Metaphor use in depersonalization/derealization

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Abstract

This study investigates the use of metaphor in the dissociative disorder depersonalization/derealization – the feeling of unreality or detachment from the senses or surrounding events. While the debilitating experience of depersonalization/derealization is prevalent, it is also under-acknowledged, such that it is often expressed through metaphor, with more typical metaphor described in diagnostic criteria. Using naturally occurring text from two prominent English language depersonalization/derealization support fora, in the current study a systematic survey is made of metaphor to communicate the experience of depersonalization/derealization in context. It is concluded that metaphor described in the formal diagnostic criteria for depersonalization/derealization does not completely represent metaphor use in the contexts investigated. A summary is made of metaphor for the experiences of depersonalization, and derealization, and depersonalization/derealization more generally, across both the contexts investigated, that may support vital understanding and diagnosis of this debilitating, under-recognized experience, across a wider demographic.

1. Introduction

Depersonalization/derealization, the under-recognized experience of unreality or detachment from the senses or surrounding events, has a lifetime prevalence of around 50% of adults for short-term symptoms lasting from hours to days, and around 2% of adults for the longer-term symptoms that meet the criteria for depersonalization/derealization as a disorder, with a gender ratio of 1:1 (American Psychiatric Association, 2013). Depersonalization refers to experiences of the self as unreal or detached, as though one was an "outside observer with respect to one's thoughts, feelings, sensations, body, or actions" (American Psychiatric Association, 2013, p. 302); derealization refers to "experiences of unreality or detachment with respect to surroundings" (American Psychiatric Association, 2013, p. 302). Depersonalization/derealization as a disorder is the persistent or recurrent experience of

one or both of depersonalization or derealization. In the current study depersonalization/derealization is referred to as dp/dr, and specific references to depersonalization or derealization use those individual terms.

Metaphor is a figure of speech in which a typically more abstract target concept is described in terms of typically more concrete, or more familiar, source concepts, such that existing understandings of those source concepts may be made more available to shape understandings of the target concept, a process which entails that other aspects of the target concept are suppressed (Lakoff & Johnson, 2003). In their conceptual and phenomenological analysis of the language of depersonalization, Radovic and Radovic (2002) suggest that the prominent use of metaphor signalling devices such as 'as if' and 'feels like' reflects the use of metaphors in a novel context, where they reference poetry as a standard context. This characterization of metaphor is not consistent with conceptual metaphor theory (CMT) (Lakoff & Johnson, 2003), the current metaphor research paradigm, in which metaphor is understood to be pervasive, and fundamental to the way in which we conceptualize our worlds. In the terms of CMT, since there is no direct way of perceiving more abstract concepts they must necessarily be understood in terms of metaphor. And further, it is argued that linguistic metaphors are possible because of the existence of conceptual metaphors in the brain, such that linguistic metaphors may provide insights into the way the more abstract target domain is structured in the minds of their users.

People living with illness may use metaphor to communicate an experience which is likely to be atypical for them (Bowker, 1996; Gibbs & Franks, 2002). Because it is under-recognized, the experience of dp/dr is often expressed as metaphor (Modigh, 2002), such that metaphor that may be used to communicate the experience forms part of the DSM (Diagnostic and Statistical Manual of Mental Disorders) (American Psychiatric Association, 2013) and *British Medical Journal* (Hunter et al., 2017) diagnostic criteria. Depersonalization was first included in DSM-II (American Psychiatric Association, 1968) as "Depersonalization neurosis", for which no associated metaphors are noted. It was included as "Depersonalization disorder" in DSM-III (American Psychiatric Association, 1980), at which point the metaphors "feel 'mechanical' or as though in a dream" are included in the description. In DSM-IV (American Psychiatric Association, 2000) "feel like an automaton or as if he or she is living in a dream or a movie" are included as diagnostic features. In the current DSM-V (American Psychiatric Association, 2013), in which it is identified as depersonalization/derealization disorder, the diagnostic descriptions of the range of experiences relating to depersonalization and derealization include distinct metaphoric framings. For depersonalization, metaphors include "head filled with cotton", which is identified as being related to detachment from thoughts, and "feeling robotic, like an automaton", which is related to "diminished sense of agency" (American Psychiatric Association, 2013, p. 303). For derealization it is noted that "individuals or objects are experienced as unreal, dreamlike, foggy, lifeless, or visually distorted", and "the individual may feel as if he or she were in a fog, dream, or bubble, or as if there were a veil or a glass wall between the individual and the world around" (American Psychiatric Association, 2013, p. 303). The current *British Medical Journal* definition similarly includes the following metaphors that those experiencing dp/dr might use: "It's like I'm just watching life from behind glass", and "I feel as if I'm living in a dream", and notes that "patients may describe using phrases such as 'it is as if…'" (Hunter et al., 2017), which is a way of signalling that metaphorical interpretation is required (Goatly, 2011).

It can be seen, then, that the DSM definition of dp/dr has changed over time, including in relation to recognized metaphoric framings of the experience. While the DSM is controversial (Frances, 2013; Strong, 2012), it remains highly influential, being used worldwide for the diagnosis of mental illness in a wide range of social settings, including law and education (American Psychiatric Association, 2022). Updating the DSM is a long process, with over 1,500 health professionals contributing to DSM-V, which draws on "extensive literature reviews and secondary data analyses, and solicited feedback from other professionals" (American Psychiatric Association, 2022). But despite its prevalence and debilitating effect, dp/dr is an under-acknowledged and under-researched (Phillips et al., 2001) condition, for which there has been no systematic analysis of how metaphor is used in context by those experiencing it.

The DSM-V diagnostic criteria for dp/dr also state that reality testing – the ability to distinguish between the internal world of thoughts and feelings and the external world (Freud, 1951) – remains intact. This points to a potentially problematic relationship between dp/dr and use of metaphor to express this experience, in that (i) dp/dr experience expressed as metaphor may not be understood by a hearer as metaphoric, which may support the interpretation that reality testing is not intact; and conversely (ii) for cases in which reality testing is not intact, what a hearer interprets as metaphor may be an expression of a lived alternate reality. This issue is recognized within the communities considered in the current study, for example from the dp/dr internet forum dpselfhelp.com: "the biggest mistake doctors make with dp [depersonalization] is diagnosing it as psychosis because they mishear something like 'i feel like a zombie' as 'i believe *i* am a zombie'", where fear of being "crazy", or "going crazy", is characteristic of dp/dr (American Psychiatric Association, 2013, p. 303).

In addition to dp/dr as a primary disorder there is a "rather vast variety of physical and emotional states, psychiatric symptoms, organic factors, and life experiences with which it can be associated" (Simeon & Hollander, 1993), including fatigue, stress, anxiety, depression, and neurological conditions such as epilepsy. This supports the view that the "vast terrain" of dp/dr "would benefit from a broader lexicon to help find words for the unspeakable" (Simeon & Abugel, 2008, p. 77). It is vitally important to understand the range of figurative language used to express dp/dr in different contexts. To support this, the current study undertakes a systematic analysis of metaphor used to communicate the experience of dp/dr in the contexts of two long-established and currently still active dp/dr internet fora, where such fora have been instrumental in raising awareness of and providing support for this condition (Simeon & Abugel, 2008). This starts with determination of the prevalence of the current diagnostic metaphor terms for dp/dr across all posts from each forum (Section 3.1), and an investigation into their use in context in a sample of 50 instances (where available) of each term from each forum (Section 3.2). The subsequent focus is on metaphor prevalence and use more generally to express the experience of dp/dr, in a random sample of 500 posts from each forum (Section 3.3), and in a random sample of 100 posts containing the phrase *as if* from each forum (Section 3.4). Themes of metaphor use are sought, and there is a focus on metaphor used to express depersonalization and derealization separately, and dp/dr more generally. Attention is paid to the relative prevalence, and use in context, of the current diagnostic metaphor terms, and new metaphor source terms for dp/dr. It is concluded that metaphor described in the formal diagnostic criteria does not completely represent

metaphor use in the contexts investigated. A summary is made of metaphor for the experiences of depersonalization and derealization and dp/dr more generally across both the contexts investigated: this may widen vital understanding and recognition of this under-recognized experience.

2. Data and methods

2.1. Data

The data of the current study consists of naturally occurring discourse from two internet fora focused on the experience of dp/dr, which are the two dominant English language internet platforms for this topic at the time of writing, both of which have participants from multiple countries. Both fora are participant led, and have no formal presence of healthcare professionals.

The first dataset consists of all posts from the Reddit discussion website r/dpdr subreddit, which has been running since 2011, and consists of 205,419 posts made by 27,503 participants, over a span of around 10 years. The r/dpdr data was collected in June 2022 via the Reddit pushshift.io api (Baumgartner, 2022), which provides access to an ongoing archive of all Reddit posts. The second dataset consists of all posts from the internet forum dpselfhelp.com, which was founded in 2004. While there are several sub-fora on dpselfhelp.com, including specific fora relating to treatment options, research papers about depersonalization/derealization, and member polls, the data for the current study consist of the 10 sub-fora that focus most on the personal experience of dp/dr. These include the general "Discussion" sub-forum (~178 K posts), which has by far the most posts and is the main focus of the forum; "The Daily Forum" (~40 K posts), which is another very active sub-forum, in which participants discuss how they are feeling currently; and the "Introduce Yourself" forum (~26 K posts), which is typically where participants' first post on the forum is made. The dpselfhelp.com data was collected in August 2022 using the Scrapy web scraping framework (Scrapy, 2021) and consists of 281,128 posts made by 12,472 participants, over a span of around 18 years.

For both sets of data, each post is stored as a separate entry consisting of the date and time the post was made in unixtime (the number of seconds since the start of 1970); the id of the participant who made the post; and the text content of the post. The text has been converted to lowercase, and urls and emojis have been removed. Posts with empty text fields have been removed, as have post duplicates based on a combination of participant id and text content. For each post, in addition, an additional field is calculated that represents the post number for a participant (ppi = participant post index), such that, for example, ppi = 1 is the first post a participant made. This allows analysis of metaphor use based on level of participation on the forum.

2.1.1. Ethics

The British Psychological Society ethics guidelines for internet-mediated research (BPS, 2017) state that consent is not necessary where online data can be considered to be in the public domain, which is the case for both fora used here. In addition, Reddit specifically allows data to be used for research, and is a data source for a wide range of research. While permission was sought for the use of dpselfhelp.com data, no reply was received from the company that now runs this and many other fora that were

originally set up by individuals. Where quotations are made from the fora, they consist of at most one sentence from any post, and are anonymized in terms of spelling errors, names, and dates.

2.2. Methods

2.2.1. Natural language processing
In the current investigation the naturally occurring text data from the fora investigated is processed using the spaCy natural language processing Python library (Honnibal & Montani, 2021). Using statistical language models to process text according to its context, the spaCy parser is quick and has high accuracy, which is evaluated rigorously. Its English part of speech tagger uses the OntoNotes5 version of the Penn Treebank tag set, and tags are mapped to the Universal Dependencies v2 POS tag set. This allows for terms to be analyzed as the relevant parts of speech in context. For example, in the current study *dream* is analyzed as the noun lemma *dream*; and the potential metaphor signal *as if* is analyzed as the lemma *as* as a subordinating conjunction followed by the lemma *if* as a subordinating conjunction.

2.2.2. Linear least squares regression analysis
The Python SciPy linregress method (SciPy, 2022) is used here to calculate linear least squares regression (r) for the percentage of posts containing specific terms by month over time, with *r* interpreted such that 0.3 denotes a weak relationship, 0.5 denotes a moderate relationship, and 0.7 denotes a strong relationship.

2.2.3. Metaphor analysis
Random text samples for metaphor analysis are extracted automatically from the data. For analyses considering use of specific metaphor terms, extraction is based on presence in posts of term lemmas as the relevant part of speech. The PIMS method for identifying metaphorical scenes (Falck & Okonski, 2022) is used to identify metaphor in this complex, naturally occurring discourse. This allows for consideration of metaphorical meaning extending over longer sections of text in addition to the focus on linguistic units of the MIP (Pragglejaz, 2007), metaphor identification method. The PIMS method focuses on experience represented in linguistic metaphor, such that it represents the CMT approach that linguistic metaphor may provide insights into the way the more abstract target domain is structured in the minds of speakers, which in the context of the current study may provide insights into the experience of dp/dr. The *Oxford English Dictionary* (OED) is used to check word meanings. Metaphor analysis continues by considering how identified metaphors may be grouped into themes of common experience, which may give another level of information about the experience of depersonalization, derealization, and dp/dr more generally.

3. Results

3.1. Density of use of established metaphor terms for dp/dr

In the current section the frequency in the data of the metaphoric terms from the DSM-V and BMJ diagnostic criteria for dp/dr is noted for each term as a noun

Table 1. Density of use of established diagnostic terms in r/dpdr and dpselfhelp.com

	r/dpdr			dpselfhelp.com		
	% all posts	% first posts	r by month	% all posts	% first posts	r by month
dream	2.21	4.46	−0.01	3.11	13.12	−0.12
	(4,545)	(1,226)		(8,738)	(1,636)	
fog	1.26	2.04	0.02	1.24	3.79	0.21
	(2,593)	(561)		(3,500)	(473)	
robot	0.29	0.61	0.07	0.37	1.84	0.27
	(591)	(168)		(1,042)	(229)	
bubble	0.12	0.21	−0.24	0.19	0.75	0.15
	(247)	(59)		(523)	(94)	
veil	0.10	0.16	−0.04	0.10	0.31	0.06
	(198)	(45)		(282)	(39)	
robotic	0.08	0.17	−0.01	0.11	0.40	0.05
	(164)	(46)		(305)	(50)	
cotton	0.05	0.12	0.02	0.08	0.27	−0.06
	(97)	(33)		(224)	(34)	
glass wall	0.02	0.04	0.19	0.03	0.22	0.18
	(48)	(11)		(86)	(27)	
automaton	0.01	0.01	−0.13	0.03	0.07	0.04
	(24)	(4)		(74)	(9)	
as if	1.35	3.13	−0.33	2.42	9.47	0.26
	(2,783)	(860)		(6,790)	(1,181)	

lemma, adjective lemma (*robotic*), or nominal phrase (*glass wall*); *robot*, the nominal form of the adjectival diagnostic term *robotic,* and *as if* (the subordinating conjunction *as* followed by the subordinating conjunction *if*) are also included. The results in Table 1 are in descending order of the percentage of posts on r/dpdr that contain each term; number of posts is in brackets. Terms that have been specifically associated with depersonalization (*robotic, cotton, automaton*) are underlined; terms that have been specifically associated with derealization are not underlined.

It can be seen that *dream* is the most prevalent of these terms in both fora, occurring in 2.21% of r/dpdr posts and 3.11% of dpselfhelp.com posts. The next most prevalent metaphoric term for both fora, *fog*, is used around half as often as *dream* in r/dpdr and around one-third as often as *dream* in dpselfhelp.com. The dominance of these two terms that have been associated with derealization suggests that the experience of derealization is more prevalent than the experience of depersonalization in the contexts considered, or that identified diagnostic terms are more typically used to express derealization than they are depersonalization.

It can be seen that each term has predominantly the same rank in the two comparative fora, suggesting that this is indicative of the relative use of these terms more generally in relation to dp/dr. Each term is used more in dpselfhelp.com than in r/dpdr, except for *fog* which is used slightly more on r/dpdr, and *veil* which is used in the same percentage of posts on both fora. The column titled *r by month* shows linear least squares regression for the percentage of posts containing each term, by month. It can be seen that on r/dpdr use of *as if* decreases significantly over time ($r = -0.33$), and that this is the only significant change in percentage of posts using any term over time. Although they do not meet the 0.3 interpretation threshold, on dpselfhelp.com there is a notable increase in use of *robot* ($r = 0.27$) and *as if* ($r = 0.26$) over time.

The Table 1 column titled *% first posts* shows the percentage of first posts made by participants that contain each term, where in first posts participants typically introduce themselves and try to communicate their personal experience of dp/dr. It can be seen that use of each term is more common in the first post made in comparison to all posts (which includes all first posts), with *dream* present in 13.12% of first posts on dpselfhelp.com, and *as if* present in 9.47%. This supports the view that metaphor is an important aspect of communication of the personal experience of dp/dr.

3.2. Use of established metaphor terms for dp/dr in forum contexts

To determine how each of the established metaphor terms for dp/dr are used in the r/dpdr and dpselfhelp.com contexts, for each forum separately a random sample was made of 50 sentences (where available) containing that term as the relevant part of speech. The use of a term on r/dpdr is discussed first, followed by a discussion of the use of that same term on dpselfhelp.com, with consideration given to whether a term is used metaphorically to reference specifically depersonalization, or derealization, or is used more generally.

3.2.1. dream, noun lemma

On r/dpdr the noun *dream* was found to be used metaphorically to represent the experience of dp/dr in 27/50 instances sampled, and all of those metaphoric uses of *dream* appear to express derealization, which is also specifically mentioned in two sampled instances, for example:

    a)   so in comparison to whatever shitty thing in reality is going on, derealization feels great and *i* just feel like i'm tripping or in a *dream*.

Literal use of *dream* on r/dpdr also predominantly references the experience of dp/dr, for example:

    b)   i've had *dreams* and there is no possible way that a *dream* can be so realistic and detail sensitive.

On dpselfhelp.com *dream* is similarly used metaphorically in 26/50 instances sampled. As with r/dpdr, all of the dpselfhelp.com metaphoric uses of *dream* appear to express derealization, which again is specifically mentioned in two sampled instances, for example:

    c)   hey, i do have derealization not sure about depersonalization but when i see like tv and eating, my mind thinks its all *dream* …

As with r/dpdr, on dpselfhelp.com non-metaphorical use of *dream* also typically references the experience of dp/dr, for example:

    d)   i cannot tell reality from my *dreams*.

3.2.2. fog, noun lemma

The noun *fog* was found to be used in 33/50 (over 60%) sampled r/dpdr instances as the more general metaphorically derived phrase *brain fog*, which is sufficiently pervasive in general discourse that it is formally identified as a noun (Oxford English Dictionary, 2022). While *brain fog* does not appear in general to reference derealization exclusively, it is linked specifically to derealization in one use:

  a) i don't even care about derealization itself, i just want to relieve the *brain fog* that comes with it.

The 17 sampled uses of *fog* without *brain* do appear to represent derealization metaphorically, for example:

  b) everything sounds far away and muffled, as if blinded by a mist or a *fog*.

Similarly to r/dpdr, on dpselfhelp.com *fog* is used as the phrase *brain fog* in 31 of 50 instances sampled (over 60%). As with r/dpdr, while *brain fog* does not appear to reference derealization exclusively in general, it is specifically linked to derealization in one instance:

  c) i didn't use the word derealization (i used *brain fog* because it seems to better describe my symptoms).

The use of *fog* without *brain* is metaphoric in 18 of the sampled dpselfhelp.com instances, all of which do appear to reference derealization, including one specific reference, which appears to express metaphorically how a worsening of symptoms is experienced:

  d) when my dr [derealization] hits hard, it feels like how when the town transitions from *fog* world to nightmare world.

3.2.3. robot, noun lemma

The noun lemma *robot* was found to be used metaphorically in 44/50 sampled r/dpdr instances. There are two predominant metaphoric uses of *robot* on r/dpdr. One use, in 32 sampled instances, expresses that the speaker feels as if they are a *robot*, which may be related to depersonalization, for example:

  a) i felt completely alien from my body, like some automated biological *robot*.

The contrasting use, in 10 instances, is to express the speaker's feeling that other people are *robots*, which may be related to derealization, for example:

  b) my mom feels like an npc or a *robot*.

In example (b) the initialization *npc* stands for "non-playable character: a character in a computer game that is not controlled by someone playing the game" (Cambridge Dictionary, 2023), which is metaphoric in this context (*npc* is not present in the OED).

While *robot* is predominantly used more generally, it appears to specifically represent lack of agency, as suggested in the DSM-V description, in four metaphoric uses, for example:

c) sometimes *i* do thing on autopilot or like a *robot.*

Another theme, also in four uses, is to evoke that the self or others do not experience emotion, for example:

d) when i have my episodes, it feels like I am a *robot* and i feel completely emotionally/physically numb.

On r/dpdr the remaining two metaphoric sampled instances of *robot* are related to philosophical thinking, which is a recognized aspect and potential trigger of dp/dr, such that dp/dr has been found to be significantly more prevalent amongst philosophy students, and has been identified in the work of prominent philosophers (Apter, 1992), for example:

e) even as an atheist *i* believed that there was a point to life but now after all the thoughts that bombarded my mind *i* am left seeing humans including my self as mindless *robots* programmed by evolution and evolution only.

On dpselfhelp.com, the noun lemma *robot* is used metaphorically in 48/50 sampled instances. Of these, 38 uses of *robot* refer to the self, which may be related to depersonalization, for example:

f) all *i* can do is pretend to be human and pretend that i am not a *robot* which is very hard when you feel like your only part in the conversation has become nodding your head and twitching your eye.

Another 10 uses of *robot* refer to other people, which may be related to derealization, for example:

g) i don't look at people as people anymore, *i* look at them as *robots* without feelings, i presume this is so because i myself feel like a machine and the world is a reflection of how we feel inside.

As with r/dpdr, while *robot* on dpselfhelp.com is predominantly used more generally, it appears to specifically represent lack of agency in six uses, for example:

h) when i talked to anyone, i felt like it wasn't really me talking to them, like i was a *robot* with a pre-automated script.

As with r/dpdr, on dpselfhelp.com, another theme associated with *robot*, also in six uses, appears to link it to lack of emotion, for example:

i) now I watch like some *robot* and wish i could feel something more.

3.2.4. robotic, adjective lemma

In the OED, the two current uses of the adjective *robotic* are "Of the nature of a robot; of or relating to robots"; and "Resembling or suggestive of a robot; mechanical; emotionless." On this basis, none of the uses of *robotic* in r/dpdr and dpselfhelp.com are metaphoric. They do however represent the experience of dp/dr.

As with *robot*, discussed above, *robotic* is predominantly used to reference the self, in this case in 41/50 sampled instances, for example:

   a)   i feel *robotic* and feels like I am in a dream.

It is used to describe others in four of the sampled instances, for example:

   b)   everyone seems so alien like and *robotic*.

On dpselfhelp.com also the adjective *robotic* was found to relate predominantly to the self, in this case in 42/50 sampled instances, for example:

   c)   while *i* was having my bout with dp i became *robotic*.

It was used to reference others in seven of the sampled instances, for example:

   d)   people seem to be artificial or *robotic*, thinking in frames, fake expressions of emotions.

3.2.5. bubble, noun lemma

The noun lemma *bubble* was found to be used metaphorically in 42/50 sampled r/dpdr instances, for example:

   a)   everything looks sort of dreamy and almost like i'm in a *bubble*, the focus is never quite right either like my consciousness is trapped in a *bubble* inside of this meat suit.

On dpselfhelp.com, use of *bubble* similarly is metaphoric in 40/50 sampled instances, for example:

   b)   since that time i've always felt that i'm living in a clear *bubble*, seeing the world but not feeling part of it.

Four metaphoric instances on dpselfhelp.com consist of the more generally applicable construction "burst your *bubble*", for example:

   c)   really i'm sorry to burst anyone's pro-psychiatry *bubble* here.

All metaphoric uses of *bubble* on both fora represent a separation from the world, such that metaphoric *bubble* seems to be used entirely to reference derealization.

3.2.6. *veil, noun lemma*

On r/dpdr the noun lemma *veil* is metaphoric in 49/50 sampled instances, predominantly representing an obscuring barrier, for example:

a) it's as if dp/dr is a *veil* placed over your senses.

Twelve of the metaphoric uses of *veil* reference compromised vision, for example:

b) do you have visual problems, as in your surroundings look weird and unreal, this *veil* between your eyes and the real world?.

On dpselfhelp.com, *veil* was found to be used metaphorically in 48/50 instances sampled, again predominantly representing an obscuring barrier, for example:

c) it felt like there was this *veil* separating me from everyone else and no matter how hard *i* tried i couldn't cut myself out of the *veil* or escape.

Similarly to r/dpdr, on dpselfhelp.com, 10 metaphoric instances of *veil* relate specifically to compromised vision, for example:

d) i can remember that it didn't all happen at once, but like a *veil* that was coming over my vision slowly.

3.2.7. *cotton, noun lemma*

The noun lemma *cotton* was found to be metaphoric in 41/50 sampled r/dpdr instances, with a more varied range of uses than for the terms investigated previously in this section. Of the metaphoric sampled uses of *cotton*, 21 reference a feeling that the brain or head is filled with *cotton* for example:

a) my head just feels like it's filled with *cotton* and is blank in a way.

And eight uses of *cotton* reference a feeling of the brain, head, or body, being wrapped in it, for example:

b) my body feels like it's wrapped in *cotton* and my own touch feels desensitized, like i'm not touching 'myself'.

Five uses of *cotton* reference the more generally applicable symptom *cotton mouth*, for example:

c) will cbd give me *cotton mouth* though like regular weed?.

Five sampled instances of *cotton* on r/dpdr are represented as the phrase *cotton wool*:

d) my mind feels real clouded also, like its all stuffed with *cotton wool* in there.

One instance references a *cotton ball*:

e) i feel like there's a giant *cotton ball* where my brain is.

And one instance is expressed as *cotton candy*:

f) they make me super spacey and *i* feel like my brain is full of *cotton candy*.

The six literal uses of *cotton* in the r/dpdr sample are also informative about the experience of dp/dr – they reference the idea that wearing 100% cotton clothing can impact dp/dr symptoms, for example:

g) with 100% *cotton*, however - *i* seem to feel okay, which makes perfect sense, because *cotton* is a natural fiber, whereas acrylic and polyester are synthetic (man-made).

On dpselfhelp.com, *cotton* was found to be metaphoric in 42/50 sampled instances, again with a range of uses. Of the 42 metaphoric uses of *cotton,* similarly to r/dpdr, the predominant use, in 22 instances, is to reference the brain or head as being full of *cotton*, for example:

h) my head will feel like my brain is full of *cotton*.

As with r/dpdr, eight uses reference the brain, head, or the self more generally, being wrapped in *cotton*, for example:

i) i have two ton arms that *i* can hardly lift, drooping wet eyes that see but do not comprehend because the brain that controls them is wrapped in *cotton* balls of anxiety, of fear.

Similarly to r/dpdr, four metaphoric uses of *cotton* consist of the more generally applicable phrase *cotton mouth* as a symptom of some treatment, for example:

j) side effects are *cotton mouth* and blurry vision.

16 of the 42 sampled metaphoric instances of *cotton* on dpselfhelp.com are represented as the phrase *cotton wool*, for example:

k) i have horrible vivid dreams and wake up to this nothingness in my head like its full of *cotton wool*.

Six instances reference *cotton balls*, for example:

l) it's like i have all this crazy shit going on in my head but at the same time i feel like my head is stuffed with *cotton balls*.

And as with r/dpdr, one instance is expressed as *cotton candy*:

m) i've never felt robotic either, or like my head is wrapped in *cotton candy* (as many do).

Metaphoric uses of *cotton*, then, are similar on both fora. Metaphoric *cotton* does not appear to reference derealization or depersonalization specifically, but conveys a sense of attenuated perception or thought.

3.2.8. glass wall

On r/dpdr, the phrase *glass wall* was found to be used metaphorically in all sampled instances. It is used similarly to *veil*, to represent an invisible barrier between the self and the world, which could be related to derealization, for example:

    a)   it's like i'm behind a cloudy *glass wall* permanently or a *veil.*

In one sampled instance the speaker references a *vr headset* as describing their experience better than *glass wall*:

    b) it made 'reality' feel more like a *vr headset* than a *glass wall* that separates you from the world.

And two sampled metaphoric instances of *glass wall* quote from dp/dr diagnostic criteria, for example:

    c) symptoms of derealization include: feelings of being alienated from or unfamiliar with your surroundings for example, like you are living in a movie or a dream; feeling emotionally disconnected from people you care about, as if you were separated by a *glass wall.*

On dpselfhelp.com, use of the phrase *glass wall* was found to be used metaphorically in 48/50 sampled instances, also predominantly to represent an invisible barrier between the self and the world, for example:

    d) the best way *i* could explain my dr to her was as if i was surrounded by a *glass wall.*

And four of the sampled dpselfhelp.com instances of *glass wall* reference diagnostic criteria, for example:

    e) the individual may feel as if he or she were in a fog, dream, or bubble, or as if there were a veil or a *glass wall* between the individual and world around.

3.2.9. automaton, noun lemma

There are only 25 instances of the noun *automaton* on r/dpdr, all of which are metaphoric. As with the related humanoid noun *robot*, there are two contrasting uses of *automaton.* In the dominant use, in 21/24 metaphoric instances, the speaker references themselves as an *automaton*, which may represent the experience of depersonalization, for example:

    a)   *i* felt like an *automaton.*

In three instances, *automaton* references other people, which may represent dereal-ization, for example:

b) more and more *i* started to feel like other people were just walking *automatons*, engaging in meaningless behaviors, like running scripts.

And one use of *automaton* on r/dpdr is an example of philosophical thinking:

c) it may seem that we are helpless against being reduced to *automatons* of our biological and cultural dna… but - that doesn't make us artificial, robotic or non human, in fact, it is the very essence of our humanness and what life is.

On dpselfhelp.com also use of *automaton* was found to be metaphoric in all of the 50 instances sampled, of which 37 uses relate metaphorically to the person experi-encing dp/dr, for example:

d) when *i* have a really strong dp, i feel body-less, or floating, or like an *automaton*, or a doll.

One such use references both the self and others as *automata*:

e) not only myself i feel like an *automaton*, but i think that everyone is *automaton*, but they don't really realize that.

It is notable that 10/50 sampled dpselfhelp.com instances of *automaton* reference diagnostic criteria, for example:

f) the individual may feel like an *automaton* or as if he or she is living in a dream or a movie.

3.3. Survey of metaphor for the experience of dp/dr in 500 sampled posts

To further investigate the use of metaphor in dp/dr, a random sample of 500 posts was taken from r/dpdr and dpselfhelp.com separately, such that metaphoric terms that are present in >0.2% of posts should be seen. Consideration is given here to themes of use, including repeated use of the same metaphor source terms.

3.3.1. r/dpdr, metaphors representing dp/dr in a sample of 500 posts

On r/dpdr, 60 metaphoric expressions of the experience of dp/dr were found in a random sample of 500 posts, of which 24 appear to reference derealization. These include five *dream* references, for example:

a)   it felt like nothing was real, *i* was in a *dream.*

Two uses of *veil* appear to reference derealization, for example:

b) i can still see but life is through a *veil.*

There is one use of *robot* to reference derealization:

    c) i used to totally lose it in public, and think that everyone was *robots.*

And while there are no sampled instances of the recognized metaphoric phrase *glass wall,* the phrase *invisible wall* is used once to express derealization:

    d) i feel like there's an *invisible wall* between me and the things i love.

There are two references to being inside a *video game*, with one of these also referencing being in a *simulation*:

    e) it's like another layer of *simulation* if that makes sense, like i'm playing a *video game* inside a *video game.*

And there is similar reference to other digital worlds, such as "the life game", "a really bad sims game", and to the movie "the matrix":

    f) its exactly what i've been experiencing: being unplugged from *the matrix.*

The other metaphoric references to derealization are singular, for example:

    g) i feel like a mad person talking to her dolls.

On r/dpdr, 16 of the identified metaphors for the experience of dp/dr appear to relate to depersonalization specifically. Of these, two have *robot* as a source term, for example:

    h) i feel like a *robot* every time, just doing stuff that were previously programmed.

Other, related, metaphor source terms for the self experiencing depersonalization include *two dimensional person*, and *clone.* There is also the following use of *screen* that is similar to use of *veil* in derealization but with the self as the target:

    i) i literally feel like i'm watching myself behind a *screen.*

The remaining 20 metaphors from the r/dpdr sample are more general, in that they do not appear to reference depersonalization or derealization specifically. Seven of these reference *brain fog*, for example:

    j) my *brain* is in a *fog* and *i* don't feel real.

Five of the metaphors relate to a *journey* through the experience of dp/dr, which introduces a temporal element, for example:

    k) it's been a long *journey* to get where i am now.

And there are three instances of personification of dp/dr, including "evil twin", and "beast", and the following less specific example:

l) it's always there chewing at my sanity.

The remaining five more general metaphors are singular, with no apparent repetition of theme of use, or source term, for example:

m) it seems as if i'm trying to claw through a foot thick steel barrier with nothing but my hands.

The established diagnostic terms *bubble, robotic, cotton, glass wall,* and *automaton* are not present in this r/dpdr sample of 500 posts.

3.3.2. dpselfhelp.com, metaphors representing dp/dr in a sample of 500 posts

In the 500 posts sampled from dpselfhelp.com, 50 metaphors were found that appear to reference the experience of dp/dr. Of these, 13 appear to reference derealization, of which five contain *dream*, for example:

a)   everything around me felt so different like in a *dream* but *i* knew it was all real.

One use of dream also references being in a *simulation*:

b) makes me feel like i'm in a *dream* or am in a *simulation.*

While there is no reference in this sample to a *glass wall*, as with r/dpdr there is a similar reference to an *invisible wall*:

c) i feel like there's a barrier that separates me from reality, like an *invisible wall.*

And there is also reference to being behind a *screen:*

d) talking to people face to face, i feel like i am doing it through a *screen.*

Derealization is also represented in singular humanoid references to other people as *robots, zombies,* or *2d people.*
  Nine of the dpselfhelp.com sample metaphors appear to reference depersonalization, and while most of these are singular, there are two references to feeling like a *robot,* for example:

e) i feel like a *robot.*

And two references to feeling like an *alien*:

f) feeling like a weird *alien* when trying to relate to most people.

Singular humanoid metaphor source terms that appear to express depersonalization include feeling like a *ghost,* or a *monster.*

Of the remaining metaphors, which reference dp/dr more generally, there are five instances of personification, including "200 pound gorilla", "devil", "dark enemy", and two *monster* references, for example:

g) before this *monster* ever showed up at my door.

While, in comparison to r/dpdr, there are no metaphoric uses of *journey* in the dpselfhelp.com sample, the experience of dp/dr is referenced with metaphor having a temporal element as a *war,* or a *marathon race.* It is also referenced in terms of compromised brain function as: "that brain squeezed feeling", feeling "fuzzy", having "cotton wool brain", "going into a pretty deep brain fog", or "the feeling of being constantly stoned". And it is referenced in terms relating to non-existence as being in a "black hole", or "detached void"; to being "a soul-less nothing" or "beginning to dissolve into nothingness"; and to feeling as if you are "already dead". Other metaphoric instances are more singular, such that they can not obviously be organized into themes, for example:

h) it's like I am just a pair of eyes and thoughts.

The established diagnostic terms *bubble, veil, glass wall*, and *automaton*, are not present in this dpselfhelp.com sample.

3.4. Use of 'as if' to signal metaphor

To further investigate use of metaphor in relation to dp/dr, in this section consideration is given to use of the characteristic phrase *as if* (Hunter et al., 2017), which has been identified as a potential signal that metaphoric interpretation is required (Goatly, 2011). To investigate use of *as if,* 100 instances were sampled randomly from each forum of *as* as a subordinating conjunction followed by *if* as a subordinating conjunction. Results from each forum are discussed separately below, and again themes of metaphor use and experience are sought.

3.4.1. r/dpdr, metaphor signalled by *as if*

On r/dpdr, 72/100 sampled instances of *as if* were found to signal metaphoric reference to the experience of living with dp/dr. The dominant use, in 29 instances, is to express a sense of disconnection from the self or body, which may be related to depersonalization, for example:

a)   it's *as if i* died but my body is still alive.

There are 16 sampled uses of *as if* to express a sense of separation from the world, which may be related to derealization, for example:

b) i've always had these states of mind where the things around me don't feel real, almost *as if* nothing exists and everything is an illusion.

Related to this, a further 11 uses of *as if* reference distorted vision, for example:

c) *as if i* had a filter over my eyes and i felt detached from reality.

And the feeling of perception being altered *as if* the person were drunk or has taken drugs, is referenced in six instances, for example:

d) it's *as if* i was forever stuck on an acid trip.

It is notable that in this sample of 100 uses of *as if* on r/dpdr, *dream,* of which there are four instances, is the only represented metaphoric term from the diagnostic criteria.

The remaining sampled r/dpdr figurative uses of *as if* are more idiosyncratic and do not fit into the groupings discussed above, for example:

e) i've been feeling *as if i* was on an amusement park ride for over a year now.

Two non-metaphoric uses of *as if* express advice that to recover from dp/dr it might help to act *as if* you do not have it, for example:

f) you should act *as if* you felt better, with the goal that it might actually make you feel better a bit.

3.4.2. dpselfhelp.com, metaphor signalled by *as if*

On dpselfhelp.com, 63/100 sampled uses of *as if* were found to metaphorically reference the experience of dp/dr, with dominant themes similar to those found in r/dpdr. Disconnection from the body or self is represented in 25 instances, for example:

a) i'll feel *as if* my fingers are typing, and i'm just watching them work from elsewhere.

Disconnection from the world, or other people, is represented in 11 instances, for example:

b) when *i* do venture out of the house and come across the normal people, i sort of look at them and think 'who are these people?' and look at them *as if* they are just skeletons walking around the place.

Related to this, six instances of *as if* reference distorted vision, for example:

c) *as if* the self is peering at the world through a *fog*, or a hologram.

And the feeling of the mind being altered *as if* the person were drunk or has taken drugs is referenced in three sampled dpselfhelp.com uses, for example:

d) like *as if* i was still stoned, but a really bad type of high.

In terms of formal diagnostic metaphors, in addition to its single sampled use with *fog*, quoted above, on dpselfhelp.com, *as if* is used in conjunction with the *cotton* metaphor in one sampled instance, extracted below, but other DSM-V metaphors, including *dream*, are not present in conjunction with *as if* on dpselfhelp.com:

b) other times i speak in a manner *as if* my vocal chords are paralyzed and my mouth feels full of *cotton*.

The remaining sampled uses of *as if* are singular, and idiosyncratic, for example:

c) it was *as if* my firmware had been returned to default settings.

A notable non-metaphoric use of *as if* on dpselfhelp.com, present in 8/100 sampled uses, is to express the idea that to cure yourself of dp/dr it is necessary to "live *as if* you did not have it", an idea which, as discussed above, was also present in two sampled instances on r/dpdr.

It is notable that, for both fora, the humanoid metaphors that are relatively prevalent in previous investigations are not used in conjunction with *as if*.

4. Discussion

In the current study, a systematic survey has been carried out of metaphor used to represent the prevalent but under-recognized experience of dp/dr in the contexts of two long-established dp/dr internet fora, where such fora have been instrumental in raising awareness of and providing support for this condition (Simeon & Abugel, 2008). It is notable that for every analysis undertaken, across both fora there are fundamental similarities of metaphor use.

The study started by considering the use of metaphor terms from the established diagnostic criteria (American Psychiatric Association, 2013; Hunter et al., 2017), showing that they have predominantly the same rank of density of use in the two comparative fora investigated, suggesting that this is indicative of the relative use of these terms more generally in relation to dp/dr. It was also found that use of *as if* decreases significantly over time on r/dpdr ($r = -0.33$), but there is no significant change in percentage of posts containing the other metaphor terms over time.

For both fora, *dream* was found to be the most used of the diagnostic terms investigated, and *fog* the second most used, and these were found to be relatively prevalent in the data, each being present in more than 1% of posts. Both these terms have been associated with derealization, which suggests that the experience of derealization is more prevalent than depersonalization in the contexts considered, or that identified diagnostic terms are more typically used to express derealization than they are depersonalization. It was also found that use of each term investigated is more common in the first post made by any participant in comparison to all posts, with *dream* present in 13.12% of first posts on dpselfhelp.com, and the phrase *as if* present in 9.47%. Since it is in first posts that participants typically introduce themselves and describe their personal experience of dp/dr, this supports the view that metaphor is an important aspect of communication of that experience.

In relation to how the diagnostic terms investigated are used in these contexts, it is notable that for both fora the relatively dominant metaphor term *fog* is used singly to express derealization, which is consistent with the DSM diagnostic criteria, but in over 60% of sampled instances *fog* is used as the apparently more general phrase *brain fog*, which for both fora is specifically associated with derealization in only one instance of use. And while the DSM-V suggests *cotton* may be used metaphorically as "head filled with *cotton*" (American Psychiatric Association, 2013), it was found that

cotton may reference that the head or brain is filled with *cotton*, or to a lesser degree that the head, brain, or body is wrapped in *cotton.*

While DSM-V references "feeling robotic, like an automaton", the nominal form *robot,* which is not present in the DSM-V criteria, is used over three times as often on both fora as is the adjective *robotic.* The noun *automaton* is the least used diagnostic term on both fora, which combined with the fact that 20% of dpselfhelp. com uses of *automaton* specifically reference the diagnostic criteria that contain it suggests that *automaton* may not naturally be a metaphor through which people express their experience of dp/dr. The DSM-V relates use of the humanoid references *robotic* and *automaton* to depersonalization, and a diminished sense of agency. However, for both fora the humanoid terms *robot, robotic,* and *automaton*, while they predominantly refer metaphorically to the self, also notably refer metaphorically to others, which may be related to derealization. In addition, uses of these terms were found to equally reference both lack of agency, a use which as mentioned previously is specifically referenced in the DSM-V criteria, and lack of emotion, which is not.

In an analysis of metaphor use more generally, in each sample of 500 posts from each forum there were five *dream* references, two uses of *robot* to reference the self, and one use of *robot* to reference others. The established metaphor terms *bubble, cotton*, *glass wall*, and *automaton*, were not present in 500 posts sampled from either forum. On r/dpdr there were two references to being in a *video game*, but no other new source terms were present in multiple instances in either forum. It was found, then, that metaphor to express the experience of dp/dr, including depersonalization, derealization, and dp/dr more generally, is predominantly singular and idiosyncratic. New metaphoric references for derealization include the digital other-world references being in a *video game*, a *simulation*, *a really bad sims game*, *the matrix*, and playing *the life game*; metaphors similar in use to *veil* include *screen*, and *invisible wall*; new humanoid references for other people include *zombies* or *dolls.* New metaphoric references for the self experiencing depersonalization include being a *doll*, *ghost*, *alien*, *2d person*, *video game character*, a "*clone* of my former self", or a *monster.* Eight instances of personification across the two fora also include two instances of *monster*, alongside *evil twin*, *beast*, *200 pound gorilla*, *devil*, *dark enemy*, and the more general personification "it's always there chewing at my sanity". And on dpselfhelp.com, there are also themes of compromised brain function, in five instances, and non-existence, also in five instances.

Use of metaphor signalled by the phrase *as if* on r/dpdr and dpselfhelp.com was found to predominantly express a sense of disconnection from the body or the self, with the second most prevalent use referencing disconnection from the world, or others: the same distinction found in relation to the humanoid metaphors *robot, robotic*, and *automaton*, and in the general survey of metaphors in 500 sampled posts. It is notable, however, that no identified humanoid metaphors were used in conjunction with *as if* in either forum. Use of *as if* was significantly associated with expression of compromised vision, and altered perception more generally, including a notable number of references to perception being altered *as if* the person were drunk or had taken drugs. And as with the general survey of 500 posts from each forum, it was found that metaphoric expression of the subjective experience of dp/dr signalled by *as if* is predominantly singular and idiosyncratic. Use of *as if* to signal metaphoric

expression of the experience of dp/dr may also represent that reality testing of the speaker is intact.

In future work, given that the *as if* construction has been found to be associated with mostly idiosyncratic figurative language to communicate the personal experience of dp/dr, it would be productive to analyze a wider range of such metaphor signalling devices (Goatly, 2011), to consider in more detail dominant themes of that experience. Potential deliberateness of use of signalled metaphor, which has been associated with communicative intent (Steen, 2017), could also be explored further in relation to reality testing, including use of the explicit marker *metaphor* to specifically clarify metaphoricity of discourse of the self and of others. And while some examples quoted in the current study include metaphors from multiple source domains, it would be productive to specifically consider occurrences of mixed metaphor, which Charteris-Black (2016), in a study of people experiencing chronic pain, found to support the communication of pain, and to specifically occur where the intent is to emphasise the intensity of pain, and to characterize it as out of control; the mixing of metaphor has also been related to potential deliberateness of metaphor use (Steen, 2016), which again could be investigated in relation to reality testing. The new metaphoric source terms for experiences of dp/dr more generally, and for depersonalization or derealization specifically, could also be further investigated in terms of extent of use, and application in context.

It is important to widen understanding of the range of lived experience of dp/dr, and the language used to represent it, to reach a more diverse demographic. As discussed previously, the experience of dp/dr is diverse. However, the ability to use metaphor to communicate or interpret this under-recognized condition may be dependent on mental flexibility and the ability to create metaphoric association, which has been found to be different, for example, in autism (Kalandadze et al., 2018; Morsanyi et al., 2020), and schizophrenia, (Rossetti et al., 2018), which is highly relevant since depersonalization is commonly experienced in conjunction with schizophrenia (Maeda & Mimura, 2014), including the more extreme form vital depersonalization, which relates to awareness of the ego, or body (Bezzubova, 1991). And while depersonalization diagnosis is relatively rare before age 15, this might be because minors are less able to use metaphor to communicate their experience (Shimizu & Sakamoto, 1986). Wider knowledge of a wider range of metaphor to express dp/dr, based in age-relevant experiences, for example onset over the age of 25 accounts for fewer than 5% of instances (American Psychiatric Association, 2013), may lead to greater identification from those who are otherwise unable to express their experience of this debilitating condition. In the naturally occurring texts analyzed in the current study, while it has been found that the majority of metaphor to express the experience of dp/dr located through a general survey, and through consideration of use of the potential metaphor signalling construction *as if*, is singular, and idiosyncratic, the following have been found to be the most prevalent metaphoric expressions of dp/dr in the contexts investigated:

Depersonalization

- May feel like a robot, in terms of both lack of agency, and lack of emotion.
- Other humanoid metaphor source terms to represent the self experiencing depersonalization include: doll, ghost, alien, 2d person, video game character, clone, monster.

Derealization

- May feel as if they are in a dream, or fog.
- May feel as if other people are robots.
- Other humanoid metaphor source terms for other people, include: 2d people, npc, zombie, dolls
- May feel as if there is an invisible barrier between themself and the world, which may be expressed as a bubble, veil, glass wall, invisible wall, or screen; where it is expressed as a veil, it may often relate to distorted vision.
- May feel as if they are in a digital world, including: a video game, a simulation, a sims game, the matrix, and playing the life game.

Depersonalization/derealization more generally

- May experience 'brain fog'.
- May feel as if the brain or head is stuffed with cotton, which may also be referenced as cotton wool, or cotton balls; or as if the brain, head, or body, is wrapped in cotton.
- The phrase *as if* may signal idiosyncratic figurative expression of the personal experience of dp/dr unrelated to the specific metaphor terms described above. Use of *as if* may otherwise reference compromised vision, or feeling *as if* they are under the influence of alcohol or drugs. Specific signalling of metaphor by use of *as if* may also support the view that reality testing of the speaker is intact.

In conclusion, metaphor described in the formal diagnostic criteria for dp/dr does not completely represent metaphor use in the contexts investigated. The above summary of metaphor for the experiences of depersonalization, and derealization, and dp/dr more generally, across both the contexts investigated, may support vital understanding and diagnosis of this debilitating, under-recognized experience, across a wider demographic.

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