METAPHORS AND ANTHROPOMORPHISM IN MEDICAL DISCOURSE

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Abstract

The crucial question in this study is how anthropomorphic metaphors influence medical discourse by attributing human characteristics to illnesses. We implemented the research design based on the frameworks of cognitive linguistics and critical discourse analysis, placing emphasis on developments in the conceptual metaphor theory (CMT) by Lakoff and Johnson (1980), more recently elaborated by Kövecses (2010), Semino et al. (2017), and Gibbs (2017). In the process of analysing a manually collected corpus of communicative exchanges between patients, non-patients and medical workers retrieved from online platforms, the Metaphor Identification Procedure VU University Amsterdam (MIPVU) as outlined by Steen et al. (2010) was employed. We narrowed down the focus of our study to previously underexplored linguistic analysis of anthropomorphic metaphors in health and disease narratives. We hypothesized that 1) anthropomorphic metaphors are the most prevalent form of metaphors in medical communication, and 2) they are effective in bridging the experiential gap. Consequently, the research questions were formulated: What is the occurrence of anthropomorphic metaphors? What are the functions of anthropomorphic metaphors from the speakers' and recipients' perspectives? In what way can such language constructions influence patients' mutual understanding and interaction? Which conceptual domains are most frequently represented through anthropomorphic metaphors? Results indicate that 40 per cent of the metaphors used in medical discussions are anthropomorphic. On the interpersonal level, they enhance both empathy and comprehension by creating a sense of shared experience. Corpus analysis further revealed that the strategic use of anthropomorphic metaphors in medical communication can potentially improve patients' engagement and comprehension. In this sense our findings align with the current research on the impact of metaphors on speakers. More importantly, our research brings new perspectives on anthropomorphic metaphors, providing classification of direct and metaphoric anthropomorphism as well as further analysis of subtype categories.

Keywords

medical discourse, metaphor, anthropomorphism, disease, communication

1 Introduction

The recent global pandemic has put pressure on the healthcare systems in English-speaking countries, which are currently experiencing a crisis with limited-service availability, poor health outcomes, and general public dissatisfaction. Studies (Commonwealth Fund, 2021; Nuffield Trust, 2023) highlight significant flaws and complexities in healthcare performance. Discussion of these complexities often entails the use of figurative language such as metaphors, which could affect healthcare communication by serving as framing devices. Defined as complex cognitive mechanisms by Lakoff and Johnson (1980), they extend from poetry and rhetoric to everyday speech, education and medicine and can enhance understanding by linking abstract ideas to concrete and widely recognized concepts.

Similarly, as explained by Kövecses (2010), metaphors have the capacity to influence discourses, opinions and decisions. Medical discourse is filled with complex terms and concepts that may be difficult for the general public to grasp, and the interaction between healthcare professionals, patients and non-patients - in essence, people with different experiences - often presents challenges. Charon (2006) and Kövecses (2010) describe a lack of 'shared experience' as one of the main causes of misunderstanding in communication. One way of bridging this experiential gap would be to create what we term 'artificial shared experience' by talking about the unfamiliar in terms of the familiar. Anthropomorphism, attributing familiar human traits to non-human entities, could offer a way of achieving that. Evidently, the practice of using metaphors to make information more accessible, relatable and emotionally resonant is common in discussions about health, disease and emotional states (Semino et al., 2015). Anthropomorphic metaphors are frequently seen in discussions of disease, pain, treatment, symptoms, emotions and feelings. Whether these metaphors are simply convenient vocabulary tools, lead to oversimplification and misunderstanding, or could indeed improve healthcare communication is a matter that requires in-depth analysis.

The aim of this paper is to find out how anthropomorphic metaphors are used in addressing health and disease. Our hypothesis suggests that anthropomorphic metaphors are the most prevalent form of metaphorical expression in medical communication and are effective in bridging the experiential gap. Their success stems from their ability to create an artificial shared experience, which could increase empathy and understanding in discussions about health and disease. To confirm this, we ask the following research questions: What is the occurrence of anthropomorphic metaphors? What are the functions of anthropomorphic metaphors from the speakers' and recipients' perspectives? In what way can such language constructions influence patients' mutual understanding and interaction? Which conceptual domains are most frequently represented through anthropomorphic metaphors?

2 Literature review

Lakoff (1992, p. 1) argues that metaphor does not exist inside the language itself, but rather in the manner in which one mental domain is conceptualized in terms of another. The traditional theory of metaphor has evolved with the conceptual metaphor theory (CMT) proposed by Lakoff and Johnson (1980) and expanded in more recent works by Lakoff (2008), Kövecses (2010), Semino et al. (2017), Gibbs (2017), and Steen (2023), which highlight that our cognitive and behavioural processes are metaphorical in nature, using concrete source domains to understand abstract target domains, particularly in complex fields like health and disease. The current body of academic work on the use of metaphors in medical discourse has grown significantly and encompasses a wide range of perspectives and topics. In a general sense, scholarly investigations pertaining to metaphor within healthcare settings can be categorized into three primary classifications: i) metaphor as a practical tool in medical communication (Taylor & McLaughlin, 2011); ii) the use of metaphor in public communication about disease in media (Koteyko et al., 2008) and pharmaceutical marketing (Reisfield & Wilson, 2004), physical symptoms including pain (Loftus, 2011), emotions (Locock et al., 2012), and patients' self-perception (Appleton & Flynn, 2014); iii) the role of metaphor in the personal experience of disease, particularly in relation to cancer and AIDS (Gibbs & Franks, 2002; Semino & Demjén, 2017). The existing literature may have focused on specific domains or diseases, however, in our study, we perform a broader examination across medical specialties or contexts, which could provide a more comprehensive understanding. The matter of generalizability or applicability has major significance across different fields of medical and social research (Polit & Beck, 2010, p. 1457). The greater the scope of the analysed factors, the higher the potential for universality of the results. Hence different studies assess various kinds of data, such as patient-doctor conversations, questionnaires (e.g., Appleton & Flynn, 2014), interviews (e.g., Gibbs & Franks, 2002), and online blogging (e.g., Semino et al., 2015). Scholars employ different approaches based on the data and research aspects. For instance, Appleton and Flynn (2014) apply a qualitative technique in their study, while other studies use quantitative analyses, such as the computer-assisted methods of corpus linguistics, as demonstrated by Crawford and Csomay (2015). Regarding our research, the study by Semino et al. (2018) was most inspiring and influential. Working with extensive data on the use of metaphors in the context of cancer and end-of-life experiences, this research identified patterns of metaphorical language and examined their underlying functions and implications. The authors showed the benefits of employing a corpus-based methodology to analyse

metaphors related to health and disease. In this line, the project on the impact of vaccine metaphors published by Flusberg et al. (2024) was influential mostly in terms of project design and procedures applied.

3 Anthropomorphism and personification

Anthropomorphism is more common in metaphor studies than one might initially expect. In Metaphors We Live By, while not using the term explicitly, Lakoff and Johnson (1980) explore its connection with ontological metaphors, which help structure our experiences by conceptualizing abstract concepts, objects or forces as entities or substances (p. 23). These metaphors often lead to personifications, where non-human entities are given human characteristics in other words, are anthropomorphized. For example, describing cancer as an entity that 'attacks' or 'steals' transforms it into a personified force, allowing us to understand and respond to complex medical phenomena in familiar human terms (p. 28). This process is a form of anthropomorphism, where we ascribe human-like qualities to non-human agents. Epley et al. (2007, p. 864) define anthropomorphism as "the tendency to imbue the real or imagined behaviour of nonhuman agents with humanlike characteristics, motivations, intentions, or emotions," emphasizing how it serves as a cognitive tool, often realised through language and metaphor, to interpret the non-human world through a human lens. Anthropomorphism in metaphors can be represented in two ways. Directly anthropomorphic metaphors attribute human characteristics to non-human entities explicitly, for example, 'Mother Nature' uses direct anthropomorphism by portraying nature as a parental figure (Ziliang & Zheng, 2023). On the other hand, metaphorically anthropomorphic metaphors, widely known as personification, merely imply human characteristics through symbolism or analogy. For example, in the context of war, such metaphors are often used to evoke emotional responses, framing war as a sentient entity without direct naming, as seen in the case of 'Mother Nature' - war takes lives and steals youth, face of war, etc. (Materynska, 2021). Both types serve to bridge a gap in understanding; the distinction between them lies in their contextual implications and their representation of human traits.

The study of anthropomorphic metaphors within medical discourse has drawn some scholarly interest in the past, notably in organization studies by Schoeneborn et al. (2013) and in scientific communication by Wood (2019), which have made significant contributions. Furthermore, the work of Newton et al. (2017) explores the potential behavioural changes resulting from these metaphors in health contexts. This array of studies demonstrates the diverse applications and implications of anthropomorphic metaphors across various fields. Although existing studies offer valuable insights, the use of anthropomorphic metaphors in health and disease narratives has yet to be fully examined. Everyday language is filled with anthropomorphic phrases, such as referring to a car as 'hungry' for gas or describing the weather as 'angry' (Airenti, 2018). However, the human capacity for imagination expands anthropomorphism well past humanlike objects (e.g., dolls, mannequins) to abstract concepts like disease and pain. The reasons why people anthropomorphize in the context of metaphors of health and disease are briefly discussed by Kövecses (2010, p. 18), and, in more detail by Vaňková et al. (2005, p. 60–61). Our research suggests that the main reason could be an innate tendency towards anthropomorphism and done in order to create shared experience.

4 Methods and language material

This is a corpus-based study, employing the method of conceptual metaphor theory (CMT), as supported by Musolff (2012), Prażmo (2020), and Zhao et al. (2023), supplemented by critical discourse analysis of the language material collected. Our research material consists of a manually collected corpus of communicative exchanges, comments and narratives, considered as a 'target corpus' providing the language material that we examine. The corpus consists of three sets of data involving an account of health-related subjects, such as descriptions of disease, symptoms, patient experiences, and treatments, currently comprising 200 texts. The largest data set contains 100 communicative exchanges collected from Reddit, at an average length of 400 words each. The second data set comprises 50 narratives collected from specialized forums such as Healthboards, PatientInfo and Mental Health Forum. The average length of each example is 600 words. The third set contains texts excerpted from articles published in online journals, such as Very Well Health, Health Affairs, Medical News Today, Beyond Blue and others, devoted to health and lifestyle issues and published between 2013 and 2023, with an average length of 1,000 words. All texts were selected randomly without preference for age, gender or profession. Information on social and cultural background of the speakers was not available in all cases; thus socio-cultural aspects were discussed only marginally. A lack of more complex information on the speakers' backgrounds may be considered one of the potential limitations of the presented research, since these aspects might be useful in deriving a broader perspective. However, it was established that the majority of speakers were citizens of the USA, UK and Canada. Table 1 below illustrates the corpus composition in more detail, providing information on the total size of the corpus linked to metaphor occurrences provided in Table 2. We consider both figures significant: the information on the word count

shows differences between the structuring of narratives when addressing an open community of participants such as Reddit, a closer community of patients sharing their thoughts on specialized forums, and the more complex narratives provided by unspecified authors in online journals. By means of identifying particular dissimilarities we may better understand speakers' communicative goals and related discourse practices. Breaking the size of the corpus down by occurrence of metaphorical expression is further illuminating, showing the speakers' state of mind as reflected in their preferences for using and reusing particular metaphorical expressions. The corpus consists of three data sets. Table 1 differentiates between communicative exchanges and commentaries, commentaries and posts, and narratives.

Corpus overview	Total word count	Number of texts					
Total size of corpus	82,638	200					
Corpus composition							
Data set 1. Communicative exchanges and commentaries collected from Reddit	22,489	100					
Data set 2. Commentaries and posts collected from specialized forums	15,735	50					
Data set 3. Narratives collected from articles in online journals	44,383	50					

Table 1: Corpus composition

For convenience and clarity, the texts in the corpus were tagged following this scheme //#/publication_date/access_date/source, where # stands for the number of the text; publication_date – for date of its creation; access_date – date of our access; and source – the source where the text was taken from. As an example, the following text is number 7 in the corpus, the year of publication is 2018, date of access is 28 July 2023, and the source is a Reddit community dedicated to discussion of mental health:

(1) //7/2018/28072023/ https://www.reddit.com/r/mentalhealth/

Speaker A: Tell me what your mental illness feels like. I have ADHD and it's that one friend in the group that never shuts up, except he is in my head.

Speaker B: How I describe my anxiety. When you're a kid in you're sitting in a chair, and you lean back on two legs and you're just balancing. [...] Anxiety is like a school bully who is gonna keep pushing your chair back so the feeling of falling lasts.

Speaker C: Close to mine. Mine is like the feeling when you're jaywalking and a car just misses you

The complete annotated corpus is publicly available and can be accessed via this link: https://docs.google.com/spreadsheets/d/1vU_vGmD3mPPa3 dMJgdP2gBHtl-U_APzd/edit?usp=drive_link&ouid=103680490371 389194376&rtpof=true&sd=true

Since our work centres around metaphors in medical discourse, we examine how language is implemented in social interactions through a discourse perspective. Our method consisted of a manual search through the corpus materials and applying the MIPVU (Metaphor Identification Procedure VU University Amsterdam) (Steen et al., 2010), an advanced and systematic procedure for identifying metaphor-related words. MIPVU builds on the basic principles of MIP (Metaphor Identification Procedure) (Pragglejaz Group, 2007) by incorporating additional guidelines and handling more complex linguistic phenomena. The key steps of MIPVU include: i) identifying lexical units within the text, ii) determining the contextual meaning of each lexical unit, iii) establishing the basic meaning of each lexical unit, iv) comparing the contextual meaning with the basic meaning to identify potential metaphors, v) evaluating whether the difference between these meanings can be explained by cross-domain mapping, and vi) addressing complex lexical phenomena such as phrasal verbs, compounds and indirect metaphors.

5 Anthropomorphic metaphors and cognitive target domains in the corpus

Eighty per cent of samples contained at least one metaphorical linguistic expression. The total number of metaphorical expressions that were identified following MIPVU is 552, with 239 in the first data set (commentaries from Reddit), 131 in the second data set (commentaries and posts from specialized forums), and 182 in the third data set (articles from online journals). All expressions were further divided into groups according to their target conceptual domains, namely DISEASE, TREATMENT, PAIN, EMOTION, PATIENT, and BODY. This can serve as the answer to our research question "Which conceptual domains are most frequently represented through anthropomorphic metaphors?". As listed above, we identified six target conceptual domains. A more detailed distribution of target domains in the corpus is demonstrated in Table 2. The third column provides examples of metaphor tokens, i.e., the number of individual metaphor occurrences in the corpus.

Target domain	Number of metaphorical linguistic expressions	Examples of metaphorical linguistic expressions	Metaphor words
DISEASE	257	soldiers do not fight , my liver attack s my body, illness is kill ing me, battling the fear of death, the final battle of my life, mental war , anxiety is a bitch	FIGHT/23, ATTACK/20, KILL/9, KILLER/7, BATTLING/10, BATTLE/23, WAR/15, BITCH/3
TREATMENT	92	needed to replace the darkness and despair, to shift that dark cloud and let the light back in, a blessing in disguise, still fighting every day, race against time, pull out weeds , time the best healer	DARKNESS/1, DARK/13, LIGHT/4, BLESSING/3, FIGHTING/13, RACE/4, WEEDS/4, HEALER/2
PAIN	67	pain is killing me, pain is a bastard , kid carving pumpkins, pain is a damn torturer	KILLING/9, BASTARD/6, CARVING/1, TORTURER/4
EMOTION	61	putting a brave face on, moments of sunshine that break through the clouds, my heart breaks , you are near your breaking point, trying to juggle , exploded like bomb	MASK/1, BREAK/12, BREAKING (point)/4 JUGGLING/1, EXPLODED/2,
PATIENT	39	they see women as incubator , hovering above my own body like a ghost , I am essentially a slave to whichever customer, continue to feel like a robot , a burden to everyone close,	INCUBATOR/1, GHOST/3, SLAVE/1, ROBOT/1, BURDEN/9 (repeatedly used by many patients)
BODY	36	body is like a garden , like a computer that says 'error not found', my brain was jump-started , a very intolerant bouncer , help the gatekeeper regain control	GARDEN/8, COMPUTER/2, JUMP-START/1, BOUNCER/2, GATEKEEPER/4 (by the same speaker/nurse)

Table 2: Target domains

Metaphors that give human attributes to various aspects of disease are divided into directly anthropomorphic and metaphorically anthropomorphic (personification). The following table demonstrates the distribution of such metaphors in the corpus: out of the total number of metaphors, 40 per cent are anthropomorphic and refer to the act of assigning human attributes or behaviours to objects or entities that are not human.

Type of metaphor	Number	Individual metaphor words	%
Direct	91	ENEMY, THIEF, KILLER, SHADOW MAN,	16%
anthropomorphism		ROBBER, HITMAN, TORTURER, BASTARD,	
		CREEP, VILLAIN, JACKASS, FIREFIGHTER,	
		POSTMAN, MESSENGER, CLOWN	
Personification	127	TORTURES/TORTURING, KILLS/KILLING,	24%
		FORCES/FORCING, ATTACKS/ATTACKING,	
		STEALS/STEALING, COOPERATES,	
		UNDERSTANDS, CREEPS/CREEPING,	
		TRAVELLING, JUMPING	
Other	334	JOURNEY, TOOL, GARDEN, SALAD, BLESSING,	60%
		CURSE, HELL, GHOST, ALIEN, SHADOW, CLOUD	
Total	552		

Table 3: Anthropomorphic metaphors in the corpus - general word count

Metaphors that directly named disease and its aspects as humanlike are in the minority, with a total of 91 instances. We categorized direct anthropomorphism into three distinctive groups: pejorative, violent and social. In the absence of a widely accepted standard for classifying metaphors specifically within the context of health and disease, we created this classification based on how diseases and pain are personified, signifying the different levels of animosity, familiarity or social engagement associated with them. While broader classifications such as those by Semino and other respected scholars (Semino, 2008; Cameron, 2011; Demmen et al., 2015) distinguish general domains like VIOLENCE, these were too expansive for our analysis; therefore, we narrowed them down to better suit the specificities of the topic. Pejorative concepts are often represented by anthropomorphic metaphorical models (Kulchytska, 2022). Pejorative metaphors tend to be employed to mock or diminish the disease and its aspects, serving as a coping mechanism for patients to minimize the perceived threat of their condition. Metaphors such as PAIN IS A BASTARD, DISEASE IS A CREEP, DISEASE IS A JACKASS we classified as pejorative because they attribute unpleasant characteristics to diseases. In this context, the term 'pejorative' refers to the act of minimizing the disease's perceived power or importance, presenting them as annoyances rather than major obstacles. Metaphors we labelled as violent depict diseases as forceful or destructive entities, highlighting the confrontation between the patient and their disease. Examples include DISEASE IS A KILLER, DISEASE IS A THIEF, DISEASE IS AN INTRUDER, DISEASE IS A ROBBER, DISEASE IS AN ENEMY, DISEASE IS A TORTURER. These metaphors emphasize the combative aspect of the disease, typically using the imagery of assault or theft of health, in order to motivate the individual to resist and battle against it. The 'social' category covers metaphors that ascribe social roles or behaviours to diseases, emphasizing the complex nature in which diseases can become part of an impact individuals' social life. Examples in this category include metaphors such as PAIN IS AN OLD FRIEND, DISEASE IS A SCHOOL BULLY. The term *bully* is often associated with abuse; however, its categorization as 'social' is based on the focus on the interpersonal dynamics and manipulative tactics that are typical for harassing actions. Similarly, an enemy might mirror an inherent inclination towards violence, although its classification is determined by the specific context of antagonism within a socially established framework, such as warfare or competition. The 'other' category in Table 3 includes metaphors that do not attribute human characteristics to health and disease. These might incorporate natural forces, mechanical operations, or any non-human entities affecting the individual or their condition. For example, describing cancer as a storm or depression as a shadow corresponds to this classification. These metaphors use a variety of real-life experiences to understand disease, demonstrating various ways in which medical discourse can be metaphorical.

Table 4 conveys the data related to the research question "What is the occurrence of anthropomorphic metaphors?". The identified six target domains and their occurrences are listed separately for each set of data. Anthropomorphic metaphors are classified into direct and metaphorical anthropomorphism, with their occurrences stated. Illustrative examples of individual metaphors within each domain are provided within both categories. Metaphors are often accompanied by personification; thus, some metaphors were listed in both categories since both direct and metaphorical anthropomorphism can be identified. For instance, *ADHD is a clown that is controlling my mind* is both named explicitly and is attributed with a human-like action.

			Metaphor occurrences/ illustrative examples		
	Target domain		anthropomorphism		
			direct		metaphorical
Data set 1	DISEASE	53	that toxic boyfriend that keeps messaging you; magician performing unexpected acts; mysterious person talking in riddles ;	32	chronic illness tells me, ,,No!"; my liver attacks my body; silently shooting ; tragedy is going to haunt me; get violently mugged ;
	PAIN	7	a really strong man was squeezing my head with his arms; kid carving pumpkins; nasty little dwarfs are trying to push all that outside of my body;	4	state that makes it nearly impossible; pain is killing me; pain travelled from my bladder to my kidneys; cramps would make me pass out;
	TREATMENT	2	brave firefighter,	-	
	BODY	5	a very intolerant bouncer ; brain as an adult , the unconscious part as a child ;	5	tongue doesn't cooperate with me; my brain was splitting open and made me cry ; body starts to attack itself ;
	PATIENT	5	I'm some sort of android;	-	
Data set 2	DISEASE	9	anxiety is a bitch,	11	my bladder wakes me up with pain; illness that attacks me; self-destructing;
	PAIN	2	ripped away by someone slightly,	7	Tingling up and down my arms; despair washes over you again; it could switch off;
	PATIENT	1	brave firefighter,	1	makes me turn into mad hatter;
	BODY	-		8	my mind noticed itself and suddenly zoomed out and put my whole reality into perspective; my body is forever attacking itself; my body betrayed me and left me alone;

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		Metaphor occurrences/ illustrative examples			
	Target domain		anthropomorphism		
			direct		metaphorical
	TREATMENT	-		5	12 chemos nearly killed me; Morphine did great job; fentanyl made me have some really nasty side effects; Your mind has to understand you;
	EMOTION	-		2	fuels my anger; thoughts pass my mind;
Data set 3	DISEASE	3	Cancer used to stand behind your back as a watcher; invaded by enemy cells; the shadows and the man;	31	Depression convinces you; dark feelings returned; Cancer used to stand behind your back as a watcher; invaded by enemy cells; my cancer diagnosis taught me to live in the present:
	BODY	1	Dopamine is the brain's chemical messenger;	3	listen to your body; mind convinced me; my body serves as a constant reminder;
	EMOTION	1	battling with my employer;	7	you been bothered by little interest; the past had evaporated; lost my mind;
	4. TREATMENT	-		3	kill the virus that's living in me; the treatment failed the patient;

Table 4: Target-domain occurrences as identified in each data set, direct and metaphorical anthropomorphism occurrences, and illustrative examples

The results show that the conceptual target domain DISEASE comprises the largest number of anthropomorphic-metaphor occurrences in all three data sets. Certain differences between the number of occurrences of direct and metaphorical anthropomorphism are seen in all three data sets; however, the difference in Data set 3 (3/31) seems most significant. A smaller difference was calculated in Data set 1 (53/32), while the figures in Data set 2 appear insignificant (9/11). While the dominance of cognitive target domains of DISEASE and PAIN, as well as the absence of metaphorical anthropomorphic metaphors in the domain TREATMENT were predictable, the absence of direct anthropomorphic

metaphors in the domains of BODY, TREATMENT and EMOTION in Data set 2 seem revealing. Similarly, Data set 3 shows no direct anthropomorphic metaphors in the TREATMENT domain. These manifestations are discussed in more detail below.

6 Social, discursive and textual dimensions of anthropomorphic metaphors

In this section, the functions of anthropomorphic metaphors from the speakers' and recipients' perspectives, and the influence of particular language constructions on patients' interaction are considered. The data were analysed following the model of the three-dimensional approach in CDA (Fairclough, 1995).

6.1 Data set 1. Communicative exchanges and commentaries collected from Reddit

As noted earlier, the occurrence of anthropomorphic metaphors is highest in Data set 1 where speakers employ a rich variety of informal language inventory. Anthropomorphic metaphors seem to best accommodate speakers' communicative needs. For instance, calling ADHD disease (attention deficit hyperactivity disorder) a tiny clown sitting inside my head or PTSD disease (post-traumatic stress disorder) a butcher who killed the old me can be seen as expressive speech acts executing a unique illocutionary force, allowing speakers to voice an array of feelings. Participants make inferences about expressions of fear and despair behind seemingly brave speeches, and react with compassion, suggesting ways of handling the disease. Informal colloquial language helps to ease the sharing of the most difficult experiences (e.g., Cancer fucking stole her from me. That stupid thief, violent robber who got in our life.). Optimistic attitudes were inferred in expressive speech acts, enhanced by boosters and other devices, such as visual foregrounding (e.g., You should definitely give YOURSELF a chance and go see a doctor! Maybe it's not cancer at all.), and often expressed non-verbally by emoticons, self-invented acronyms and symbols. Humour and irony are also used (I guess it doesn't sound too bad haha...).

6.2 Data set 2. Commentaries and posts collected from specialized forums

While Data sets 1 and 2 share similar characteristics, specialized-forum speakers are considerably more focused in their talk, asking direct questions and seeking advice (e.g., *anyone else have the same?*). Social and discursive dimensions are observable via the notion of shared experience. Interlocutors interact via sharing their views on treatment results, medication (e.g., *I had to stop the meds, doctor advised me*), doctors and other medical workers (e.g., *my*)

doctor an absolute legend; has been my rock), sometimes referring to the diverse reactions of the neighbouring community to their health conditions (*Noone understands me.*). The closeness of community is demonstrated by framing the discourse with the speech acts of greeting and saying goodbye, respectfully addressing the speaker's face, using verbal politeness to express sincere interest, respect and understanding:

(2) //115/2022/12092023/mentalhealthforum/

Hi everyone. I have posted on here a few times but I haven't been back since. First of all *how is everyone I hope your all well.*

(3) //115/2022/12092023/mentalhealthforum/

Im not a religious person *but always happy to hear someone* find comfort in anything, including in religion. *Maybe you can share* your anxiety depression episode? *What triggers them, how does it make you feel and how you went through it*? As someone who suffer anxiety, im *always eager* to learn from others. *Cheers.*

The narratives of speakers A in Data sets 1 and 2 often take the form of a story, where speakers introduce their health conditions as stories of their lives. Providing a brief context to their stories, they share basic personal information, such as age and gender, as well as briefly describing their social situation. The other participants' responses convey sincere concern and a desire to offer helpful advice (e.g., Have you talked to a disability lawyer..., you could freelance...). Politeness strategies are employed by both speaker A and other participants reacting to initial posts. The frequent occurrence of sorry in a variety of linguistic formulations shows the informal nature of the communication (45 occurrences). When used by speaker A, it commonly denotes apologies, and recipients infer their worry of being a bother (e.g., I'm sorry for the long rant...). Functioning as maxim hedges, these expressions enhance the efficient flow of the talk via instigated cooperation. Respondents B and C employ the phrases with sorry as expressions of understanding and sympathy, often with increasing expressiveness (e.g., I am so sorry for your loss. I'm so sorry..., I'm sorry you're going through it. I'm very sorry about your struggle. That's awful. Fuck cancer!). Avoiding potential face threats, speech acts expressing concern for others are used all through the corpus. A variety of linguistic structures functioning as mitigating devices are used (e.g., not doubting you ..., it sucks out here, I'm sorry.). In truly difficult emotionally challenging situations, these posts turn out to be extensive, often more than 800 words long (e.g., //106/2023/12092023/ hivnet).

Throughout the data in Data sets 1 and 2, the patients were the only interlocutors initiating every interaction. Medical workers, especially specialist

doctors, entered communication when explanation, correction or expert advice were required. Doctors never exercised their power over patients. They were careful not to threaten the patients' face needs avoiding performing directive speech acts without using redressive strategies (e.g., then maybe don't attend anymore; ..., Not sure what judo is other...). There were no systematic recurrences of expressions that indicate the manifestation of power relations between the doctors and the patients. On the contrary, the forums display a place of noticeable openness and trust (e.g., I'm trying so hard to get better and be better; I'm scared. And tired. And angry. I would just like to hear some nice words please. Or that I'm not alone in this.). Social life options, such as relationships, dating, working possibilities, hobbies and treatment options were discussed with genuine concern, respecting both cooperative and politeness principles to pursue successful communication. On occasion, professional debate between two or more doctors developed, providing a chain of responses offering expertise and medical advice. Here, the patients were not involved, and the talk was informal but professionally valid. Direct speech acts were performed with no intention to harm but be quick, specific and accurate (e.g., You have a 63 y old pt.). When providing suggestions or expert advice maxim hedges and other mitigating devices were used (e.g., If possible ..., Would obtain ..., seems to fit). The corpus data did not show any dominance of participating doctors. Similarly to 'patient - non-patient - other' communicative exchanges, no asymmetrical relations were detected.

(4) //116/2021/12092023/acp

Speaker A: I am working in a rural hospital in Sri Lanka with limited facilities. We have a 63 year old lady who presented with proximal muscle weakness for 1 week in both lower limbs...

Speaker B: *You have a 63 y old pt* with an acute presentation of proximal weakness and dysarthria, with preserved reflexes...

Speaker C: If possible, an MRI may be needed to rule out stroke.

Speaker D: *Would obtain* a detailed dermatological exam as well. Dermatomyositis seems to fit the clinical picture if a consistent rash is present.

Generally, speech acts of appreciation and thanks were frequently used (e.g., *Hi, just want to say it's amazing how so many people are experiencing the same thing! I thought I was going insane until I found this forum!*). Cases of metaphor hedging were also identified in the corpus. Throughout the corpus we identified 26 occurrences of *kind of* used as hedging devices, out of which 20 can be classified as maxim hedges and six as metaphor hedges. The example below illustrates the use of a maxim hedge (*I kind of enjoyed*) and metaphor hedge

where *paint a picture* metaphorically names the existing stage of a disease (*kind of paint a picture*).

 (5) //3/2023/15072023/https://www.reddit.com/r/ChronicIllness/ It helped to kind of paint a picture of what a day in my life with my unknown mystery illness was. I kind of enjoyed that phase, it comes and goes.

Other metaphor hedges can be listed here:

HIV is that corrupt border guard who gets all kind of scum in without checking, but do not give up. (DISEASE)

Now it's kind of like having a balloon wedged in there or I have some kind of flesh-eating disease that is spreading to consume my whole body...(BODY) It's kind of like an interview to see if it's a good match (TREATMENT)

From the speakers' point of view, metaphor hedges help them to adjust the force of metaphorical utterances, while from the recipient's point of view, metaphor hedges enable the making of accurate inferences of the messages implied between the lines. Occasionally, other maxim hedges were used, such as *I believe*, *I think*. Frequency of boosters was also noted. Unsurprisingly, the most frequent one was *really* with 160 occurrences, followed by *especially* used 27 times, *total/y* with 11 occurrences, *absolute* with 14 occurrences and *absolutely* used eight times.

Data sets 2 and 3 reveal noticeably less direct anthropomorphic metaphors with the majority used to describe disease. Speakers preferred to use personifications of disease, body parts, and pain. For instance, disease was often described as an entity that has power over a person's life, performing both violent and non-violent actions (*waking up, teaching, stopping, forcing, understanding, killing*, etc.) In metaphorical anthropomorphism (personification), disease and pain become active performers of actions characteristic of humans. Various illnesses from cancer to depression were attributed predominantly violent actions, such as stealing, murdering and killing. These findings dovetail with previous studies (e.g., Gibbs & Franks, 2002; Semino et al., 2015) proving that the concept of violence is most frequently used. Another common theme identified in the corpus material was being healthy and overcoming disease. Several patients described health as a *blessing* or *heaven*, while being ill as a *curse, hell* and *punishment*. Such comparisons have religious connotations and provide insights into the impact of cultural and religious views on language and comprehension of health.

6.3 Data set 3. Narratives collected from articles in online journals

Data set 3 differs significantly on a textual level, displaying formal characteristics of thoughtfully edited popular-scientific writing. More importantly, the articles reveal different communicative purposes. Whereas posts and commentaries in the first two sets generally functioned as a form of 'group therapy', where all participants share the same condition and via talking about it seek understanding, help and encouragement, the primary purpose of the articles is to inspire via providing instances of successful coping with the disease and the most effective illness management. This aim is achieved through telling 'life stories' of 'real' people - other patients. Unlike Data sets 1 and 2, where all communication was initiated exclusively by patients, these stories are told from the third-person perspective by unspecified narrators, probably medical workers (e.g., Kali had always been labelled as unreliable. Philip was a married man with two children. Annmarie has lived with psoriasis since she was 11, etc.). All the stories have an opening sentence serving as a title, establishing the topic (e.g., How my cancer diagnosis taught me to live in the present. / In February 2021 I checked into a psychiatric ward. / A black tunnel with no way out. / My Story of Living with Obesity.). Personal data, such as gender, age and location (a city and/or state) are given to enhance trust, such as in Mariana Castrillon, a 17-year-old from the Bronx has struggled with her weight her entire life. Occasionally, articles written by doctors occur, yet these are explicitly marked as "doctor article" and take a significantly more explanatory and educational attitude towards a particular topic, as implied by the opening sentences 'War on cancer' metaphors may do harm, research shows or Like many diseases, cancer has its own special language. The articles vary in length, alongside articles 4-600 words long, extensive texts over 2,000 words long were noted, and, on challenging topics, such as AIDS or ADHD, they were even more extensive (e.g., AIDS epidemic takes toll on black women - 2,984 words; With her long dark hair flying, Saorla Meenagh, 10, can execute a perfect switch leap – 5,970 words). In several samples, medicine and treatment procedures are compared to tools or instruments, which suggests that disease is considered a malfunction that can be corrected or fixed. The tool/instrument metaphors convey perception of power over illness. They propose a dynamic and direct approach to healthcare, where healthcare workers are viewed as skilled technicians or mechanics having the ability and knowledge to resolve issues. This can mirror more extensive social and cultural beliefs regarding the function and power of medical knowledge and technology in the management of health.

7 Conclusion

Our research has built on the hypothesis that anthropomorphic metaphors are the most prevalent form of metaphorical expression in medical communication and are effective in bridging the experiential gap. The results confirm their ability to create an artificial shared experience, as shown mainly in the analysis of Data sets 1 and 2. The results of the discourse analysis provide linguistic evidence that the use of anthropomorphic metaphors increases the level of empathy and understanding between speakers. The research results brought insights into the frequency and distribution of anthropomorphic metaphors, showing that pejorative, violent and social metaphors are frequently used by both patients and medical workers.

Throughout the corpus, we identified six target conceptual domains, namely DISEASE, TREATMENT, PAIN, EMOTION, PATIENT, and BODY. The most frequently represented domain through anthropomorphic metaphors is DISEASE with 257 examples of metaphor; the least frequent is the domain BODY with 36 identified metaphors. The discourse analysis method was employed to explore the functions of anthropomorphic metaphors from the speakers' and recipients' perspectives. The results show that participants in communication respect both cooperative and politeness principles to pursue successful and smooth flow of the talk. The closeness of the patients' and medical workers' community is palpable via framing the discourse by speech acts of greeting and saying goodbye, respectfully addressing the speaker's face, and employing politeness strategies expressing sincere interest, understanding and encouragement. Throughout the data, the patients are the only interlocutors initiating every interaction in Data sets 1 and 2. Doctors and other medical workers never exercised their power over patients. The forums in Data set 3 display room for noticeable openness and trust. We presented evidence on the effectiveness of anthropomorphism in metaphors in eliciting emotional reactions and establishing insightful relationships between speakers. Statistically, metaphors directly naming disease and its aspects as humanlike are in the minority with a total number of 91 instances out of a total of 552 metaphorical linguistic expressions identified in the corpus. Compensating for the absence of a widely accepted standard for classifying metaphors within the context of health and disease, we categorized direct anthropomorphism into three distinctive groups: pejorative, violent and social. This enabled us to produce a classification showing how diseases and pain are personified, and identify the different levels of animosity, familiarity or social engagement associated with them accordingly. In contrast with previous studies, such as Semino et al. (2015) and Gibbs (2017), this paper contributes to current research on metaphors by

narrowing the focus specifically onto the notion of anthropomorphism and its application in metaphor creation. Hence our findings dovetail with the research of Epley et al. (2007) and Newton et al. (2017). Aiming at identifying specific types of anthropomorphic metaphors, we created an in-depth classification of direct anthropomorphic metaphors as compared to metaphorically anthropomorphic metaphors. Prospective research could expand to include a wider variety of cultural contexts and languages to explore how different cultural backgrounds may influence the use and interpretation of medical metaphors. Particular types and forms of disease, such as non/treatable diseases, need to be considered in further research, as these aspects directly influence the recipients' attitude toward the use of metaphors talking about these sensitive topics. With the rise of digital health communications, studying the role of metaphors in telemedicine and online health forums could provide insights into their effectiveness across different media.

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