Curiosity and Zetetic Style in ADHD

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Abstract: While research on Attention Deficit Hyperactivity Disorder (ADHD) has traditionally focused on cognitive and behavioral deficits, there is increasing interest in exploring possible resources associated with the disorder. In this paper, we argue that the attention-patterns associated with ADHD can be understood as expressing an alternative style of inquiry, or "zetetic" style, characterized mainly by a lower barrier for becoming curious and engaging in inquiry, and a weaker disposition to regulate curiosity in response to the cognitive and practical costs associated with inquiry. Exploring this zetetic style from an epistemological perspective, we show that it is often epistemically rational and can be advantageous in important respects. We close by suggesting that the very aspects of the zetetic style that might at times render it disadvantageous from the point of view of individual subjects with ADHD, will often confer epistemic benefits to the social group that the subjects are part of.

Keywords: Curiosity; inquiry; attention; rationality; ADHD.

1. Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is one of the most commonly diagnosed disorders. Systematic reviews suggest that the pooled prevalence is 2.5 to 5.0% in adults and 5.9% to 7.1% in children and adolescents (Simon et al., 2009; Willcutt, 2012). Inattention, impulsivity, and hyperactivity constitute the core clinical features of the condition, and they also form the basis of three subtypes of ADHD (APA, 2013). In the DSM-5, ADHD symptoms are categorized into inattention (11 symptoms) and hyperactivity/impulsivity (9 symptoms), and the condition is further classified into three primary presentations: mainly inattentive, mainly hyperactive/impulsive, and combined, with an additional partial remission category. The ICD-11 includes five subcategories for ADHD that align with the DSM-5 classifications (Drechsler et al., 2020). However, it is

crucial to acknowledge that ADHD encompasses a diverse range of presentations, which can sometimes be contradictory.

While research has largely focused on the cognitive and behavioral deficits, a growing number of researchers, practitioners, and activists highlight cognitive and behavioral resources associated with ADHD (e.g., Sedgwick et al., 2019; Schippers et al., 2022). The prominent psychiatrists and activists Edward Hallowell and John Ratey (2021) thus point to a number of positive flipsides of the negative traits associated with ADHD, which can help reduce the stigma attached to the condition as manifesting problematic dispositions. For example, the flipside of *hyperactivity* is being *energetic*; the *inability to stay on point* can be a matter of *seeing connections that others can't*; *forgetfulness* can show *absorbedness*; *inconsistency* shows *flexibility*; and *impulsiveness* is associated with *creativity*. Finally, to echo one of their main catchphrases, *distractibility*, the fleetingness of attention, has the potentially positive flipside of expressing *curiosity*. A number of qualitative studies confirm this picture and identify a "high degree of curiosity" (Schippers et al., 2022; Mahdi et al., 2017; Holthe & Langvik, 2017; Watters et al., 2018; Lefler et al., 2016) and the "motivation to know" as common characteristics, linked to the satisfaction experienced in trying to comprehend something new (see e.g., Morsink et al., 2017).

We believe that for a more nuanced picture of both difficulties and advantages of ADHD that can potentially help reduce stigma, more attention needs to be paid to this heightened sense of curiosity and willingness to engage in inquiry that some individuals with ADHD attach positive value to, without forgetting that such patterns of curiosity and inquiry can also be problematic, not just depleting the individual's attentional and cognitive resources but also potentially putting them in a less favorable epistemic position.[1] While much of this paper will be focused on curiosity and attentional patterns in ADHD (including both episodes of high distractibility and hyperfocus), it is important to note that ADHD comprises a broad spectrum of presentations, to which these characteristics may not necessarily apply, and that the diagnostic criteria for ADHD are primarily based on inattention, impulsivity, and hyperactivity rather than curiosity.

In §2, we investigate the general role of curiosity in motivating inquiry, showing how conceiving of curiosity as an *epistemic emotion* can shed light on how curiosity disposes and regulates inquiry and attentional patterns. In §3, we describe how such patterns can become extreme and compulsive, as they often do in individuals with ADHD.[2]

[1] While such a more nuanced perspective highlights certain traits in ADHD as a potential strengths rather than merely as limiting burdens, it does not directly advocate a "conserving disability" stance, which implies that disabilities should be preserved, promoted, and considered advantageous rather than negative (see e.g., Garland-Thomson, 2012).

[2] When referring to "individuals with ADHD" in the following, we do not mean to suggest that ADHD can be comprehended as an individual trait outright owing to one's neurology or biology. Indeed, as argued by several authors, while ADHD has genetic and neurobiological causes, it is mistaken to adopt a "genetic essentialism" with

In §4, we draw on the epistemology of inquiry to develop a framework for evaluating the epistemic rationality of different dispositions with respect to inquiry (what we call "zetetic styles"), including those found in ADHD. In §5, we argue that individuals with ADHD are prone to a zetetic style characterized, among other things, by a lower barrier for becoming curious and engaging in inquiry, and a weaker disposition to regulate curiosity in response to the cognitive and practical costs associated with inquiry. But crucially, in §6, we also argue that there no uniquely rational zetetic style exists, and that our framework allows an "epistemically *different* but not for that reason *worse*" verdict when evaluating ADHD from an epistemic perspective. In fact, strengthening this point, in §7, we highlight some possible benefits of group diversity with respect to zetetic styles, and bolster this idea by drawing on evolutionary psychiatry. We hope that a better comprehension of the nature of curiosity and inquiry will not only contribute to a more nuanced picture of ADHD, but perhaps also to reducing the stigma attached to ADHD as manifesting epistemically problematic dispositions.

2. Curiosity as an epistemic emotion

Engaging in inquiry to settle questions undoubtedly plays a key role in our lives as epistemic agents. Whether the question is "When does our train depart?" or "What governs DNA methylation in the brain?", we reason and act based on beliefs formed and updated via inquiries. When posing such questions, we are typically motivated by *curiosity* or some comparable interrogative state that we aim to satisfy. We open an inquiry into some question Q by adopting an interrogative attitude towards Q, and our inquiry legitimately closes when the interrogative attitude is *satisfied* (by having attained an answer to Q via forming a belief, attaining knowledge, or understanding) or *acceptably suspended* (e.g., based on reasons to think that the inquiry will be fruitless or too costly). However, some also stress a conceptual link: there is no inquiry without some interrogative state of mind directed towards some question. An actor who is merely pretending to be curious about who committed the crime can display identical behavior to that of the police detective, yet she would not be engaged in genuine inquiry (Friedman, 2019).

According to the view we adopt here, curiosity is an emotion, which we take to be temporally extended processes that exhibit a multifaceted structure (see e.g., Brady, 2018, pp. 185-186). Curiosity shares many of the features that we standardly take to characterize emotions. First, curiosity is associated with distinctive and familiar vocal and facial expressions (e.g., open-eyed expressions) that we can recognize in adults or children when they display curiosity about objects or events. Second, there is a feeling attached to

respect to ADHD. A comprehensive understanding should include the role of the sociocultural context in the expression, development, and diagnostic assessment of the symptoms. See e.g., Brinkmann (2016) and Koi (2021).

curiosity, which has been described as "a feeling of wanting to investigate, become involved", which can lead to excitement and feeling animated (Izard, 1977, p. 216; cited in Brady, 2018). Others have described it as an emotion that reflects a tension between being in a state of knowledge deprivation and a pleasurable anticipation of discovering something new (Noordewier and Dijk, 2017; Csiksentmihalyi, 1990). But clearly, the satisfaction of curiosity through inquiry is linked to an immediate reward that reinforces the relevant dispositions. The fact that we often inquire without an evident motive suggests that the reward associated with resolving uncertainty and "making sense of things" is potent (Gottlieb et al., 2013), and it is sometimes described as a "mental orgasm" (Gopnik, 2000, p. 300). The pleasurable phenomenology is nature's way of motivating inquiry, just like orgasm is nature's way of encouraging reproduction (Lipton, 2009).

Third, curiosity alters attention such that it becomes focused on the object or event that we are curious about. In general, beyond enhancing stimulus detection and processing, emotions not only capture, but also "consume" attention (Brady, 2013, 92), keeping attentional mechanisms focused on the relevant stimuli and increasing sensitivity to them. For example, undergoing an emotion such as fear not only focuses the subject's attention on frightening stimuli, but also fixes attention in a way that makes it taxing to change focus. At the same time, it changes the priority of processing such that the threatening stimuli receives preferential processing while the processing of neutral information is ascribed less urgency (Najmi et al., 2012). The same is true of curiosity, but its pattern of evaluation is such that it directs our attention to things that are novel, unfamiliar, unexpected, or unexplained, and we quickly lose interest in them once we have achieved some degree of insight (Brady, 2018).

Undoubtedly, the general view presented here grants emotions an important epistemic role. Nonetheless, a certain subgroup of emotions, like curiously, are often discussed as specifically *epistemic* emotions, due to their even more direct and central role in our attempts to acquire and maintain beliefs and knowledge (Morton, 2010). They function as motivations for inquiry, orient towards the inquiry for achieving the answer to their questions, and are entangled with intellectual virtues that reliably lead to knowledge (e.g. Brady, 2018; Whitcomb, 2018; Fairweather & Montemayor, 2018).

Among our epistemic emotions, curiosity is particularly notable, because it constitutes an adaptive trait in environments like ours that are only partially predictable (Pennock, 2019, pp. 13–14), and assists the efficient allocations of our scarce attentional resources (Wojtowicz & Loewenstein, 2020). Thus, similar to biological drives, curiosity articulates and seeks to satiate a need: it arises due to an awareness of a discrepancy between one's current and desired epistemic state, and it motivates exploratory behavior – inquiry – that aims to alter one's epistemic state by closing the information gap

(Loewenstein, 1994; Golman & Loewenstein, 2015). Such exploratory behavior can exhibit a more *horizontal tendency* (i.e., a preference toward increasing the diversity of information) or more *vertical tendency* (i.e., a preference toward increasing the depth in one's information). A fruitful way of thinking about such differences is in terms of stylized models of curiosity, as suggested by Zurn (2019) and Zurn and Bassett (2022), who explore three such models. *The Busybody* has a wide-ranging and untargeted curiosity, "busy making it their business to know anything and everything" (Zurn and Bassett, 2022, p. 98). This person is easily pulled in different directions and has difficulties resisting the temptations of novelties. *The Hunter* selectively pursues specific information, has a clear purpose in mind, and is able to maintain focus on the relevant predetermined subject area. Finally, *The Dancer* is a flexible, playful experimenter that breaks with traditional pathways of investigation (Zurn and Bassett 2022, p. 107). Operationalizing the busybody and hunter models in a specific instance of knowledge network building, Lydon-Staley et al. (2021) show that while busybodies build a loosely connected, sprawling knowledge network, hunters construct targeted and tight knowledge networks that are well-researched. The busybody will have access to a more diverse network of information while the hunter will contain greater depth on fewer subjects. We will return to discuss these models of curiosity below.

3. Curiosity, attention, and inquiry in ADHD

As is the case with other emotions like fear or anger, curiosity can become unruly (excessive, unsuitable), with downstream effects on inquiry and attention that may be seen as irrational. Curiosity predisposes us to explore the world beyond what we need to know (e.g., how to resolve a puzzle), and strong forms of curiosity may bias us toward a suboptimal balance between exploiting information and exploring for further information. Excessive curiosity, often driven by boredom, can lead us to waste our attentional resources by inquiring into questions without any significance, or to rapidly changing lines of inquiry that produce a flood of details and lead to mental clutter. Curiosity can even lead us to inquire despite predictably undesirable consequences of obtaining the relevant information (Kruger & Evans, 2009; Kashdan, Rose, & Fincham, 2004).[3] Pointing to such cases, some argue that curiosity can become maladaptively *overgeneralized*, carried from situations where closing the information gap leads to desirable outcomes to situations where it does not (Hsee & Ruan, 2016). Such maladaptive types of curiosity aim to resolve uncertainty regardless of potential harm, and they can be excessive both horizontally (i.e., into

[3] This is one of the reasons why Augustine warned that curiosity leads to intellectual restlessness and spiritual corruption. With the beginning of the modern period and the emerging sciences, curiosity has substituted spiritual wonder as an acceptable motivation for inquiry (Zurn, 2021, p. 25), and became celebrated as fueling the "inquisitive appetite" of scientists.

excessively many issues) or vertically (i.e., into the same issue, but down to excessive detail). In some cases, curiosity can appear excessively strong, generating a compulsive urge to inquire in a way that can be likened to being irresistibly compelled to scratch an itch.

Returning to ADHD, many individuals with ADHD report a strong sense of curiosity and inquisitiveness, which they often describe as potentially positive aspects (e.g., Sedgwick et al., 2019; Mahdi et al., 2017). At the same time, individuals with ADHD sometimes describe how a strong curiosity and enthusiastic interest in inquiry coincides with the tendency toward distraction (Schippers et al., 2022). As an adult participant, Harry, puts it in a recent qualitative interview, "I think I have a greater sense of wonder about the world around me… my brain is constantly asking, "Oh wait, what about this? And something over there's shining...Why is that shining?" (Redshaw and McCormack, 2022, p. 24). Combining their expertise as psychiatrists with their personal experience as being diagnosed with ADHD, Hallowell and Ratey (2021, p. 21) note: "Our imagination fuels our curiosity to find out what that noise was, or what was under the rock, or why the petri dish looks different from when we left it. If we weren't so dreamy and curious we could stay on track and never get distracted."

The strong sense of curiosity in ADHD not only coexists with a tendency to be derailed by irrelevant information and difficulties with organizing and completing inquiries, but also with episodes of highly focused exploratory activities. There is evidence that some exploratory activities are characterized by episodes of "hyperfocus", when individuals intensely attend to something, losing track of time and becoming totally engulfed in the subject of interest (se e.g., Hupfeld et al., 2019; Ozel-Kizil et al., 2016). This has led some researchers to speculate that ADHD, at least in some subpopulations, is better understood as involving a *maldistribution* of attention (Leimkuhler, 1994; Doyle, 2007; Hupfeld et al., 2019) instead of a *deficit* of attention. The idea is that some individuals with ADHD display a different attentional pattern that both includes episodes of high distractibility and hyperfocus, which can be strengths, especially in environments that offer the right kind of support (Ozel-Kizil et al., 2016; Schippers et al., 2022).

4. Norms of inquiry and zetetic styles

As the above indicates, the strong sense of curiosity and consequent dispositions to inquire associated with ADHD are often experienced by individuals as both liabilities and strengths. But how can they be assessed from an epistemological, normative point of view? And what kind of epistemic norms are best suited for such an assessment?

When evaluating epistemic agents, epistemologists tend to distinguish two broad aspects of an agent's epistemic capacity and performance. The first has to do with how

well the agent's beliefs are supported by her current and changing epistemic circumstances – how rational or justified her beliefs are in light of her evidence, and how well she responds to changes in those epistemic circumstances by updating her beliefs. For example, in light of my current evidence, it would not be rational for me to believe that humanity will manage to limit global warming to 2 degrees, although we can imagine developments that would make such a belief rational. The norms governing this aspect of our epistemic performance might be called *evidential* norms. Many agree, for example, that believing *p* is rational only if *p* is sufficiently likely given one's available evidence (Feldman and Conee, 1985).

There is little reason to suppose that individuals with ADHD are disposed to perform significantly differently from individuals without ADHD with respect to conforming to evidential norms. As we shall see, the patterns of curiosity and inquiry characteristic of ADHD will often cause individuals with ADHD to find themselves in atypical evidential circumstances, having more or less evidence than others do. But there is nothing to suggest that they are better or worse than others at ensuring that their beliefs conform to the evidential circumstances they end up in, however unusual those circumstances may be.

This leads us to the other broad aspect of agents' epistemic capacity and performance that we might focus on when evaluating them epistemically. This does not have to do with the narrow relationship between beliefs and evidence, but with how well they perform in *impacting* or *bettering* their epistemic situation, and how well they manage their epistemic resources – what questions they become curious about and focus their attention on, how they go about answering those questions, and so on. In other words, how they *inquire*. The norms governing inquiry have recently been dubbed *zetetic* norms.[4] Since individuals with ADHD often display unusual levels of curiosity, and this in turn disposes such individuals to unusual patterns of inquiry, there is some *prima facie* reason to think that they also perform differently with respect to conforming to zetetic norms. But in what way? And do they, for that reason, perform *worse*? To answer this question, we must turn to the content of the central zetetic norm.

It is widely agreed that inquiry is an *aim-directed* activity, and that it, as such, falls under an *instrumental* norm directing us to take means to our aims (e.g. Kelly, 2003; Friedman, 2020). In some sense or another, inquiry is something we engage in with the aim of becoming able to answer some question. Accordingly, Friedman has proposed a central norm of inquiry named the 'Zetetic Instrumental Principle' (Friedman, 2020, p. 503):

[4] As Friedman (2020, fn 1) explains, 'zetetic' derives from the Greek verb 'ζητεω', meaning 'seek for' or 'inquire after'.

> **Zetetic Instrumental Principle**: If one wants to figure out *Q*, then one ought to take the necessary means to figuring out *Q*.

This instrumental principle takes us from *wanting* to achieve the aim of figuring out the answer to some question *Q*, to an *obligation* to take the necessary means to figuring out the question by engaging in inquiry. Friedman uses "figuring out" as a generic placeholder for what we aim at in inquiring a question, which can be filled in with several more substantive understandings of the aim of inquiry. A minimal understanding of this would be to *believe the true proposition* that is the answer to the question one wants to figure out. But some authors have proposed more demanding candidates for the aim of inquiry than mere true belief, such as *knowing* the answer (Williamson, 2000), or achieving *understanding* of what one is inquiring (Kelp, 2021). But we might also adopt a more pluralistic approach, according to which inquiry can appropriately aim at different kinds of epistemic states, depending on the situation. This is our preferred approach, and we shall have more to say about it below.

Although it provides a useful starting point, Friedman's proposal for a norm of inquiry is problematic for at least two reasons. First, the general instrumental principle that ZIP exemplifies is itself implausible: one cannot create an obligation to take necessary means to an aim simply by wanting to achieve that aim, since the aim might itself be irrational or wrong (Bratman, 1981). Secondly, and more importantly for the purpose of assessing ADHD, the principle is silent on what questions we have reason to inquire, and how their importance or lack thereof matter. But as seen above, this issue is at the core of what seems potentially problematic about the patterns of curiosity and inquiry found in ADHD. For these reasons, we instead follow Steglich-Petersen (2022a) in understanding the central norm of inquiry as an instance of a subtly different kind of instrumental principle, namely that governing the *transmission of reasons* from aims to means, whereby reasons to pursue aims transmit to the means, such that we acquire reasons to take means in virtue of having reasons to pursue aims.[5]

In addition to capturing the basic mechanism of transmission, a plausible transmission principle should capture that the *strength* of one's reasons to take means depends partly on the strength of one's reasons to pursue the aim, and partly on how likely the means are to help achieve the aim. The following general principle, adapted from Kolodny (2018), has proven fruitful for understanding the norm of inquiry:

[5] This understanding of the central norm of inquiry forms part of a general theory of epistemic normativity as a species of instrumental normativity, developed in Steglich-Petersen (2011; 2013; 2018; 2022a; 2022b) and Steglich-Petersen & Skipper (2019; 2020).

> **General Instrumental Transmission:** If there is reason for one to pursue aim A, and there is positive probability conditional on one's φ-ing, that one's φ-ing helps bring about A, then that is a reason for one to φ, the strength of which depends on the reason for one to pursue A and the probability.

An example from a non-epistemic context might help clarify this principle. Suppose that you have reason to pursue the aim of increasing your physical fitness. Many different actions are likely to be able to help bring about this aim, including various kinds of physical exercise, dieting, proper sleep, etc. If so, then your reason to pursue the aim of increasing your fitness will transmit to those actions, and the strength of the transmitted reason will depend on two factors: the strength of the reason you have to pursue fitness; and how likely the actions are to help bring about that aim.

If we take this general transmission principle as our basis for understanding the reasons bearing on us as inquirers, we can insert the appropriate terms to arrive at the following principle for *zetetic* instrumental transmission (Steglich-Petersen, 2022a):

> **Zetetic Instrumental Transmission:** If there is reason for one to pursue the aim of figuring out *Q*, and there is positive probability conditional on one's φ-ing, that one's φ-ing helps figuring out *Q*, then that is a reason for one to φ, the strength of which depends on the reason for one to pursue the aim and the probability.

To illustrate, suppose that there is reason for me to figure out what caused the outbreak of the Thirty Years' War. Various things that I can do are likely to help me figure this out. For example, asking my historian friend is likely to help. The strength of the reason I thereby gain to ask my friend is determined by two factors: the strength of the reason I had to figure out the question in the first place; and the probability that asking my friend will help me figure out the true answer.

So, when is it rational to inquire in some particular way φ as a means to figure out some question *Q*? As a start, there must be a sufficiently strong reason to figure out *Q*, and φ-ing must be sufficiently likely to help figure out *Q*, so as to allow a sufficiently strong reason to be transmitted to φ-ing. In other words, *Q* must be a sufficiently worthy object of inquiry, and φ-ing must be a sufficiently promising step to figuring out *Q*. But that is not the whole story. At any given point in time, we have reason of varying strength to figure out numerous questions. In fact, we have reason to pursue the aim of inquiry with respect to many more questions than we are able to inquire, since inquiring them all would demand much more time, attention and energy than we have at our disposal. This means that

inquiring agents must prioritize their cognitive resources, and focus on the questions they deem most important, or most likely to be answerable with an amount of cognitive effort that is proportionate to the epistemic reward. In other words, they must weigh the reasons they have for pursuing various inquiries against each other, as well as against reasons for pursuing competing non-epistemic aims, taking into account the cost of pursuing these inquiries. Finally, inquiries are only rational so long as they neither close prematurely, nor go on for too long. For example, an inquiry might end prematurely with a belief in an answer to *Q* that is not sufficiently warranted or detailed to satisfy the epistemic need; or it might go on beyond what is needed, by being excessively preoccupied with certainty about the answer, or by going into excessive detail.

Based on the zetetic transmission principle, we can thus distinguish between the following four parameters that are all relevant when evaluating the rationality of an agent's inquiry:

Zetetic Parameters:

1. The worthiness of the question
2. The effectiveness of the inquiry
3. The costs of the inquiry
4. The satisfaction of the inquiry

While these parameters apply to individual instances of inquiry, we are primarily interested in the general zetetic dispositions associated with ADHD. We therefore need to integrate the parameters into a concept that allows us to characterize such dispositions. To this end, we can usefully draw on the idea of *epistemic styles*, recently developed by Flores (2021).[6]

As Flores observes, different people interact with evidence in different ways. For example, they update their beliefs differently in light of the same evidence, differ in what they take the same evidence to bear on, assess sources of evidence differently, and so on. Flores describes such differences as a matter of having different "epistemic parameters". For example, two people might have different epistemic parameters with respect to how much evidence they require to form a belief. Given that there are multiple parameters that people might differ on, an epistemic style consists of a way of interacting with the evidence that expresses a unified set of epistemic parameters:

Epistemic Style: An epistemic style is a way of interacting with the evidence that expresses (aspects of) a unified set of epistemic parameters.

[6] The notion of epistemic styles has also been deployed in the psychological literature, where it has been defined as "an individual's habitual or favored process of making a judgment or solving a problem" (Eigenberger et al., 2007).

As examples of distinct but familiar epistemic styles, Flores mentions the *paranoid* style, expressive of "heated exaggeration, suspiciousness, and conspiratorial fantasy", and the *rationalist* style, characterized by strong adherence to Bayesian reasoning and a keen willingness to change one's mind. Having an epistemic style is then a matter of being disposed to interact with the evidence in accordance with that style.

In the same vein, we might define *zetetic styles* as ways of *inquiring* that express a unified set of *zetetic* parameters:[7]

> **Zetetic Style:** A zetetic style is a way of inquiring that expresses (aspects of) a unified set of zetetic parameters.

The four zetetic parameters introduced above thus enable us to distinguish different zetetic styles, characterized by differences in individuals' zetetic dispositions with respect to these parameters. First, individuals might differ in how much interest or importance a question must carry in order for them to open an inquiry. Some individuals may have a very low threshold of importance or interest for becoming curious and disposed to inquire, while others may only become curious and inquire about questions of high importance or interest. Second, individuals may be more or less discerning when it comes to the steps they take to figure out the relevant question. For example, some might approach the inquiry in an intuitive or opportunistic way, going with what comes first to mind, while others might be more methodical and reflective in their approach. Third, individuals may be more or less strongly disposed to regulate their inquiries in response to the cognitive and practical costs associated with the inquiry. Some individuals may be disposed to inquire in a way that is not very responsive to considerations about cognitive costs, while others may impose stricter limits on their willingness to inquire to avoid cognitive overload and leave energy for more pressing inquiries. And finally, individuals may differ in what they demand from the epistemic quality of the inquiry and its end point for it to satisfy their curiosity and thus conclude their inquiry.

5. Zetetic style and ADHD

The patterns of heightened curiosity characteristic of ADHD arguably give rise to a unique zetetic style on all four parameters. We propose the following as a characterization of the zetetic style associated with ADHD:

[7] Flores (2021) does not provide a list of epistemic parameters, but mentions some possible candidates, some of which we would classify as zetetic, such as differences in how we gather evidence. For our purposes, we find it useful to distinguish between epistemic and zetetic styles, where the latter might be seen as a substyle of the former.

Zetetic Style in ADHD: The zetetic style of ADHD is a way of inquiring that expresses the following unified set of zetetic parameters:

1. The worthiness of the question: *low threshold of interest*
2. The effectiveness of the inquiry: *low regard for effectiveness*
3. The costs of the inquiry: *low responsiveness to costs*
4. The satisfaction of the inquiry: *informationally high/epistemically low threshold of satisfaction*

First, as discussed above, it seems that individuals with ADHD often operate with a very low threshold of importance for becoming curious and disposed to inquire questions. Recall the first-personal reports quoted in §3. Clearly, Harry not only highlights a heightened sense of wonder and curiosity leading him to questions and inquiries, but also that the threshold for engaging in inquiry is low: "Oh wait, what about this?"; "Why is that shining?" (Redshaw & McCormack, 2022, p. 24). Some individuals with ADHD even seem aware of the apparent incongruity between the importance of their objects of inquiry, and their level of inquisitiveness, such as Wiyona: "I get very excited about little things, like a smell, or a texture, or a taste, or a…moment. It can be described as a childlike access to joy, I guess" (Redshaw & McCormack, 2022).

Second, it seems that individuals with ADHD are less discerning with respect to *how* they inquire the questions. Although it is harder to find direct support for this trait, it is a natural corollary of other traits. In particular, the tendency to seek immediate gratification is likely to lead people with ADHD to adopt a "satisficing" strategy in their inquiries over a more "maximizing" strategy, seeking quick answers rather than delaying their inquiry for more reliable ones. This may also be linked to a feature of the well-described lack of patience and difficulties with organizing the steps one needs to take to successfully carry out the inquiry. As "Participant F" notes in a study by Oscarsson et al. (2022), "All the little things like deciding for yourself in what order things should be done, how they should be done, what exactly we are in need of… Those things take a lot of time and energy for me, which it doesn't always do for my colleagues." When tasks like this are difficult, we are more inclined to approach them in a more opportunistic and intuitive way, which will lead to less discerning and reflective choices in the course of inquiry.

Third, it seems that individuals with ADHD have a weaker than normal disposition to regulate their curiosity about questions in response to the cognitive and practical costs associated with inquiry into them. For example, recalling an event from her youth, Hood (2015, p. 9) describes ignoring advice about the dangers of touching the stove. She understood the dangers, but "impulsivity and curiosity would take over and I just had to

touch the stove to see if what they told me was really the truth. (...) My actions were always seen as mischievous, but were driven by this need to know." Relaying a different sort of cost, others note that directing awareness exclusively to one issue for a long time comes at the cost of excluding other issues of importance. For example, when engulfed in pleasurable tasks, individuals with ADHD report "a failure to attend to the world" (Hupfeld et al., 2019) and "ignoring personal needs" (Schippers et al., 2022). In a similar manner, in her memoirs, Rebecca Schiller notes that the way she engages in inquiry is like "a laser beam of focus on a shiny new idea that puts everything else into the shadows" (Schiller, 2021, p. 207). She is aware that her exploratory activity might be counterproductive to her overall interests, but she is unable to stop: "Knowledge flows in from everywhere—an ice-cream headache—I keep eating despite the pain, because it is pleasure too" (Schiller 2021, p. 146). Further supporting this point, in an interview given to *The Cut*, a woman with ADHD notes that while people tend to think of her as self-absorbed, she merely feels drawn to and inspired by a great number of things. As she puts it, "I'm aware of so much that seems interesting and it's really hard to cut anything off. I sincerely want to do 100 things at the same time, feel devastated when I can't, but try anyhow. Everything seems so interesting and important" (Miller, 2018).

With respect to the fourth parameter concerning the satisfaction of inquiry, the picture is more divided, in that the patterns of attention and curiosity characteristic of ADHD often seem to give rise to a zetetic style that has more demanding satisfaction conditions in one sense, and less demanding satisfaction conditions in another sense.

It is *more* demanding in the sense that individuals with ADHD report a tendency to "let one question lead to another." This is intimately related to the first parameter, and will often more be a matter of inquiries drifting into altogether different topics. For example, over the course of a chapter, Schiller describes how her curiosity about her plot leads her to a veritable avalanche of more or less related inquiries, including the date her house was built. Finding out that the year was 1922, she describes being "unable to resist the impulse to know more about the year" (Schiller, 2021, p. 248), which leads her to finding out that during the same year, a Senegalese boxer won an international sports title, Egypt gained its independence, and physicist Niels Bohr was awarded the Nobel Prize. Such inquiries often end up turning into unconstrained "foraging" for information, which lead to informationally rich, yet unfocused end states.

It is worth noting that Schiller's description is consistent with studies highlighting that information foraging in ADHD populations displays bias towards novel information and reflects prioritizing exploration over exploitation (Gliga et al., 2018). However, when the inquiry stays on course, the "one question leading to another" tendency can also lead to inquiries that are at once focused and informationally rich. Schiller thus describes how

her occasional hyperfocus leads her to continue inquiry beyond the stage at which many would regard as appropriate for closing the inquiry, thus operating with quite demanding satisfaction conditions for this inquiry: "My need to know every stage of a seed's or chick's development, my love of breaking down words into their component parts, this project of peeling back each layer of the plot" (Schiller, 2021, p. 208). She likens her approach to scientific inquiries: "my repeated, roving search for answers, my need to spot and make patterns out of the jumble, the desire to understand fully and my inability to let things that niggle go. (...) The restless impulse to keep turning it over until the mismatch revealed itself to me wasn't pathological; it was scientific" (Schiller, 2021, p. 200). Although Schiller and many others report enjoying this process, there is also an awareness that the informationally rich inquiries come with a risk of "drowning in details" (Ozel-Kizil et al., 2016) and a "difficulty stopping and moving on to a new task" (Hupfelt et al., 2019). Schiller (2021, 201) notes that to disable her "inner scientist" she sometimes has to stop the flow of detailed information, for example by putting a blindfold over her eyes. In a similar vein, Melissa R. Hood describes in her memoir how her motto was "leave no stone unturned", but sometimes when confronted with an interesting question, "impulsivity and curiosity would take over" (Hood, 2021, 18) leading to more and more details at the risk of losing a sense of the bigger picture.

At the same time, the patterns of attention and curiosity characteristic of ADHD can give rise to a zetetic style with *less* demanding satisfaction conditions. In particular, the drive to move onto new questions as soon as the felt need for answering old ones is satisfied will likely often lead individuals with ADHD to be less preoccupied with the certainty of the answer, and thus end their inquiry at a stage that others would regard the answer as insufficiently certain. For example, when Schiller (2021, pp. 197-198; pp. 173-174; p. 191) describes the deeply felt need to know what spacetime is, whether time travel is possible, or how some bulbs made it to her plot, it is clear that she is satisfied with answers with a relatively low degree of certainty. Given the constraints of her more or less constant research into very different topics, she often can do no other than accept answers that neither enjoy a high epistemic status nor come with a high degree of psychological certainty.

It is worth briefly comparing the zetetic style we associate with ADHD with the three stylized models of curiosity described by Zurn (2019) and Zurn and Bassett (2022). The concept of zetetic styles differs from their curiosity models in being defined in terms of the four parameters that flow from the central zetetic norm, and in allowing an open-ended variety of different zetetic styles, according to how they each differ on these parameters. The zetetic style that we associate with ADHD seems to involve aspects of all three stylized curiosity models. Most obviously, the style bears resemblance to The

Busybody's wide-ranging and unfocused style of information seeking. But the occasional hyperfocus as described by Schiller and others resembles the selective and sustained style of The Hunter. Finally, the tendency to make seemingly unconnected leaps from one question to another might more resemble The Dancer's playful and unconstrained experimenting. Although the stylized models of curiosity are useful analytical tools, it thus seems that the flexible concept of zetetic styles is more suitable for understanding and evaluating the zetetic dispositions associated with ADHD.

6. Rationality and zetetic styles

If ADHD is associated with a particular zetetic style, does this also mean that the zetetic style associated with ADHD is *less rational* than the more typical style? That is far from obvious. In fact, as we shall now suggest, it seems that many different zetetic styles can qualify as rational, including the one that we associate with ADHD.

When it comes to *epistemic* style, especially if construed specifically to concern people's styles in assessing and responding to their evidence by updating their beliefs, the possibility of different styles being equally rational is debatable. Flores (2021) does not take sides on this question, but notes that there is a lively discussion in the literature between "permissivists" (e.g. White, 2013; Dogramaci & Horowitz, 2016), holding that there can be more than one rational response to the evidence, and "impermissivists" (e.g. Douven, 2009; Kelly, 2013), who deny this.

In contrast, it seems much clearer that many different zetetic styles could be rational. Consider the four parameters. First, is there a uniquely rational way of selecting what questions to inquire? An initial source of skepticism about this stems from the *diversity* and *interest-dependence* of reasons bearing on whether a question is worthy of inquiry. Some reasons will relate to the practical use of knowing the answer to the relevant question. For example, it is practically useful to know the answer to questions such as "Where are my keys?" or "How do we solve the climate crisis?". Questions such as "Do fish experience pain?" and "Which charity will make the most of my contribution?" arguably warrant inquiry for moral reasons. But it also seems clear that one's idiosyncratic interests and personal tastes could ground acceptable reasons for inquiry. For one person, "What caused the Thirty Years' War?" might be an eminently worthy object of curiosity, while it might be perfectly warranted for others to ignore it.[8]

Allowing personal interests and tastes to act as normative reasons for engaging in inquiry might seem to preclude that curiosity can be irrational, at least in this respect. After

[8] In the same vein, Fairweather and Montemayor (2018) ask whether *neophilia* - the love of novelty - might be epistemically responsible, but respond that it will only very rarely be so, because it will lead to too many inquiries, thus preventing them from meeting appropriate satisfaction conditions. However, as we argue below, this assumes a non-pluralist and epistemically demanding understanding of these satisfaction conditions.

all, doesn't curiosity about *Q* imply that one is interested in it, thus precluding that one can be curious about *Q*, and thus disposed to inquire *Q*, without this curiosity being supported by one's interests? Perhaps to some extent. But it also seems obvious that zetetic dispositions can be out of sync with one's more considered interests, and that one could therefore be disposed to inquire questions that one has no reason to inquire, all things considered. Consider, for example, how susceptible we are to having our curiosity aroused by click-bait: a skillfully crafted headline can make it hard for us to resist clicking on it, even if we are reflectively aware that such an act of inquiry will almost certainly not be worth our time. Nevertheless, because of the deep entanglement with broader practical issues and personal interests, it seems unlikely that there should be a uniquely rational way of selecting what questions to inquire.

Much the same can be said with respect to the third parameter, concerning sensitivity to the costs of inquiry. Inquiry consumes both cognitive and practical resources that could be devoted to other pursuits, so assessing the rationality of inquiry into *Q* involves weighing whether the value of figuring out *Q* is proportionate to the cost in resources, and whether the resources are not better spent elsewhere. For example, although figuring out what caused the decline of tuna in our local bay is of *some* interest and value to us, the cost of figuring this out may very well outweigh the value of figuring out the answer. But again, because of the entanglement with broader practical issues and personal interests, it seems unlikely that there should be a uniquely rational way of regulating inquiry in light of costs.

On the face of it, the second parameter about regard for effectiveness in means taken to figure out questions might seem to allow less wiggle room when it comes to rationality. It would certainly be irrational to be wholly indiscriminate in our choice of such means. But that doesn't exclude that different approaches in such choices can be equally rational. Contrast, for example, a satisficing approach (i.e., settling for the first means of inquiry that seems good enough) with a maximizing approach (i.e., settling only for the most effective). There is a rich literature discussing the advantages and drawbacks of each, and one upshot is that while maximizers tend to make better choices, satisficing is often more cost-effective and positively related to subjective well-being (Vargová, 2020). Once again, it seems that the rationality of different settings on this parameter are influenced by broader practical considerations, and it thus seems possible for more than one setting to be rational, depending on the context.

With respect to the last parameter concerning the point at which we can rationally regard an inquiry as satisfied, epistemologists have traditionally focused on the *epistemic quality* rather than the *informational richness* of the end state. For example, as mentioned above, a popular view has it that inquiry aims at knowledge, in the sense that inquiry

whether p can be regarded as satisfied when and only when the inquirer comes to *know* whether *p* (e.g., Williamson, 2000; Kelp, 2021). Although we cannot enter a discussion of this issue, it seems to us that a more pluralistic approach is more promising. Subjects often inquire questions while being aware that they cannot realistically come to know the answer; and even if one decides to suspend inquiry before attaining knowledge of the answer one is inquiring, it need not be seen as a failed effort. This suggests that inquiry can be aimed at a plurality of epistemic outcomes, and once again, it seems that practical circumstances and personal interests play a part in determining the appropriate satisfaction conditions. What is important from an epistemic point of view, of course, is that one does not close the inquiry by adopting an attitude that is not warranted by the evidence that the inquiry has uncovered. For example, if the inquiry into *Q* closes before belief in an answer to *Q* is warranted, one should not form such a belief. A zetetic style that is less preoccupied with certainty and more driven by curiosity about the next shiny question uncovered in the course of inquiry will often end up in such evidential situations. But this can be both rational and valuable, in having uncovered interesting questions, suggestive possibilities, and promising solutions, as long as the subject's degree of belief in the answer does not exceed that supported by the evidence.

This is not to say that the zetetic style characteristic of ADHD is always immune from rational criticism. In fact, as should be evident from the testaments recorded above, subjects with ADHD often find their style counterproductive to their considered interests. But the above makes it evident that there is nothing *inherently* irrational about this zetetic style, and that it can be advantageous in important respects. Going further, as we shall now argue, the very aspects of the zetetic style that might at times be disadvantageous from the point of view of *individual* subjects with ADHD, will often confer epistemic benefits to the social *group* that the subjects are part of.

7. Group benefits of zetetic diversity

To identify potential epistemic group advantages associated with ADHD, it is helpful to start by exploring evolutionary approaches that have emerged upon the "adaptive turn" in psychiatry (Nesse & Williams, 1995). These approaches apply insights about evolutionary processes to shed light on the persistence of disorders (Murphy, 2005). Numerous conditions like ADHD are both impairing, have a partly genetic basis, and occur at prevalence rates that are too high to be explained as mutations (Williams & Taylor, 2006). This raises questions as to whether ADHD increases fitness.

Evolutionary approaches to ADHD typically offer *mismatch explanations*, according to which the traits specific to individuals with ADHD increased the fitness of their carriers in ancestral environments and were therefore distributed in the population due

to natural selection (Swanepoel et al., 2017). However, with fundamental and rapidly ensuing changes to our social environments, these traits have become maladaptive in current environments. So, the deficits associated with the conditions do not stem from some component of the mind or body failing to fulfill its evolutionary function, but from the mismatch between the demands of our current environments and traits developed for ancestral environments. For example, some have argued that traits such as the swift redirection of attention to a new stimulus during the completion of another task were useful for prehistoric hunters (Hartmann, 1993). Supporting this view, Jensen et al. (1997) stress the advantages that such a trait confers upon their carriers in generally unpredictable and hostile environments, enabling rapid reactions to changes (for a review, see Jiaqing, 2021). Others suggest that hyperactivity might have evolved as a useful trait for physical combats (Shelley-Tremblay & Rosen, 1996), while high levels of curiosity, investigativeness, information foraging, and novelty-seeking could have been fitness-conferring in hunter-gatherer societies (Swanepoel et al., 2017).

While these accounts focus on benefits for individual carriers, some take a different approach that also purports to explain why ADHD is seen in only a minority of humans. Williams and Taylor (2006) stress that in ancestral environments, curiosity and inquisitiveness were important for exploratory knowledge acquisition, for instance with respect to detecting hazards and locating edible food for one's community. As long as individuals with inquisitive behaviors such as in ADHD only constitute a minor part of a group, there are clear benefits for the community, even if the relevant individuals are exposed to increased risk. As an example, Williams and Taylor (2006) note that in the prehistoric contexts, groups might have learned to avoid certain things in the environment after curious individuals with ADHD traits were harmed by them. Overall, a minority with inquisitive and novelty-seeking traits could have bestowed significant benefits upon the group, and such often risky exploratory activity is not limited to the physical environment, but also to probing the limits of cultural beliefs, superstitions, and social arrangements.

We can substantiate these evolutionary perspectives by considering how ADHD traits in individual group members might bestow epistemic benefits to the group as a whole, in the form of increasing its common pool of knowledge. It might be thought that when individual members of a group perform suboptimally from an epistemic perspective, the group suffers epistemically as well. However, an important lesson emerging from recent social epistemology and philosophy of science is that epistemically well-performing groups can be made up of epistemically ill-performing individuals. For example, Kitcher (1990) demonstrates that a certain kind of division of epistemic labor, although epistemically suboptimal from an individual point of view, creates the best epistemic results from a communal perspective; Goodin (2006) shows that biased individuals may be

able to pool their information in ways that give rise to unbiased groups; Zollman (2010) argues that scientists who hold on to their theories longer than is warranted by the evidence may help ensure that the scientific community doesn't abandon those theories prematurely; and Hallson and Kappel (2020) show that people's tendency to engage in motivated reasoning can constitute a beneficial form of epistemic diversity in groups of deliberating agents.

In the same vein, it might be speculated that although ADHD traits, and in particular the zetetic style these traits give rise to, might be epistemically suboptimal from an individual perspective, it can be epistemically beneficial for a group to include members with this style. Because of their more cautious and discriminating zetetic style, typical group members will tend to limit their inquiries to questions that are relatively likely to have valuable answers, and are relatively likely to be answerable with a reasonable investment of cognitive resources. This zetetic style makes very good sense for the typical members, but it will also limit the pool of questions that the group collectively will inquire, in part because it will cause a significant overlap in the questions that the members will individually inquire.

However, if a minority of group members have a less discriminatory zetetic style, with less regard to the cost in cognitive resources and a tendency to let one question lead to another, the pool of questions collectively inquired by the group will increase dramatically. Metaphorically speaking, we might say that group members with ADHD play the epistemic role of casting a wide epistemic net, discovering questions of potential interest, and performing a rough sorting of questions into those that warrant further inquiry, and those that do not. This would also make the relatively low preoccupation with certainty an asset from a group perspective, rather than a flaw. In the epistemic division of labor sketched here, it would make sense for group members with ADHD traits to stop inquiry into questions as soon as they lose interest, and leave the more painstaking and detail oriented phase of inquiry to group members with a more patient zetetic style, while themselves moving on to explore new questions. Of course, these potential contributions of ADHD traits to epistemic group performance presuppose that the group is organized in a way that allows it to benefit from them. A full account of these contributions thus requires appropriate contextualization to the kinds of groups they occur in.

8. Conclusion

In an editorial in *Journal of Child Psychology and Psychiatry,* Lesch (2018) maintains that research on ADHD needs reorientation, away from the deficit-focused view towards the examination of positive traits and resources that individuals with ADHD might be able to exploit, in part to compensate for deficits. But for such a reorientation to be successful, it

is important to reduce the stigma attached to ADHD, for example as manifesting epistemically problematic dispositions. Such stigma is not merely a form of "epistemic injustice" that unduly diminishes the status of individuals as epistemic agents (Fricker 2007), but it also affects whether they are able to view themselves as harboring the relevant kinds of resources.

In this paper, we aimed to contribute to this endeavor by focusing on the heightened sense of curiosity and inquisitiveness to which many individuals with ADHD attach positive value. We drew on the epistemology of emotions and inquiry to propose a framework that enables comparing different zetetic styles and showed how the zetetic style associated with ADHD displays unique features on several parameters. Importantly, the framework also indicates that many different zetetic styles can qualify as rational, including the one we associate with ADHD. For further support, we closed by showing how diversity with respect to zetetic styles can confer advantages to groups.

We should note several limitations. First, although we hope that our argument that various zetetic styles can be considered epistemically rational will serve to nuance the debate, we recognize that it may not address those who believe that the concept of rationality itself is problematic.[9] Second, some of the literature we cite embraces what one could call a "positive psychology" approach to ADHD, focusing on identifying strengths and capabilities with respect to curiosity and attention which can be harnessed, rather than solely addressing challenges and deficits. While this approach offers several benefits, it is essential to strike a balance between recognizing strengths and addressing difficulties, also to avoid the risk of inadvertently placing too much responsibility on the individual to improve their condition simply by focusing on their strengths and virtues. Third, we have focused on how curiosity regulates inquiry and attentional patterns, but have not taken into consideration how these might be affected by other core symptoms and characteristics of ADHD, such as a sensitivity to sensory stimulation or above-average levels of anxiety. Fourth, our account is informed not only by findings from quantitative research, but also by qualitative research and first-personal reports, which carry certain challenges. For example, reports by individuals on their condition, as cited in Hallowell and Ratey (2021), Schiller (2021), and Hood (2015) will to some extent be shaped by sociocultural norms and expectations. While we believe that such first-personal accounts constitute a rich resource for theoretical and empirical research, we also acknowledge that they must be approached with sensitivity (for a discussion, see Radden & Varga, 2012). That said, we see no reason

[9] A number of authors in disability studies and advocates for a "mad studies" approach not only question the suitability of the biomedical model, but also challenge the idea of rationality as a measure of valuable cognitive ability. They highlight that the concept of rationality has been used to marginalize those who do not fit the normative standards of cognitive function, such that the "mad" do not appear as candidates for recognition but as recipients of medical care (Rashed, 2019, p. 185).

to assume that the first-personal accounts are somehow significantly biased and should not be taken seriously. Finally, it bears stressing that no single zetetic style will characterize all individuals with ADHD and capture the full complexity of the condition. Our account merely provides a model that aims to improve our understanding of the nature of curiosity and inquiry in ADHD in a way that could contribute to the kind of reorientation that Lesch (2018) calls for. While future work is required to offer a more detailed, comprehensive, and empirically testable picture of zetetic styles, we hope to have charted a course that merits further examination and contributes to a more nuanced picture of ADHD.

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