

# *Representing behavioral pathology: the importance of modality in medical descriptions of conduct, ADHD as case study*

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Sara Vilar-Lluch

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# Representing Behavioral Pathology: The Importance of Modality in Medical Descriptions of Conduct, ADHD as Case Study

Sara Vilar-Lluch <sup>a,b</sup>

<sup>a</sup>School of English, University of Nottingham; <sup>b</sup>Philosophy, University of Reading

## ABSTRACT

This paper examines the role of modality resources (e.g. “may,” “often”) in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) in representing behavioral pathology focusing, in particular, on Attention Deficit Hyperactivity Disorder (ADHD). ADHD diagnosis requires reports of non-practitioners (e.g. carers and teachers); an effective understanding of behavioral descriptors by the lay community is thus of paramount importance. The study combines qualitative linguistic discourse analysis and a corpus approach to study the presence and functions of modality, adopting a Systemic Functional perspective toward language. The study argues that in the DSM-5 modality is an important linguistic resource for conveying clinical significance, inferred from graduations of recurrence and probability. However, adopting features of professional discourse in representing behavioral pathology for non-experts, especially when those resources are inherently evaluative, stresses the need of health literacy among the lay social community and accessibility in health communication materials, particularly when non-practitioners are involved in the diagnosis practice.

## Introduction

This paper examines how abnormal behavior is represented in the *Diagnostic and Statistical Manual of Mental Disorders* 5<sup>th</sup> Edition (DSM-5), focusing on the behavioral traits associated to Attention Deficit Hyperactivity Disorder (ADHD), one of the psychological conditions most commonly diagnosed in childhood (Kutcher et al., 2004, p. 12). The DSM is the official publication of the American Psychiatric Association (APA) and presents all mental conditions recognized to date and the diagnostic criteria for clinicians. Although the DSM is written for the psychiatric community, it has a strong social impact beyond the clinical setting. In ADHD diagnosis, the influence of the DSM in other social spheres is particularly significant; ADHD is diagnosed only if symptoms are observed in at least two different settings, hence requiring reports by third party informants (e.g., parents and teachers) (American Psychiatric Association [APA], 2013, p. 60). Informants are commonly asked to complete questionnaires, which comprise rating scales that reproduce the DSM diagnostic criteria with minor changes<sup>1</sup>. This practice has two important implications: (i) DSM definitions can influence teaching and family communities’ understanding of ADHD, ultimately conditioning the reports provided to inform the diagnosis, and (ii) since behavior traits are defined following the psychiatric genre, non-experts should be able to interpret these descriptions correctly to provide effective reports.

This paper considers the linguistic features employed in the DSM-5 to portray ADHD-behavioral traits as clinically significant, focusing on modality, linguistic resources inherently evaluative. The importance of evaluation in psychiatric diagnosis

is recognized in discourse studies and philosophy of psychiatry literature (e.g., Crowe, 2000; Sadler, 2013), but it remains an under-researched topic from a linguistics standpoint. Notably, the paper addresses two main questions: (i) Is evaluation a significant characteristic of the DSM, in comparison to the general medicine and natural science genres? and (ii) How does evaluation contribute to the representation of ADHD symptomatic traits? In those cases where lay community participation is a requirement for diagnosis, the lay understanding of descriptions of symptomatic behavior is of paramount importance, since unsuccessful communication could lead to undesirable consequences for the patient, either encouraging or preventing diagnosis.

## Mental disorder in the DSM-5

### *The shift in the conceptualization of mental disorders*

The DSM-5 adopts a dimensional approach toward psychological conditions and understands most mental disorders as a spectrum, without well-defined boundaries (APA, 2013, p. 6). Diagnostic criteria do not identify a homogeneous group of individuals (2013, p. 12); instead, individuals may show different traits, and still share the same diagnosis. The spectrum conceptualization intended to end the subtyping proliferation of the psychiatric nosology which, in its turn, was meant to exclude false-positive diagnoses (i.e., the diagnosis of individuals who do not present the condition) (2013, p. 12). Prior to DSM-5 publication, scientific research increased the empirical evidence of the flexible boundaries of mental disorders. These new findings were difficult to integrate

**CONTACT** Sara Vilar-Lluch  [sara.vilarlluch@nottingham.ac.uk](mailto:sara.vilarlluch@nottingham.ac.uk)  School of English, University of Nottingham, Nottingham, UK

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with the classification employed, escalated the rate of comorbidity (i.e., different disorders are presented together), and escalated the employment of the “Not Otherwise Specified” (NOS) category (applied when diagnostic criteria are not met completely) (APA, 2013, p. 5, 12). These difficulties were blamed for lowering diagnoses’ thresholds (Busfield, 2012, p. 587).

The dimensional approach merged previously differentiated diagnoses, now understood as spectrum, such as autism and sexual dysfunctions (APA, 2013, p. 7). The shift involved a new conceptualization of “mental disorder.” The traditional understanding of categories regards membership as binary, individuals are either included in a category or not (Taylor, 1995, p. 23); boundaries are clear-cut, removing liminal cases (Cantor et al., 1980, p. 182). In contrast, a spectrum understanding regards category membership as a graded continuum, and members are defined according to their similarity to prototypical cases (Taylor, 1995, p. 54). This view explains borderline cases; symptoms associated with a diagnosis need not always present for the condition to be diagnosed, and it explains the frequently heterogeneous presentations of mental disorders (Cantor et al., 1980, p. 183–185).

While the dimensional model has been described as more “functionally specific” (Sanders, 2011, p. 401), it has also been criticized for over-inclusiveness, already denounced in the DSM-IV (Wakefield, 1997, p. 633). Over-inclusiveness involves increase of false-positive diagnosis and a potential pathologization of ordinary extreme behaviors (Deacon, 2013, p. 852; Sanders, 2011, p. 399). Importantly, first discussions about the DSM-5 emerged among the psychiatric community. Allen Frances, chair of the DSM-IV Task Force, showed concerns over the first draft of the new edition (Frances, 2010), and just before DSM-5 publication, Thomas Insel, Director of the National Institute of Mental Health (NIMH) at the time, expressed strong reservations (Insel, 2013) and proposed a new research program in NIMH, the Research Domain Criteria (Cuthbert & Insel, 2013). Debates about the difficulties involved in psychiatric nosology among psychiatry researchers and practitioners highlight the importance of considering the communicative challenges derived from descriptions of symptomatic behaviors, particularly when such portrayals can inform lay community reports.

### Defining ‘mental disorder’

The DSM-5 defines “mental disorder” as a “syndrome characterized by *clinically significant disturbance* in an individual’s cognition, emotion regulation or behavior that reflects a *dysfunction* in the psychological, biological, or developmental processes underlying mental *functioning*,” and excludes any “*expectable* or *culturally approved* response to a common stressor or loss” and “socially deviant behavior (. . .) and conflicts between the individual and society” (APA, 2013, p. 20; emphasis added by author). Three main factors stand out from this description: (1) emphasis on “clinical significance” as a determinant condition for the diagnosis; (2) a functionalist perspective; and (3) the distinction between mental disorders and extreme but ordinary forms of conduct. Points (1) and (3) reflect the need to identify a marker that makes it possible to

differentiate pathological conducts from ordinary behavior; point (2) raises concerns about the notion of normality as opposed to the dysfunctions regarded as signs of a disorder. These three aspects lead to the preoccupation about the cross-cultural applicability of the DSM nosology.

The specification “clinically significant disturbance” echoes the necessity to distinguish between extreme ordinary values of distress and behavioral patterns, which constitute diagnosable symptoms. In describing the “Other Specified” and “Unspecified” categories for the ADHD diagnosis, the DSM-5 employs the expression to limit clinical behavior: individuals should present “symptoms (. . .) that cause *clinically significant* distress or impairment in social, occupational or other important areas of functioning (. . .)” (APA, 2013, p. 65–66). Wakefield identified the expression as a threshold elevator for the application of the diagnostic criteria and criticized it for not increasing, on its own, the validity of the diagnosis (Wakefield, 1997, p. 641–642).

The functionalist approach has generated applause and concern among researchers. The main difficulty in addressing the presence of a dysfunction as determinant factor for a diagnosis is the absence, in the DSM, of a description of what “dysfunction” is understood to be. “dysfunction” can involve some biological abnormality (Wakefield, 1997, p. 635), or describe abnormal behavior in terms of deviation from the standard (Canino & Alegria, 2008, p. 238). In the first case, “dysfunction” biologizes symptomatic behavior; in the second case, it naturalizes the standard behaviors in the culture where the diagnosis is defined.

Differentiating common extreme behaviors from clinical conditions is a recurrent issue in the DSM. “Culturally expectable and/or approved” extreme reactions are excluded from diagnosis (APA, 2013, p. 20). Taking greater consideration of the context in which the symptoms appeared may be a way to distinguish between extreme ordinary behavior from behaviors caused by a dysfunction (Canino & Alegria, 2008, p. 238; Wakefield, 1997, p. 633). The DSM-5 acknowledges the importance of cultural factors and the existence of divergent thresholds of tolerance in different cultures (APA, 2013, p. 14), as well as the tension that this poses to the biomedical approach (APA, 2013, p. 21).

Concerns have been raised about the Western-based universality of the DSM and the actual possibility of a cross-cultural application (Brown et al., 2011, p. 939; Canino & Alegria, 2008, p. 239), as well as cultural-bound syndromes (disorders which are mostly diagnosed in Western cultures) (Thakker & Ward, 1998, p. 504). Such concerns are supported by the occasional influence of socio-political pressures in determining the inclusion or exclusion of disorders in the DSM (e.g., homosexuality, Post-Traumatic Stress Disorder), and by the low correspondence of prevalence rates across cultures shown by some conditions, such as ADHD (Canino & Alegria, 2008, p. 240).

This paper addresses how “clinical significance” is linguistically marked in descriptions of pathological behavior. Despite the importance of “clinical significance” in psychiatric diagnosis, the concept has remained under-researched (see Galasiński, 2012, pp. 103–104 for a review). Galasiński (2012) addressed this gap by examining how practitioners accounted

for the criterion in semi-structured interviews; lamentably, satisfactory explanations were not provided. This paper contributes to the investigation examining those linguistic expressions in the DSM-5 that inform the clinicians' evaluation, providing an insight to what is deemed "significant" for a diagnosis.

## Materials and methods

This study considers the ADHD section of the DSM-5 (APA, 2013, pp. 59–66) from a text-based discourse analysis perspective, combining qualitative linguistic study and corpus methods. Discourse analysis has a long tradition in health communication. In mental health, discourse analysts have studied representations of mental disorders and the sufferers (e.g., Harvey & Brookes, 2019 on dementia); first-person narratives (e.g., Galasiński, 2008 on men's experiences of depression); interviews and focus groups (e.g., Hunt, 2021, on depression, Knapton, 2015, on Obsessive Compulsive Disorder); medical communication (e.g., Ziółkowska, 2012); and the talk of patients with conditions that involve some speech anomaly, such as schizophrenia, dementia or psychosis (e.g., Kramer, 2001). Previous discourse studies have evidenced that the DSM influences practitioners' reports (Berkenkotter & Ravotas, 1997) and interview practices (Ziółkowska, 2012), highlighting the effect of the manual in the experts' understandings of, and interactions with, the patients. Since the DSM also informs descriptions of the diagnoses for the broader social community, such as those available in ADHD rating scales, it is important to examine whether these descriptions could lead to any misunderstanding by the lay communities involved.

## Analytical approach

The linguistic analysis draws on Systemic Functional Linguistics (SFL) (Halliday & Matthiessen, 2004), a comprehensive linguistic framework that focuses on the functions that language preforms in communication, integrating ideational, interpersonal and cohesive functions. The interest in language as a social semiotic activity has rendered SFL as a valuable approach for language-oriented discourse analysis since the early days of Critical Linguistics (e.g., Fowler, 1981, p. 28).

This paper considers the interpersonal function, i.e., the expression of evaluation, and it focuses on modality resources. Modality refers to the gray area between a "yes" and a "no:" we may say that something *is* or *is not* the case, but also that it *may be* (Halliday & Matthiessen, 2004, pp. 146–147). Since modality allows for the expression of certainty, SFL understands it as an interpersonal resource. SFL characterizes modality according to type, value, polarity and orientation (2004, p. 150). An overview of the modality framework is provided below.

- **Modality types:**

- Modalization: expression of Probability ("He *may* be Paul") and Usuality ("Paul *usually* takes this train")—it covers the "epistemic modality" of traditional grammar.

- Modulation: expression of Obligation ("You *should* do that") and Inclination ("I *will* be punctual!") (2004, p. 147)—it covers the "deontic modality" of traditional grammar.

- **Polarity:** expression of positive or negative evaluations (2004, p. 143).
- **Value:** gradation of the evaluation, i.e., high, median or low (2004, p. 149).
- **Orientation:** the speaker's angle (2004, p. 624),
  - Subjective: the speaker stands as the source of the evaluation ("I'm *certain* that he is Paul," explicit, or "He *must* be Paul," implicit).
  - Objective: the evaluation is presented as factual ("It *is certain* that he is Paul," explicit, or "*Certainly*, he is Paul," implicit) (2004, p. 149–150).

Modality was coded according to *type*, *orientation* and *value* as indicated above—to examine the types and degrees of certainty expressed and how the writers position themselves toward these judgments. The expression of evaluations of behavior was also examined following (Martin & White, 2005) appraisal framework, which distinguishes three types of attitude: *affect*, expression of feelings, *appreciation*, evaluation of things or performances, and *judgment*, evaluation of human behavior in terms of property, veracity, normality, capacity or tenacity (Martin & White, 2005, pp. 45–58). In order to ensure analysis reliability, data was coded twice by the author in the expand of a month, and any inconsistency was double-checked with senior colleagues.

Linguistic expressions that account for what counts as abnormal behavior are to be expected in the DSM; identifying the linguistic resources that enable a dimensional approach can shed some light on how clinical significance is construed in language, making it possible to better understand the grounds of clinical judgment, and address the difficulties that may occur in employing evaluative language with the lay community.

## Methodological considerations

The ADHD section of the DSM-5 (APA, 2013, pp. 59–66) was copied in an Excel spread sheet for coding purposes. Grammatical resources were manually annotated clause by clause. The annotation evidenced that modality is recurrent in the description of ADHD. In order to examine whether the modality resources identified are specific for ADHD, the same resources were searched in the following corpora: (i) the section of the DSM-5 dedicated to Oppositional Defiant Disorder (ODD), a condition often presented in comorbidity with ADHD and frequently included in ADHD diagnostic rating scales, thus potentially presenting linguistic similarities (APA, 2013, pp. 462–466); (ii) the DSM-5; and (iii) the medical and natural science corpora of the general corpus *British National Corpus* (BNC), as allowed by the CQP-Edition of the BNCweb. The BNC would make it possible to compare the ADHD description and the DSM-5 with the general medical genre.

**Table 1.** Contrastive account of modality in the DSM, the BNC medical and natural sciences corpus, the ADHD and ODD sections.

	DSM-5 (449,197 words)			BNC (medicine and natural sciences) (2,557,269 words)			ADHD section of the DSM- 5 (3,523 words)			ODD section of the DSM-5 (2,021 words)		
	Hits	Normalized frequency <sup>a</sup>	% of modality <sup>b</sup>	Hits	Normalized frequency	% of modality	Hits	Normalized frequency	% of modality	Hits	Normalized frequency	% of modality
<i>May</i>	3432	7.6403	55.71	7094	2.7741	53.68	43	12.2055	47.25	9	4.4532	23.08
<i>Often</i>	685	1.5249	11.12	1502	0.5873	11.37	24	6.8124	26.37	15	7.4221	38.46
<i>Must</i>	399	0.8883	6.48	1239	0.4845	9.38	5	1.4192	5.49	4	1.9792	10.26
<i>Tend(s) to</i>	153	0.3406	2.48	298	0.1165	2.25	4	1.1354	4.40	0	0.0000	0.00
<i>(un)common(ly)</i>	698	1.5539	11.33	1353	0.5291	10.24	6	1.7031	6.59	7	3.4636	17.95
<i>More likely/unlikely/likelihood</i>	409	0.9105	6.64	609	0.2381	4.61	5	1.4192	5.49	0	0.0000	0.00
<i>Probable/probability</i>	84	0.1870	1.36	1015	0.3969	7.68	1	0.2838	1.10	0	0.0000	0.00
<i>Typically</i>	301	0.6701	4.89	106	0.0415	0.80	3	0.8515	3.30	4	1.9792	10.26
<b>Total</b>	<b>6161</b>	<b>13.7156</b>	<b>100</b>	<b>13,216</b>	<b>5.1680</b>	<b>100</b>	<b>91</b>	<b>25.8303</b>	<b>100</b>	<b>39</b>	<b>19.2974</b>	<b>100</b>

<sup>a</sup>Frequencies have been normalized per 1000 throughout.

<sup>b</sup>Inter-modality ratios, modality distribution.

**Table 2.** Modality in the DSM-V corpus compared to the BNC (medical and natural science) corpus.

	Observed frequencies		Expected frequencies		Over/under-use	Log Likelihood	Normalized frequencies	
	DSM	BNC	DSM	BNC			DSM	BNC
<i>May</i>	3432	7094	1572.69	8953.31	+	2053.76	0.00764	0.00277
<i>Often</i>	685	1502	326.76	1860.24	+	371.48	0.00152	0.00059
<i>Must</i>	399	1239	244.73	1393.27	+	99.27	0.00089	0.00048
<i>tend(s) to</i>	153	298	67.38	383.62	+	100.41	0.00034	0.00012
<i>(un)common(ly)</i>	698	1353	306.44	1744.56	+	461.38	0.00155	0.00053
<i>more likely/unlikely/likelihood</i>	409	609	152.10	865.90	+	380.47	0.00091	0.00024
<i>probable/probability</i>	84	1015	164.20	934.80	-	54.49	0.00019	0.00040
<i>typically</i>	301	106	60.81	346.19	+	711.90	0.00067	0.00004
<b>TOTAL words (corpus)</b>	<b>449,197</b>	<b>2,557,269</b>						

The quantitative analysis involved, first, some descriptive statistics regarding the modality resources in the different corpora. The analysis considered: (i) the frequencies of each modal expression within each corpus, to examine the presence of modality, and (ii) the proportion of each modal expression within the total modal expressions considered, to examine the distribution of the different modality resources (see Table 1, Section 4.1). Significance testing was conducted to determine whether differences observed across the corpora are statistically significant; it employed the *log-likelihood* (LL) statistic, a common significance measure adopted in corpus linguistics that can also be applied to small corpus such as the ADHD section (Brezina, 2018, p. 83; Rayson & Garside, 2000) (see Table 2 –Table 4, Section 4.1). LL was calculated with Paul Rayson’s calculator, available at [ucl.ac.uk](http://ucl.ac.uk/~lanacs/).<sup>2</sup> The cutoff point for significance adopted is an LL larger than 6.63 ( $p < .01$ ).<sup>3</sup> The test would make it possible to determine whether the modality observed in the ADHD description and the DSM should be regarded as a linguistic trait characteristic of psychiatric descriptions (by opposition to the general medical and scientific corpus) or, contrarily, the psychiatric corpus shares the same distributions observed in the general medical and scientific corpus.

The quantitative analysis is complemented by a qualitative study of the main modality realizations identified in the ADHD corpus, “often” and “may.” The analysis examines the functions

that the modals realize in the corpus and their representational implications in allowing for portrayals of behavioral traits as clinically significant.

## Results

### *Modality in psychiatry vis-à-vis medical and natural sciences*

All modality expressions distinguished in the ADHD section are of the modalization type (i.e., epistemic modality, expressing evaluations of certainty). Comparing the normalized relative frequencies of modality expressions across the corpora evidences modality is recurrent in the DSM-5 description of ADHD-symptomatic behavior (Table 1).

Previous studies have described modality as a common resource in the medical and natural sciences genres (Facchinetti, 2003; Salager-Meyer, 1992), and have reported epistemic modality as the most predominant type (Piqué et al., 2001, p. 220). Comparing modality frequencies in the DSM-5 with the medical and natural sciences corpora of the BNC shows that the modality distributions of the DSM follow those observed in the medical and natural sciences; in particular, similarities are observed for “may,” “often,” “tend(s) to” and “(un)common(ly)” (Table 1). However, the DSM presents

**Table 3.** Modality in the ADHD corpus compared to the DSM-V corpus.

	Observed frequencies		Expected frequencies		Over/under-use	Log Likelihood	Normalized frequencies	
	ADHD	DSM	ADHD	DSM			ADHD	DSM
<i>May</i>	43	3432	27.04	3447.96	+	8.05	0.01221	0.00764
<i>Often</i>	24	685	5.52	703.48	+	34.09	0.00681	0.00152
<i>Must</i>	5	399	3.14	400.86	+	0.94	0.00142	0.00089
<i>tend(s) to</i>	4	153	1.22	155.78	+	3.98	0.00114	0.00034
<i>(un)common(ly)</i>	6	698	5.48	698.52	+	0.05	0.00170	0.00155
<i>more likely/unlikely/likelihood</i>	5	409	3.22	410.78	+	0.85	0.00142	0.00091
<i>probable/probability</i>	1	84	0.66	84.34	+	0.15	0.00028	0.00019
<i>typically</i>	3	301	2.37	301.63	+	0.16	0.00085	0.00067
TOTAL words (corpus)	3,523	449,197						

higher frequencies of modality, being the total frequency in the DSM more than twice as high as the BNC medical and natural sciences genre (2.65 times). Table 2 shows an overuse<sup>4</sup> of modality resources in the DSM-5 as compared to the BNC-medical and science corpus. LL scores above the critical value (6.63) are marked in bold, and cases of overuse are marked with a “+” sign. These results prove the importance of modality for the representation of behavioral pathology in the DSM-5.

Comparing the frequencies of the ADHD section with the DSM shows that, while modality is characteristic of the DSM genre, it is particularly important in portraying ADHD behavior (Table 1). Modality distributions show more dissimilarities than the DSM when compared to the BNC-medical and science corpus. The significant test (Table 3) evidences “may” and “often” as the resources with the most significant overuse in ADHD description (above the critical value 6.63).

Although ADHD and ODD are close conditions, descriptions of their symptomatic behavior present very different uses of modality. Normalized frequencies show the importance of modality in describing ADHD traits (Table 1). For some modality expressions (“may,” “tends to,” and explicit expressions of likelihood), the ODD description shows a considerably lower presentation than expected (Table 4). The significant test (Table 4) shows a significant overuse of the modal “may” in the ADHD description.

Modality is thus an important feature in official descriptions of psychiatric diagnoses, being particularly significant in

ADHD-symptomatic behavior descriptions. “May” and “often” are the preferred expressions in all the corpora, showing that the DSM adheres to the linguistic conventions of the medical genre. Comparing the modality distributions of the BNC-medical and natural sciences corpus with those of the psychiatric corpora shows the latter present less explicit expressions of probability (i.e., “probable,” “probably”), suggesting a preference for more implicit expressions of probability in the psychiatric genre. The overuse of “May” observed in the DSM (Table 2) could be a potential explanation, but detailed analysis of the uses of the modal is needed to verify this hypothesis.

#### **ADHD behavioral traits: Recurrence and probability as marks of clinical significance**

The main modality type identified in the ADHD section is the usuality subtype of modalization. The majority of modalizers are objective-oriented (i.e., the speaker/writer does not stand as the source) and present a middle value (Table 5).

These findings resonate with previous studies of modality in medical research articles, which reported a predominance of median and low modality values and frequent uses of implicit subjective orientation (Yang et al., 2015). Modality functions differ across the genres: medical articles tend to use modality to express the writers’ commitment to truth and negotiate with the readers (Yang et al., 2015, p. 9); in the DSM, modality also plays an important role in defining symptomatic behavior.

**Table 4.** Modality in the ADHD corpus compared to the ODD corpus.

	Observed frequencies		Expected frequencies		Over/under-use	Log Likelihood	Normalized frequencies	
	ADHD	ODD	ADHD	ODD			ADHD	ODD
<i>May</i>	43	9	33.04	18.96	+	9.24	0.01221	0.00445
<i>Often</i>	24	15	24.78	14.22	-	0.07	0.00681	0.00742
<i>Must</i>	5	4	5.72	3.28	-	0.24	0.00142	0.00198
<i>tend(s) to</i>	4	0	2.54	1.46	+	3.63	0.00114	0.00000
<i>(un)common(ly)</i>	6	7	8.26	4.74	-	1.62	0.00170	0.00346
<i>more likely/unlikely/likelihood</i>	5	0	3.18	1.82	+	4.53	0.00142	0.00000
<i>probable/probability</i>	1	0	0.64	0.36	+	0.91	0.00028	0.00000
<i>typically</i>	3	4	4.45	2.55	-	1.23	0.00085	0.00198
TOTAL words (corpus)	3,523	2,021						



**Table 5.** Modality types in ADHD representation.

Modality resources	Hits	Type	Orientation	Value	Context of use
<i>May</i>	43	Modalization: Probability & Usuality	Subjective	Low	- Diagnostic criteria - Diagnostic features - Associated features - Development and course - Risk and prognostic factors - Culture-related diagnostic issues - Functional consequences - Differential diagnosis
<i>Often</i>	24	Modalization: Usuality	Objective	Middle	- Comorbidity - Diagnostic criteria - Associated features - Development and course - Functional consequences
<i>Must</i>	5	Modalisation: Probability (& Modulation)	Subjective	High	- Comorbidity - Diagnostic features - Differential diagnosis (modulation)
<i>Tend(s) to</i>	4	Modalization: Usuality	Objective	Middle	- Diagnostic features - Functional consequences - Differential diagnosis
<i>(un)common(ly)</i>	6	Modalization: Usuality	Objective	Low/Middle	- Associated features - Development and course - Differential diagnosis - Comorbidity
<i>More likely/ unlikely/ likelihood</i>	5	Modalization: Probability	Objective	Middle/Low	- Risk and prognostic features - Gender-related diagnostic issues - Functional consequences
<i>Probable/ probability</i>	1	Modalization: Probability	Objective	Middle	- Functional consequences
<i>Typically</i>	3	Modalization: Usuality	Objective	Middle	- Diagnostic features - Differential diagnosis

Table 5 summarizes the contexts in which the modality expressions were observed in the ADHD section, notably: descriptions of the diagnostic criteria and features, and differential diagnoses. The preponderance of usuality modalizations in descriptions of symptomatic traits suggests that recurrence is an important factor for a behavioral trait to be clinically significant. The middle-value of the modalizers allows descriptions to have increased applicability to potential cases, preventing under-diagnosis. Behavioral traits need not be *always* present to be considered clinically significant.

The most recurrent modal expressions, “often” and “may,” are examined in more detail below; the quantitative overview showed their relevance for the portrayal of ADHD, and revealed that they are also characteristic of the DSM more generally.

#### (i) Often

The frequency adverb “often” is typical in all the corpora examined, notably in the ADHD section. The adverb is mainly used to formulate the 18 symptoms that define inattention and hyperactivity-impulsivity (APA, 2013, pp. 59–60) (examples 1–4), and to formulate common correlations with ADHD (examples 5–6).

- (1) Often fails to give close attention to details [-*Judgment: Capacity*]
- (2) Is often easily distracted by extraneous stimuli [-*Judgment: Capacity*]
- (3) Often interrupts or intrudes on others [-*Judgment: Propriety*]
- (4) Often leaves seat in situations when remaining seated is expected [-*Judgment: Propriety*]

Examples (1–2) correspond to inattention, and examples (3–4) to hyperactivity-impulsivity. Evaluations are annotated in square brackets and the “-” sign indicates negative valence. Besides representing regularity, “often” stresses the lack of capacity or propriety of the conduct, functioning as an evaluative intensifier. While negative evaluations are inferred from the behavior or the circumstances in which that behavior occurs (underlined), it is not the conduct on its own which signals clinical significance, but the usuality modalizer (“often”) that depicts the problematic behavior as recurrent.

In examples 5 and 6 “often” is employed to depict difficulties frequently correlated with ADHD.

- (5) Even in the absence of a specific learning disorder, academic or work performance is often impaired. [-*Judgment: Capacity*]
- (6) Peer relationships are often disrupted by peer rejection, neglect (...)

When “often” traces correlations between ADHD and particular outcomes, the frequency associated with “often” connotes probability. If academic performance is “often impaired” among the ADHD population, individuals with the diagnosis will be attributed a higher probability of developing academic difficulties than somebody without the condition. Thus, “often” can function as a mark of usuality (as described in SFL) or probability depending on the context and genre. In the DSM, the recurrence of a trait with a condition is interpreted in probabilistic terms, and the recurrence and probability of particular behaviors and outcomes constitute a mark of pathology.

**Table 6.** Functions of “may” in the DSM-V’s description of ADHD.

Type: Epistemic-oriented (Modalization: Probability & Usuality)	Examples
(1) Expression of a strong or “certain” possibility	<ul style="list-style-type: none"> <li>• “Impulsive behaviors <b>may</b> manifest as social intrusiveness”</li> <li>• “The increased motoric activity that <b>may</b> occur in ADHD”</li> </ul>
(2) “Objective possibility.” A fact X has been evidenced as occasionally being the case.	<ul style="list-style-type: none"> <li>• “e.g., (...) <b>may</b> start using other people’s things without asking or receiving permission (...)”</li> <li>• “individuals with ADHD <b>may</b> exhibit cognitive problems”</li> </ul>
(3) Expression (mainly) of hypothesis. The fact is possible in logical terms but assumption of low probability.	<ul style="list-style-type: none"> <li>• “A minority of cases <b>may</b> be related to (...) aspects of diet”</li> <li>• “There <b>may</b> be a history of child abuse (...)”</li> <li>• “Family interaction patterns (...) are unlikely to cause ADHD but <b>may</b> influence (...)”</li> </ul>

*(ii) May*

In consonance with previous research, which identified “may” as the modal with the highest frequency in scientific writings (Hyland, 1998, p. 356; Piqué et al., 2001, p. 216; Salager-Meyer, 1992, p. 105), “may” is the most recurrent modal expression across all the corpora. “may” indicates possibility, the lowest level of epistemic modality (Halliday & Matthiessen, 2004, p. 148), thus allowing for a range of “hedging possibilities” to construct cautious statements (Facchinetti, 2003, p. 316; Salager-Meyer, 1992, p. 105). Scientific productions also use the modal as a mark of “pretension of universality” (Salager-Meyer, 1992, p. 105). In those cases, “may” does not undervalue the statement but presents the findings as non-conclusive. In scientific writings, “may” can also take an “existential” value to account for the factuality of a possibility (Facchinetti, 2003, pp. 304–305). This variety of uses explains the range of contexts identified for “may” in Table 5. Following these observations, the functions of “may” in the ADHD section are distinguished as described in Table 6.

While all three uses of “may” identified in Table 6 involve the expression of probability and usuality, they involve different degrees of certainty attribution. In Level 1, “may” identifies highly probable situations, such as common behavioral manifestations of core symptoms. In the examples, “intrusiveness” is a consequence of impulsivity-hyperactivity which implies, by definition, intensive behavior. In Level 2, “may” connotes that the facts are occasionally the case, but their presentation varies depending on the individual. In Level 3, “may” expresses hypotheses, situations that could influence the development of ADHD but that lack full support in the psychiatric community. “May” acknowledges the hypothesis by expressing little endorsement and avoiding overt disapproval.

Modality constitutes an important resource in describing ADHD, defined as a cluster of behavioral traits characterized by a high recurrence and probabilities of presenting specific outcomes. Despite the importance of such recurrence and probability in portraying clinical significance, modality shows middle and low values, leaving room for the clinician’s professional judgment of each individual case. The quantitative analysis enables us to extrapolate these observations about ADHD and hypothesize that recurrence and probability of behavior constitute crucial factors in determining the clinical significance of abnormal behavior.

**Discussion**

The analysis has shown the importance of modality in the DSM genre and its centrality in descriptions of behavior pathology. In intensifying the evaluations of behavioral traits and stressing

the recurrence and probability of certain condition-related difficulties, modality constitutes a linguistic mark of clinical significance. ADHD descriptions show that it is not the presence of a trait what is deemed of medical attention, but the high levels of recurrence or probability attributed to it.

Although modality is a significant resource of the DSM, its uses vary across the descriptions of different disorders, even between close-related conditions, such as ADHD and ODD. The high reliance on modality in the ADHD description may be explained by the wide range of behavioral manifestations that inattention and hyperactivity-impulsivity involve. The adverb “often,” for example, is mainly used to portray symptomatic behavior in both ADHD and ODD descriptions. The ADHD diagnostic criteria include 18 traits, and 21 occurrences of “often” out of 24 belong to this section; in contrast, the ODD diagnostic criteria only include 8 traits, but 13 occurrences of “often” out of 15 are used in the section. These observations suggest that descriptions of conditions with a high variety of behavioral manifestations will need more modality expressions to define the symptoms.

The evaluative function of modality coheres with other qualitative graduations used to describe ADHD traits which have occasionally been deemed redundant (Wakefield, 1997, pp. 641–642), for example: “substantial clinical presentation,” “clinically significant distress or impairment (...),” “symptoms result in marked impairment.” While such descriptions would be redundant if disorders were understood as exclusionary categories, a spectrum understanding recognizes that some behavioral traits may be present, and yet be assessed as being within the limits of the ordinary. Graduation assessments constitute the differentiating mark between ordinary behavior and distress, and traits considered worth medical attention.

Reliance on modality and other graduation resources as marks of clinical significance highlights the importance of the clinician professional judgment in assessing abnormal behavior. Although such formulations might seem obvious, they bring into question the cross-cultural applicability of the descriptions: cultures may show different thresholds in assessing behavior; different value attribution to grading expressions offers an explanation to divergent diagnostic rates observed across countries. Identifying modality as a central resource of the DSM, and the employment of modal expressions in materials to be used by non-experts, also cast doubt on its interpretation by the lay community in those cases where their judgment is required to inform the diagnosis. The goals and conventions of institutional discourses often involve constraints on the meaning of terms and inferences associated with them (Drew & Heritage, 1992, p. 22; Levinson, 1992, p. 72). While these conventions

are well-understood by the professional members of the medical institution, non-experts may infer different interpretations, especially when the communication materials use the evaluative wordings employed in the medical genre or very similar ones, as the ADHD rating scales. These considerations highlight the importance of health literacy among the lay community and stress the need of accessibility in health materials aimed at non-experts. When evaluative resources are used, it is important to clearly specify how they are interpreted in the context considered – for example, indicating the degrees of recurrence and probability expressions (how often “often” is, how probable “may” is). Besides supporting non-experts, clarity in evaluation interpretation can also elucidate cross-cultural evaluative differences.

## Notes

1. Examples of publicly available rating scales are: The SNAP-IV Teacher and Parent Rating Scale; Vanderbilt ADHD Diagnostic Teacher Rating Scale; Vanderbilt ADHD Diagnostic Parent Scale; ADHD Rating Scale-IV: Home Version; Adult ADHD Self-Report Scale (ASRS-VI.I) Symptom Checklist; DIVA 2.0 –Diagnostic Interview for ADHD in Adults.
2. Available at: <http://ucrel.lancs.ac.uk/llwizard.html> (accessed 01 May 2022).
3. Correspondences can be found at: <http://ucrel.lancs.ac.uk/llwizard.html> (accessed on the 7 September 2021).
4. Overuse is identified when the normalized frequency of an expression in the corpus considered (i.e., the first column on the left in Table 2 –Table 4) is superior to the normalized frequency of the same expression in the corpus of comparison.

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## ORCID

Sara Vilar-Lluch  <http://orcid.org/0000-0002-5495-9386>

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