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# Mindfulness

## Mindfulness and Body Awareness in Depersonalization Disorder

--Manuscript Draft--

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| <b>Order of Authors Secondary Information:</b>       |  |
| <b>Abstract:</b>                                     | <p>Anomalous bodily experiences and automaton-like feelings constitute some of the core symptoms of depersonalization disorder (DP), features which may be considered antithetical to mindfulness. We thus investigated traits in a random sample of 22 stable patients with DP using the 14-item Freiburg Mindfulness Inventory (FMI) and predicted an overall negative correlation to their symptomatology as measured by the Cambridge Depersonalization Scale (CDS). We also conducted a regression analysis in order to elucidate the contribution of depression and anxiety measures on the above-mentioned correlation. Overall, the FMI and CDS were strongly negatively correlated (Pearson's <math>r = -.64</math>, <math>p &lt; .001</math>) as predicted, driven particularly by FMI items 1-4 and 7. The correlation withstood adjustment for depression and anxiety symptoms using regression analysis (<math>R^2_{adj} = 33\%</math>; <math>F(1, 19) = 10.83</math>, <math>p &lt; .005</math>). In sum, our results suggest a possible impairment of mindfulness abilities in DP. Future research should explore the links between DP and psychopathology and seek to devise therapeutic interventions for DP based on mindfulness.</p> |
| <b>Response to Reviewers:</b>                        |  |

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**ORIGINAL PAPER**

**Mindfulness and Body Awareness in Depersonalization Disorder**

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[No running head is required]

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**Abstract**

Anomalous bodily experiences and automaton-like feelings constitute some of the core symptoms of depersonalization disorder (DP), features which may be considered antithetical to mindfulness. We thus investigated traits in a random sample of 22 stable patients with DP using the 14-item Freiburg Mindfulness Inventory (FMI) and predicted an overall negative correlation to their symptomatology as measured by the Cambridge Depersonalization Scale (CDS). We also conducted a regression analysis in order to elucidate the contribution of depression and anxiety measures on the above-mentioned correlation. Overall, the FMI and CDS were strongly negatively correlated (Pearson's  $r = -.64, p < .001$ ) as predicted, driven particularly by FMI items 1-4 and 7. The correlation withstood adjustment for depression and anxiety symptoms using regression analysis ( $R^2_{adj} = 33\%$ ;  $F(1, 19) = 10.83, p < .005$ ). In sum, our results suggest a possible impairment of mindfulness abilities in DP. Future research should explore the links between DP and psychopathology and seek to devise therapeutic interventions for DP based on mindfulness.

**Keywords**

Depersonalisation disorder, Body awareness, Cambridge Depersonalization Scale, Freiburg Mindfulness Inventory, Depression, Anxiety

## Introduction

1  
2 Clinically significant depersonalization occurs in around 1-2% of the general adult  
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4 population (Hunter, Sierra, & David 2004). Besides emotional numbing, changes in the  
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6 subjective experience of imagery, and alienation from surroundings, anomalous body  
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8 experiences (or disembodiment) and automaton-like feelings (or feelings of a loss of agency)  
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10 make up the core symptoms of this syndrome (Sierra et al. 2005; Simeon et al. 2008). It has  
11  
12 been said that the antithesis of depersonalization is mindfulness, *i.e.*, non-judgmental  
13  
14 attention to present-moment experiences (Michal et al. 2013). Indeed psychometric  
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16 measures of the two phenomena have been shown to correlate inversely (Michal et al.  
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18 2007). This seems to follow from the fact that mindfulness is said to promote tolerance of  
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20 negative affect and at the same time enhances bodily awareness (Farb, Anderson, & Segal  
21  
22 2012). Furthermore, it has been claimed that mindfulness interventions may be helpful in  
23  
24 reducing DP symptoms (Allen 2004; David, Baker, & Hunter 2007; Michal 2014). Recently,  
25  
26 Michal and colleagues (2013) demonstrated that mindful breathing increased low baseline  
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28 autonomic responsiveness (a feature of DP) and reduced depersonalization symptom scores  
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30 as measured by the Cambridge Depersonalisation Scale (CDS).  
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35 Given the above-mentioned difficulties that people with depersonalization disorder  
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37 experience with mindfulness and body perception, we predicted negative correlations  
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39 between the FMI and the CDS as well as the Dissociative Experiences Scale (DES)  
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41 (Dubester & Braun 1995). We also explored correlations between the FMI and two well  
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43 established measures of non-psychotic psychopathology, the Beck Anxiety and Depression  
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45 inventories (Beck, Epstein, Brown, & Steer 1988; Beck & Steer 1984). Since depression and  
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47 anxiety are common comorbidities in patients with DPD we further sought to explore whether  
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49 the inverse relationship between mindfulness and DP was in any way confounded by such  
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51 psychopathology.  
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## Method

### Participants

All 22 patients were assessed by a qualified psychiatrist as part of the depersonalization unit at the Maudsley hospital in South London and had a confirmed diagnosis of depersonalization disorder according to the ICD-10. However, three patients scored below the typical cut-off (70 points) on the Cambridge Depersonalisation Scale (Sierra and Berrios 2000) and were therefore excluded from further analyses, unless otherwise specified. Participants' demographics are listed in table 1.

*[ Insert Table 1 about here ]*

### Procedure

This study sought to investigate in more detail the precise relationship between DP and mindfulness by administering the Freiburg Mindfulness Inventory (Walach, Buchheld, Buttenmüller, Kleinknecht, & Schmidt 2006) to a random sample of patients with depersonalization disorder.

### Measures

Patients are routinely administered the Cambridge Depersonalisation Scale-Trait Version (CDS) (Sierra & Berrios 2000), Beck's Anxiety Inventory (BAI) (Beck et al. 1988), Beck's Depression Inventory (BDI) (Beck & Steer 1984), and Dissociative Experiences Scale (DES) (Dubester & Braun 1995) prior to their first appointment visit. The Freiburg Mindfulness Inventory (FMI) (Walach et al. 2006) was included in their assessment package irrespective of any previously known participant characteristics. Note that a higher score on the clinical scales indicates a greater degree of clinical problems.

The Freiburg Mindfulness Inventory (FMI), in its short form, is a 14-item scale which has been shown to be useful in measuring the construct of mindfulness (Walach et al. 2006). In its original publication, it was successfully applied in lay, meditating, and clinical

1 participants achieving good internal consistency (Cronbach's alpha = .86). It includes items  
2 such as "I am open to the experience of the present moment"; "I accept unpleasant  
3 experiences"; and, "I sense my body, whether eating, cooking, cleaning or talking."  
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## 8 **Analyses**

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10 Scores were analysed in terms of correlations between above-mentioned survey  
11 totals as well as between FMI individual items and the CDS total. Having established a  
12 correlation between the FMI and CDS total scores, we also carried out a linear regression,  
13 examining the variance accounted for by the BAI and BDI in the correlation between CDS  
14 and FMI in order to qualify this relationship further. The study was approved by the local  
15 research ethics committee.  
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## 26 **Results**

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28 Among our participants, women were less predominant. Participants appeared for  
29 the most part able to function in terms of education and employment status, but a subgroup  
30 (eleven participants or ca. 58%) also exhibited some symptoms of comorbid mood and other  
31 disorders (see Table 1). Mean age was 35.9 years (*SD* 9.4) and mean duration of illness  
32 was 12.0 years (*SD* 11.0).  
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40 Questionnaire total scores are listed in table 2.  
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44 *[ Insert Table 2 about here ]*  
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49 The average CDS-Trait total score was 167.5 (*SD* 61.6). The mean scores on the  
50 Beck inventories indicated mild anxiety or depression, respectively.  
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53 As expected, there was a significant inverse correlation between the FMI and the  
54 CDS (trait version) measures (see Table 2). As a rule of thumb, correlations of Pearson's *r*  
55 up to .10 tend to be considered small, up to .30 medium, and > .50 large. Hence, we could  
56 categorise the correlation between the FMI and our measure of depersonalization as  
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strongly negative. Somewhat surprisingly, the correlation between the FMI and the DES, a widely used general measure of dissociation, was not significant, and the same is true for its depersonalization/derealisation subscale.

Examining the relationship between the individual items of the FMI and the CDS-T, only item 4 (“I am able to appreciate myself”) of the FMI was significantly correlated with the CDS total score (Pearson’s  $r = -.52, p < 0.03$ ). Given that a number of correlations were on the border to being significant at  $p < 0.05$ , the analysis was re-run with all 22 participants included (irrespective of sub-threshold CDS total scores). We discovered that the overall correlation (Pearson’s  $r = -.64, p < .001$ ) was primarily driven by items 1-4 and 7 (see Supplementary Figure 1). Arguably, these items relate the strongest to the responder’s body perception rather than their reflectiveness or humility out of all 14 FMI questions.

[ Insert Figure 1 about here ]

Additionally, we showed a strong negative correlation between the FMI and our measure of depression (BDI) as well as a significant negative correlation of medium strength between the FMI and our measure of anxiety (BAI; see Table 2).

In order to form a clearer impression of the relationship between the FMI and CDS irrespective of participants’ potential depression and anxiety symptoms, we performed a linear stepwise regression with the FMI total score as the dependent variable. In the initial step, BAI, BDI, and CDS total scores were entered as independent factors with only the CDS remaining in the second step. The first step achieved a good regression fit ( $R^2_{adj} = 46.6\%$ ), but this dropped after having removed the BAI and BDI components ( $R^2_{adj} = 29.5\%$ ). Nonetheless, the relationship in the second remained significant,  $F(1, 16) = 8.11, p < .05$ . The regression coefficients are listed in table 3.

[ Insert Table 3 about here ]



## Discussion

1  
2 We were able to replicate the negative correlation between psychometric measures  
3  
4 of depersonalization and mindfulness (Michal et al. 2007). This suggests that, in individuals  
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6 with depersonalization disorder, the symptoms as measured by the CDS and mindfulness as  
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8 assessed via the FMI are indeed moderately to strongly opposed. We also found a moderate  
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10 to strong negative correlation between our measure of mindfulness (FMI) and of depression  
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12 (BDI). However, the regression analysis indicated that this is not a pure relationship in that a  
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14 negative correlation between depersonalization (CDS) and mindfulness (FMI) remained after  
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16 the statistical removal of variance contributed by the BDI and BAI. At the same time, we  
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18 were able to replicate negative correlations between a measure of mindfulness (Kentucky  
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20 Inventory of Mindfulness Skills or FMI) and dissociation (DES) (Baer, Smith, & Allen 2004;  
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22 Walach et al. 2006), even though our correlation between the FMI and DES did not reach  
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24 significance ( $p > .2$ ). This could be due to our study sample being underpowered. However,  
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26 it does leave open the question whether the antagonism with mindfulness might be particular  
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28 to the depersonalization population as opposed to individuals with other  
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Despite the fact that mindfulness training has been applied in the treatment of depression and anxiety (e.g., Sharplin et al. 2010), another question that is outstanding is whether, because of the close relation between the BDI and the FMI, the latter may merely represent a proxy measure for depression. In a factor analysis by Kohls, Sauer, and Walach (2009), shortened versions of the FMI and BDI did correlate, but only for the acceptance subfactor. This implies that the FMI does measure a separate construct from the BDI. A further limitation of our research is that the sample of DP patients was predominantly male and overall well-functioning (with a majority being well-educated and in employment), thereby limiting generalisability.

Finally, our data suggest that techniques to increase mindfulness would be expected to improve symptoms of DP/DR significantly although patients may find such techniques particularly alien and difficult to apply. Nevertheless, training in such techniques as the harnessing of attention and 'staying present', should be considered as potential therapeutic approaches (Zerubavel and Messman-Moore 2013).

In conclusion, in our sample of patients diagnosed with depersonalisation disorder, we found significant and negative correlations between a measure of mindfulness (FMI) and questionnaires assessing symptoms of depersonalization (CDS), depression (BDI), and anxiety (BAI). Mindfulness may serve as a valuable component in the treatment of such disorders, provided there is a focus on somatic symptoms and attention in depersonalization and a greater emphasis on acceptance in depression.

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## ***Conflict of Interest***

None.

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1  
2 **Tables**

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4 *Demographic Variables of Participants*

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| <u>Category</u>   | <u>Labels</u>             | <u>Count (Percentage)</u> |
|-------------------|---------------------------|---------------------------|
| Gender            | Females                   | 5 (26.3%)                 |
| Marital status    | Single                    | 12 (63.2%)                |
|                   | Cohabiting/married        | 7 (36.8%)                 |
| Work status       | Unemployed                | 5 (26.3%)                 |
|                   | Various professions       | 13 (68.4%)                |
|                   | Missing                   | 1 (5.3%)                  |
| Education         | Secondary school          | 3 (15.8%)                 |
|                   | University                | 15 (78.9%)                |
|                   | Missing                   | 1 (5.3%)                  |
| Comorbid symptoms | Anxiety and/or depression | 9 (47.3%)                 |
|                   | Dissociation              | 1 (5.3%)                  |
|                   | Schizophrenia             | 1 (5.3%)                  |
|                   | None                      | 8 (42.1%)                 |

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40 **Table 1.** Demographics for 19 participants with DP.  
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Participants' Mean Totals on Assessment Questionnaires

| Questionnaire   | Mean  | SD   | Pearson's $r$ | $p$  |
|---|-------|------|---------------|------|
| <u>Correlation with FMI</u>                           |       |      |               |      |
| Freiburg Mindfulness Inventory (FMI)                  | 29.4  | 6.7  | n/a           | n/a  |
| Cambridge Depersonalization Scale<br>(CDS)            | 167.5 | 61.6 | -.618**       | .005 |
| Beck's Anxiety Inventory (BAI)                        | 19.1  | 16.4 | -.460*        | .048 |
| Beck's Depression Inventory (BDI)                     | 21.4  | 11.3 | -.626**       | .005 |
| Dissociative Experiences Scale<br>(DES)               | 31.7  | 18.0 | -.312         | .208 |
| DES – Depersonalisation and<br>derealisation subscale | 44.1  | 18.0 | -.105         | .678 |

**Table 2.** N = 19 (scores on the BDI, DES, and DES subscale were missing for one participant).

Correlations between clinical measures and the Freiburg Mindfulness Inventory. \*Significant at .05-level. \*\*Significant at .005-level.

Stepwise linear regression with Freiburg Mindfulness Inventory

|              |            | Unstandardized |           | Standardized |          |          |
|--------------|------------|----------------|-----------|--------------|----------|----------|
|              |            | Coefficients   |           | Coefficients |          |          |
| <u>Model</u> |            | <u>B</u>       | <u>SE</u> | <u>Beta</u>  | <u>t</u> | <u>p</u> |
| 1            | (Constant) | 43.82          | 3.65      |              | 12.01    | .000     |
|              | BAI Total  | -.22           | .12       | -.38         | 1.79     | .095     |
|              | BDI Total  | -.10           | .09       | -.22         | 1.15     | .270     |
|              | CDS Total  | -.05           | .02       | -.42         | 2.14     | .051     |
| 2            | (Constant) | 40.23          | 3.86      |              | 10.43    | .000     |
|              | CDS Total  | -.06           | .02       | -.58         | 2.85*    | .012     |

**Table 3.** FMI total score as dependent variable. \*Significant at .05-level.

**Captions**

**Supplementary Figure 1.** Shows non-parametric correlations between Cambridge Depersonalization Scale (trait version) and Freiburg Mindfulness Inventory - individual items. Note that item 13 is reversed-scored ('I am impatient with myself or others'). \*Significant at .05-level. \*\*Significant at .01-level.



## Correlations between CDS Total Score and FMI Individual Items

