The effects of (pseudo-)medical menopause discourse on YouTube

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Abstract

The abundance of online medical misinformation pertaining to the treatment of menopause symptoms can create significant confusion for afflicted individuals seeking answers while browsing the Internet. This study investigates oral online menopause discourse employed by ‘health influencers’ and medical professionals in terms of its pragmatic impact. Two distinct sets of YouTube videos were selected for analysis. The first corpus consists of 20 videos (89,046 words) uploaded between 2010-2022 by individuals promoting natural hormone balancing and compounded Bioidentical Hormone Therapy (cBHT) as a treatment for menopause symptoms. The second dataset includes 16 videos (66,333 words) and was added between 2013-2022 by institutions and medical professionals advocating for Menopausal Hormone Therapy (MHT). To investigate the effects of the discourse, the study focuses on the speakers’ use of subjective mental verb projections and reporting verbs. As engagement resources, these constructions allow for an exploration of the speakers’ dialogistic positioning and commitment to the validity of the shared information. Based on part-of-speech (POS) categories and the Appraisal framework, a contrastive appraisal analysis was conducted on both corpora, examining the system of Engagement and quantifying the appraisals. Further analysis focused on the lexicogrammatical realisations of subjective epistemic and evidential formulations beyond the sentence level, including the speakers’ deployment of attitude and graduation resources. The comprehensive computer-assisted appraisal analysis shows how the interplay of deliberate objectification and affectivity may render online media content more persuasive and increase the likelihood of false information. It shows that health influencers employ a higher number of non-congruent mental verb projections in pronounce moves, in an attempt to align the audience with their own stance, even though the constructions are described as entertain resources in Appraisal theory. In entertain moves, the YouTube creators primarily select metaphorical formulations to influence the viewers’ perception of the shared information, promoting cBHT. The health influencers predominantly attributed the shared information to human sources and hearsay evidence through the amplified use of lower-value reporting verbs and lexical graduation. In contrast, the medical professionals mainly opted for mental verb projections in pronounce moves to share specific views of reality grounded in scientific consensus. As members of the scholarly community, they attributed the communicated knowledge to research evidence, employing reporting verbs that indicated a high commitment to factual information and endorsing sources. The study offers valuable insight into the rhetorical effects of pseudo-medical discourse related to the online debate on appropriate menopause treatment. As a critical discourse analysis, it underscores the need for awareness of the increasing prevalence of medical disinformation in the digital sphere, especially in the light of repeated menopause medication shortages.

All tables and figures are my own.
The effects of (pseudo-)medical menopause discourse on YouTube

1. Introduction
Social media platforms are increasingly being used as channels for the distribution of medical information. While widely perceived as globalised platforms where individuals can freely gather to exchange ideas on an equal footing, social networking services (SNSs) have also proven to be effective digital marketing tools that can help businesses reach and retain potential customers. In order to boost sales, it is now widely recognised among modern marketers that providing a personal touch to products and cultivating individual relationships with potential customers across multiple platforms is crucial. This practice, often referred to as adding value to a brand or product, has become increasingly common. Some companies even take the approach a step further by enlisting ‘influencers’ or ‘brand evangelists’ to convert consumers (Mogaji, 2021). By engaging with customers, businesses aim to empower them to make better-informed purchasing decisions in the future. Similar, more appropriate, strategies have been explored in the field of health communication, attempting to tailor information to meet specific individual needs (Lutkenhaus et al., 2019).

Despite the fact that perimenopause and menopause are typically seen as natural and inevitable stages in the ageing process¹ for most women² (Harper et al., 2022), the knowledge about the phenomena varies significantly due to sociocultural factors such as attitudes and beliefs. Individuals experiencing this transitional period often encounter unexpected symptoms, such as hair loss, hot flushes, or breast tenderness (Zouboulis et al., 2022), which may lead them to browse the Internet for more information. Unfortunately, the available information about the topic on platforms like YouTube, with its limited content regulations, often consists of easily consumable but scientifically inaccurate videos or websites (Murtaza et al., 2021). YouTube, in particular, exemplifies the issue, hosting only a small number of videos that provide scientifically correct information (Yeter & Ackay, 2022). Furthermore, some individuals, who may be labelled as ‘health influencers’ (HIs) tend to exploit the popularity of SNSs to propagate conspiracy theories and sell their products (Baker, 2022).³ Consequently, a gap emerges between privileged and powerful speakers who possess new knowledge, and a vulnerable audience that often lacks the necessary interpretive resources to adequately understand the conveyed meanings, resulting in a form of epistemic injustice (Fricker, 2007). When novel information is shared with the intention to deceive and to motivate individuals towards a course of action that may negatively impact their mental or physical health, it is crucial to identify and ultimately address such fraudulent discourse.

Nevertheless, any discrepancies in viewpoints should not be seen as a simple black-and-white polarisation. Epistemic injustice often occurs gradually by infiltrating individuals’ minds with appealing ideas that promise desirable outcomes such as youth, strength, health, or wealth. Marketing and health ideologies alike aim to reshape social behaviour by becoming integral parts of daily life (Lukin, 2013). Medical misinformation, as defined by Chou, Gaysynsky, and Cappella (2020: 273), encompasses any health-related claim that is false according to current scientific consensus. Medical misinformation needs to be differentiated from disinformation, which is closely

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¹ Menopause may also occur as a result of the surgical removal of the female reproductive organs.
² In this paper, the terms ‘woman’ or ‘female’ and the pronouns ‘she’ and ‘her’ are used to refer to people experiencing menopausal symptoms.
³ Not all health influencers (HIs) participate in the dissemination of misinformation and disinformation online.
linked to the philosophical concept of Post-truth, described by Bufacchi (2021) as a deliberate strategy aimed at undermining the impact of objective facts and scientific truths. The online environment, where HIs share false information, allows pseudo-medical discourse and its accompanying ideologies to thrive, especially amid regular menopause medication supply issues, including in Australia (Australasian Menopause Society, May 2023).

As Halliday and Matthiessen (2004: 117) state, semantics is not concerned with truth but rather with consensus about validity, and consensus is negotiated through dialogue. Therefore, instead of solely focusing on the truth value of false information, the crucial role of persuasion in dialogical interactions between speakers and their online audience deserves closer attention, following Appraisal theory (Martin & White, 2005). YouTube presenters project their own views and attitudes onto a putative viewer, who is depicted as being like-minded, unlike-minded, or uninformed but persuadable (White, 2020: 407). Based on Systemic Functional Linguistics (SFL) and the appraisal framework, this computer-assisted study investigates how HIs and medical professionals (MPs) employ MVPs in engagement moves to encourage putative viewers to accept a desired viewpoint on menopause treatment and how the interactants use RVs to convey commitment to the information they share on YouTube. Broadly speaking, when individuals browse the Internet, they need to be able to distinguish between fact and opinion. This paper aims to provide valuable insights into how both groups of YouTube speakers engage with their primary target audience of (peri-)menopausal women. By contrasting the videos created by HIs (89,046 words) with the content produced by MPs (66,333 words), it demonstrates how the former attempt to persuade (peri)menopausal women to believe that they should replace conventional Menopausal Hormone Therapy (MHT) with alternative treatments that aim to naturally balance hormones, including Bioidentical Hormone Therapy (cBHT), based on misleading assumptions. Within the medical community, the use of bioidentical hormones is a highly controversial and well-discussed topic. The cBHT versus MHT debate started after the publication of the since rebutted findings of a trial conducted in the United States (Writing Group for the Women's Health Initiative Investigators, 2002), claiming erroneous risks of breast cancer and cardiovascular disease. This caused a spike in the use of cBHT in several Western countries, especially since, as a result, it also became more challenging for women with menopausal symptoms to access MHT. Often marketed as a more natural and individually tailored treatment for menopause symptoms, cBHT is not recommended by the International Menopause Society (L'Hermite, 2017), North American Menopause Society (2022), Endocrine Society (2 October, 2019), Australasian Menopause Society (May, 2018), or regulatory bodies such as the Australian Therapeutic Goods Administration (n.d.) or the U.S. Food and Drug Administration (7 February, 2019) due to safety concerns, limited scientific evidence supporting its efficacy, unreliable dosage, and a lack of standardisation. Natural hormone balancing aims to address possible hormone deficiencies that may contribute to symptoms commonly associated with (peri-)menopause. MPs share information about more mainstream options for treating menopause symptoms, with the goal of educating women about their safety and effectiveness. It is argued that investigating possible misinformation in oral discourse should focus on persuasion, the interactants’ communicative objectives, and dialogic positioning rather than semantic truth values. More specifically, the study demonstrates that MVPs can carry a deliberate assertive rhetorical function as ‘pronounce’ strategies, revealing underlying assumptions tied to ideologies about knowledge and neoliberal forms of power. While the use of RVs with high speaker commitment (‘show’, ‘recommend’) typically serves the rhetorical aim of persuading an audience about the credibility and reliability of shared information (Bloch, 2010), lower-value RVs may be employed contractively to foster an impression of objectivity and authority. These persuasive strategies are further supported through the interactants’ use of attitudinal and graduation resources.

4 Formerly referred to as hormone replacement therapy (HRT) (Australasian Menopause Society, 2023).
The paper is organised as follows. Section 2 presents a literature review that examines the concepts of misinformation, grammatical markers of interpersonal communication, the Engagement system within the appraisal framework, and stance. Section 3 explains the research method, followed by the presentation of the study's findings in the subsequent section. Finally, Section 5 discusses the speakers’ putative ideological standpoints and concludes the paper.

2. Literature review
2.1 Detecting deceptive language automatically
The proliferation of false information on social networking services (SNSs), particularly during the COVID-19 infodemic, spurred computer scientists to develop automated detection tools capable of rapidly identifying misinformation using machine learning algorithms (Horne & Adali, 2017; Rubin et al., 2016). Researchers primarily endeavoured to identify the most informative linguistic characteristics of deceptive language (Gravanis et al., 2019; Zhou et al., 2020). Grammatical categories play a crucial role in this research, often through the extraction of features based on part-of-speech (POS) tags (Choudhary & Arora, 2021). Similarly, linguists since the 2000s have explored linguistic cues associated with fake information. For instance, Newmann et al. (2003) found that liars tend to employ more negative emotion terms, as well as an abundance of pronouns and conjunctions, in their discourse. Another study conducted by Hancock et al. (2007) revealed that deceitful language usage appears to involve a decreased frequency of first-person pronouns and an increased overall word count. More recently, Kapusta et al. (2020) examined the morphological characteristics of a news article corpus, uncovering significant differences in verb and noun usage. Additionally, Igwebuike and Chimuany (2021) analysed a sample of posts from platforms like WhatsApp, Facebook, and Twitter, identifying common discursive strategies employed in the creation of false news. Contextual factors should not be overlooked either, as they can play a vital role in discerning whether a text intends to deceive the general public. A comprehensive analysis of mental verb projections (MVPs) and reporting verbs (RVs) within a larger dataset can provide deeper insights into the persuasive function of discourse in convincing individuals to adopt novel perspectives on reality. Such an approach emphasises language as a social practice (Halliday & Matthiessen, 2004) and its role in positioning a targeted audience to accept a specific stance that aligns with that of the speaker or writer.

2.2 Grammatical markers of subjectivity and interpersonal meaning
Epistemic modals and evidentials are commonly recognised by linguists as grammatical markers of interpersonal meaning across a wide range of languages (Arakaki, 2013; Givón, 1982; Pan, 2018; Willis, 2007). Building upon a Boasian (1911) perspective, semantic scholars like Kaplan (1966), Wierzbicka (2021), and Aikhenvald (2004) tend to interpret subjective expressions as entry points into cultural systems of thought. Palmer (1986) proposed that epistemic judgements reflect subjective attitudes towards knowledge, a viewpoint also embraced in Appraisal theory (Martin & White, 2005; White, 2012). Within SFL, MVPs serve a modal function and are situated on the interpersonal plane, constituting a “modal assessment of the presumption type” that may also encompass other forms of evaluation (Halliday & Matthiessen, 2004: 605). These grammatical constructions often exhibit hypotactic structures and explicitly convey subjectivity, with the speaker assuming the role of Senser (‘I believe’) or Sayer (‘I suggest’). Such non-congruent formulations are frequently associated with politeness or social status (Halliday & Matthiessen, 2004: 631). Incongruity occurs when there is a mismatch between the lexicogrammatical realisation and the speaker’s intended meaning or the addressees’ interpretation. The use of inclusive ‘we’ in ‘we all know’ is an example of this type of ‘mismatch,’ as the first-person pronoun in the construction implies a consensus or common knowledge, with the speaker disguising their personal view as an expert opinion.
2.3 The system of Engagement

Rather than focusing on the devices' grammaticalisation or semantic properties, several recent studies have revealed the pragmatic effects involved in the use of so-called 'markers of belief' (Carretero & Zamorano-Mansilla, 2019; Gonzalez-Vazquez, 2021; Jahiu, 2022; Marín Arrese, 2015; Ruskan, 2017). Another example is Geng and Wharton's (2019) qualitative analysis, which looked into how student writers engage with findings obtained in previous studies in the discussion section of their thesis. While exploring engagement strategies employed by UK-based researchers and authors residing in Mainland China or Taiwan, Xu and Nesi (2019) discovered subtle deviations in their use of epistemic markers. Similarly, Hyland and Jian's (2019) work includes an investigation of how engagement patterns in academic writing evolved in the period between 1965 and 2015. In a more comparative study, Huan (2016) linked engagement strategies employed by Chinese and Australian journalists to the notion of power. Apart from research conducted by Qiu and Jiang (2021) or Di Scotto Carlo (2015), however, most of the aforementioned appraisal studies focus on stance-taking in the register of academic writing. Biber, Staples, Raso and Mello (2014) did include spoken register in their corpus study but examined the same genre. As emphasised by Biber et al. (1999) and Biber (2006), stance markers tend to be more common in oral conversation. A closer look at a social media genre such as YouTube videos may thus provide further insight into the use of MVPs and RVs as engagement strategies in online oral register corpora.

Martin and White (2005: 36) describe engagement as "the ways in which resources such as projection, modality, polarity, concession, and various comment adverbials position the speaker/writer with respect to the value position being advanced and with respect to potential responses to that value position." Through the use of various engagement moves, a speaker adopts a particular position with regard to their own statements. Within the system of Engagement, entain values comprise epistemic modality, which, generally speaking, pertains to the speaker’s assessment of the probability of their claims, as well as evidentiality, which may be linked to the speaker’s commitment to the truth value of the knowledge they share. This type of appraisal, describing evaluative language use, is comparable to Biber et al.’s (1999) notion of stance, which comprises both epistemic and attitudinal meanings.

Engagement is but one category of Martin and White’s (2005) Appraisal framework, which also includes the systems of Attitude and Graduation. Attitude includes the expression of positive or negative emotions, labelled affect ('depressed'), assessments of other people’s behaviour, indicated as judgement ('lazy'), and evaluations of concrete or abstract entities, referred to as appreciation ('delicious', ‘well-structured'). Graduation encompasses a wide range of resources which may be used to adjust the intensity of the proposition or grade categories. The former is referred to as force ('a highly theoretical paper') and the latter as focus ('somewhat disappointed'). While SFL offers a typological or system view, Martin and White’s (2005) framework adopts a topological perspective to allow for a scaled analysis of various realisations of interpersonal meaning. Following Bakhtin’s (1981) notion of heteroglossia, writers or speakers can either opt for monoglossic utterances ('Menopause is a hormone deficiency') or heteroglossic propositions ('Obviously, you should talk about this with your doctor'). According to Martin and White (2005), heteroglossic resources can contract the dialogic space through the use of deny, counter, concur, pronounce, and endorse devices, or expand it by employing entertain resources or strategies belonging to the subcategory of attribute, which involves the speaker’s acknowledgement or distancing from sources.

2.4 Stance

2.4.1 Mental verb projections

When addressing their audience on YouTube, the speakers in the sampled videos express various ideas, feelings, and thoughts regarding menopause treatment while interacting with viewers who hold their own viewpoints. This positioning of the speakers with respect to the users and shared information is referred to as stance. According to Biber, Egbert, and Davies (2015: 104), stance
encompasses “attitudinal or epistemic assessments.” The notion differs from evaluation in terms of the explicitness of its discursive realisation, relying on clear lexicogrammatical constructions, whereas evaluation can be expressed lexically or otherwise. In opinionated discourse (OP) and informational persuasive (IP) registers, Biber, Egbert, and Davies (2015) found that stance was not clearly realised in their corpus of Amazon reviews, but evaluative language expressing judgement was abundant.

Hunston (2010) argues that evaluation is both subjective and intersubjective. Consequently, an exploration of epistemic modality in terms of subjectivity may reveal that MVPs can originate from the speaker’s own subjectivity, increasing commitment, or that they can be more objective, reducing commitment while interacting with others. Modality in SFL represents the speaker’s perspective on the validity of the assertion or the merits of the proposal. Halliday and Matthiessen (2004: 624) mention that speakers may aim to emphasise their personal viewpoints or present views as belonging to someone else. The primary goal of authors, according to Martin and White (2005), however, is to persuade others to align themselves with a proposed value position. This negotiation of perspectives or dialogic positioning sometimes leads to collective discrepancies in viewpoints (Van Poucke, 2023). In their YouTube videos, the MPs seem to affiliate with the scientific community by advocating for MHT, while the HIs disaffiliate with this view, instead aiming to convince the general public that menopause is caused by hormonal imbalance and can be remedied with cBHT, diet, and supplements. The immediate clausal context in which MVPs occur, as emphasised by Hunston (2010), also plays a significant role in the interpretation of the discursive exchanges.

Dialogistic stance can be conveyed through the use of epistemic modals. Martin and White (2005: 105) suggest that MVPs are particularly revealing of the communicative purpose of these modals. While the structure of expressions of belief has been extensively studied, their function and rhetorical effects deserve further attention. Appraisal theory primarily focuses on the strength of an individual’s commitment to a specific viewpoint rather than a commitment to truth. The dialogical approach, as advocated by White (1999; 2008), emphasises the rhetorical goals that emerge during the communication process. When analysing linguistic patterns of deceitful content, it remains important to investigate the speaker’s or writer’s certainty regarding the truth of the knowledge they share. Nevertheless, the main focus here is on how the information may be interpreted by the hearer or reader, which is firmly situated within an intersubjective discursive exchange, despite the view that epistemic markers are typically seen as pragmatic devices that aid in maintaining face and politeness (Biber et al., 1999; Mullan & Karlsson, 2012; Nuyts, 2001).

As mentioned previously, the immediate and wider context of non-congruent MVPs are important in clarifying their rhetorical effect. Halliday and Matthiessen (2004: 614) explain that, when an MVP such as ‘I think’ is used in its assertive function, it expresses probability:

(1) I think it’s going to rain.

They add that the semantic equivalent of the clause is ‘it’s probably going to rain,’ which is metaphorically realised since the main proposition is not ‘I think’ but rather encapsulated in ‘it probably is so.’ In the example, the speaker makes a tentative prediction based on their belief about the likelihood of rain. According to Martin & White (2005: 104), constructions such as ‘I think’ constitute expanding engagement resources that belong to the subcategory of entertain, which include “those wordings by which the authorial voice indicates that its position is but one of a number of possible positions and, thereby, to greater or lesser degrees, makes dialogic space for those possibilities.” However, speakers can also use MVPs to pronounce their subjective views on a topic with high authority and align themselves with a positive or negative subjective explicit evaluation of a specific entity in the projection, which is a contracting engagement strategy that generally aims to limit alternative perspectives:
I don’t think the rain is particularly refreshing.

This is why it is necessary to analyse the semantic configuration of each MVP separately, within its given context, for the engagement analysis, even when adopting a corpus approach (Bednarek 2009; Pöldvere, Fuoli & Paradis 2016). The interlocutors’ use of multiple contracting resources, such as counter devices (‘actually’), deny resources (‘not’), simple present or future tense (‘is’, ‘will’), emphasis (‘IS’), or up-scaling (‘very’) may provide additional clues as to whether the MVP is employed to pronounce a personal standpoint. Since pronounce devices are heteroglossic, however, the speaker remains aware of the existence of other existing views, even if this large diversity of perspectives is not immediately considered by the interlocutors themselves (Bakhtin, 1981; Martin & White, 2005). The analysis of MVPs, based on Appraisal theory, may thus provide insight into how speakers are perceived and how the information may be received by the audience, as MVPs can be used by a speaker to entertain other possible perspectives, concur with other viewpoints, or to proclaim their own stance. When the YouTube speakers employ MVPs as pronounce strategies, for example, they appear highly committed to their argumentation and well-informed about menopause treatment. Conversely, the use of MVPs as concur or entertain devices may cause them to come across as less certain and inexperienced to viewers.

2.4.2 Reporting verbs

Evidentiality analysis, as highlighted by Berlin (2008), can further help viewers distinguish between fact and opinion, providing insights into how YouTube speakers can manipulate the audience using grammatical constructions. Hyland (2005: 176) defines stance as the way writers assert their personal authority or conceal their involvement, while Halliday (2004: 616) suggests that speakers have various means of disguising the expression of personal views. Following Appraisal theory, RVs constitute engagement resources which may be used by speakers to concur with putative viewers’ perceived ideas (‘admit’), to deny previously shared information (‘deny’), to counter a statement (‘contradict’), to pronounce facts asserted as being evidence-based (‘believe’), to endorse external sources (‘indicate’), to entertain possible facts based on probability (‘guess’), or to attribute information to various sources through acknowledging them (‘says’) or by distancing themselves from sources (‘claim’) (Table 3). Factive RVs (‘confirm’) may serve as contracting endorsement strategies, endorsing reported information as true based on the speaker’s perspective (White, 2012). From a dialogical perspective, however, speakers continuously position themselves for potential responses, either impeding meaning negotiation (contractive) or facilitating discussion (expansive). The use of RVs may subsequently reveal authorial attitude towards the conveyed information and commitment to the credibility of what is being shared, both of which are relevant to misinformation detection.

Table 3: Engagement strategies involving MVPs or RVs

<table>
<thead>
<tr>
<th>Engagement strategies</th>
<th>Examples HI sample</th>
<th>Examples MP sample</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MVPs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>concur</td>
<td>I know that can be very very frustrating.</td>
<td>We know this is a disruptive time for sleep.</td>
</tr>
<tr>
<td>pronounce</td>
<td>I find that it helps calm my mood.</td>
<td>We believe that women should be able to use hormone therapy for as long as the need is there.</td>
</tr>
<tr>
<td>entertain</td>
<td>I think the MPa might have</td>
<td>I guess in that vein that if they</td>
</tr>
</tbody>
</table>
been the biggest issue in that study.  

can't use hormones or they choose not to that we have other options to help treat them.

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<table>
<thead>
<tr>
<th>RVs</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>concur</td>
<td>Absolutely, I agree.</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>pronounce</td>
<td>I have to argue that bio-identical estrogen will work better in the human body than horse estrogen.</td>
<td>I'll just tell you that's very frustrating.</td>
<td></td>
</tr>
<tr>
<td>endorse</td>
<td>This review showed that that high leptin may contribute to the etiology or the cause of the development of PCOS so that's huge.</td>
<td>The Keep study shows very clearly that it's not true.</td>
<td></td>
</tr>
<tr>
<td>entertain</td>
<td>-</td>
<td>We had little bits of pieces throughout the literature suggesting that there may be benefit here.</td>
<td></td>
</tr>
<tr>
<td>attribute: acknowledge</td>
<td>It goes into describing the different pathways in this study.</td>
<td>Women's stories usually tell us as much of what's going on as as anything else.</td>
<td></td>
</tr>
<tr>
<td>attribute: distance</td>
<td>That's a whole other topic, I guess.</td>
<td>There's a lot of claims being made about them about them being safer.</td>
<td></td>
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</tbody>
</table>

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### 3. Research method

YouTube offers a diverse range of information through recorded presentations, vlogs, and documentaries. The platform attracts speakers with varied intentions regarding knowledge dissemination on menopause treatment. Speakers can range from professors in gynaecology to personal experience vloggers. Two sets of videos were selected for analysis: a corpus of 20 videos (89,046 words) promoting cBHT for menopause symptoms uploaded by individuals between 2010-2022, and a corpus of 16 videos (66,333 words) providing research-based information on menopause treatment and recommending MHT uploaded by institutions and medical professionals between 2013-2022.

Classifying online texts is a challenging task. Both corpora in this study belong to the general register of spoken text since they are transcriptions of YouTube videos. In both groups, speakers target the general public, providing expert opinions. The HIs’ discourse can be categorised as a hybrid combination of informational explanation and persuasion, similar to a personal blog sub-register, even though they often present themselves as knowledgeable professionals. This implies a higher occurrence of first-person pronouns, mental processes, and verbal processes (Biber & Egbert 2018). The MPs’ discourse is likely more script-based, however, leading to possible pragmatic differences. The analytical focus of the study is on the use of subjective explicit modals and evidential markers (Halliday & Matthiessen 2004), labelled as MVPs and RVs, as such lexicogrammatical selections may demonstrate the speakers’ attitude and their commitment to the validity of the shared information sources (Martin & White, 2005).
An initial search was conducted using the QuotationTool developed by Jufri and Sun (2022) for instances containing RVs. However, due to an unfortunate high number of inaccuracies in terms of results, with the tool producing only a few RVs, it was decided to generate a more comprehensive list using Part-of-speech-tagging through the Natural Language Toolkit (NLTK), Python 3, and the text editor Notepad++, version 8.5.4. POS-tagging was also used to retrieve any mental processes in the corpora. The transcripts were converted to text files and analysed using targeted searches for statistical and focused analyses of salient epistemic and evidential constructions within both the clausal and wider textual contexts. A comprehensive appraisal analysis, based Appraisal theory (Martin & White, 2005), primarily focusing on the system of Engagement, was then performed. The analysis examined linguistic features such as existential verbs (EX), modal auxiliaries (MD), modal adjuncts (RB), comment adverbs (RB), and conjunctions (CC and IN), as well as negated constructions (polarity) (see Appendix). In investigating the speakers’ MVPs, non-congruent formulations used as interpersonal metaphors (Martin 2020) formed the main point of attention. The coded epistemic projections involved subjective explicit probability using first-person pronouns and excluded direct speech. The mental processes in the discourse samples were categorised based on orientation and value, differentiating between subjective and objective modality as well as explicit or implicit realisations and the values associated with the modal judgement (Halliday & Matthiessen, 2004: 620)(Table 1). The value of the MVPs and force of the employed verbal processes were explicated as well (Table 2) (Halliday & Matthiessen, 2004; Hyland, 2018). An investigation of how both MVPs and RVs are employed in engagement moves allows for deeper insight into the contextual factors that shape intersubjective meaning-making and may highlight some of the rhetorical effects of the constructions (Martin & White, 2005). In addition, the deployment of amplified moderate-value RVs (‘I tell’, ‘we say’) may convey a strong stance, depending on important pragmatic cues in the clausal context, such as intensifiers.

Table 1: Orientation of mental and verbal processes in SFL (Halliday & Matthiessen, 2004: 620)

<table>
<thead>
<tr>
<th>Mental processes</th>
<th>Examples</th>
<th>Verbal processes</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Orientation</strong></td>
<td><strong>Examples</strong></td>
<td><strong>Orientation</strong></td>
<td><strong>Examples</strong></td>
</tr>
<tr>
<td>Subjective explicit*</td>
<td>I think menopause is annoying.</td>
<td>Subjective explicit*</td>
<td>We usually say that the use of estrogen is very valuable for a woman.</td>
</tr>
<tr>
<td>Subjective implicit</td>
<td>Everyone should know what it's about.</td>
<td>Subjective implicit</td>
<td>You should talk about this with your doctor.</td>
</tr>
<tr>
<td>Objective implicit</td>
<td>They know that that’s the case.</td>
<td>Objective implicit</td>
<td>(There is) no evidence whatsoever after four years of anything that would suggest that...</td>
</tr>
<tr>
<td>Objective explicit*</td>
<td>A lot of practitioners, you know, aren't aware of the fact that this...</td>
<td>Objective explicit*</td>
<td>There is just no doubt about that there are any number of large clinical trials that have shown...</td>
</tr>
</tbody>
</table>

*Non-congruent constructions/interpersonal metaphors

Table 2: Value and force of mental and verbal processes (Halliday & Matthiessen, 2004: 620; Hyland, 2018)
<table>
<thead>
<tr>
<th>Mental processes</th>
<th>Verbal processes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Value</strong></td>
<td><strong>Force</strong></td>
</tr>
<tr>
<td>High</td>
<td>High</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>Moderate</td>
</tr>
<tr>
<td>Low</td>
<td>Low</td>
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</tbody>
</table>

4. Findings

4.1 Engagement

The HI corpus includes 72.28 engagement resources per 1,000 words, while the MP corpus contains 72.44 engagement devices per 1,000 words (Figure 1). Broadly speaking, both groups of speakers mostly employed engagement devices contractively (55.15 vs. 56.34) to proclaim a subjective standpoint regarding menopause treatment (21.26 vs. 19.22) and dismiss any divergent views (16.08 vs. 16.1). Despite a predominantly expansive use of engagement resources, the HIs appeared to strategically select engagement resources of the subtype of entertain (15.83 vs. 13.58) to persuade and influence viewers, driven by ideological motivations. They extensively employed subjective explicit MVPs, which constitute non-congruent constructions that carry strong context-dependent meanings, and self-referential RVs. Additionally, the MPs’ expansive use of engagement devices focused more on the acknowledgement of evidence-based sources than that of the HIs (Martin & White 2005: 104). Further explanation and examples will follow below.

Figure 1: HI and MP engagement strategies

4.2 Dominant patterns in the discourse samples

4.2.1 Non-congruent formulations

At first blush, the HIs’ and MPs’ frequent adoption of a subjective explicit epistemological stance suggests a strong link between the propositional value of their statements and their own subjectivity (Halliday & Matthiessen 2004). However, the first-person singular pronoun ‘I’ occurred more frequently in the HIs’ discourse (2.31 vs. 0.43), while the use of first-person pronouns in the MPs’ speech was more balanced (I: 1.04 vs. we: 1.01). The HIs also employed a higher number of MVPs.
compared to the MPs (2.66 vs. 2.12). Both groups of speakers predominantly expressed their views using the median-value MVP ‘I think’ (1.62 vs. 1.44). The HIs opted for a larger number of higher-value MVPs, including ‘I know’ compared to their counterparts (0.71 vs. 0.49). Most importantly, they also used median-value formulations, such as ‘I think’ or ‘I find’ to express high commitment.

4.2.2 The speakers’ use of MVPs as engagement strategies
The HIs’ discourse revealed a higher number of MVPs, suggesting that both groups of speakers are inclined to readily share their personal standpoint (Figure 2). However, the MPs rely more on objective evidence rather than their own views.

Figure 2: Use of MVPs in engagement moves

Considering the rhetorical effects of subjective explicit constructions, the HIs primarily use MVPs as pronounce strategies, combined with other contracting resources (in bold), to express their personal viewpoint on menopause treatment, in favour of cBHT. Their use of higher-value epistemic markers (‘know’) indicates strong commitment to the advanced argumentation:


By using a high-value MVP as a pronounce strategy and the first-person pronoun ‘we’, the speaker makes a factual statement based on their own observations of the efficacy of fennel. The inclusion of the contracting device ‘actually’ emphasises that this piece of information is trustworthy and the positive evaluation ‘great’ reinforces the overall persuasive effect of the statement, indicating invoked appreciation. Most MVPs used in this manner by HIs include highly potent unsupported claims that appear to be based on the speaker’s own beliefs, assumptions and personal experience while being consistently presented as expert advice. In high-value formulations, the use of inclusive ‘we’ is highly preferred by HIs:

(4) We know [eng: pron] magnesium deficiency is rampant [appr: neg] in the US and other countries.

(5) We know [eng: pron] it (myrrh) also has hormone-balancing [appr: pos] benefits.

The speakers’ use of invoked positive appreciation links the shared information to widely accepted and established knowledge, supposedly based on substantial evidence (Liardet & Black, 2019). Presenting subjective views as common sense is a well-documented and highly persuasive strategy (Fairclough, 2001). In both examples, pronounce devices are combined with negative (‘rampant’) and positive (‘hormone-balancing’) appreciation. This demonstrates the strong investment of HIs in expressing their own perspective on various entities and situations in the outer world and the
ideologies they share with other cBHT adepts. It also creates a discursive dichotomy between individuals who use cBHT for treating menopausal symptoms and those who prefer MHT.

The combination of ‘I think’ and contracting devices such as present tense (‘is’), up-scaling (‘really’) and positive inscribed positive judgement (‘important’) can significantly impact the speaker-viewer relationship:


Here, the MVP is used to explicitly pronounce a personal viewpoint, as the speaker states their conviction that, generally speaking, hormonal balance is important. Aided by the speaker’s inscribed positive judgement, the semantic configuration still positions the HI as an expert on natural hormone balancing, lending them an air of authority that may lead the audience to share the same beliefs. Several examples further demonstrate how HIs construct individual experiential meanings, using pronounce resources, that exemplify actions with positive consequences and positive evaluations:

(7) I’ve used it (product offered for sale); I find [eng: pron] that it helps calm my mood.
(8) I believe [eng: pron] its (supplement) goal is to nourish the blood.

When making more moderate statements, HIs tend to express their views using ‘I’ in median-value constructions.

Projections involving the relational identifying process ‘be’ are particularly powerful resources for constructing meaning, as they carry a high symbolic load and draw viewers’ attention to the Tokens (‘black cohosh’), which are identified by the preceding Values (Lecompte-Van Poucke, 2022):

(9) I think [eng: pron] in Europe the number one [judg: pos] prescribed nutraceutical for hot flashes and menopause issues is black cohosh.

The use of MVPs (‘I think’) as pronounce strategies, occasionally combined with high-value modals of obligation (‘should’), modal adjuncts (‘definitely’), appears to be a highly prevalent pattern in the HIs’ discourse:

(10) I think [eng: pron] you should go to your naturopath, get your hormones checked
(11) I definitely think [eng: pron] she should see somebody.

According to Martin and White (2005), these constructions present beliefs about the world that may or may not be accepted by the audience. However, such formulations also constitute implied directives, which are common in the hybrid advice subregister, integrating opinion and information (Biber & Egbert, 2018). By presenting their own ideas with authority and positive evaluations, the HIs can more easily persuade viewers to take a preferred course of action, such as seeing a naturopath or a practitioner offering cBHT. In the HIs’ discourse, these constructions also include up-scaling of both positive and negative qualities (‘really great’) of abstract and concrete entities, which is characteristic of texts aimed at selling products (Biber & Egbert, 2018):


Whenever the MPs use MVPs to pronounce beliefs, they do so to project specific conceptualisations of reality agreed upon by the scientific community they represent, rather than
based on common sense or personal opinion. This is particularly evident when additional information about the source of their knowledge (‘from research’) is provided:

(13) We know [eng: pron] from research... that MHT is the most [grad: force: int] appropriate [appr: pos] treatment for moderate to severe menopausal symptoms that impact quality of life.

The MPs predominantly opt for lower-value MVPs (‘we think’) employed as entertain strategies, combined with other entertain devices (‘might’) and softening graduation resources (‘some’), indicating a more neutral stance and demonstrating the less persuasive nature of their discourse:

(14) We think [eng: ent] it might [eng: ent] have to do with some [grad: quant] increased sensitivity in a part of our brain that’s basically [eng: pron] like our body’s thermostat.

This type of knowledge is rooted in scientific consensus as a social construct (McKenna, 2022). It is also evidence-based, as reflected in MP formulations that use ‘I think’ as a pronounce strategy while expressing high certainty through up-scaling (‘very’, ‘really’) and negation (‘not’). The speakers also used less affect and more judgement (‘clear’, ‘good’) pertaining to various non-human entities:

(17) I think [eng: pron] we have really [grad: force: int] good [judg: pos] data to say the timing hypothesis isn’t true [judg: neg].

The HIs frequently denied propositions put forth by medical professionals:

(18) I don’t think [eng: pron] I feel better [aff: pos] at all [grad: force: int].
(19) I don’t think [eng: pron] my sin and my period are linked.

Example 19 aims to achieve a sarcastic effect by implicitly negating the assumption that some individuals believe in a connection between sinfulness and menstrual cycles.

While the MPs mostly used entertain resources to encourage open dialogue, the HIs frequently linked MVPs and entertain devices (‘maybe’, ‘I think’, ‘can’) to suggest alternative treatment options, influencing the viewers’ perception of the conveyed information by establishing a personal connection with them, presenting the content as valuable:

(20) I think [eng: ent] I’ve heard of maybe B vitamins helping with sores in the mouth.

They further used MVPs and other entertain devices (‘might’) to share assumptions that explicitly contradict opposing viewpoints in the wider context of the debate:

(21) We think [eng: ent] sometimes women that have estrogen dominance might only [grad: int] have progesterone deficiency.

Overall, the HIs seemed to employ more contracting MVPs than the MPs, indicating that their projected statements tend to exclude scientific understanding. The MPs, on the other hand, appear to offer their viewers the opportunity to make up their own minds regarding treatment options.
4.2.3 The speakers’ use of RVs as engagement strategies
RVs are not used to express personal views but they can facilitate stance (Liardét & Black, 2019). The most frequently used RVs in the HI sample were ‘say’, ‘recommend’, and ‘show’, whereas the MPs preferred the verbs ‘tell’, ‘say’, and ‘report’. The latter group of speakers mainly opted for RVs to attribute the shared information to various sources using invoked attitude (Figure 3).

Figure 3: Use of RVs in engagement moves

The acknowledge subcategory tends to involve lower speaker commitment, as it places responsibility for the information on the sources and with those who produced it. The MPs’ frequent selection of acknowledge resources appears to emphasise the trustworthiness of their sources, such as studies (example 22) or scientific evidence (example 23) often combined with deny devices (‘not’, ‘no’) and up-scaling (‘ever’):

(22) There are compounded estrogen products available for women; however, studies have not [eng: deny] shown [eng: ackn] that they’re necessarily safer or more effective than traditional estrogen therapy.

(23) If you have a very restricted diet and you’re vitamin deficient you should take vitamins but no [eng: deny] clinical evidence has ever [grad: force: int] shown [eng: ackn] that any kind of special multivitamin aimed at menopausal women has measurably improved symptoms.

The HIs’ less frequent use of RVs in acknowledgement moves indicates a lower level of commitment to the reliability of their sources and these regularly involved hearsay evidence:

(24) One of the doctors, the endocrinologist that I have discussed [eng: ackn] this with in the past, says [eng: ackn] that it is escalating that young women are having anovulatory cycles.

(25) I heard recently from a medical doctor fertility specialist, whose business, by the way, is booming. He said [eng: ackn], that if we creep up a few more points of infertility for couples that we would be considered borderline an endangered species.

The HIs also made regular use of lexical intensification (‘escalating’, ‘booming’, ‘endangered’) (Martin & White, 2005).

Both HIs and MPs frequently used RVs (‘predict’, ‘say’) when pronouncing subjective views on menopause treatment, displaying confidence and authority, with the MPs doing this more often than the HIs, in combination with softening devices (‘almost’, ‘sort of’), to express caution and maintain solidarity with the viewer, while using inscribed appreciation:
We say [eng: pron] under the age of 45 it’s sort of [grad: foc: soft] a red flag [appr: neg].

The sample included several examples of more confident statements made by MPs as well. However, these were consistently evidence-based (‘the science’, ‘trial’) and uttered on behalf of the scientific community (‘us’, ‘we’):


I will tell [eng: pron] you that we also did a calcium vitamin D trial to look and see if we could [eng: ent] prevent fractures.

The phrase ‘I will tell you’ constitutes an emphatic pronouncement which serves to signal to the addressee that significant information is about to be shared.

Similar to the use of non-congruent formulations involving mental verbs (‘I think’, ‘it is thought’) that are used to pronounce views or to concur with previous claims, RVs may be employed contractively, as a pronounce strategy, to lend an impression of objectivity to the shared information and especially to convince the target audience to follow a desired course of action. Again, it is the combination of pronounce devices (‘will’), along with these lexicogrammatical realisations, that produces this particular rhetorical effect. The HI excerpts demonstrate a high level of commitment to the trustworthiness of the relayed information, contributing to a predominantly persuasive tone.

In contrast, moderate-value RVs were regularly used by the MPs to indicate invoked attitude on behalf of the scientific community to which the speakers belong. Their selection of RVs seemed to reinforce their own authoritative stance and contributed to convincing their viewers of MHT as a preferred treatment option. This pattern included the use of softening (‘kind of’), down-scaling (‘generally’), and other entertain (‘likely’, ‘probably’) resources:


The MPs’ more expansive use of RVs in entertain moves allows for the expression of alternative viewpoints, acknowledging possible limitations in the conducted research, which suggests that the MPs adopt a more nuanced argumentation style that respects other views.

In comparison, the HIs seem to do the opposite by consistently employing pronounce strategies while indicating invoked attitude:


The HIs’ frequent use of non-congruent pronounce devices involving RVs and the addition of high modals such as ‘need to’ or up-scaling (‘really’, ‘huge’) reveal high commitment to the validity of the shared information by amplifying the speakers’ claims, to lend their propositions more credibility. They mostly opted for lower-value reporting verbs (‘share’, ‘tell’, ‘say’), amplified through up-scaling (‘honestly’, ‘really’), rendering the shared information more convincing and creating a sense of urgency:

So the reason I share [eng: pron] that is because, honestly [grad: force: int], you need to commit to yourself to take on some [grad: quant] of these rituals and routines.
I want to take a quick minute to just tell you that, as you can see from that last slide, these daily habits really add up and they make a huge difference.

The MPs further employed RVs to tentatively entertain various suggestions made by other MPs (example 33) and did so more often than the HIs, who entertained views expressed by less trustworthy entities such as the media (example 34) and attempted to align the viewer with the same standpoints through invoked attitude:

There is some studies to suggest that regular exercise may attenuate severity of hot flashes and practising relaxation techniques as well. There was a huge fiasco, huge press announcement about it suggesting that the women … had a higher incidence of breast cancer.

As per Martin and White (2005: 127), endorsements involve high speaker commitment to the validity of the shared information’s sources (in italics). Subsequently, the use of endorsement devices is contractive, as doing so prevents others from rebutting one’s propositions. Through the analysis of RV usage in both corpora (see Appendix), it was found that the MPs frequently selected RVs (‘show’, ‘indicate’, ‘demonstrate’) to endorse non-human sources such as scientific studies, research, or data (example 35), and ‘recommend’ to endorse authorities on menopause treatment (example 36). They employed this strategy more often than the HIs and mostly combined the endorse resources with up-scaling (example 37) and/or negation to emphasise the credibility and strength of their claims:

The bioidentical hasn’t been shown (in trials) to be any better. The problem with them is that they’re not FDA regulated so they come in different doses. The FDA doesn’t recommend bioidentical hormones because there can be some problems with them. It is very strongly shown (by researchers) that both estrogen and progesterone receptors are present in all the blood vessels in the heart.

The HIs mainly chose self-referential RVs and more moderate-value verbs (‘share’) to endorse the value and relevance of primarily human sources (‘so many answers’) or certain desirable behaviours, combining this with positive affect (‘excited’) and up-scaling (‘really’, ‘so’):

I’m really excited to share with you so many answers to so many of your questions about hormonal imbalance.

5. Further discussion and conclusion
Based on the discursive interactions observed in the sample, a common HI persona emerges, one that seems to be heavily influenced by the principles of neoliberal individualism, which aligns with prevailing health discourses circulating in the digital sphere. It is worth underlining that the representation of HIs has historically been dominated by Western, white individuals, even though the online social practice is slowly becoming more inclusive (Wellman, 2022). As a relatively recent online phenomenon, the rise of social media influencing can be attributed to factors such as micro-celebrity, the allure of rewards and wealth, and commercial viability (Khamis, Ang & Welling, 2017). Not only does the practice offer potential incentives, it may also empower individuals to
transcend the uncertainties and mediocrity of their existence and grant them the ability to effect social change – albeit of a rather ephemeral nature – reclaiming a sense of control. However, despite the apparent empowerment associated with self-branding, the social media activity epitomises the laissez-faire economy by shifting the responsibility for financial success from the government to the individual (Bandinelli & Arvidsson, 2012), rendering the subject to its whims and unpredictabilities. This dynamic might drive HIs to endorse certain treatments without sufficient evidence of their scientific efficacy. Predominantly motivated by self-preservation, HIs may further be inclined to exploit gaps in accountability and regulation, leading to a higher prevalence of online misinformation. Some HIs endorsing cBHT may even view it as their duty to amass a large following in order to reach a wider audience, based on perceived positive experiences with the products. What may be deemed most concerning, however, is that the COVID-19 pandemic revealed that some of the language used by HIs seemed to stem from a broader scepticism towards medical authorities, reflecting the presence of an often unanticipated psychosocial dimension in health communication that might continue to dominate the landscape of modern medicine (Parsons, 1951). Subsequently rather than viewing (peri-)menopause as a disease, it can be understood as a menopausal experience or transitional stage for a high number of women, except for less fortunate individuals who involuntarily end up in surgical menopause due to cancer, endometriosis, or adenomyosis.

The emerging social media trend of ‘deinfluencing’ appears to offer a much-needed counterbalance to dominant neoliberal narratives (Bateman, 10 June, 2019). As a form of counter-discourse, providing brief objective and corrective explanations, grounded in factual argumentation, in the comments section of SNSs such as YouTube, might guide users toward consulting more reliable sources of information or seeking advice from certified health professionals. Deinfluencers are increasingly active on platforms such as TikTok and Facebook, often as part of the #jagårhär (#iamhere) network, which combats hate speech. However, as Buerger (2021) points out, the notion that readers can be persuaded to reject misinformation through rational reasoning presented by other users may be an illusion, as it requires a conscious rejection of what is commonly accepted knowledge shared by others on the platform. Furthermore, the fact that #iamhere activists are members of a distinct online discourse community themselves can undermine the authenticity and effectiveness of their counter-speech efforts.

The appraisal analysis findings revealed that high persuasiveness, indicated by objectification, up-scaling, or appeals to pathos, can play a significant role in the spread of misinformation. In terms of its rhetorical effects, HI discourse appears to successfully target a putative viewer who is likely to share the same assumptions and beliefs by signalling high certainty, thus creating a power imbalance in the relationship with the addressee. A closer investigation of HI discourse on YouTube showed various dominant engagement patterns in the speakers’ language use, indicating more inscribed positive attitude and a higher use of pronounce resources involving MVPs imbued with heightened authority created by frequent up-scaling. The HIs regularly asserted fact-like propositions based on personal beliefs, in a contractive manner, presenting the assumptions as widely accepted knowledge. Their strong commitment to persuasive argumentation appears to be propelled by neoliberal capitalist ideology. The MPs’ discourse, on the other hand, primarily demonstrated a more contractive use involving MVPs to present consensual beliefs agreed upon by the scientific community. Through alternating this with a more expansive use of entertain and softening graduation resources, they seem to welcome opposing views and encourage viewers to make informed decisions with regard to menopause treatment.

Additionally, an examination of the speakers’ use of RVs elucidated the manipulative and highly persuasive character of the discourse employed by some HIs, again, due to a large amount of inscribed attitude and ‘hearsay’ evidence. In the context of selling products, the YouTuber creators tend to exaggerate the positive qualities of cBHT and alternative menopause treatments. Their discourse contains multiple instances of misinformation, possibly motivated by anti-establishment
attitudes and caused by an apparent lack of appropriate regulation on YouTube. The study underlines the necessity of critical evaluation of health communication on SNSs and recommends a careful verification of claims regarding long-term management of menopause symptoms made by HIs. An increased understanding of manipulative engagement strategies employed by brand evangelists and their rhetorical effects, the use of trustworthy online sources, and targeted, accessible information provided by MPs may more effectively contribute to the empowerment of menopausal individuals to make well-informed decisions on their health and well-being.
References


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https://doi.org/10.1177/26349795231153955


Data availability statement: the datasets generated during and/or analysed during the current study are available in the Figshare repository:

HIs Corpus: https://doi.org/10.6084/m9.figshare.23898060.v1

MPs Corpus: https://doi.org/10.6084/m9.figshare.23898063.v1