

Investigating self-reported compensation strategies for attention-deficit/hyperactivity disorder on Reddit: An analysis of user content from 2012-2023 with a focus on trends during COVID-19

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Abstract

Background: Across the lifespan, attention-deficit/hyperactivity disorder (ADHD) can cause functional impairments in various domains, with adults often employing compensation strategies to mitigate these deficits. Recently, the social media platform, Reddit, has become a valuable platform for disorder-specific exchanges, particularly in subreddits like r/ADHD.

Objective: This investigation explored the visibility and engagement around self-reported compensation strategies in r/ADHD content between 2012-2023, assessing the range of skills and practices evident for symptom management. Specifically, the study aimed to ascertain whether r/ADHD content corresponded with a five-category taxonomy developed in prior research, which identified Social, Organizational, Attentional, Motor, and Psychopharmacological strategies. Relatedly, the methodology sought to understand the impact of the COVID-19 pandemic on these discussions through longitudinal trends.

Methods: Using a custom-written code, we extracted a corpus of 134,437 posts and comments from 55,688 r/ADHD users that contained phrases related to ADHD compensation strategies. Subsequently, a two-tiered analysis was applied to evaluate the relevance of this content and label it into distinct groups. This involved a machine learning approach incorporating a large language model with human in the loop for review and classification based on the existing five-category framework. Having excluded content with no discernible techniques and duplicates, this resulted in a dataset grouped by compensation strategies of 78,340 posts and comments from 41,019 r/ADHD users and 739,620 upvotes. Quantitative totals were then visualized by year to capture temporal discourse patterns.

Results: The majority (90.08%) of the 78,340 eligible posts and comments on r/ADHD could be categorized into the five groups (Social, Organizational, Attentional, Motor, and Psychopharmacological). The remaining 9.92% of content (7,772 posts and comments) required two newly-found classifications (Self-Care and Help-Seeking) to reflect the additional types of compensation strategies described in this online community. Longitudinally, there was observable growth in both r/ADHD content and users in the COVID-19 pandemic, demonstrating increased online engagement with compensation strategies during this time.

Conclusions: These results contribute to the wider understanding of ADHD symptom management, suggesting a consistency between perspectives on r/ADHD and existing literature about compensation strategies. Nevertheless, the identification of new strategies also highlights the evolving nature of symptom mitigation and the value of Reddit as an information source. Likewise, growth in r/ADHD dialogues throughout the COVID-19 pandemic signifies an interest in compensation strategies during adaptive and stressful intervals. Online communities could serve as beneficial outreach platforms for expert guidance and psychoeducation to address real-world challenges for individuals with ADHD.

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Original research paper

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Data Availability

The code used during this study and the dataset of the results are available in Open Science Framework Storage: https://osf.io/g8st9/?view_only=5517e2832342403c82e23da9938a02d8

Declaration of competing interests

The authors have no competing interests to declare.

Keywords

ADHD; Compensation strategies; Reddit; COVID-19; Symptom management; Social media analysis

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1. Introduction

1.1. Attention-deficit/hyperactivity disorder and compensation strategies

Attention-deficit/hyperactivity disorder (ADHD) is a neurodevelopmental disorder characterized by patterns of inattention and/or hyperactivity-impulsivity that disrupt functioning or development in several areas of life [1]. Despite its associations with younger age groups, evidence indicates that ADHD often continues into later life; pooled prevalence rates for this disorder in adulthood range from ~2%~3.5% (e.g., [2-4]). Nevertheless, ADHD remains underacknowledged and underdiagnosed in adult populations due to complex determinants, shaped by sociocultural paradigms, stigma, and limited health literacy [5,6].

ADHD symptom presentations in adulthood typically diverge from younger demographics, reflecting a dimensional shift in their profile and impact over time [1,7]. In adults, hyperactivity may exhibit as fidgeting and externalized restlessness, inattention can entail forgetfulness, unreliability, or disorganization, motor hyperactivity may present itself as an inner restlessness, and impulsivity can manifest through recurrent occupational instability, relationship changes, and involvement in civil and criminal disputes [8,9].

Accordingly, ADHD may engender deleterious outcomes over the lifespan across academic, vocational, and interpersonal domains, and beyond [1,4,10]. These can induce difficulties related to organization, parenting, job performance, domestic disorder, elevated accident risks, psychosocial pressures, and additional issues [10-12]. Likewise, individuals with ADHD may be more prone to develop psychiatric comorbidities than the general population [13].

Consequently, people with ADHD often adopt compensation strategies to navigate these challenges (e.g., [8,14-18]), some of which they may initiate independently prior to a formal, professional diagnosis. Following previous definitions used elsewhere [8,16], compensation strategies can be described as psycho-behavioral activities or adaptive processes and skills that mitigate the functional impairments resulting from ADHD symptomatology, with some appearing highly effective and others less so. Interestingly, certain strategies devised by affected individuals may closely resemble those formally recommended in psychotherapeutic treatments for ADHD, such as Cognitive Behavioral Therapy programs [19].

Contingent on individualized factors and symptom profiles in adults, compensation strategies can vary in functionality and may encompass adaptive and maladaptive practices [8,14-18]. Maladaptive behaviors may include drug consumption, particularly of illicit substances, to temporarily mask the effects of ADHD, which can lead to the clinical misrecognition of symptoms or delayed diagnoses

[20]. Moreover, the tendency to adopt certain strategies may be greater in stressful situations or when symptoms become more pronounced [14].

Given the variation in ADHD compensation strategies, there have been demarcations between internal processes (e.g., implementing cognitive techniques, emotional skills, or memory aids) and external procedures (e.g., using a diary, seeking assistance from others, drug use, reducing environmental stimuli, and engaging in physical activities) [8,16,21]. Analogously, across different studies, classifications for compensation strategies have been further refined [8,16]. For example, to capture the nuances of their findings, Canela et al. categorized ADHD compensation strategies into a taxonomy of five discrete groups [8]. These were: *Social*: adopting skills in interpersonal situations to diminish the effects of symptoms, such as fidgeting, forgetfulness, or impulsive behavior; *Organizational*: methods used by people with ADHD to improve their organization in personal lives and work environments; *Attentional*: strategies to manage distracting stimuli and maintain attention; *Motor*: physical activities to attenuate ADHD symptoms; *Psychopharmacological*: the consumption of drugs perceived to have a beneficial effect for ADHD, ranging from cocaine, MDMA and THC to nicotine, alcohol and caffeine, among others [8].

1.2. Attention-Deficit/hyperactivity disorder, online communities, and r/ADHD

Recently, social media has provided an important venue for individuals with particular health conditions to describe real-world insights and share common narratives, leading to the foundation of disorder-based peer support groups [22]. Specifically, for ADHD, online communities have facilitated information exchanges around symptomatology, medication, help-seeking, and interpersonal functioning (e.g., [23,24]).

Within this context, Reddit has offered a prominent platform for these dialogues owing to its structured subreddits and the pseudonymous nature of its interactions. Approximately four hundred and eighty million monthly Reddit users are able to post content, comment on discussions, and vote on posts to influence their popularity; Reddit users are predominantly White males aged between 18-29 and based in the United States [25].

Across different inquiries, subreddits have become a rich data source for garnering individual perspectives about various mental health issues, like substance use disorder, eating disorder, depression, anxiety, and ADHD [23,25-27]. This was particularly apparent in the COVID-19 pandemic, where subreddits were a valuable resource for individuals with mental health disorders who were experiencing social isolation and lacking access to conventional forms of support [28].

Notably, Reddit hosts a publicly-available English-language community dedicated to ADHD (r/ADHD), which at the time of writing has ~1.8 million members [29]. r/ADHD is a “disability-oriented peer support group for people with ADHD with an emphasis on science-backed information”, encouraging users to disseminate “stories, struggles, and non-medication strategies” [29]. Previously, researchers have used r/ADHD to explore salient topics about ADHD and evaluated how user experiences corresponded with diagnostic criteria [23,30].

1.3. The present study

The current study examined self-reported compensation strategies described on r/ADHD, using online community data from 2012-2023 to quantitatively assess the visibility and engagement around this topic (measured by user posts, comments, and upvotes) and longitudinal discourse patterns. Specifically, this project sought to label the practices and skills discussed by r/ADHD users and ascertain whether they corresponded with past classifications, particularly the taxonomy from Canela et al. that was utilised as a benchmarking framework in the methodology [8].

We envisaged that we would identify a wider array of symptom management techniques on r/ADHD than earlier work using conventional research designs (e.g., qualitative interviews and psychometric assessments), which would require expanded categorization. This was informed by the anonymous nature of r/ADHD in allowing for open and instantaneous exchanges, as has been noted for various subreddits [31]. Equally, the inclusion of longitudinal data up to 2023 might have captured emerging strategies or social shifts not represented in earlier, cross-sectional analyses.

Our secondary hypothesis predicted discernible content growth about ADHD compensation strategies throughout the COVID-19 pandemic. For the scope of this investigation, we defined this timeframe as spanning from March 2020, when the World Health Organization declared a global outbreak, to May 2022, when the majority of countries had lifted all COVID restrictions. This period was marked by pronounced socioenvironmental risk factors (e.g., lockdowns and barriers to care pathways), alongside disruptions to daily life routines and structure [32,33]. These circumstances could have increased tendencies to adopt compensation strategies and heightened help-seeking on r/ADHD; in this regard, other findings from r/ADHD illustrated distinctive stressors during COVID-19, detecting negative semantic changes and increases in health anxiety themes [34].

2. Methods

2.1. Data extraction

Following methodologies implemented elsewhere [35], in June 2023, we utilised Reddit's freely-accessible application programming interface (API) to extract posts and comments and upvote data from r/ADHD. This was facilitated through Python code written in a Jupyter Notebook [36]. To comply with Reddit's recent rate limits of one hundred queries per minute [37], the code accounted for waiting times and is available online through the Open Science Framework repository [38].

Based on established practices for collecting Reddit data [39], the dataset was created by downloading all r/ADHD content that replied to a post with at least one of these phrases: "How do you handle", "how do you manage", "how do you deal with", "compensation strategy", "compensation strategies", and "dealing". This resulted in a corpus of 134,437 user-generated posts and comments from r/ADHD between 12th April 2012 and 14th June 2023.

2.2. Data analysis

We used a two-tiered machine learning with human in the Loop (HITL) approach to analyze the dataset [40] and compare the self-reported compensation strategies with the categories from Canela et al. as a benchmark model (i.e., *Social*, *Organisational*, *Attentional*, *Motor*, and *Psychopharmacological*) [8]. Initially, we leveraged OpenAI's Large Language Model (LLM) GPT-Turbo-3.5 for a weak supervision strategy, focused on distinguishing the main compensation strategies. Weak supervision methodologies have proven useful for annotating sizeable datasets [41]. Moreover, the employment of an LLM was influenced by the promising performance of these models in tasks to structure disparate information [42].

Our code used GPT-3.5-Turbo to evaluate each comment and the accompanying post. For ease of analysis, the instructions given to the model established that the compensation strategy should be phrased in three words or less (see: [38]). Furthermore, if the r/ADHD posts and comments exhibited no clear strategy, the label was given as "no_strategy", and if the content contained two or more techniques, it would be flagged for manual assessment.

Although LLMs can accelerate these tasks, there are limitations for ChatGPT in producing accurate data annotation [43]. Accordingly, together with the posts with more than one compensation strategy, a sample analysis of the dataset and labelling was periodically conducted by the research team to ensure a higher level of robustness. In cases of disagreement, another member of the team was consulted, and consensus was sought. Duplicate posts and comments were also removed from the dataset prior to formal analysis.

Per this methodology, out of the initial 134,437 posts and comments, 58.27% had an identifiable self-reported compensation strategy and were included in the analysis. This yielded a corpus of 78,340 posts and comments from 41,019 r/ADHD users, which were eligible for HITL labelling (see: [38]). The purpose of this labelling was not to achieve a taxonomy of mutually exclusive classifications [44], but a foundation that allowed for comparisons between r/ADHD content and the categories from Canela et al. [8]. Consequently, if the LLM had labelled the strategy from r/ADHD content as "marathon training" instead of "running", the label was not changed, as the overarching classification remained, and the comment could be grouped as part of the *Motor* segment.

Subsequently, post and comment volumes for each category were visualized by year to track and

quantitatively map annual occurrences and temporal shifts. It should be noted that through Reddit's API, chronological information about upvotes is not available. However, the overall number of upvotes was obtained and is presented in the results.

2.3. Ethical considerations

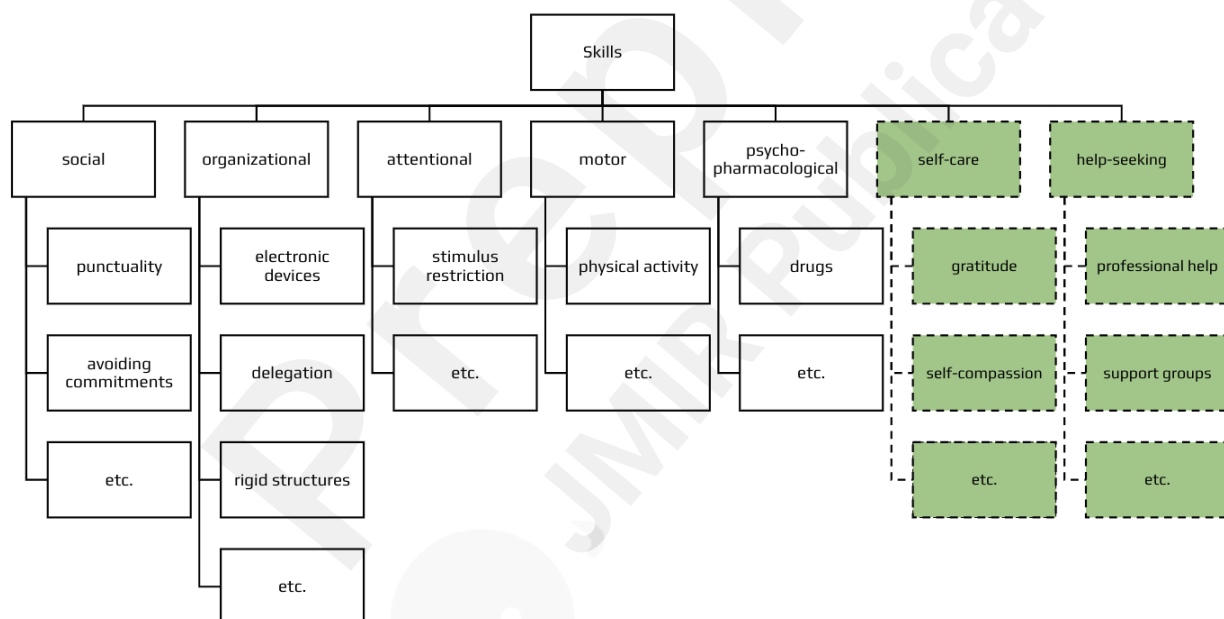
As per previous inquiries into mental health topics on Reddit (e.g., [24-26,34]), this investigation did not involve direct human participation or recruitment protocols and the research group did not engage in any discussions on r/ADHD. All analyzed data pertaining to posts, comments, and upvotes was freely accessible and extracted with Reddit's open API, through which no identifiable information is available (e.g., user locations, Internet Protocol addresses, and personal names). Therefore, this study does not fall under the remit of the Human Research Act in Switzerland. Nonetheless, given evolving best practices for Reddit research [39], all usernames were anonymised after data extraction to nullify any conceivable harms and to further uphold ethical integrity.

3. Results

3.1. Compensation strategy classifications

90.08% of the 78,340 eligible posts and comments on r/ADHD from 2012-2023 could be grouped into the existing five-category model (i.e., *Social*, *Organizational*, *Attentional*, *Motor*, and *Psychopharmacological*) [8]. The remaining 9.92% of posts and comments fell outside these existing classifications. Consequently, based on our analysis, this led to the formation of two additional and separate clusters, namely: *Self-Care* and *Help-Seeking*. The expanded seven-group taxonomy of compensation strategies found on r/ADHD is displayed in Figure 1.

Figure 1. Expanded framework for ADHD compensation strategies identified on r/ADHD.



Posts and comments that were grouped into the *Self-Help* category discussed the adoption of internalized or mindful practices and skills, such as gratitude and self-compassion, and a prioritization of overall personal wellbeing. Users reported that these behaviors enabled them to manage ADHD symptoms and enhanced emotional resilience. An illustrative post from r/ADHD from the *Self-Care* classification is presented in Text Box 1.

Text Box 1. Sample post from the *Self-Care* category identified on r/ADHD.

I have two flavors of these days:

- I decide fairly early in the day, "I'm just not feeling it today," and cancel appointments and just hang around, nap, read a book--feels a lot like giving myself a break, or self-care.
 -The non-self-care days. Like yesterday, a friend was supposed to get in touch in the morning about going for a walk. She didn't. And I didn't call her, and I didn't know what to do, hung around waiting for a while just in case, then felt bad about myself, and just wasted the rest of the day getting nothing done, in an unfocused/unsettled way. Didn't feel like self-care; felt like I was trapped in something and couldn't escape. Come to think of it, these days happen a lot when my plans get cancelled by someone/something else.

The *Help-Seeking* category consisted of posts and comments in which users actively engaged with external assistance or resources to manage functional deficits from a non-pharmacological perspective. This included professional help from specialists, therapy, and coaching. Equally, *Help-Seeking* content highlighted the role of informal connections, such as engagement with ADHD peer support networks.

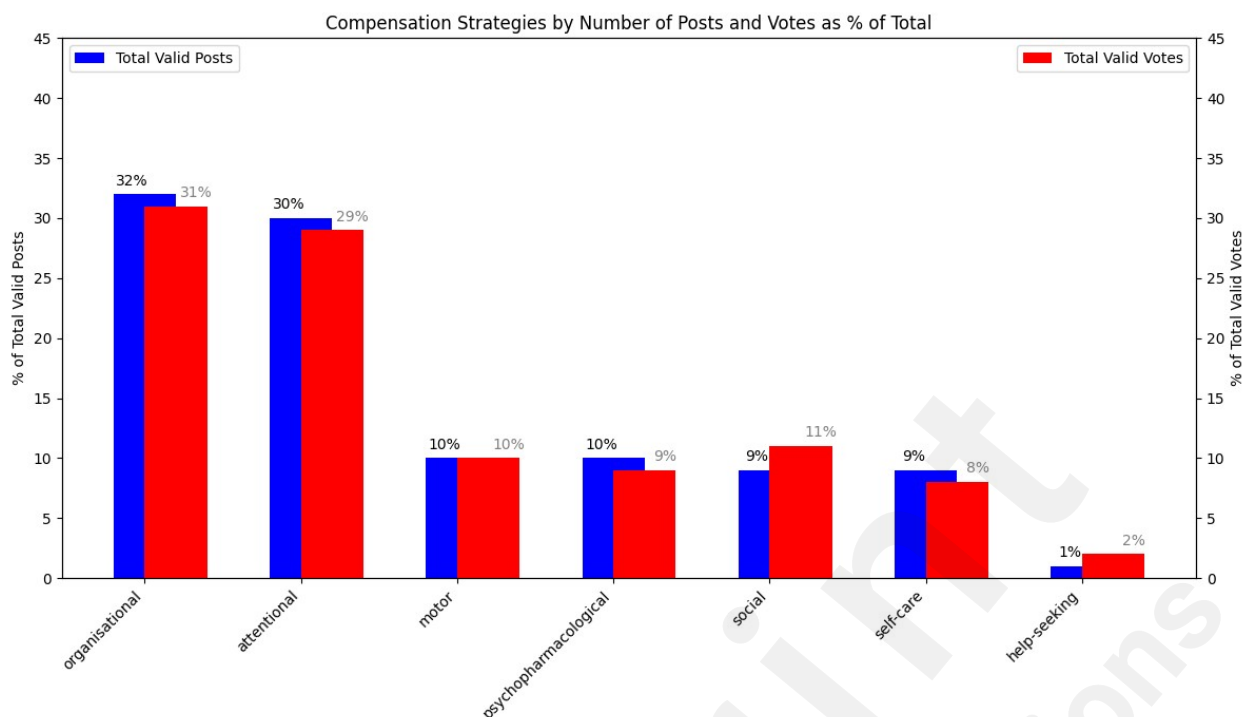
That said, it is important to note that posts and comments about stimulant psychopharmacological treatment for ADHD were not included in the *Help-Seeking* category and were classified separately in the *Psychopharmacological* group. A *Help-Seeking* post from r/ADHD is outlined in Text Box 2. Text Box 2. Sample post from the *Help-Seeking* category identified on r/ADHD.

*If you can afford it, an ADHD coach.
 Therapy is also very important, but coaching helps develop better habits and focused on Cognitive Behavior Therapy (which is reprogramming your neuro pathways).
 Not being medicated is tricky, but pills don't teach skills. You can start small and try to build little habits, and it will compound.*

3.2. Visibility and engagement around compensation strategy categories on r/ADHD

From the r/ADHD taxonomies shown in Figure 1, the *Organizational* grouping received the highest visibility and engagement, with 24,771 posts and comments (31.62% of the total 78,340 eligible posts and comments from 2012-2023) and 231,723 upvotes (31.33% of total 739,620 upvotes). This was followed by *Attentional* with 23,534 posts and comments (30.04%) and 212,863 upvotes (28.78%), *Motor* with 8,030 posts and comments (10.25%) and 70,707 upvotes (9.56%), *Psychopharmacological* with 7,544 posts and comments (9.63%) and 69,894 upvotes (9.45%), *Self-Care* with 6,871 posts and comments (8.77%) and 59,687 upvotes (8.07%), and *Help-Seeking* with 901 posts and comments (1.15%) and 12,056 upvotes (1.63%). The *Social* category had 6,690 posts and comments (8.54%), placing it fifth for content volume, and 82,690 upvotes (11.18%), ranking it third by this metric. The percentage of posts and comments and upvotes for each classification as a proportion of the respective totals can be seen in Figure 2.

Figure 2. Chart displaying compensation strategy groups by number of posts and number of votes as % of total.



3.3. Temporal insights from r/ADHD content

Longitudinal data from r/ADHD presented in Figure 3 shows a significant increase in the total number of posts and comments across all compensation strategies in the key intervals of the COVID-19 pandemic (i.e., March 2020-May 2022). Equally, as displayed in Figure 4, this coincided with a rise in the overall number of unique users sharing their insights into symptom management methods in this timeframe.

Figure 3. Temporal view of content and unique users discussing ADHD compensation strategies on r/ADHD by year.

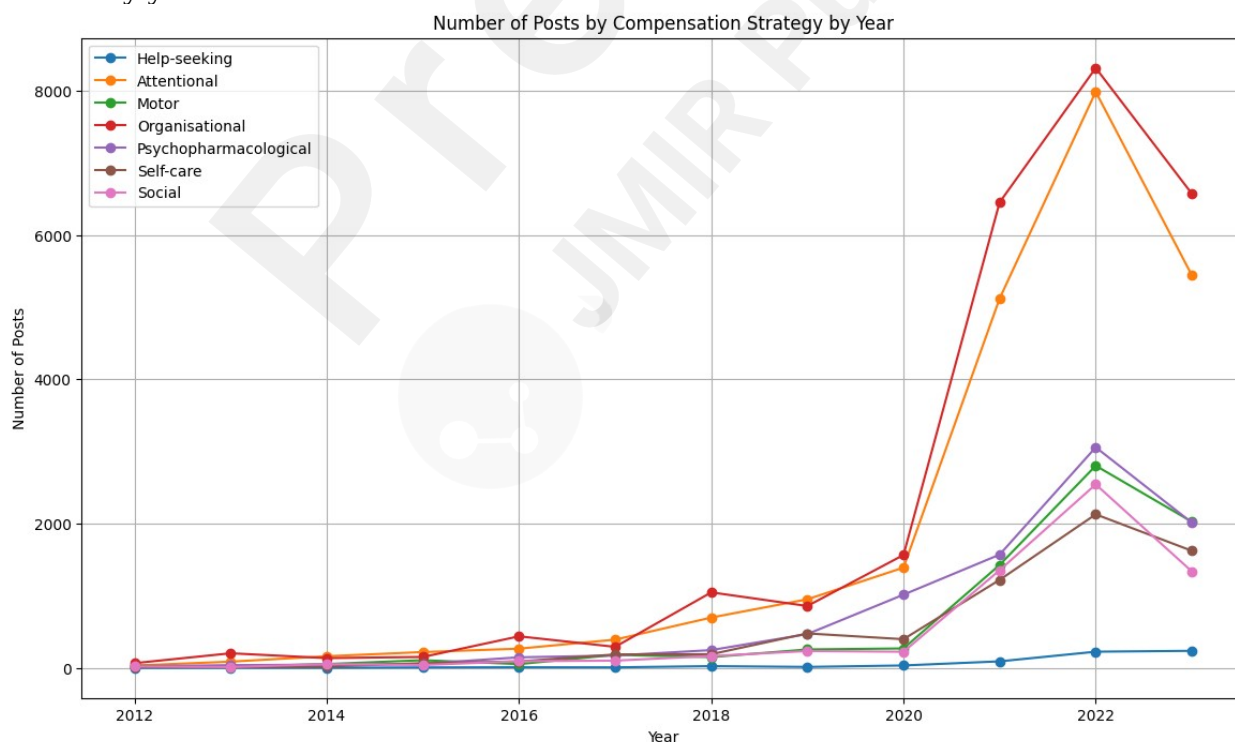
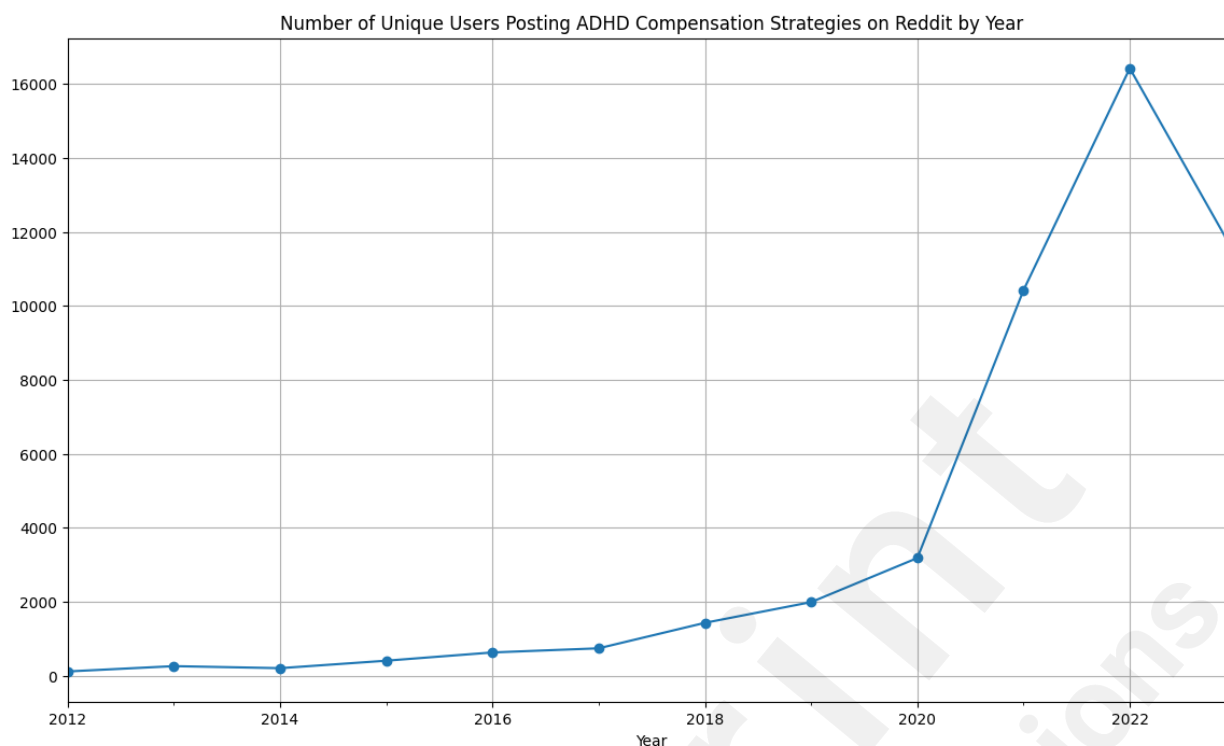


Figure 4. Temporal view of unique users discussing ADHD compensation strategies on r/ADHD by year.

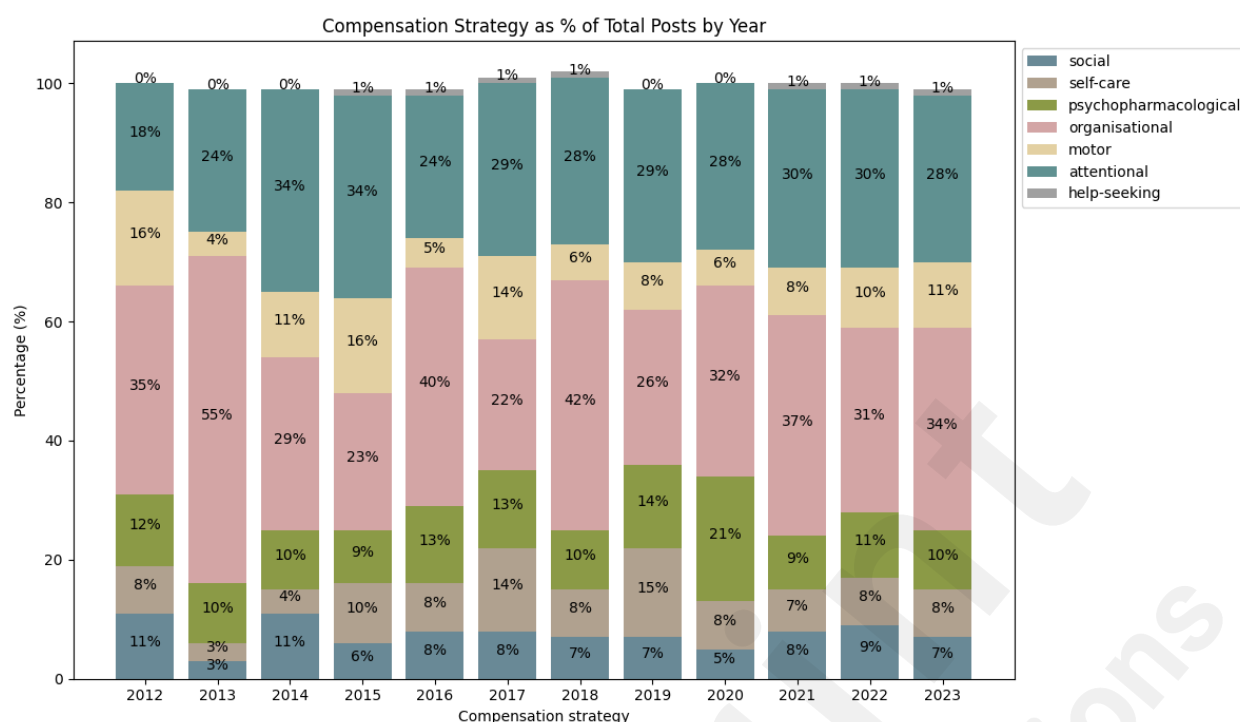


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compared to overall figures, the post and comment volumes for the seven compensation strategies remained largely consistent between 2012-2023, with a maximum deviation of 26.27% found in the *Organizational* category in 2013.

Nevertheless, the COVID-19 pandemic (2020-2022) saw interesting temporal trends across several groups. Notably, as measured by total posts and comments, the visibility of the *Psychopharmacological* category attained a proportional peak in interest on r/ADHD in 2020 (from 14.38% of total posts and comments on r/ADHD in 2019 to 20.73% in 2020) and this percentage declined in subsequent years. That said, total post and comment volumes for this classification continued to grow from 2020-2022 (from 1,015 posts in 2020 to 3,057 in 2022). Moreover, r/ADHD content that was grouped into the *Motor* and *Social* category decreased as a proportion of overall posts and comments from 2019-2020, before returning to similar pre-pandemic levels in the following years. The longitudinal data for the proportional visibility of each group is presented as a percentage in Figure 5.

Figure 5. Compensation strategies on r/ADHD as percentage of total content in the dataset by year.



4. Discussion

4.1. Compensation strategies on r/ADHD

To the authors' knowledge, this is the first study that assessed social media conversations for ADHD compensation strategies. Our primary hypothesis assumed a wider range of categories would be observable on r/ADHD than found through conventional methodologies; specifically, this was influenced by the open dynamics of Reddit and the inclusion of longitudinal data from 2012-2023. However, the majority of practices and skills (i.e., 90.08% of content/70,568 posts and comments) could be classified into the five-group taxonomy previously developed by Canela et al. [8], which was applied as a conceptual basis in our methodology. This suggests a consistency between r/ADHD quantitative data and other studies about the functional domains most impacted by ADHD symptoms and the types of strategies commonly employed to mitigate these challenges.

For example, the *Organizational* category ranked highest for combined posts and comments and upvotes (24,771 posts and comments and 231,723 upvotes), comprising strategies related to technological aids, external assistance for maintaining routines and structure, task delegation, and time management procedures. The significant incidence of these posts and comments corresponds with evidence elsewhere highlighting the detrimental implications of ADHD in these domains and the frequency with which individuals use such strategies for organization [8,16,18,45]. Likewise, in our results, there was a high proportion of content and upvotes for *Attentional* techniques (23,534 posts and comments and 212,863 upvotes), including socioenvironmental adaptations to remove stimuli and manage distractibility. Again, these findings are comparable to earlier investigations showing how people with ADHD enact analogous practices to improve attention regulation [8,16].

Centered around physical activity and exercise, discussions grouped in *Motor* category also attracted a considerable level of visibility and engagement on r/ADHD. This denotes an awareness about the ameliorative effects of physical activity for ADHD symptoms throughout this online community, which is supported by research demonstrating the associations between physical activity interventions and cognitive functioning, especially for attention impairments [46].

Interestingly, though still receiving a sizeable volume of posts, comments, and upvotes, the *Psychopharmacological* category ranked lower quantitatively than several non-pharmacological groups from 2012-2023 (i.e., *Organizational*, *Attentional*, and *Motor*), possibly indicating broader interest among r/ADHD users for alternative approaches. In this regard, this trend could be influenced by the focus of r/ADHD, which offers a space for "stories, struggles, and *non-medication*

strategies” (italics ours) [29] or that users lacked access to medications or had not received a verifiable ADHD diagnosis.

In addition to these similarities, our analysis did reveal two further content groupings compared to the framework from Canela et. al, with 9.92% of posts and comments from 2012-2023 (7,772 eligible posts) falling outside the five-category model. This included *Self-Care*, defined as the adoption of routines and behaviors to prioritize personal wellbeing or engender a sense of relaxation and fulfilment. The presence of these conversations aligns with emerging literature exploring the importance of *Self-Care* routines for people with ADHD [18]. Equally, in the authors’ opinion, the visibility and engagement around *Self-Care* strategies could be indicative of the openness and reduced self-stigma in this online community, as could the interest in the newly-identified *Help-Seeking* group. Notably, *Help-Seeking* emerged as a discernible category based on r/ADHD conversations, where users illustrated the value of support networks and non-pharmacological assistance for managing their symptoms (e.g., therapy and coaching).

The identification of these two classifications on r/ADHD may also be attributable to the methodology utilized by Canela et al., which focused solely on individuals who had received a formal diagnosis of ADHD from a therapist [8]. Resultantly, this may have meant that *Self-Care* and *Help-Seeking* behaviors exhibited by individuals without a formal diagnosis were overlooked. Similarly, the current study minimized the possibility of social desirability bias, given its reliance on observations of r/ADHD content rather than clinical interviews, as have previously been utilised to gain perspectives on ADHD compensation strategies [8,16]. As has been highlighted in other research projects, these dynamics corroborate the value and novelty of Reddit as an information source for collating individual experiences with ADHD [23,30,34].

4.2. r/ADHD compensation strategies and COVID-19

The longitudinal analysis of r/ADHD data revealed apparent quantitative rises in the volume of posts and comments about compensation strategies in the COVID-19 pandemic (March 2020-May 2022), alongside an upsurge in unique users in this period. Such temporal trends align with our secondary hypothesis that predicted that the COVID-19 pandemic would stimulate broader growth in the online visibility and engagement around techniques for symptom management. This was exemplified in 2022, where the highest content frequency and active users were evident.

Socioenvironmental determinants in the COVID-19 pandemic likely influenced these patterns, increasing user preferences to seek different strategies and practices online. For example, lockdowns, social isolation, and a lack of routine and structure created concomitant stressors for individuals with ADHD [32-34]. These circumstances could have conceivably prompted users to rely more on r/ADHD as an information resource, thereby amplifying the volume of content on this platform. In this regard, other literature has emphasized the role of Reddit communities as critical support networks during COVID-19, particularly for people with mental health conditions [28]. Equally, the impact of lockdowns and social distancing was perhaps observable in the proportional visibility in the *Motor* and *Social* groupings, which decreased from 2019-2020 before returning to similar pre-pandemic levels in subsequent years as COVID-19 measures eased.

Interestingly, there was limited growth in the *Help-Seeking* classification across this timeframe and this could have been shaped by wider impediments to care pathways and challenges in obtaining non-pharmacological support, especially at the beginning of the pandemic [47]. The socioenvironmental dynamics of COVID-19 could have unmasked a group of people affected by ADHD who were more likely to look for help on social media due to limited access to elective treatments during the pandemic [32,48]. Conversely, the *Psychopharmacological* category (including stimulant medication) had proportional rises in the early intervals of the COVID-19 pandemic (from 14.38% of posts and comments about compensation strategies on r/ADHD in 2019 to 20.73% in 2020) and an overall upsurge in content from 2020-2022.

Given the disruptions to care services caused by COVID-19, these temporal trends could instead imply a reliance on ADHD medication as a more accessible form of symptom management, which is

consistent with evidence showing stimulant prescription growth throughout COVID-19 [49]. Additionally, COVID-19 saw burgeoning general consumption rates for psychotropic substances (e.g., alcohol [50]). Again, these dynamics could be encapsulated by the expanded discourse patterns in the *Psychopharmacological* classification at this time.

4.3. Reddit and r/ADHD dynamics

Several community-specific factors could have influenced the types of compensation strategies represented on r/ADHD. Notably, the anonymous nature of Reddit allows for candid dialogues [31]. Yet, it is conceivable that users remained reluctant to describe certain compensation strategies on a publicly-accessible platform, albeit under a pseudonymous username. This could be applicable for illicit substances, which would also be limited by the scope of r/ADHD moderation policies [51]. Discrepancies between content and upvotes in our results may support this argument (i.e., 134,437 total posts and comments vs 1,230,456 upvotes), with users potentially more inclined to express their interest or agreement through upvotes rather than text-based engagement. Nonetheless, motivations behind Reddit upvotes are unclear and may not directly signal community intentions or approval [52]. Likewise, user characteristics could have affected the compensation strategies we distinguished; demographic data for subreddits is unobtainable but Reddit comprises a mainly male userbase across adults aged 18-29 based in the United States [25].

More generally, the substantial posts, comments, and upvotes available on r/ADHD demonstrates its importance as a platform for community engagement. As found in our analysis, r/ADHD allows for instantaneous and iterative dialogues, with users often commenting on suggested strategies to refine or create new methods for managing symptoms that are responsive to different circumstances. Consequently, r/ADHD could offer a promising avenue for targeted psychoeducation schemes about healthy and adaptive processes and behaviors that reach larger audiences and bridge cultural divides, which could be developed in conjunction with related stakeholders (e.g., community moderators).

To that end, r/ADHD has an “Ask Me Anything” feature [29], enabling ADHD specialists to answer real-time questions from users without giving personalized medical advice. Prior sessions have disseminated targeted guidance on non-pharmacological therapies for ADHD (e.g., [53]). Such schemes may be increasingly timely since individuals with ADHD have expressed unease about the level of misinformation in online communities [54], underlining a need for expert outreach and evidence-based recommendations.

4.4. Limitations and future research directions

This investigation provided an extensive overview about self-reported compensation strategies for managing ADHD symptoms using a sizeable dataset of posts and comments across r/ADHD from 2012-2023 and an innovative methodology predicated on machine learning and LLM processing with HITL. The findings encompass important community dialogues about ADHD compensation strategies and longitudinal discourse in the COVID-19 pandemic. The size of the dataset, alongside the ability to quantify preferences for specific skills and chart temporal patterns are significant strengths of this research. However, the study has several limitations that could be considered and addressed in future work.

Firstly, the two-tiered machine learning with HITL approach for data labelling may have led to the potential for misclassifications in compensation strategies. LLMs offer scalability and efficiency for processing large volumes of text data, but their precision and context comprehension can be inconsistent [40]. Specifically, these models may struggle with the subtleties of human language, including sarcasm, idioms, and domain-specific terminology, affecting their accuracy [55]. To counter this, members of the research team periodically conducted a sample analysis of the data and manually reviewed the labels given by the LLM.

Equally, the reliance on self-reported data from r/ADHD raises the possibility of biases that could

impinge upon the accuracy and representativeness of the findings. This subreddit contains an extensive user-base and without a full clinical description, it is not possible to ensure every individual discussing the topic of compensation strategies has a verifiable ADHD diagnosis or make inferences about symptom profiles, comorbidities, and treatment regimens. Resultantly, this also precludes any analysis of the interactions between ADHD symptom severity and applicable skills and practices.

Though the pseudonymous nature of Reddit can promote honest exchanges [31], users may still have selectively described their experiences and bespoke moderation policies for r/ADHD could have limited certain content. Moreover, definitive demographic information, such as age, gender, and geographical location, was not available through Reddit's API and as an English-language platform r/ADHD may not encompass distinct cross-cultural dynamics. While demographic data is not available at a subreddit level, evidence suggests that Reddit users may be disproportionately represented within the United States and among younger adult age groups (i.e., ages 18-25) [25].

These aspects restrict the ability to generalize the results to larger populations beyond the r/ADHD userbase, especially for cross-cultural or gender-based discrepancies. Despite this, the size of the dataset, consisting of 134,437 posts and comments from 55,688 users from 2012-2023, offers unique and unaltered perspectives on the perceptions and beliefs surrounding the usefulness of skills and compensation strategies within this community.

Future research could include a range of social media platforms and online domains beyond Reddit. With contemporary evolutions in discourse online, discussions on platforms like X, Facebook, Instagram, and TikTok could provide holistic perspectives on ADHD compensation strategies. Correspondingly, this cross-platform approach would facilitate the collation of insights into the sociocultural and demographic variations in how ADHD is managed and discussed. Finally, qualitative content analyses of online communities could be conducted to map the connections between ADHD symptom profiles and relevant adaptive processes, enhancing prior work on the contextual factors influencing different approaches.

4.5. Conclusions

This study explored the visibility and engagement around compensation strategies on r/ADHD from a dataset of 134,437 total posts and comments. The findings affirm the relevance of previous research into the types of techniques adopted by individuals with ADHD to mitigate their symptoms and improve functioning, while identifying two new content categories from r/ADHD conversations: *Self-Care* and *Help-Seeking*. Additionally, temporal quantitative analysis revealed how interest in these discussions grew during the COVID-19 pandemic, likely shaped by exogenous risk factors and socioenvironmental pressures.

Taken together, the results contribute to the understanding of ADHD compensation strategies, underlining the importance of digital platforms in facilitating valuable information exchanges. Accordingly, online communities could be leveraged for psychoeducational outreach to promote evidence-based guidance about ADHD symptom management.

Abbreviations

ADHD: Attention-deficit/hyperactivity disorder

API: Application programming interface

HITL: Human in the loop

LLM: Large language model

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Supplementary Files

Figures

Expanded framework for ADHD compensation strategies identified on r/ADHD.

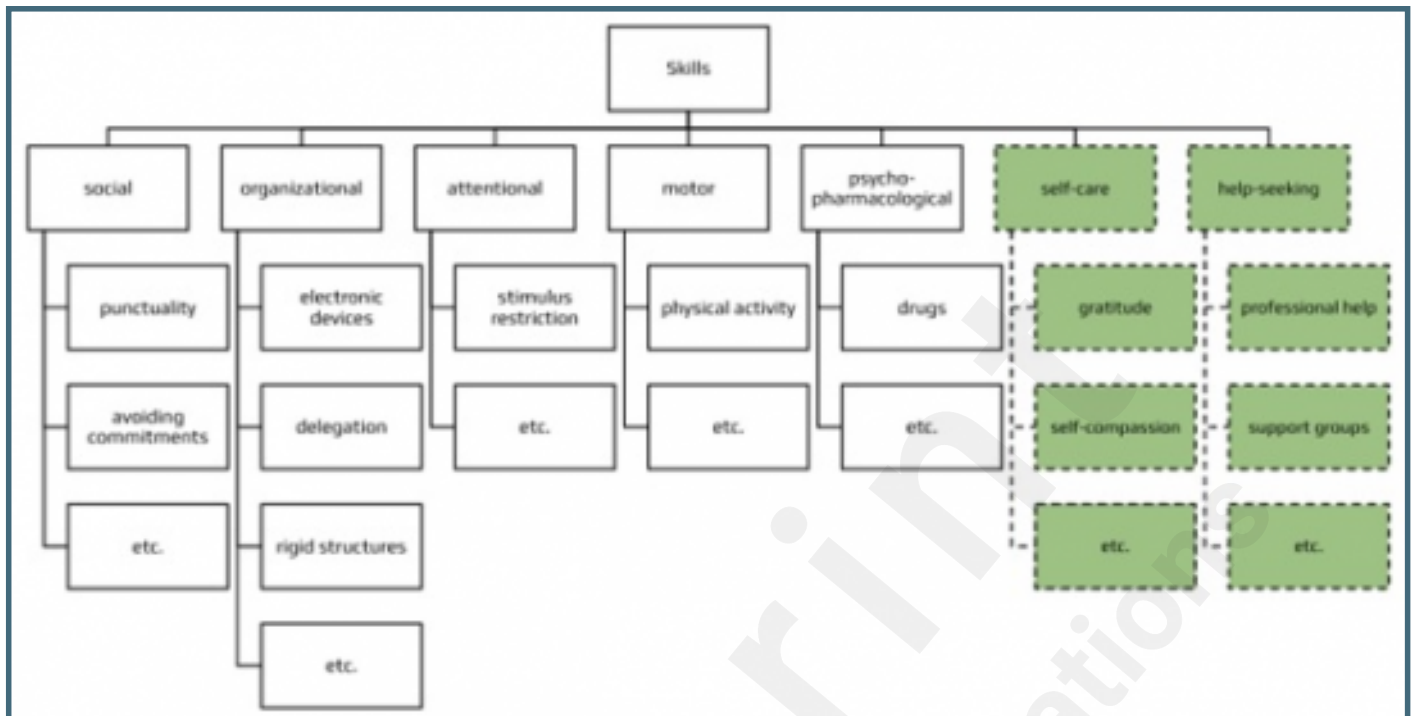
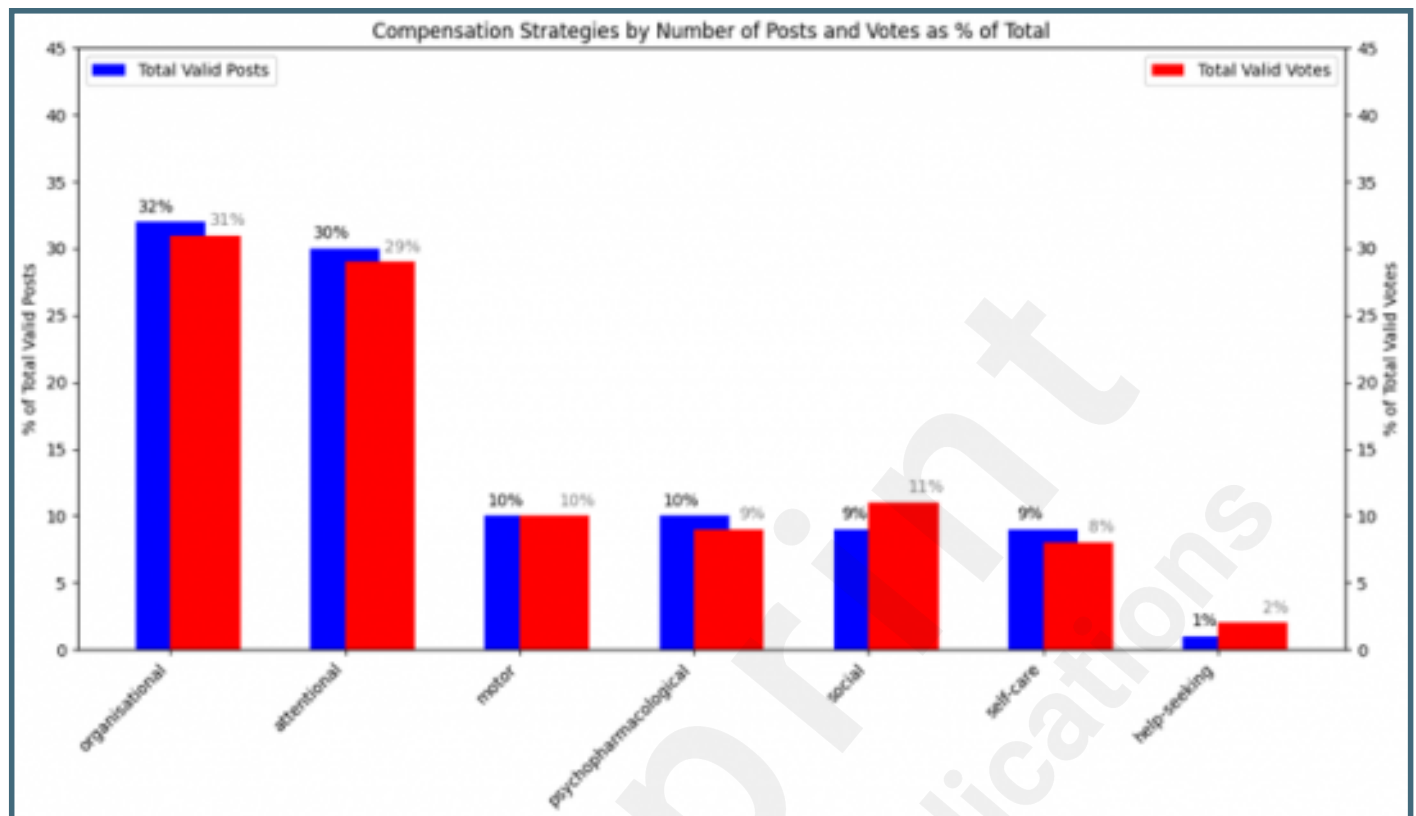
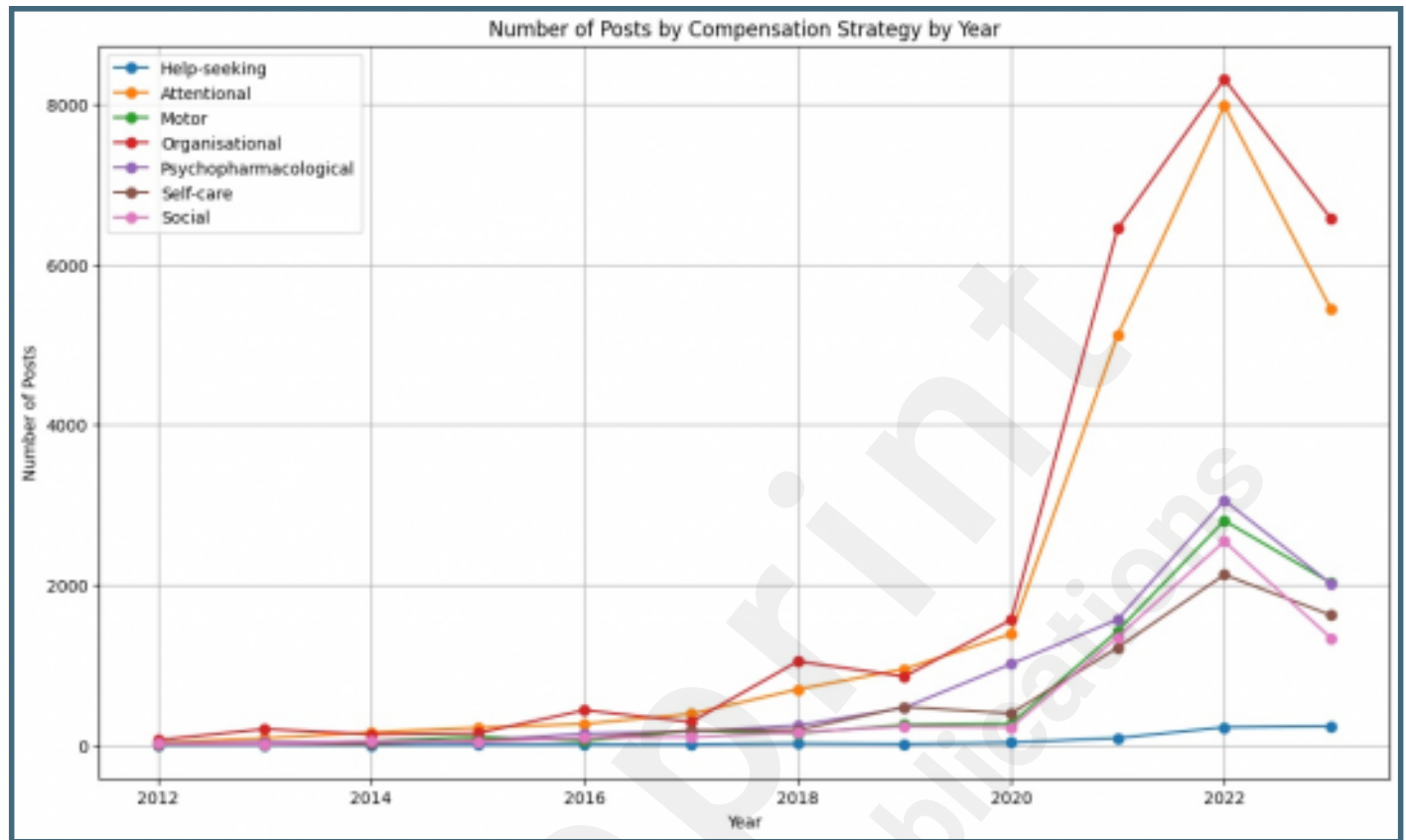


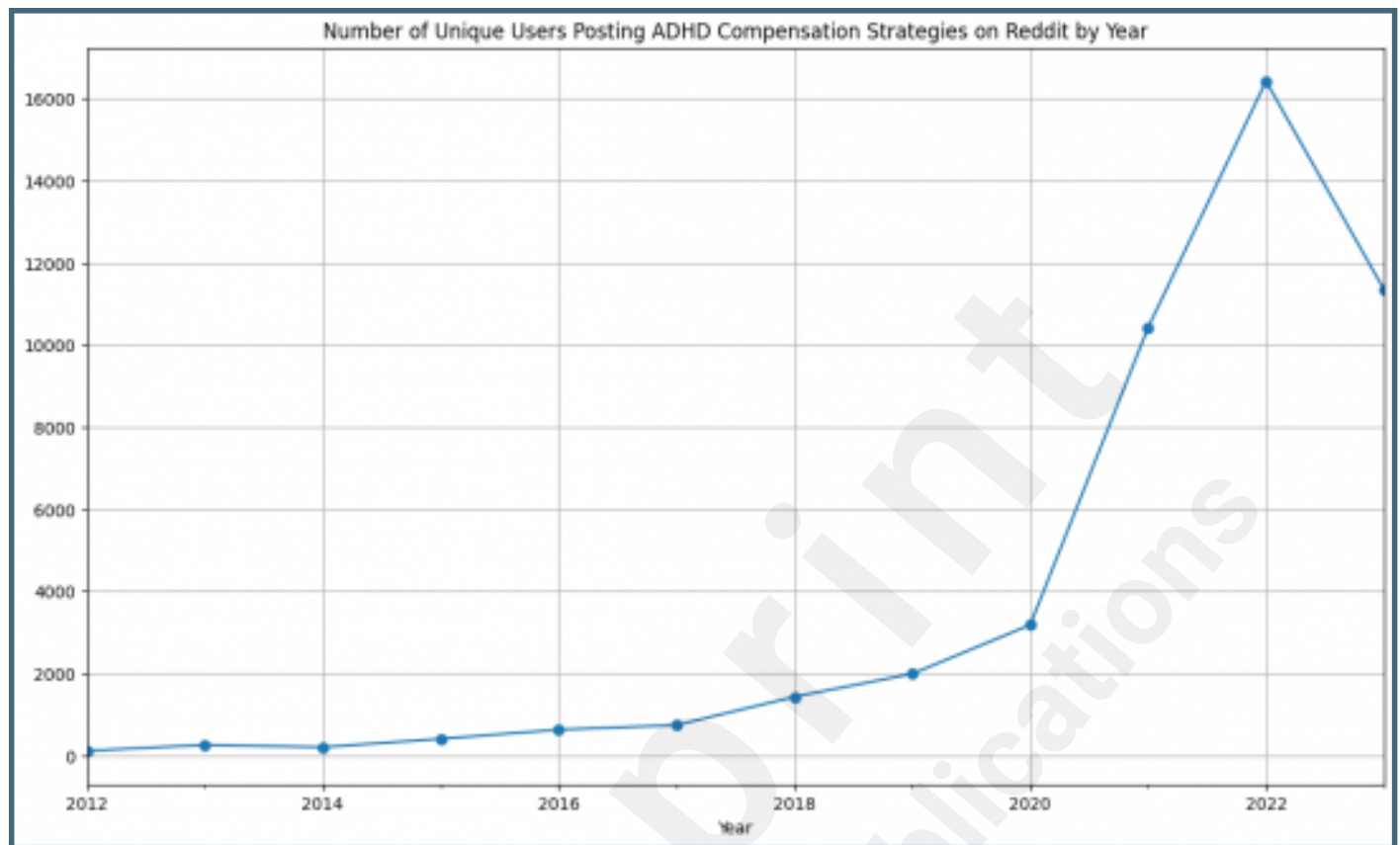
Chart displaying compensation strategy groups by number of posts and number of votes as % of total.



Temporal view of content and unique users discussing ADHD compensation strategies on r/ADHD by year.



Temporal view of unique users discussing ADHD compensation strategies on r/ADHD by year.



Compensation strategies on r/ADHD as percentage of total content in the dataset by year.

