing withdrawal symptoms may become restless or have difficulty waiting to get on the device. In addition, these individuals may lack self-control and act impulsively due to the withdrawal symptoms. Heavy reliance of a device negatively impacts an individual's mental health. Although these symptoms show similar ADHD-like traits, further research needs to be conducted on smartphone addictions to fully understand whether the criteria is based on addiction or underlying traits associated with other disorders.

With the rise of internet and smartphones in society, the development of dependency and psychosocial problems associated with video-games is another area of increasing concern. A study by Gentile (2009) reported that boys play more frequently than girls, and the amount of time playing video games increases as children and adolescents become older. Video games appear to enhance concentration in children with ADHD, and Yoo, Cho, Ha, Yune, Kim, Hwang, Chung, Sung, and Lyoo (2004) support the assumption that "games are the most stimulating and immediately rewarding activities on the Internet." Children need cognitive stimulation, but it appears that prolonged exposure can have detrimental effects towards cognition and real-life social interactions in seemingly healthy, young individuals. For many individuals, playing a favorite video-game will not adversely affect their social life, school, or work; however, young children and adolescents who are unable to put aside their video-games may be at risk for developing self-control and social skills. Video-games increase visual attention and the fast pace of games requires quicker information processing. The stimulation of video-games can de-sensitize the individual to the real world; thus, teaching children to become more impulsive and developing a greater need for instant gratification while producing shorter attention spans.

Increased Technology and Cognitive Overload

Technology is becoming a strong factor in how individuals function and accomplish everyday tasks. Our attitude towards technology continues to change as technological devices evolve, expand, and change. Attitudes shape our thoughts, beliefs, and opinions about the surrounding environment. The impacts of technology will be a significant factor in how the attitudes of younger generations manage with the new technological advancements. Information and communication technology has influenced change on practically all social structures. In today's world, we can access information from anywhere, at any time, with the use of internet, smartphones, and tablet devices. With the speed of access, it is very common for students to work on a project and at the same time check emails, instant message, and converse with friends on social networking sites. However, with rapid advancement in technology, many children are being exposed to increased screen time that includes activities of using smartphones, watching television, playing video

games, and surfing the internet. Children being exposed to excessive stimulating functions for longer amounts of time become at-risk for developing over competent behaviors for the deficiency of satisfaction in their lives.

Subsequently, social networking sites have become a popular form of communication for a vast number of individuals, especially the younger generation. However, technology is not limited to one specific age group. Internet and smartphones have continued to increase in popularity over all age groups, races/ethnicities, and education levels. With increased technology, the whole population is becoming hyperactive with the technology of internet, smartphones, and tablet devices. The pervasive use of electronic devices and social media has created individuals who constantly stay connected due to fear of missing out on something. The result on cognitive functioning has lead individuals to pay “continuous partial attention” to all aspects of information processing (Sparks, 2012). Even in classrooms, while attending lectures, students are simultaneously checking and sending texts and engaging in other social media interactions. The concept of multitasking allows us to fulfill multiple tasks simultaneously; however, attention cannot be fully focused on all of these tasks at one time. Each task is only partially in focus, but engaged in all tasks.

As an individual’s level of cognitive information capacity increases, Roberts, Milich, and Fillmore (2012) explained that “so does the ability to simultaneously process both tasks.” Our brains only have a limited capacity for processing information which makes it difficult to respond to multiple tasks at once. To optimize attentional aptitude, we engage in dual-task methods. Conversely, easy tasks tend to be processed more efficiently without regard to consequence, but more difficult tasks hinder our aptitude of attention and possibly create more inaccurate responses due to the limitations in processing. Every task we add to contribute concurrently, our attention to each item is substantially decreased.

Two tests, in a study, by Roberts, Milich, and Fillmore (2012) were conducted with a group of ADHD participants and a control group to investigate the capacity-limited process in multitasking situations. The first method used was a psychological refractory period paradigm. During this experiment, participants had to make quick choice responses for task one and then make a quick choice response to a second task in a rapid sequence. When performed alone, both task one and task two were relatively simple tasks, but when performed in rapid procession, task one used the majority of cognitive resources which delayed the processing of task two. The second experiment conducted reflected cognitive capacity in working memory storage. The participants performing this task were required to retain several pieces of information in memory while simultaneously making a choice response based

on the information retained. Manipulations regarding amount of information to be retained will increase or decrease the cognitive capacity. An increase in information retained decreases the individual's ability of the task to make an accurate choice response; therefore, as memory load increases, accuracy of the information decreases. The findings from both experiments resulted in the ADHD showing slower responses compared to the control group; however, in the second experiment, there was no difference in working memory capacity between both groups. Roberts, Milich, and Fillmore (2012) stated, "In general, those with ADHD did not show more pronounced impairment as processing load increased."

Limitations in cognitive processing restrict individuals' abilities to process tasks simultaneously. Due to increased technology, people tend to multitask on a regular basis. The fast pace of technology has infiltrated into the personal lives of people forcing them to become multitasking machines. Edward Hallowell, a Harvard Medical School psychiatry professor, described a new widespread theory that he called Attention Deficit Traits (ADT). Hallowell proposes that continuous electronic messaging weakens functioning and increases impatience and/or sensitivity to otherwise normal stimuli (Lauer, 2004). Repetitive multitasking tends to take more time than completing one task before moving on to the next task. Media-multitasking continues to increase and the disruptions of multiple tasks limits an individual's ability to process information. Part of the problem may be unrealistic expectations. Due to quick expansions in technology, the human brain is not as quick to evolve.

American society feels the need to be invariably connected with others, and without these technologically irresistible needs, people feel lost. Symptoms of distraction, restlessness, and a hunger for these devices are the same symptoms we associate with ADHD (Hallowell, 1997). ADHD occurs in childhood, whereas ADT develops as a result of the environment. The environmental conditions that produce ADT are issues of competitiveness, difficulty managing time, expecting to complete more without resting, and an overabundance of distractions. ADT tends to be similar to the hyperactive and impulsive symptoms of ADHD in that there is a sense of rush by making quick decisions to get more tasks done faster, and a constant need to be on the run. Processing too many input and output response cycles produces trait-like conditions of ADHD from a chronically, busy lifestyle induced by technology.

Discussion

ADHD is a real medical condition characterized by symptoms of inattention, hyperactivity, and impulsivity. Many studies have provided evidence that it is a universal disorder; however, the diagnosis of ADHD is much more common in certain countries and areas today than twenty years

ago. Although ADHD is considered to be a disorder that starts in early childhood, some healthy children may mimic symptoms similar to ADHD. The production of these traits occurs from adaptations in the child's surrounding environment.

American culture provides an important framework of how ADHD is expressed through behaviors, hence shaping what our society considers an abnormal pathology. It is likely that environmental factors are a contributor to the rise of this disorder. With the fast pace of modern electronic devices, children's developing brains are being programmed to the speed of the stimulating information which leads them to struggle with inattention in the less-stimulating world. Understanding environmental aspects that increase or decrease attention, such as parental involvement and limiting device usage, may have an impact on treatment of the problem before moving on to medicating with stimulant drug therapies. A major concern with medicating children with stimulant drugs is that they are not taught better ways to cope with stress and normative childhood difficulties. An examination of parent-child interactions and support strategies in Eastern and Southern (Tribal) cultures could advise how to counteract the amount of American children's time spent on-line and involved with artificial electronic interactions. Such cross-cultural research could enlighten treatment approaches that are possibly more effective and probably less developmentally harmful, such as non-pharmacological interpersonal prescriptive interventions

There is increasing concern that many children with symptoms of ADHD are being labeled without consideration of immaturities due to age that produces possible dangers in misdiagnosing children and adolescents with ADHD. In many settings, professionals are pressured to find a quick solution to difficult behaviors of young individuals. Assessments for diagnosis sometimes come from evaluations of parents and teachers looking for an immediate treatment plan for problem behaviors. The drive for quick results may lead to ineffectual treatment. In essence, concentration on early parental interventions could be a significant indicator of preventing a chain of pathological events. Children develop maladaptive behaviors of inattention, and impulsivity possibly as a result of changing patterns in the amount of time parents spend with their children, and the conflict of managing appropriate child-technology interactions. Parental, family and community support, approval and encouragement has been found to not only motivate culturally approved behavior, but also act as a reinforcer of that behavior. Developing real world family and community systems of interacting and socializing will perpetuate functional negative feedback loops that allow for increasing focused interactions and rejection of electronic device additions.

In addition to misdiagnosis and ineffectual treatment, advances in technology have produced more sedentary lifestyles for all age groups. In the

past, children engaged in more physical activity compared with modern society. The rapid advancements with computers, internet, smartphones, and video-games have changed the environmental settings faster than the ability for humans to adapt and evolve. However, as a result of more screen time, children's development of physical play and meaningful interactions are not being met due to becoming disconnected from the real world. With prolonged use of electronic consumption, children have fewer opportunities to develop their own autonomy through the engagement of active play which limits their ability to become creative and use their imaginations in addition to reducing their physical training and release of energy. This problem would also be alleviated with a family systems intervention and the restructuring of the local community.

While cognitive overload due to technology and multitasking is associated with poorer attention spans, the link between ADHD and technology has not yet been proven. With this in mind, the development of ADHD in children could be correlated with a number of contributing factors that suggests more investigation is needed to understand causal pathways of this disorder. One area of concern is the foundation of population samples. Many of the study samples are based on selected groups of typically more male than female children with ADHD in which information is generally obtained from school and medical records. In addition, parent and teacher reports may not reveal underlying issues that produce problematic behaviors. Also, the adult ADHD population samples may have some inaccuracy due to diagnosis of adult ADHD that is not as likely clear-cut as the diagnosis for children leading to incorrect reporting or adults with ADHD that do not have an actual diagnosis for this disorder.

Furthermore, to understand the risk factors leading up to technological addictions, diagnostic criteria needs more refining to support the validity of these particular disorders. Internet addictions may serve as compensatory functions for lack of social skills and reluctance to engage in other tasks that require increased cognitive abilities. This could partially be the result of a biological deficiency, but reduction of parental involvement with an increase in media use is likely to manifest problematic behaviors similar to ADHD. All things considered, this literature review suggests the possibility that risk factors of decreased parent-child interactions and excessive exposure to technological devices increases the risk for trait-like symptoms of ADHD.

This paper is also an indictment of American/Western culture. Parents have abandoned much of their socializing function to the anonymous internet. They have also, possibly due to their own overfilled lives, left the traditional entertainment function of the family and immediate social community to be co-opted by the world wide web, internet chat rooms, electronic forum, and video games. This overdependence of the West of technology's use in

entertaining, educating, socializing and “programming” our children has led to a lifetime of dependence on a variety of devices and to developmental, behavioral, emotional, and cognitive side effects that mimics the biological condition known as Attention Deficit Hyperactivity Disorder.

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