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ADHD in context: Young adults' reports of the impact of occupational environment on the manifestation of ADHD

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Abstract

Does changing context play a role in the decline in ADHD symptoms in adulthood? Insufficient research has explored the functioning of adults with ADHD. As adults, individuals with ADHD have significantly more latitude to control aspects of their day-to-day environments. Do the new contexts young adults find themselves in alter their experience of ADHD? Are there particular occupational or educational contexts in which young adults report functioning better than others?

To examine this issue, we conducted semi-structured interviews at four North American sites in 2010-11 with 125 young adults, originally diagnosed with ADHD as children, regarding their work and post-secondary educational environments. Many subjects describe their symptoms as context-dependent. In some contexts, participants report feeling better able to focus; in others, their symptoms—such as high energy levels—become strengths rather than liabilities. Modal descriptions included tasks that were stressful and challenging, novel and required multitasking, busy and fast-paced, physically demanding or hands-on, and/or intrinsically interesting. Consistent with a developmental psychopathology framework, ADHD is experienced as arising from an

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interaction *between* our subjects and their environments. These findings demonstrate the need to account for the role of context in our understanding of ADHD as a psychiatric disorder, especially as it manifests in young adulthood.

INTRODUCTION

A central question in the study of attention deficit hyperactivity disorder (ADHD) is how the disorder changes over an individual's lifespan. A disorder characterized by difficulties with attention, hyperactivity, and impulsivity, longitudinal studies demonstrate considerable declines in ADHD with age. Between half and two-thirds of children diagnosed with ADHD no longer meet full diagnostic criteria by young adulthood (Barkley et al., 2010, Biederman et al., 2010, Hinshaw et al., 2012).

Researchers differ in their interpretation of these data. Some assert that the prevalence of ADHD does not truly decline in adulthood, but rather that it has been underestimated (Faraone et al., 2006, McGough and McCracken, 2006). In this view, trends seen in longitudinal studies merely reflect poorly-worded criteria in the Diagnostic and Statistical Manual of Mental Disorders (DSM), indicating its “developmental insensitivity ... rather than the natural history of ADHD” (Biederman et al., 2010, p. 303). The criteria, after all, were initially constructed with children in mind. During the last DSM revision (DSM-5, in 2013), several changes were made to “render [criteria] more applicable to adults” (Tannock, 2013, p. 5). For example, the criteria “is often easily distracted by extraneous stimuli” now additionally states “(for older adolescents and adults, may include unrelated thoughts)” (APA, 2013, p. 59). Changes may increase prevalence rates; whether this reflects greater diagnostic validity or not is debatable (Tannock, 2013).

While the debate over the validity of diagnostic criteria is an important one, it ignores another piece of the puzzle: the role of changing context. As they age, the contexts in which individuals find themselves change significantly; the transition to young adulthood is particularly notable in this regard, as individuals find themselves in occupational and educational environments that differ significantly from standard secondary school settings (Schulenberg et al., 2004). Given this shift, several clinicians have speculated that individuals with ADHD may be able to alleviate their symptoms in adulthood by selecting high-stimulating work environments better suited to their personalities (Jensen et al., 1997, Barkley et al., 2010, Weiss et al., 2008, Whalen, 2001). The difference between school and work environments, in this view, may partially explain symptomatic remission seen among adults. Children can “grow out” of ADHD as they age because adults “have far more freedom to choose the environment in which they live and the kind of work they do so that it better matches their cognitive style and reward preferences,” asserts psychiatrist Richard Friedman (2014). “If you were a restless kid who couldn't sit still in school, you might choose to be an entrepreneur or carpenter, but you would be unlikely to become an accountant” (p. SR1).

Environmental context and ADHD

Environmental context plays a role in the presentation of ADHD in two ways. Firstly, context supplies the norms around which behavior can be measured, and, subsequently, labeled as dysfunctional. As Rosenberg (2006) explains: “The terms hyperactive or attention deficit are context-dependent by definition, reflections of specific institutional realities and cultural needs” (p. 419, see also Singh, 2006). This point is clearly reflected in the diagnostic criteria for ADHD, which include such behaviors as getting up from one's seat “in situations when remaining seated is expected” or talking “excessively” (APA, 2013, p. 60). In typical school environments, where students are asked to sit quietly, talkative and energetic individuals' behaviors can be read as impairment; by contrast, in other environments, such as theater groups or dance classes, these behaviors align more closely with environmental norms and are thus deemed “functional.”

Beyond its role in defining behavioral norms, environmental context also directly *interacts* with individuals' neurobiology to produce ADHD behaviors. The brain does not, after all, exist in a vacuum: thoughts and actions arise from interactions between individuals and the environments in which they exist. This conceptualization of psychiatric disorder comes from the lens of developmental psychopathology, which examines the ways in which “psychopathology is molded by environmental input” (Jensen and Hoagwood, 1997, p. 238). Sameroff (2000) contrasts a more traditional view of psychopathology with the developmental approach: in the former,

An individual is examined and a descriptor is applied—sad, manic, hyperactive, oppositional. Much like physical characteristics such as skin color, ... they are thought of as inhering in the individual. If the individual moves from Situation A to Situation B, these attributes remain the same (p. 304).

Developmental psychopathology, by contrast, is interested in what arises when individual and environment interact. In this view, psychopathology is not static: “[W]hen situations change the individual changes. Here, categories are not inherent in the individual but in the relationships between individuals and situations” (Sameroff, 2000, p. 304).

The developmental perspective is consistent with the “motivational impairment” model of ADHD. This model hypothesizes that, rather than a static “attention deficit” in all contexts, affected individuals have a higher threshold for “motivational salience,” becoming bored easily when performing uninteresting or menial tasks (Delisle and Braun, 2011, Sonuga-Barke, 2005). Thus, “ADHD is not characterized by an inability to sustain attention, but rather by the inability to appropriately regulate the application of attention to tasks that are not intrinsically rewarding and/or that require effort” (Kaufmann and Castellanos, 2000, p. 624). In this framework, context matters deeply. A propensity toward distraction translates into dysfunctional behavior only in under-stimulating environments; in motivating contexts, distraction diminishes.

Several experimental studies support this model, demonstrating how motivating contexts can significantly reduce impairment in individuals with ADHD. Altering neuropsychological tasks to make them more stimulating can improve performance and decrease symptom severity in children and adults with ADHD, making them appear indistinguishable from

controls (Delisle and Braun, 2011, Liddle et al., 2011, Slusarek et al., 2001, Bennett et al., 2006, Strand et al., 2012). For example, in one study (Delisle and Braun, 2011) adults with ADHD were tested on two computer-based cognitive tests. The first was a basic vigilance test; the second, a rapidly-paced simulation of work tasks with frequent performance feedback. While ADHD subjects performed inferiorly on the monotonous test of vigilance, they were undistinguishable from controls on the fast-paced test. In highly stimulating contexts—those that provide novel, challenging, and fast-paced tasks with concrete feedback and incentives—individuals are able to engage in tasks productively. It is as if they are no longer impaired by ADHD—at least, as we traditionally understand the disorder.

Though it is one of the most common environments in which they spend time, very few studies have investigated the impact of work on adults with ADHD. And, as it often lacks a contextual perspective, the small amount of existing data is challenging to assess. For example, a study (Biederman et al., 2005) on adults with ADHD in a simulated work environment showed that subjects performed poorly compared to controls on some tasks (e.g., math problems), but not on others (e.g., video comprehension). However, the study did not investigate or theorize which aspects of these tasks might explain the differential outcomes observed.

Similarly, occupational studies on adults with ADHD have not distinguished between types of work when evaluating outcomes. These studies report that overall, individuals with ADHD have poor occupational outcomes, holding lower-ranking jobs and attaining lower socioeconomic status than their peers (Mannuzza et al., 1993 and 1997, Kuriyan et al., 2013). Job “fit,” or the relationship between job type and symptoms, has not been assessed in these studies. For example, one paper found that those with ADHD were statistically more likely to be business owners than controls; however, the study did not assess how those individuals were functioning compared to those in other occupations (Mannuzza et al., 1993).

The limited data on the role of context in the experience of adult ADHD motivates the present study. Employing a developmental psychopathology perspective, we explore the impact of occupation and post-secondary educational environments on the experience of ADHD in young adulthood. (We include post-secondary education because it differs from secondary schooling in relevant ways: in North America, these settings typically allow for more choice of study and may include modalities uncommonly found in secondary school, such as vocational training and “hands-on” work.) As adults, individuals with ADHD have significantly more latitude to control aspects of their day-to-day environments. Do the new contexts young adults find themselves in impact their experience of ADHD? Are there specific occupations in which these individuals feel they function better than others?

Given the relative lack of understanding around this topic, a qualitative approach was selected. Little qualitative work has been done on adults with ADHD, let alone work and ADHD (Toner et al., 2006, Ek and Isaksson, 2013, Fleischmann and Fleischmann, 2012, Levinson and McKinney, 2013, Gerber, 2001). Qualitative methods are particularly useful when studying psychiatric disorders from a developmental/contextual perspective: given the complexity of the phenomena, an open-ended approach may provide a fuller picture of

experience, capturing data that can otherwise be obscured by more close-ended methods (Sullivan, 1998). This type of approach can be used to generate new ecologically-informed hypotheses for further exploration (Seligman and Brown, 2010).

METHODS

Participants

One hundred twenty-five young adults, originally diagnosed with ADHD as children, participated in semi-structured interviews. These data were collected as part of a qualitative add-on study to the Multimodal Treatment Study of ADHD (MTA), one of the longest-running and largest longitudinal studies of ADHD (MTA Cooperative Group, 1999). [Institution] Institutional Review Board granted approval of this study.

Demographic data for our sample is provided in Table 1. Participants were from four of the original seven MTA sites: University of California-Irvine, Duke University Medical Center, University of California-Berkeley, and Montreal Children's Hospital. All subjects initially enrolled in the MTA between ages 7-9 with a diagnosis of ADHD. They were then followed at regular intervals: upon completing the 14-month treatment phase, at 24 and 36 months, and 6, 8, 10, 12, 14, and 16 years after recruitment. Interviews were conducted between the 14- and 16-year post-baseline time point (2010-11). Because of the longitudinal nature of the study, they provide a unique source of information about the variety of experiences emerging through the multitude of individual trajectories—not simply those of adults continuing to seek clinical care.

Subjects in our qualitative sample are demographically representative of the original MTA cohort (n=579). However, one of the aims of the larger study was to examine substance use in young adulthood; for this reason, a stratified sample (n=39) of subjects with persistent substance use at prior assessments was selected, with the remainder of our sample (n=86) chosen randomly from the full sample at each site, stratified by the four original treatment group assignments of the MTA study. As substance use problems occur more frequently among those with ADHD, including in the full MTA sample (Molina et al., 2013), oversampling of subjects with persistent substance use reflects the overall MTA sample profile. For further details, see MTA Cooperative Group, 1999.

Collection

Interviews followed the Ecocultural Family Interview (EFI) model (Weisner et al., 1997, Weisner, 2014). They were conversational and open-ended; subjects were queried regarding a wide variety of topics, including ADHD effects and perceptions, school, family, turning points in their lives, and substance use. Employment was also discussed; these are the data we analyzed. Table 2 lists the prompts used to guide this section of the interview. Participants described their work experiences in their own words, rather than responding to forced-choice scales or yes/no questions. The complete EFI interviews lasted 1.5-2 hours on average. Interviews were audio-recorded and transcribed with participants' permission.

Coding and analysis

The full interviews were initially coded by lead rating coordinators and assistant raters at each site using Dedoose, a qualitative data analysis software program (Lieber and Weisner, 2010). Employing a thematic analysis strategy, initial codes were generated using a combination of inductive and deductive approaches, selecting emergent topics from an initial read of the transcripts while simultaneously being guided by clinical experience and literature review (Braun and Clarke, 2006).

Initial coding reliability was established in the following manner: 20% of excerpts from transcripts across the sample at all four sites were randomly selected across all the topics. Assistant raters then coded these excerpts, which were then compared to lead rater scores across sites. Raters were blind to the scores of other raters and to the sites from which the excerpts were drawn. There was an 80% agreement, on average, between raters across all topics.

Excerpts coded for themes related to “work” and “ADHD effects and perceptions” were then selected and further analyzed by the first author to uncover salient sub-themes. Unlike the initial process, which involved both inductive and deductive strategies, sub-themes were uncovered inductively at this stage, without prior theorization of the connection between work and ADHD (Braun and Clarke, 2006). Interview prompts did not directly query how work environment might affect ADHD or visa versa; subjects were prompted at different points to talk about their occupational experiences and ADHD experiences. However, subjects frequently discussed the influence of work and post-secondary school environment on their experience of ADHD. The prevalence of spontaneous commentary on this subject was notable, prompting an analysis of the joint confluence of these topics. The first author identified excerpts where subjects made connections between specific work contexts and symptoms, such as restlessness, boredom, and changes in focus or interest levels.

A second researcher provided a reliability check on this further analysis by independently rating excerpts across the 74 subjects identified by the first author. There was 88% agreement identifying a connection from the interviews between ADHD symptoms and work. For the remaining 12% of interviews (9 cases), one of two raters endorsed a clear connection. We took a more conservative approach, including only the 65 cases where both raters agreed. Twenty-nine of these subjects’ statements are used below to illustrate themes (24 subjects appear once, 5 appear twice). Superscript numbers indicate the unique subject from which each quote derives.

RESULTS

Context and symptoms

Over half (55%, n=65) of our subjects described some aspect of their ADHD as contextual, reporting a connection between specific environments and symptoms such as restlessness, boredom, changes in focus, and interest levels. Many noticed that while certain environments amplified these difficulties, others seemed to make them disappear. This led them to believe that their symptoms could be mitigated by selecting environments that were a good “fit.” For example, one subject¹, who loved working on cars and was training to be

an auto technician, believed that “finding where I fit in the most” helped with his symptoms. To him, matching himself to the right environment was an effective intervention for ADHD: “If you direct [ADHD] into other areas, and find out where people's strong suits are, I'm pretty sure that they can naturally just go about – dealing with it, instead of having to give people medications,” he said. In contrast to childhood, adulthood offered increased opportunity to select environments that better suited their dispositions. “When you're younger everything is just so rigid that it makes it difficult ... [to] figure out stuff that works,” one subject² explained. As an adult he had successfully been able to find “so many different outlets” that his ADHD was “not as big a factor.”

Believing the problem lay in their environments rather than solely in themselves helped individuals allay feelings of inadequacy: characterizing ADHD as a personality trait rather than a disorder, they saw themselves as different rather than defective. “I just think that people have different personalities, and maybe instead of me having this ADHD diagnosis, or whatever, maybe I'm just talented in other ways,” one subject³ said. “Different people are talented in different areas. For me to sit down and do clerical work for eight hours would be really, really difficult. But, I know people that I work with that thrive on that kind of work – attention to detail, focused on little tiny things.” Another subject⁴ interpreted his disorder similarly:

There's no perfect human being. Like some people have poor vision, or you know, they're not too athletic or they're born with some kind of deformity, and you know, it's shades of gray. And I think that this is my thing, you know, and I realize that it just means, “Hey, online class is a good idea for you because you will space out in a classroom.”

Viewing their symptoms as contextual shifted some individuals' conceptualizations of ADHD in another way: rather than seeing it as an overall attention deficit, they characterized the disorder as an issue of interest or motivation. As young adults, many found themselves better able to focus in specific environments; this led them to question previous ideas they had held about ADHD. When asked if he felt he still had the disorder, a student⁵ studying film expressed some doubt:

Originally, when I was first diagnosed with it, it was explained to me as attention deficit, just a lack of attention. An ability not to have an attention span for very long. But I can have an attention span for extremely long for the things that I care about. For the description of somebody with ADD, like having a very short attention span, that doesn't sound like somebody that can finish an entire book let alone read an entire series of books or complete a test such as writing and directing an entire film. It requires a lot of attention to make a film, especially to direct one, because you have to notice everything that's going on.

I used to be able not to focus, like, on schoolwork and stuff, but now at my point in life everywhere I'm at is where I want to be. Public education you're forced into it. Maybe that's why I didn't pay attention that much. But now I'm in college in a subject that I want to be a part of, so me having a lack of attention, it hardly ever happens anymore because I'm not usually where I don't want to be.

Another student² felt similarly, describing his ADHD as a “lack of interest, that you're actually constantly seeking out new stimuli, as opposed to you just can't focus.” He found his ability to concentrate improved after switching his major to a subject he found more interesting.

Developing an awareness of where they might best “fit” was crucial for many subjects; until they did, they struggled. Before he discovered cooking, “I didn't have anything I was really into or passionate about,” a sous chef⁶ said. “I never really liked anything to the point where I would want to concentrate on it all the time.” Working as a chef now, he no longer felt impaired by ADHD. Another subject⁷, who was training to repair cars, had had significant problems with boredom at previous jobs; now, he reported, his ADHD was no longer an issue. “It's just that I had to figure out what I wanted to do, I wanna work with cars. I don't get bored doing that,” he explained.

The stimulating environment

In which types of contexts did these individuals feel best-suited? A common theme was the desire for a highly stimulating environment. Subjects described particular components of stimulating work that either directly improved their ability to focus (e.g. working more effectively under a high-stress deadline) or engaged their symptoms in a positive manner (e.g. utilizing high energy levels in a physically-demanding job). These subcategories include work that was stressful and challenging, novel and required multitasking, busy and fast-paced, physically demanding or hands-on, and/or intrinsically interesting. Each of these categories represents between 5 to 19 responses from subjects. We provide illustrative examples below.

Stress and challenge

Some found that highly stressful or challenging work alleviated their symptoms. Stressful situations, they explained, forced them to pay attention, overcoming their propensity to become distracted. As one fireman⁸ explained, “If we go out on a call I'm focused on that one thing. Like nothing else is going on. This is what I'm here to do. And then it's almost like nothing else matters.” Similarly, a subject⁹ employed as a prison guard reported that he was able to focus because he had to: his job required him to be vigilant at all times. A software developer¹⁰ explained that stress at work was useful because it kept his boredom at bay: “It's kind of like a good stress where there's always something going on and so dynamic and the day just passes.” Likewise, one mortgage salesman¹¹ stated that stress was crucial to his productivity:

I do better whenever just the pressure's on to the max, and I guess that's why I'm such a procrastinator. I have to be forced to have that, “If I don't do this then I'm gonna fail this class,” so I have to make sure that I do it. If I just feel like that element's missing, then I get kind of complacent and I don't work as hard. I have to have the pressure on me to do what I need to do.

Having complex challenges to tackle at work also improved symptoms. As one construction worker¹² explained, having a complicated problem to work on “helps because I can like, hyper-focus on what I'm doing.” He elaborated:

Especially in the new construction, like if you're going to run a toilet and it's all new, you have to run it up, and then you have to run the vent out, and you have to run the pipes. There's so much going on that you're thinking about that I think it actually helps. My brain's so active, that I'm not just sitting behind a computer at a desk. Because I think I would just kind of zone out or fall asleep.

Because these types of problems required his complete attention, he found himself more fully engaged at work.

Novelty and multitasking

Having many different or novel tasks to do also helped individuals engage in their work. A chef¹³, noting that many of his coworkers had been diagnosed with ADHD, believed that restaurants had a “high concentration of people with ADHD” because “we like multitasking ... it stimulates our brains enough to keep us interested.” One subject¹⁴, who worked at an energy start-up, liked that he could “bounce around a lot” at his job. “You can do more than one thing at a time and you learn a lot like that,” he explained. Even though it required “a lot of patience,” a waitress¹⁵ who started working as an administrative assistant liked her new job because it was unlike anything she had done previously. “I don't like to work in the same job, having the same environment because it doesn't get exciting,” she said. “But when it's something totally different than I've done, it's very interesting to me.”

Busy and fast-paced

Sometimes having novel tasks to perform at work was less important than simply staying occupied. Because of this, many subjects enjoyed busy or fast-paced jobs. With ADHD “you're always thinking, you're always on the go,” a salesman¹⁶ explained, an asset in his line of work. As a chef⁶ told us, “I love being busy. I find when I'm not busy, I'm just – I just don't know what to do with myself.” Several others echoed this sentiment, noting that they couldn't “handle being bored.” A project manager¹⁴ explained: “One of the ways that I found to not let ADHD get to me was to keep myself busy. And when I get bored, that's when it'll kick in a little bit.” A subject¹⁷ who was planning to become a paramedic elaborated:

I have to either be a cashier, which is constantly doing something or I have to be a sales associate on the floor. I have to fix something or move something or do something or whatever. It's a necessity that I have to do something.

Another individual¹⁸ explained that he had never had a problem with ADHD at work because he was “constantly doing something” at all his jobs, whether it was washing cars, stocking shelves, or fixing water pipes.

Physical labor

Having a physical component to the job also helped improve many individuals' symptoms. As one forklift operator¹⁹ explained, having a “highly intense and physical” job kept him from “being all ADD.” When asked about traditional ADHD treatments (e.g., medication and therapy), he stated that he was only interested in making his lifestyle more active. For him, “something that taxes your energy instead of just trying to hide it somewhere” was the

best medicine for his symptoms. With physical tasks, “you get into meditative state where you're just doing it,” another subject²⁰ described, noting that he only had attention problems when having to “sit down and think, and be confined to one space.”

Hands-on work and active learning

Beyond being a way to release excess energy, physical jobs were appealing to some subjects because of their “hands-on” nature. Several individuals reported being “mechanically inclined,” able to focus intently when fixing or building things. One individual²¹, who worked in the Air National Guard, learned that he loved working with his hands while taking a few industrial classes. He went into skilled manual labor, eventually ending up working on airplanes. From these experiences, he realized: “All right, I love doing this. I need to find a career in it.” Several contrasted this type of work with the traditional educational settings they had previously experienced. As a plumber¹⁸ told us, realizing that he enjoyed this type of work had a significant influence on his occupational trajectory:

If it's something I can do with my hands, I can focus on it ten times better than if you stick me in an English class or a science class or any kind of class. If it's like – like I know in high school, if I had brought in my report card, it would definitely show on my report card ... auto tech, tractor tech and drafting I had 98, 99 and 100 in this class. But then, if you look at my English grades and my science grades, I had 70s, just above passing. So I think it kind of affected my job, my career because of the fact that if it's not something I can physically touch or do or something hands-on, I just don't like it. I can't focus on it; I can't pay attention.

Learning by doing, or “active” learning, was another appealing characteristic of hands-on work. As one construction worker¹² explained, “If I read it in the book or get lectured on it, then my brain wanders.” In his current job, however, he was able to learn much more easily:

My boss would throw me in there, tell me what to do. He would sort of show me and then he'd get in there he'd watch over my shoulder, no! do it like this. ... I was physically doing it with my hands instead of watching a projector or slide show, reading it in a book, so if I'm actually there doing it then I'm gonna retain more.

Likewise, a student²² in trade school enjoyed his courses because they were “more hands on which is easier to learn for me because, well, instead of learning it, you're doing it, and doing it, you're learning it.”

Intrinsic interest

Intrinsic interest was a defining characteristic of many subjects' occupational choices. When working on or studying something of great interest to them, subjects reported being able to focus easily on the work at hand; many experienced dramatic increases in the ability to retain information in these settings. Although they had had difficulty learning and recalling information in school, finding a compelling subject changed this experience. Upon enrolling in courses that interested her deeply, one subject³ started to do extremely well in college. When studying anthropology, she explained, “I almost have a photographic memory.” In her view, “ADHD kids are really, really good at remembering things that are interesting to them.” Another subject²³, who had discovered a passion for airplanes, contrasted his college

classes with flight training. Although he typically found studying for school “tedious and a little aggravating,” he relished the flight courses: “I really enjoy it. It doesn't seem like studying. It doesn't seem like work.” Seeing this contrast, he was determined to pursue a career in aviation. Similarly, a hairstylist²⁴ described her “crazy ability to retain information” about things she was interested in:

If you sit up there and give me a lecture on a haircut ... I will remember everything you said, word for word, like I spent hours and hours and weeks and months and years studying it. It's like that. I remember it if I'm into it. Stuff that I'm into, I am so immersed in it. But in school, it was awful. ... I'm finding that if it's things that interest me that I can fully [engage].

Difficult environments

Though many of our subjects desired highly stimulating jobs, several did not hold these types of occupations at the time of interview. Many recognized this disconnect, describing the difficulties of conforming their personalities to environments where they did not “fit.” For some, the issue was having excess energy—and nowhere to “put” it. For example, a bank teller²⁵ reported wishing she felt less energetic because her job “doesn't really require too much energy. ... When work is really slow, I get really antsy.” Similarly, a subject²⁶ was let go from a job requiring a more subdued personality type:

[My boss] said that if it was a place where I could be, you know, fun and crazy with the kids, that's fine, but working with the kids with autism, that they need someone who can be calm, collected and organized, you know, and made plans. “You're very fun to work with.” But she just says, “This, you know, this place just doesn't seem to be for you. Your strengths can be better applied elsewhere.”

Motivated by other factors, like prestige or financial security, a few individuals explicitly chose occupations that fit poorly with their ADHD. Consequently, some expressed reservations about going into these vocations. For example, two of our subjects fulfilled childhood aspirations of becoming lawyers. One²⁷, who was graduating from law school at the time of his interview, expressed deep concerns about ADHD limiting his ability to succeed. “I feel almost certain that it's going to hinder me in things that I want to do,” he explained:

Productivity and opposite that procrastination ... is kind of my big downfall. It's kind of worrying me, because I'm about to start this very kind of intense job in [CITY] in this big corporate law firm and I know a lot is going to be placed on my ability to be productive and to get things done in a timely fashion. And to do them well. And you know I don't think I've ever been in a situation where it's been that much pressure on those sorts of abilities or attributes.

Similarly, a college student²⁸ studying engineering was concerned that his lack of interest would interfere with success on the job. He had wanted to become an engineer but began to question this career choice after receiving a poor review at an internship. Because it involved sitting at a computer all day, he found the work “boring and dull.” As a result, he “had a hard time staying on task. If I found something boring, or if I found that I couldn't solve it almost

immediately ... I would just kind of go and browse and slack around.” He was concerned about “having trouble finding [his] niche.”

Some ADHD-friendly jobs require extensive higher education. Consequently, while the job itself may be a good fit for an individual, the credentialing environment may pose a significant barrier. A personal trainer²⁹ who wanted to become a physical therapist was concerned that his ADHD would make it difficult to get through physical therapy school. “You're in class eight hours a day, you take a test every week, and it's just the amount of knowledge you have to absorb and you have to learn on your own scares me,” he worried. “It's like, ah, is this going to be a limiting factor when I get there?”

Jobs have many facets; even in those that were good “fits” for our subjects, some aspects remained challenging. As one hair stylist²⁴ explained, it was easy for her to focus on cutting her clients' hair, but not on managing the financial side of her business. “I don't have a problem at work. Well, I should say doing my job. I have a problem with if somebody forgets to pay me and they're, ‘Oh, I'll send you a check.’ I forget half the time whether these people pay me,” she explained.

DISCUSSION

Together, these data paint a picture of ADHD symptomatology as context-dependent. When asked about their experience of ADHD, over half of our subjects associated occupational or post-secondary educational contexts with the exacerbation or amelioration of symptoms. In some contexts, participants described feeling better to focus; in others, their symptoms—such as high energy levels—became strengths rather than liabilities. Jobs for which they felt best-suited often involved stress or mental challenge, novel or varied tasks, physical labor, hands-on work, and/or topics of intrinsic interest.

Especially given that this connection was made without prompting by interviewers, it is striking how well these young adults' accounts align with empirical neuropsychological research demonstrating the influence of context on ADHD (e.g. Delisle and Braun, 2011). Much like our subjects describe, situations that are particularly motivating—fast-paced, challenging, novel—have been shown in laboratory settings to improve performance and reduce symptoms in these individuals. Some aspects deemed relevant by our subjects (such as “hands-on” work) have yet to be explored under experimental settings. Our hope is that these findings encourage further, ecologically-informed investigation of the salient characteristics under which individuals with ADHD perform optimally (Seligman and Brown, 2010).

Presumably, most young adults—not only those with ADHD—would benefit from work for which they are well-suited. However, because poor functioning at school or work often prompts an ADHD diagnosis—indeed, several diagnostic criteria reflect this—the issue of “fit” becomes particularly relevant for these individuals. Finding a good “fit” is more than just desirable; it may allow them to overcome poor work outcomes (e.g., unemployment), which are elevated in this population (Kuriyan et al., 2013). Many of the jobs these young adults hold might have lower pay or occupational “status”—but may also have heretofore

unmeasured positive psychosocial benefits. Additionally, work characteristics that are particularly salient to these individuals are unlikely to be generalizable to all young adults. For example, as one subject notes, work requiring “attention to detail” may “fit” others but wouldn't likely suit those with ADHD. While “fit” may be an issue for all adults, we illustrate the specific types of contexts for which our subjects feel ADHD is best-suited. Further research on the relevance, and ideal types, of “fit” in individuals with other traits or disabilities, would help situate our findings more clearly.

The findings of this study are limited to subjective reports. The very nature of first-person accounts prioritizes the individual's experience of the world and can be biased by a host of factors. Though many subjects report a connection between work and improved functioning, such improvements could also be explained by non-work-related changes leading to remission in adulthood. However, that so many subjects in a large sample drew unprompted connections between context and symptoms, closely mirroring experimental findings, lends credence to the inference that they were describing veridical, shared experiences, consistent with a cautious, skeptical epistemological realism (Hammersley, 1992). Our choice to focus on qualitative, subjective reports was motivated by a desire to gain a fuller understanding of ADHD and occupation; this allows us to generate ecologically-informed hypotheses for further studies, an advantage of qualitative and mixed-methods research (Damico et al., 2004, Kleinman, 2001, Weisner, 1996, Weisner and Duncan, 2014). What work has already been done (e.g., Mannuzza et al., 1997) has failed to assess occupational characteristics salient to our subjects; our findings could inform further research to better answer questions about the relationship between ADHD and work.

Occupational fit as therapeutic intervention

Though they may fall into jobs that suit them unintentionally—indeed, some subjects reported this—many subjects felt that finding their occupational “niche” allowed them to overcome the limitations of their ADHD diagnosis and achieve success at work. This suggests that identifying occupational contexts for which these individuals are well-suited could be an important addition to treatment. Some practitioners, based on personal experience with patients, have been advocating this approach for years; these data provide further credibility to these assertions. As Jensen et al. suggest, using this framework, “the clinician can counsel the child and family to recognize situations in modern society that might favor such an individual, both in terms of school environments, as well as future career opportunities” (1997, p. 1676, see also Whalen, 2001).

Providing adult patients alternative or adjunctive non-pharmacological interventions is especially relevant in light of the ongoing debate about efficacy of stimulant medication, the typical first-line treatment for ADHD. While the short-term efficacy of stimulants is well-documented, long-term data are both sparse and equivocal (Conners, 2002, Faraone et al., 2000, MTA Cooperative Group, 1999, Swanson and Volkow, 2009). Though medications can be tremendously helpful, our preliminary findings suggest that a good occupational “fit” might also improve patients' functioning.

There are some limitations to this type of intervention. Choice, when it comes to occupation, is often constrained by structural factors external to individuals, such as geographic location,

educational quality, the diversity of jobs available, and access to resources. However, knowledge of ideal occupational conditions could still help individuals with ADHD select from within the range of possibilities available to them.

Furthermore, our subjects did not simply view their ADHD through the lens of work; elsewhere in their interviews, they express varied beliefs of its influence on other aspects of life. As other work demonstrates, individuals with ADHD hold diverse understandings of the disorder (Bröer and Heerings 2013). Even when working in ideal environments, specific aspects of work may remain challenging (e.g., the successful hairstylist who struggles to manage her business's finances), and problems in other contexts (e.g., difficulties in personal relationships, concerns over ADHD stigma) may persist. Alleviation of symptoms through work certainly did not by itself eliminate problems in other domains of life. Further research should explore these issues in young adults with ADHD.

Incorporating context into our understanding of ADHD

Our subjects' descriptions appear consistent with a developmental approach, which examines how context interacts with individuals to produce psychopathology (Sameroff, 2000). Rather than a static "attention deficit" that appeared under all circumstances, our subjects described their propensity toward distraction as contextual: in motivating environments, they became focused and attentive. Their symptoms, or lack thereof, appeared to arise from interactions *between* themselves and their environments. Using this insight, they reported selecting (or desiring) jobs in which they could more optimally function.

In contrast to this interactional, dynamic view of ADHD, biomedical conceptualizations sometimes paint a static, "disembodied reality" of the disorder, promoting a "brain-based discourse" of ADHD devoid of contextual data (Singh, 2002, p. 598). Our capacity to resolve many of the controversies surrounding ADHD—its diagnostic validity, its remission in adulthood, its fluctuating symptoms— is limited by bracketing out context as a variable to be controlled rather than including it as a fundamental piece of the puzzle. Bracketing out context for *analytical* purposes for research can be useful; neglecting to re-incorporate context perpetuates the false notion of ADHD (and other mental illnesses) as a solely neurological matter.

As our subjects report, ADHD is not fixed in time and space; rather, it is contextually fluid. Therefore, we might better understand the disorder as a mismatch between a particular individual's biology and a particular environment. As Jensen and Hoagwood (1997) argue:

[T]he relationships between organism and environment become critical areas for assessment, perhaps even central for the understanding of a given "disorder" ... one must ask whether a given disorder need be conceptualized as 'within the person' or even 'mental' per se (p. 238-9).

This critique is not a rejection of the role of biology, but rather a call to incorporate context as fundamental to our understanding of ADHD. As Singh (2002) argues, "ADHD has biopsychosocial elements that cannot be disaggregated"; rather than reinforcing a false dichotomy between biology and context, "the most productive way forward is to recognize the multifactorial processes inherent in ADHD" (p. 360, see also Singh et al., 2013).

By expanding our understanding of ADHD beyond the brain, we can begin to investigate the contexts in which individuals with ADHD function best—not simply where they fail to succeed. When individuals stop meeting full criteria as adults, it's not necessarily that their biology has fundamentally changed; their propensity to struggle in under-stimulating environments may remain. Rather, their decreased symptoms might be understood as arising from an interaction between their biological tendencies and the new, more stimulating environments in which they find themselves. Rather than reinforcing a false dichotomy between biology and context, we need to incorporate both to more fully understand ADHD.

These are not new ideas: many clinicians and social scientists alike have called for the contextualization of psychiatric illness (Rutter and Sroufe 2000, Singh, 2002, Kleinman 1977). And though medicine as a whole employs biologically-oriented language, research demonstrates a more ambivalent and nuanced view amongst scientists, clinicians, and patients (Pickersgill, 2009, Rafalovich, 2005, Whooley, 2010, Bröer and Heerings, 2013). As Faraone et al. (2000) state, ADHD research “should focus not only on the validity of the disorder, but also on the validity of the theories that buttress the diagnosis” (p. 17). Our hope is that, by accounting for context, clinicians and scientists can improve both their understanding and treatment of the disorder.

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Explores the influence of work on young adults' ADHD symptoms through interviews.
Subjects view ADHD symptoms as context-dependent, improving in stimulating jobs.
Subjects desired highly-stimulating work environments.
Subjects experience ADHD as an interaction *between* themselves and their environment.
Context is important in our understanding and treatment of ADHD.

Table 1

Sample demographics

Age	24.40 (1.17)*
Gender	
Male	95 (76%)
Female	30 (24%)
Race/ethnicity	
White	90 (72%)
African-American	13 (10%)
Mixed (multiple ethnicities)	15 (12%)
Other (Asian, Native American, Latino)	7 (6%)
Education	
High school or less	67 (54%)
Some college, associate's, or technical degree	39 (31%)
Bachelor's degree	16 (13%)
Graduate degree	3 (2%)

* Mean (standard deviation).

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Table 2

Interview prompts related to employment

Describe job – hours, responsibilities
Making ends meet?
Income
Job satisfaction
What would you change about your work situation if you could?
Difficulties encountered – supervisors, coworkers, any negative performance reviews?
Previous work experiences – similar or different to current?

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