Original Paper

Psychopathology

Psychopathology 2001;34:259–264

Visual Imagery and Depersonalisation

Michelle V. Lambert Carl Senior Mary L. Phillips Mauricio Sierra
Elaine Hunter Anthony S. David

Depersonalisation Research Unit, Division of Psychological Medicine, Institute of Psychiatry, London, UK

Key Words
Depersonalisation · Imagery · Perception · Neuropsychology

Abstract
Twenty-eight people diagnosed with depersonalisation disorder (DD) were assessed using self-report measures of imagery ability in relation to a range of symptoms and in comparison with age- and sex-matched controls. It was found that symptoms of depersonalisation as well as other dissociative symptoms and depressed mood correlated with impaired ability to generate visual images. This was particularly evident with images pertaining to the self and other people as opposed to objects. A subgroup of 10 patients was tested on a neuropsychological battery of visual perception tests and found to be unimpaired compared with normal controls and patients with obsessive compulsive disorder, despite subjective impairments in imagery and high symptom scores. The findings add further weight to the distinctions made between imagery and perceptual processes.

Introduction

Depersonalisation is the subjective experience of unreality and detachment from the self [1]. It is often accompanied by *derealisation,* the sensation that the external world and other people appear strange or unreal [2]. In both conditions, the altered sensations have an 'as if' quality, and reality testing or 'insight' is intact.

Depersonalisation disorder (DD) has been found in 2.4% of a non-clinical population [3]. It classically begins during adolescence and may be either of acute or gradual onset [4]. The course is characteristically chronic and is accompanied by distress and a marked reduction in well-being. Depersonalisation may accompany psychiatric disorders, such as depression and panic disorders (secondary depersonalisation) [4, 5], and has been reported in up to 80% of psychiatric in-patients in one survey [6].

Mental imagery has been defined as 'the mental invention or recreation of an experience that resembles the experience of actually perceiving an object or event' [7]. While subjective alteration in perception is a feature of DD, impairment of mental or visual imagery in patients with depersonalisation has also been recognised since the end of the 19th century. Dugas [8] not only first coined the term 'depersonalisation' but also described a patient who could not 'mentally visualize an absent person, for example his parents'. Schilder [9] described sufferers as '... though dead, not alive, not real; that they *cannot image their body'* (our italics). Later [10] he expanded that '... their imagery appears to be altered ... as pale, colourless and some complain that they have altogether lost the power of imagination'. However, since these early reports, there has been little documentation or research into this impairment of visual imagery. The aim of this study was to assess visual imagery in a group of patients with primary DD, compared with normal controls. We hypothesised that (1) the severity of depersonalisation would be corre-

KARGER
Fax + 41 61 306 12 34
E-Mail karger@karger.ch
www.karger.com

0254–4962/01/0345–0259$17.50/0

Accessible online at:
www.karger.com/journals/psp

Prof. Dr. Anthony S. David
Depersonalisation Research Unit, Division of Psychological Medicine
Institute of Psychiatry, De Crespigny Park
London SE5 8AF (UK)
Tel. +44 020 7848 0138, Fax +44 020 7848 0572, E-Mail a.david@iop.kcl.ac.uk

Table 1. Demographic and psychometric data on patients with depersonalisation disorder (DD) and normal controls (NC)

	DD n = 28	NC n = 13	DD vs. NC		
			T	d.f.	p value
Gender (M)	15 (53.6%)	6 (46.2%)	$\chi^2 = 0.024$	1	0.88
Age, years					
mean	35.46	33.92	0.42	39	0.68
range	19–64	22–57			
DES	24.34 (3.25)	7.87 (2.78)	3.19	39	0.003
DES-taxon	28.67 (3.69)	3.08 (1.78)	4.58	39	<0.001
DES DP/DR	38.33 (4.50)	2.44 (1.68)	5.33	39	<0.001
DES Absorption	27.41 (3.58)	14.04 (4.39)	2.12	39	0.03
DES Amnesia (S.E.)	9.29 (2.28)	2.31 (1.50)	1.98	39	0.05
Beck Depression Inventory	21.0 (2.56)	2.69 (1.50)	4.68	39	<0.001
Beck Anxiety Inventory	17.75 (2.41)	6.08 (2.31)	2.92	38	0.006
VVIQ	3.02 (0.17)	2.30 (0.31)	2.19	39	0.03
VVIQ-P	2.97 (0.18)	2.00 (0.31)	2.91	39	0.006
VVIQ-Obj	3.04 (0.18)	2.40 (0.33)	1.84	39	0.07
VMIQ	3.12 (0.18)	2.39 (0.30)	2.16	38	0.04
VMIQ-self	3.38 (0.20)	2.52 (0.34)	2.23	38	0.03
VMIQ-other	2.86 (0.18)	2.26 (0.29)	1.80	38	0.08

Lower scores on VVIQ and VMIQ indicate high imagery ability. Results are means and SE (shown in parentheses). DP = Depersonalisation; DR = derealisation.

lated with impairment in visual imagery. In addition we sought to examine visual perception in detail in a sub-group of these patients in order to determine whether (2) objective deficits would be uncovered, and (3) whether these coincided with subjective problems with visual imagery.

Method

Subjects

Patients with a primary diagnosis of DD according to ICD-10 criteria [11] were recruited from referrals to the Depersonalisation Research Unit at the Institute of Psychiatry, London, UK. Approximately two thirds were referred from other psychiatrists, while the remainder came via their family doctor or were self-referred. The mean duration of illness was 12 years, during which time no other diagnoses (including psychosis) had emerged. A non-clinical control sample was obtained mainly from volunteers living locally. All participated voluntarily and gave written informed consent. The study was approved by the Bethlem and Maudsley Research Ethics Committee.

Assessment

Demographic details on all subjects were obtained as well as their medical and psychiatric history (table 1). In addition, the patients underwent a thorough, standard clinical interview. A detailed history of their depersonalisation and associated psychopathology was obtained and the symptoms of depersonalisation and derealisation were rated according to Present State Examination (PSE) criteria [12]. *Derealisation:* 'Have you ever had the feeling recently that things around you were unreal?' *Depersonalisation:* 'Have you yourself felt unreal, that you were not a person, not living in the real world?' If the subject answered yes to either of these probes, the examiner went on to rate severity: 1 = moderately intense... definitely occurring..., persisting for an hour; 2 = intense... persisted for hours at a time. A diagnosis of DD required a PSE score of 2 or more (total) on these items.

The following self-report questionnaires were completed by the subjects:

The Vividness of Visual Imagery Questionnaire (VVIQ) [13]. A 16-item scale consisting of descriptions of visual scenes that the subject is requested to imagine. The subject rates the vividness of the image on a 5-point scale ranging from 'perfectly clear and as vivid as normal vision' (= 1), to 'no image at all' (= 5). In view of the distinction between depersonalisation and derealisation we also subdivided the questionnaire into the 4 items which refer to a person (items 1, 2, 3, 12) and scored these separately as VVIQ-P, and the rest which refer to objects as VVIQ-Obj.

The Vividness of Movement Imagery Questionnaire (VMIQ) [14]. A 24-item scale consisting of movements that the subject is requested to imagine. The same 5-point response scale as in the VVIQ is used. The subjects are requested to imagine someone else performing the movement (VMIQ-other subscale) and then repeat the items imagining themselves (VMIQ-self).

Dissociative Experiences Scale (DES) [15], *DES II* [16]. A 28-item questionnaire with a cut-off score of 30 for severe dissociative disorders [16]. Factor analysis of the DES has enabled three subscales to be derived: amnesia (items: 3, 4, 5, 6, 8, 10, 25, 26); absorption/

Table 2. Correlations between DES scores and imagery psychometrics for patients with DD

Scale	VVIQ mean	VVIQ-P	VVIQ-Obj	VMIQ mean	VMIQ-self	VMIQ-other	BDI	BAI
DES	0.34*	0.34*	0.32	0.16	0.28	0.00	0.66***	0.46**
DES-taxon	0.36*	0.33*	0.34*	0.28	0.40**	0.09	0.62***	0.39**
BDI	0.35*	0.32	0.34*	0.26	0.33*	0.14	–	0.36*
BAI	0.24*	0.26	0.22	0.20	0.18	0.19	0.36*	–
VVIQ, mean	–	–	–	0.72***	0.69***	0.64***	0.35*	0.24

Pearson's correlations: * $0.05 < p < 0.1$; ** $0.01 < p < 0.05$; *** $p < 0.01$.

imaginative involvement (items: 2, 14, 15, 16, 17, 18, 20, 23) and depersonalisation/derealisation (items: 7, 11, 12, 13, 27, 28) [17]. A taxometric analysis of the DES [18] determined 8 items: (3, 5, 7, 8, 12, 13, 22, 27), which could be used to screen for 'pathological dissociation'. Simeon et al. [19] found that a DES-taxon cut-off score of 13 would yield a sensitivity of 80% with a specificity of 100% for the detection of depersonalisation.

Beck Depression Inventory (BDI) [20] and *Beck Anxiety Inventory (BAI)* [21]. In both inventories, the subject endorses 21 items on a 4-point severity scale over the previous week. Scores <11 may be regarded as normal.

A subset of patients with DD who volunteered to participate in further studies was tested using the Visual Object and Space Perception battery (VOSP) [22]. This comprises four visual object and four space perception tests, each of which focuses on one particular aspect of perception whilst minimising the involvement of other cognitive skills. DD patients were compared with psychiatric controls with a diagnosis of obsessional compulsive disorder recruited from the in- and out-patients of the Bethlem and Maudsley NHS Trust, London, and normal controls recruited as before. In addition to the VOSP, all patients and controls completed the DES and the Beck inventories.

Results

Symptoms and Imagery

Demographic details of the subjects along with psychometric data are shown in table 1. Twenty-eight patients with primary DD completed the battery of questionnaires. Of these, 6 were found to suffer from depersonalisation alone with the remainder having concomitant symptoms of derealisation. None of the 13 normal controls scored above the DES-taxon cut-off of 13 for the detection of depersonalisation. There were no significant differences between the groups in terms of age ($p = 0.7$), and gender ($\chi^2 = 0.42$; d.f. = 1; $p = 0.8$). The patients with depersonalisation were significantly more depressed ($p < 0.001$) and anxious, ($p = 0.006$) according to their BDI and BAI scores, respectively (table 1). There were significant differences between the patients with depersonalisation and controls on the mean VVIQ and the VVIQ-P subscale ($p < 0.05$), but scores on the VVIQ-Obj subscale only approached significance ($p = 0.07$). Similarly, there were significant differences for the VMIQ total mean and self subscale ($p < 0.05$) but the 'other' subscale only approached significance.

Correlational analyses between the DES, its subscales and imagery questionnaire scores are shown in table 2. A nearly significant correlation ($p = 0.06$) was found between the VVIQ total and person subscales and the mean DES and DES-taxon scores. Although the mean VMIQ did not correlate with the DES, the VMIQ-self subscale correlated significantly with the DES-taxon. Depression and anxiety scores strongly correlated with depersonalisation measures, and BDI scores showed a tendency to be related to imagery to a degree similar to DES scores, while BAI scores did not correlate.

Visual Perception and Imagery

Ten patients with DD completed the VOSP and were compared with 12 normal and 8 patient controls. The scores for the individual VOSP subtests are shown in table 3. The between-group ANOVA revealed no significant differences on any of the subtests ($p > 0.2$ in all cases). All subjects scored within the normal range. Hence, poor visual imagery scores were obtained despite normal levels of performance on visual perceptual tests. Individual patient scores illustrating the variation in psychometric measures, symptoms scores, and neuropsychological performance are shown in table 4.

Discussion

There has been much debate as to the validity of the VVIQ [23–25], but it remains a widely used instrument [26] with conservative cut-offs for 'good' and 'poor' visualisers. McKelvie [25] reviewed 38 published studies

Table 3. VOSP subtest scores, shown as percentages of maximum, for patients with DD, normal (NC) and patient controls (PC)

VOSP test Subject group	Screen	Visual object subtests				Space perception subtests			
		incomplete letters	silhouettes	object decision	progressive silhouettes	dot counting	position discrimination	number location	cube analysis
DD, n = 10	96.0 (1.45)	98.5 (1.07)	78.3 (3.63)	90.0 (2.98)	73.9 (4.31)	98.0 (1.33)	97.0 (2.0)	93.0 (3.35)	97.0 (1.53)
NC, n = 12	92.5 (4.90)	97.5 (0.97)	82.2 (3.00)	91.25 (1.75)	79.2 (3.69)	99.2 (0.83)	100.0 (0.0)	95.0 (2.89)	98.3 (1.12)
PC, n = 8	93.1 (1.88)	99.4 (0.63)	74.6 (4.58)	96.25 (1.25)	80.6 (6.47)	100.0 (0.0)	99.4 (0.63)	91.25 (7.43)	97.5 (1.64)

SE in parentheses.

Table 4. Individual test scores for 10 DD patients who completed the VOSP

Patient	Age	Sex	Years of education	VOSP-object	VOSP-space	VVIQ mean	VMIQ mean	VMIQ-self	VMIQ-other	PSE DP	PSE DR	DES mean	DES-taxon	BDI	BAI
1	57	F	16	81.94	92.5	1.69	1.28	1.33	1.21	2	1	54.44	43.75	16	11
2	36	F	16	72.08	88.75	2.00	3.06	4.17	2.00	1	1	12.86	25.0	8	6
3	45	M	14	89.31	100	3.56	2.83	3.54	2.13	2	1	8.52	5.0	8	22
4	28	M	13	93.06	100	4.31	4.96	5.00	4.92	1	2	19.26	25.0	16	11
5	30	M	13	85.0	98.75	3.31	4.49	5.00	4.00	2	2	37.78	38.75	22	43
6	22	F	16	92.64	100	2.50	3.28	3.38	3.17	1	1	19.63	21.25	21	13
7	44	F	13	83.06	100	3.13	3.02	3.46	2.63	2	2	4.07	5.0	22	14
8	27	M	17	90.14	100	3.06	2.79	2.54	3.00	1	1	29.26	26.25	38	13
9	28	M	13	81.81	87.5	4.00	5.00	5.00	5.00	2	1	31.11	25.0	20	22
10	37	F	13	82.78	95.0	4.30	4.30	4.42	4.17	2	2	34.81	50.0	8	9

DP = Depersonalisation; DR = derealisation. See table 1 for key to figures.

covering over 2,000 subjects and reported an overall mean score of 2.31 with a score of 1.73 (or less) for 'good' imagers and 2.93 (or more) for 'poor'. Using these figures as a guide, our normal controls' mean (2.3, SE 0.31) corresponds exactly to the normal mean derived by McKelvie [25], while the patients with primary depersonalisation as a group are clearly 'poor' visualisers. As a typical example, one subject complained: 'When I close my eyes, I can't picture a blue sky or blue sea. I can think it but cannot see it with my mind'. The patients with DD had significant impairment of imagery on both the VVIQ and VMIQ measures compared with the controls, and these impairments appeared to be more apparent on the 'person' and 'self' subscales, respectively. None of the patients assessed experienced derealisation alone, which may explain the lack of impairment in imagining objects and other people. The impairment of imagining *themselves* moving was more severe with worsening depersonalisation (assessed with the DES-taxon).

The study has also shown that depression contributes significantly to impaired imagery and that minor symptoms of depression are common in people with depersonalisation. Interestingly, few previous studies have taken depression into account [26], although McKelvie [25] showed that 'social desirability' and 'confidence' tended to result in lower (more vivid) VVIQ scores. One study assessed visual imagery ability in patients with either schizophrenia or depression and found that patient groups were slower to perform the tasks compared with normal controls, although there was no correlation with BDI [27]. Moreover, Marks [13] suggested that vividness of imagery would be related to the level of interest, meaningfulness and affect, elicited by the stimulus which is imaged, factors which would be expected to be adversely affected by depressive cognitions. The role of other psychiatric symptoms, including depression and depersonalisation, clearly merit further study. In the current cohort, depressive symptoms and depersonalisation

closely covaried, hence it was not possible to tease out their effects.

Early work by Cappon [28] suggested that perceptual distortions, such as feeling that body parts or objects were altered in size, may be predictive of the development of depersonalisation and derealisation. More recently, Lipsanen et al. [29] assessed visual distortions experienced by 297 non-clinical volunteers. Some of them (between 14–30%) reported teleopsia (objects looking distant), metamorphopsia (distortions of shapes and colours) and macropsia/micropsia (objects looking larger/smaller), and these individuals had significantly higher DES scores than those without visual aberrations.

Patients with depersonalisation and derealisation have a *subjective* impairment in perception of themselves and objects, respectively. They also complain of impairment of visual imagery; the more severe the impairment – as quantified by the VVIQ and VMIQ-other scales – the worse the symptoms of depersonalisation, although the correlation with the DES-taxon narrowly missed conventional statistical significance. However, the normal results of the VOSP, a commonly used neuropsychological battery, suggest that there is no *objective* impairment of visual perception. Thus, this study provides support for a distinction between visual imagery and visual perceptual processes. More 'objective' measures of visual imagery abilities in this group would be needed to confirm this and a true dissociation of functions (assuming such objective measures would reveal deficits). Further, the relationship between depersonalisation symptoms and subjective imagery may be weak because of imperfections in both measures and the relatively small number of subjects. The recently developed Cambridge Depersonalisation Scale [30] may be more sensitive and specific than the DES.

There is much debate as to whether the cortical areas underlying imagery and perception are the same. Studies on brain-damaged patients have shown that impairment in visual imagery usually parallels selective perceptual deficits [31] suggesting a common neural substrate. This has been supported by functional neuroimaging work [32]. However, other studies have shown a double dissociation between imagery and perception with at least one remarkable case demonstrating intact perception with impaired imagery, due to a head injury affecting the occipital lobes bilaterally [33]. Functional imaging in normal subjects while they perform colour and visual motion imagery tasks suggests that, while there may be overlap between areas of the brain which subserve imagery and perception, there are also areas specific to each function [34–36].

In conclusion, the main finding of this study is that patients with DD have impairment in imagery compared with controls, which for many is a source of distress. As well as speculating as to the underlying cause of this, it is important to consider the consequences. For example, given the links between memory and imagination [37], a primary defect in imagery may impair the ease with which events are recalled [38], and the specificity of autobiographical memory [39] perhaps leading to a greater sense that the world and people are strange and unfamiliar. This impairment may also have treatment implications. For example, visualisation is pivotal in psychological treatments such as systematic desensitisation and cognitive-behaviour therapy, which may play an important role in the treatment of depersonalisation itself and the concomitant symptoms of depression and anxiety.

Acknowledgments

Support for the study came from the Col WW Pilkington Will, Cecil Pilkington and AP Pilkington Pilozzo Charitable Trusts; and the Medical Research Council.

References

1 Simeon D, Hollander E: Depersonalisation Disorder. Psychiatr Ann 1993;23:382–388.
2 Steinberg M: Handbook for the Assessment of Dissociation. A Clinical Guide. Washington, American Psychiatric Press, 1995.
3 Ross CA: Epidemiology of multiple personality and dissociation. Psychiatr Clin North Am 1991;14:503–517.
4 Simeon D, Gross S, Guralnik O, Stein DJ, Schmeidler J, Hollander E: Feeling unreal: 30 cases of DSM-III-R depersonalization disorder. Am J Psychiatry 1997;154:1107–1113.
5 Sedman G: An investigation of certain factors concerned in the aetiology of depersonalization. Acta Psychiatr Scand 1972;48:191–219.
6 Brauer R, Harrow M, Tucker GJ: Depersonalization phenomena in psychiatric patients. Br J Psychiatry 1970;117:509–515.
7 Finke RA: Principles of Mental Imagery. Cambridge, MIT Press, 1989.
8 Dugas L, Sierra M, Berrios GE: Un cas de dépersonnalisation. Introduction and translation by M. Sierra and G.E. Berrios. Hist Psychiatry 1996;7:451–461.
9 Schilder P: Medizinische Psychologie. Berlin, 1920; translated by Rapaport D as Medical Psychology. New York, International Universities Press, 1953.
10 Schilder P: Depersonalization; in Introduction to Psychoanalytic Psychiatry. Nerv Ment Dis Monogr Ser 1928;50.
11 World Health Organization: Depersonalisation-derealisation syndrome; in The ICD-10 Classification of Mental and Behavioural Disorders. Clinical Descriptions and Diagnostic Guidelines. Geneva, World Health Organization, 1992, pp 171–173, F48.1.

12 Wing JK, Cooper JE, Sartorius N: Measurement and Classification of Psychiatric Symptoms: An Instruction Manual for the PSE and CATEGO Program. Cambridge, Cambridge University Press, 1974.
13 Marks DF: Visual imagery differences in the recall of pictures. Br J Psychol 1973;64:17–24.
14 Issac A, Marks DF, Russell DG: An instrument for assessing imagery of movement: The vividness of movement imagery questionnaire (VMIQ). J Ment Imag 1986;10:23–30.
15 Bernstein EM, Putnam FW: Development, reliability, and validity of a dissociation scale. J Nerv Ment Dis 1986;174:727–735.
16 Carlson EB, Putnam FW: An update on the dissociative experiences scale. Dissociation 1993; 6:16–27.
17 Carlson EB, Putnam FW, Ross CA, et al: Factor analysis of the Dissociative Experiences Scale: A multicentre study; in Braun BG, Carlson EB (eds): Proceedings of the Eighth International Conference on Multiple Personality and Dissociative States. Chicago, Rush, 1991.
18 Waller NG, Putnam FW, Carlson EB: Types of dissociation and dissociative types: A taxometric analysis of dissociative experiences. Psychol Methods 1996;1:300–321.
19 Simeon D, Guralnik O, Gross S, Stein DJ, Schmeidler J, Hollander E: The detection and measurement of depersonalization disorder. J Nerv Ment Dis 1998;186:536–542.
20 Beck AT, Steer RA, Garbin MG: Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. Clin Psychol Rev 1988;8:77–100.
21 Beck AT, Epstein N, Brown G, Steer RA: An inventory for measuring clinical anxiety: Psychometric properties. J Consult Clin Psychol 1988;56:893–897.
22 Warrington E, James M: The Visual Object and Space Perception Battery Test. Bury St Edmonds, Thames Valley Test Company, 1991.
23 Kaufman G: What is wrong with imagery questionnaires? Scand J Psychol 1981;22:59–64.
24 Chara PJ Jr: Some concluding thoughts on the debate about the Vividness of Visual Imagery Questionnaire. Percept Mot Skills 1992;75: 947–954.
25 McKelvie SJ: The VVIQ as a psychometric test of individual differences in visual imagery vividness: A critical review and plea for direction. J Ment Imagery 1995;19:1–252.
26 Marks DF: Bibliography of research utilizing the vividness of visual imagery questionnaire. Percept Mot Skills 1989;69:707–718.
27 David AS, Cutting JC: Visual imagery and visual semantics in the cerebral hemispheres in schizophrenia. Schizophr Res 1992;8:263–271.
28 Cappon D: Orientational perception. 3. Orientational percept distortions in depersonalization. Am J Psychiatry 1969;125:1048–1056.
29 Lipsanen T, Lauerma H, Peltola P, Kallio S: Visual distortions and dissociation. J Nerv Ment Dis 1999;187:109–112.
30 Sierra M, Berrios GE: The Cambridge Depersonalization Scale: A new instrument for the measurement of depersonalization. Psychiatry Res 2000;93:153–164.
31 Bisiach E, Luzzatti C: Unilateral neglect of representational space. Cortex 1978;14:129–133.
32 Kosslyn SM, Ochsner KN: Visual imagery and visual representation. Trends Neurosci 1994; 17:290–292.
33 Behrmann M, Winocur G, Moscovitch M: Dissociation between mental imagery and object recognition in a brain-damaged patient. Nature 1992;359:636–637.
34 Roland PE, Gulyás B: Visual imagery and visual representation. Trends Neurosci 1994; 17:281–287.
35 Howard RJ, Ffytche DH, Barnes J, McKeefry D, Ha Y, Woodruff PW, Bullmore ET, Simmons A, Williams SC, David AS, Brammer M: The functional anatomy of imaging and perceiving colour. Neuroreport 1998;9:1019–1023.
36 Barnes J, Howard RJ, Senior C, Bullmore ET, Brammer M, Simmons A, Woodruff P, David AS: Cortical activity during rotational and linear transformations. Neuropsychologia 2000; 38:1148–1156.
37 Sakai K, Miyashita Y: Visual imagery: An interaction between memory retrieval and focal attention. Trends Neurosci 1994;17:287–289.
38 Guralnik O, Schmeidler J, Simeon D: Feeling unreal: Cognitive processes in depersonalization. Am J Psychiatry 2000;157:103–109.
39 Williams JM, Healy HG, Ellis NC: The effect of imageability and predictability of cues in autobiographical memory. Q J Exp Psychol A 1999;52:555–579.