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Lack of relationship between psychological denial and unawareness of illness in schizophrenia-spectrum disorders

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Abstract

Numerous theories have been proposed to explain the unawareness of illness that is commonly seen in schizophrenia-spectrum disorders, including the theory that unawareness is the result of a psychological denial mechanism used to mitigate the emotional consequences of having a psychiatric illness. The present study was an attempt to determine whether increased denial (in the form of self-deception) is associated with impaired awareness, consistent with the denial theory. Participants included 40 patients with schizophrenia-spectrum disorders and 25 healthy comparison participants. Patients' levels of awareness and symptom attribution were assessed through interview, and all participants completed self-report questionnaires measuring mood symptoms as well as their use of self-deception. Awareness of negative symptoms was associated with increased depression. However, self-deception was not significantly correlated with awareness measures. When patients were divided on the basis of their awareness and attribution scores, no group differences emerged regarding use of self-deception. The patient group and the healthy comparison group did not differ in their use of self-deception. The current results do not support the psychological denial theory of unawareness of illness in schizophrenia-spectrum disorders.

Keywords

Schizophrenia; Awareness; Insight; Denial; Deception; Depression

1. Introduction

Unawareness of illness has long been regarded as having considerable relevance to the health outcomes of individuals with schizophrenia-spectrum disorders. The majority of patients with

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schizophrenia experience impaired awareness of their mental illness (Amador et al., 1994; Pini et al., 2001), a clinically important finding given that impaired awareness of illness has been found to be associated with poorer psychosocial functioning (Amador et al., 1994), decreased vocational functioning (Lysaker et al., 1994), a higher number of involuntary hospital admissions (Kelly et al., 2004), and reduced treatment compliance and treatment outcomes (Bartko et al., 1988; Schwartz et al., 1997; Olfson et al., 2006).

Although originally believed to be a unitary, “all-or-nothing” phenomenon, awareness is now considered a multi-dimensional construct that can be measured along several continua (David, 1990). Amador and Strauss (1993) have suggested three dimensions of awareness in schizophrenia – awareness of having a mental illness, of the benefits of treatment, and of the social consequences of the illness. In addition, they have differentiated between *unawareness of illness*, described as the failure to acknowledge a symptom even when confronted by it, and *incorrect attribution* of the symptom, or the belief that those symptoms that are acknowledged are caused by something other than a mental illness.

Despite heightened recognition of the role of awareness in mental health functioning as well as improved conceptual theories of awareness, researchers continue to disagree over its etiology. Various theoretical models have been proposed in an attempt to explain the prevalence of unawareness in psychotic illness (see Cooke et al., 2005). Several researchers have suggested that lack of awareness is a non-reducible, primary symptom of the disease, independent of both positive and negative symptoms (Peralta and Cuesta, 1994; Freudreich et al., 2004). Theories have also been proposed for a specific cognitive deficit explanation, supported by research showing associations between unawareness and lower overall intellectual ability (Lysaker and Bell, 1994) and poorer verbal memory (Keshavan et al., 2004), as well as with impaired executive functions (Drake and Lewis, 2003; Donohoe et al., 2005; Lysaker et al., 2006). Cognitive psychologists have explored the relationship between psychiatric symptoms and theory of mind, the neurocognitive capacity to infer the mental state of oneself and others in order to explain behavior (Frith and Corcoran, 1996; Frith, 1999), and some have argued that theory of mind deficits could be one explanation for poor insight in schizophrenia (Bora et al., 2007). Drawing parallels between unawareness in schizophrenia and the unawareness of symptoms that is commonly seen in neurological disorders (i.e., anosognosia), researchers have also begun using neuroimaging techniques to demonstrate relationships between impaired awareness and reduced whole brain volumes (Flashman et al., 2000), as well as ventricular enlargement and atrophy of specific subregions of the frontal lobes (Laroi et al., 2000; Flashman et al., 2001; Shad et al., 2006; Sapara et al., 2007).

In contrast to the symptom and cognitive theories, there exists a long-standing model that argues that poor awareness is a defensive mechanism, used by individuals with psychosis as a way to protect against the threats to self that may result from the diagnosis of a chronic, debilitating and potentially stigmatizing illness such as schizophrenia (Mechanic et al., 1994). In this model, individuals use denial of symptoms as a way of coping with their diagnosis, either by denying the existence of symptoms or by attributing symptoms to a less threatening source. Despite competing theories, the “denial” model has remained prominent in the literature, and researchers have indeed found links between poor insight and a preference for denial as a coping strategy (Lysaker et al., 2003). Increased awareness of mental illness has also been shown to be associated with a decrease in quality of life (Mechanic et al., 1994), worsening mood (Carroll et al., 1999), increased anxiety (Lysaker and Salyers, 2007) and suicidality (Amador et al., 1996). These results can be interpreted as suggesting that unawareness could be an adaptive strategy which is “protective” against the presumed emotional consequences of awareness of mental illness.

Moore and colleagues (1999) reported findings that are often cited as support for the denial model of unawareness. Patients with schizophrenia were assessed for level of awareness using the Scale to Assess Unawareness of Mental Disorders (SUMD; Amador et al., 1993). Thirty-four patients also completed the Beck Depression Inventory and the Balanced Inventory of Desirable Responding (BIDR; Paulhus, 1994), a self-report instrument that assesses the tendency to use positive self-deception and/or impression management with others. Results revealed that patients who showed greater awareness of their illness, in particular, awareness of the social consequences of their illness, also reported higher levels of depression. Additionally, a tendency to deceive oneself so as to maintain a positive self-image was associated with unawareness of one's mental illness as well as unawareness of the social consequences of mental illness. On the basis of these findings, these researchers argued that individuals with good awareness of the symptoms and consequences of their mental illness are also more likely to be depressed, and that unawareness may reflect the use of self-deception as a defense mechanism to mitigate the negative emotional consequences of being diagnosed with schizophrenia.

The current study is an attempt to replicate and extend the findings of Moore and colleagues (1999). First, using methods consistent with the original study, we investigated the relationship between self-deception and global ratings of awareness - specifically, awareness of having a mental illness, of the effects of medications, and of the social consequences of their illness. In addition, we examined awareness of positive and negative symptoms separately, based upon findings by Amador et al. (1994) that unawareness was associated with increased positive but not negative symptoms, and the supposition that positive symptoms such as delusions and hallucinations may be more stigmatizing than negative symptoms. Measures of both depression and anxiety were included in our study to further investigate the relationship between self-deception and mood. Finally, studies have shown that socially desirable responding such as the use of self-deception can occur frequently in even those groups of individuals with no history of mental illness (Paulhus, 1998). We therefore included a healthy comparison group in order to determine whether patients with schizophrenia-spectrum disorders demonstrate greater use of self-deception than the general population, a specific comparison which, to our knowledge, has not been reported in any previously published research.

2. Methods

2.1. Participants

This study examined a subset of 65 participants, drawn from a larger study in our laboratory on unawareness of illness in schizophrenia-spectrum disorders, who had completed the Paulhus Deception Scales: The Balanced Inventory of Desirable Responding -7 (PDS; Paulhus, 1998). Of these, 40 were patients with a primary clinical diagnosis of either schizophrenia, schizoaffective disorder, or psychotic disorder not otherwise specified (NOS). Diagnosis, as well as past and present substance use, was confirmed using the Structured Clinical Interview for DSM (SCID-IV-P; First et al., 1997). All patients were receiving neuroleptic medication and were symptomatically stable at the time of the assessments. The study also included 25 healthy comparison participants recruited from the community through the use of fliers and newspaper ads. Comparison participants were excluded from the study if they reported any history of mental illness as determined via interview with the SCID-IV-NP (Non-Patient version), if they reported a history neurological disorder or significant systemic medical illness, or if they reported having a first-degree biological relative with a history of mental illness. Demographic information is presented in Table 1. After receiving a full description of the study, all participants gave written informed consent following a protocol approved by the Dartmouth College Committee for the Protection of Human Subjects, and received financial compensation for their participation.

2.2. Measures

All participants completed the PDS, which is a 40-item self-report questionnaire. The PDS contains two subscales. The first, Self-Deceptive Enhancement (SDE), measures the tendency to unconsciously exaggerate ones' own positive attributes and deny negative attributes as a result of denial or self-deception, with items such as: "I am a completely rational person". The second subscale, Impression Management (IM), measures the social desirability phenomenon in which one intentionally reports a favorable impression of oneself to others, with items such as: "I never cover up my mistakes". Participants are asked to rate each item using a 5-point scale which ranges from "1 - not true" to "5 - very true". The PDS has a North American fifth grade reading level and completion takes 5–7 minutes on average for adults, although respondents with psychiatric problems or reading difficulties may take slightly longer.

In addition to receiving the PDS, all subjects completed a clinical assessment that included the Beck Depression Inventory II (BDI; Beck et al., 1996) and the Spielberger State-Trait Anxiety Index (STAI; Spielberger et al., 1970) as part of the larger awareness study. One patient chose not to complete the BDI. Psychiatric symptoms and awareness were assessed using the Brief Psychiatric Rating Scale (BPRS; Overall and Garham, 1988), the Schedule for Assessment of Negative Symptoms (SANS; Andreasen, 1984a), the Schedule for Assessment of Positive Symptoms (SAPS; Andreasen, 1984b), and the Scale to Assess Unawareness of Mental Disorders (SUMD; Amador et al., 1993). These measures were administered during an interview that was always conducted by one of the authors (TWM, LAF, or RMR) and attended by at least one other trained rater. Scores for each patient on the BPRS, SANS, SAPS and SUMD were established using consensus ratings.

The SUMD is a semi-structured interview that provides a measure of a patient's awareness of his or her mental illness and associated symptoms. After assessment of the presence of symptoms using the SANS and SAPS, the SUMD is then used to rate patients on their awareness of each existing symptom using a 5-point scale, with a score of 1 indicating full awareness and a score of 5 indicating complete unawareness of the symptom. If patients are judged to have some level of awareness (i.e. a score of 1, 2, or 3), they are then asked to explain the symptom and their attribution is rated in a similar manner. The ratings of the awareness and attribution of each symptom are then averaged in order to derive mean awareness and attribution scores for positive, negative, and combined symptoms. Additionally, each patient is rated on three global items – awareness of a mental illness, awareness of the effects of medication, and awareness of the social consequences of the mental illness.

2.3. Data analysis

Analyses were conducted both with and without the schizoaffective and psychosis NOS patients to determine whether differences would be seen within the schizophrenia-spectrum population. As no significant differences in results were found, the patients were combined into one group for all final analyses.

While within-group correlational analyses can be useful in exploring the separate relationships between self-deception and the different dimensions of awareness (Moore et al., 1999), this type of analysis does not allow for simultaneous consideration of both awareness and attribution. We therefore chose to additionally classify the patient participants into groups that take into account both of these factors and allow for between-group categorical analyses. Group assignment was based on the model proposed by Flashman and Roth (2004) that argues that awareness is a multi-dimensional construct which may fluctuate depending on what symptoms or aspects of the illness are being assessed, and that to be truly "aware" requires having both the ability to recognize symptoms of mental illness as well as the ability to correctly attribute them to a mental illness. Using a SUMD cut-off score of 3 in which average awareness or

attribution scores greater than 3 were considered impaired, the patient population was split into a “fully aware” group (FA) of individuals who showed good awareness and correct attribution, and an “impaired awareness” group (IA) who showed either impaired awareness or attribution. To further explore this theory, patients with impaired awareness were subdivided into two more specific groups, again using their average awareness and attribution scores. In this three-group model, patients were considered either “fully aware” (FA), “aware but misattributing” (AM), or “unaware” (U).

The decision to utilize this model of unawareness gave rise to an additional set of questions. Specifically, we investigated whether, when split into groups, patients with impaired awareness (IA) would employ self-deception at higher levels than patients with good awareness (FA), as well as show lower levels of depression and anxiety. In addition, we examined whether patients who were both aware and able to correctly attribute their symptoms (FA) would show less self-deception and more severe mood symptoms than patients who were aware of their symptoms but misattributed them to sources other than mental illness (AM), and whether both of these groups would differ from those patients who were unaware (U) of their symptoms and therefore unable to correctly attribute them to mental illness.

As scores on the PDS subscales did not conform to parametric assumptions, a two-tailed Spearman's rank order correlation was employed to address the hypothesis regarding the within-group relationship between level of awareness (including awareness of negative and awareness of positive symptoms) and response patterns on the subscales of the PDS. Mann-Whitney *U* tests were used to compare the PDS scores of patients and the healthy comparison groups, as well as to examine group differences between fully aware and impaired aware patients. A Kruskal-Wallis analysis of variance was used to assess the differences between the FA, AM, and U groups.

In order to examine the relationship between awareness and mood (i.e. depression and anxiety) two-tailed Pearson correlations were used, while specific comparisons of mood symptoms between the different awareness groups were conducted using t-tests and one-way analysis of variance (ANOVA). Statistical significance was evaluated using an alpha level of .05 for all tests with and without Bonferroni correction for multiple comparisons.

3. Results

3.1. Participant characteristic data

Table 1 presents the descriptive statistics for patients with schizophrenia-spectrum disorders and the healthy comparison group. Results revealed that the patient and comparison groups were well-matched for age, gender, and parental education, and that the various patient groups were all well-matched for these demographic factors as well as for severity of symptoms as measured by the BPRS, SANS, and SAPS.

Within the patient group, the majority had a primary clinical diagnosis of schizophrenia ($n = 25$), while the remaining patients had a diagnosis of either schizoaffective disorder ($n = 13$) or psychotic disorder NOS ($n = 2$). All were outpatients at the time of the study, and had a chronic history of mental illness, with no first episode patients. Interview using the SCID revealed that ten patients met criteria for a past history of substance use disorder, while five had a current diagnosis (either alcohol and/or cannabis).

Overall, the patients in this study had a relatively mild severity of positive and negative symptoms, as evidenced by the mean summary scores on the BPRS as well as on the SANS and SAPS (see Table 1). They also represented a group that was relatively aware of their symptoms, with only 10 patients (25%) having average awareness scores that fell within the

impaired range, and 12 patients (31.6 %) with impaired average attribution scores (2 patients could not be rated on attribution due to their complete unawareness of symptoms). Average scores on the global items were 1.92 ($SD = 1.49$) for awareness of illness, 1.83 ($SD = 1.36$) for awareness of the effects of medication, and 2.50 ($SD = 1.92$) for awareness of social consequences of mental illness (where a score of 1 indicates full awareness, and a score of 5 indicates complete unawareness).

3.2. Correlations between PDS, awareness, and mood

As seen in Table 2, scores on the SDE and IM subscales did not significantly correlate with either the average awareness score or the attribution score, nor were they correlated with any of the three global SUMD questions. Splitting the average awareness score into awareness of positive symptoms and awareness of negative symptoms also failed to yield any significant correlations with the PDS subscales. Due to the relatively high number of aware patients in our sample, analyses were also conducted solely within the subset of patients with impaired awareness to assess whether any significant relationships would become evident. Once again, no significant correlations were found for any of these relationships.

Significant correlations were revealed between awareness scores and measures of mood symptoms. Awareness of the social consequences of mental illness was negatively correlated with trait anxiety, with anxiety increasing with greater awareness (i.e. lower average scores on awareness ratings). There was also a trend for greater awareness of social consequences to be correlated with elevated depression. Analysis of the average awareness and attribution scores revealed significant negative correlations between awareness and both depression and state anxiety, with an additional trend towards a negative correlation between awareness and trait anxiety. Examination of the average awareness scores for positive and negative symptoms revealed that, while awareness of positive symptoms was not related to mood, awareness of negative symptoms was significantly correlated with all three of the mood measures. The average attribution score did not show any significant correlations with self-reported mood symptoms. After application of a Bonferroni correction, however, only the correlation between awareness of negative symptoms and depression remained significant.

3.3. Group differences on mood measures and PDS subscales

Table 3 shows all median scores and interquartile ranges for non-parametric tests, as well as all means and standard deviations for parametric tests.

The total sample of patients did not differ from the healthy comparison group in scores for either the IM (Mann-Whitney U , $P = 0.75$) or SDE (Mann-Whitney U , $P = 0.25$) subscales.

When patients were separated into FA and IA groups, there were no significant differences between the groups on either IM (Mann-Whitney U , $P = 0.839$) or SDE (Mann-Whitney U , $P = 0.978$) (Table 3). The two groups did, however, show a trend towards a significant difference on the BDI [$t(37) = 2.02$, $P = 0.05$], with the FA group reporting a higher level of depression than the IA group. The two groups also showed a significant difference in trait anxiety (Table 3), with the FA group reporting higher levels of anxiety than the IA group. No significant differences were seen for state anxiety, and none of the effects remained significant after Bonferroni correction.

Dividing the patients into three awareness groups (FA, AM, and U), did not result in any significant group differences on IM [$\chi^2(2) = 2.08$, $P = 0.35$] or SDE [$\chi^2(2) = .01$, $P = 0.99$]. When the BDI scores of the three groups were compared, the groups did show a significant difference (Table 3), with Tukey HSD post-hoc comparisons indicating that the FA group reported significantly higher levels of depression ($P = 0.04$) than the U group, although neither

of these two groups differed significantly from the AM group. Group differences also approached significance for trait anxiety [$F(2, 37) = 2.83, P = 0.07$], with the FA group again showing a trend towards higher levels of anxiety ($P = 0.09$) than the U group, with neither group differing from the AM group. No group differences were found for state anxiety.

4. Discussion

The theory that unawareness of mental illness is the result of psychological denial or self-deception is popular in the literature, supported by findings such as those of Moore et al. (1999) showing a relationship between unawareness, depression, and self-deception. The current study, an attempt to replicate and extend these results, did not replicate the findings, and the current results do not support the denial theory of unawareness in schizophrenia. Not only did patients in our study show levels of self-deception that were comparable to those of a healthy comparison group, their use of self-deception was not found to be related to their level of awareness on either global ratings or specific ratings of positive, negative and combined symptom ratings. When patients were grouped on the basis of their awareness and attribution scores into either two groups (FA and IA) or three groups (FA, AM, U), no group differences were observed in terms of their use of self-deception.

Consistent with previous research, awareness of the social consequences of illness and awareness of negative symptoms were shown to be correlated with depression and anxiety, and fully aware patients reported higher levels of depression and anxiety than patients with impaired awareness in this study, though only the relationship between awareness of negative symptoms and depression remained significant when using a more stringent statistical criterion. The current study design did not allow for a specific analysis of self-deception as a moderator of the relationship between awareness and mood symptoms. Nonetheless, the finding that good awareness is related to poorer mood but not to an increase in the use of self-deception suggests that denial is not being used by individuals with schizophrenia in order to avoid the negative emotions such as depression and anxiety that may result from awareness of psychiatric symptoms.

The patients in the current study were of a similar age range and showed similar clinical characteristics to the patients in the Moore et al. (1999) study. Both groups had relatively low levels of the positive symptoms of schizophrenia, and reflected a patient population that was generally aware of their symptoms. Both studies also included patient participants with average BDI scores in the mild range. However, the current study did differ in several ways which may have contributed to differences in results. Updated versions of the self-report measures were used, and participants in the original study appeared to report a mean SDE score somewhat higher than that of the patient cohort in the current study. The current study also included more participants, and demographic variables were assessed in which differences between the two groups may have been observed had they been used by both studies - for example, we analyzed parental education while the original study reported social class.

Despite previous findings that the majority of patients with schizophrenia show impaired awareness (Amador et al., 1994), the patients in the current study as well as the Moore et al. (1999) study were a relatively aware group, which may limit the ways in which the results can be generalized. Our sample also included some participants (32.5%) who met criteria for lifetime alcohol or cannabis abuse, which may present a limitation of the study despite being generally reflective of a chronic mentally ill population, who have been found to have an approximately 29% lifetime prevalence of comorbid substance abuse (Regier et al., 1990). Furthermore, different results may have been revealed in a population experiencing greater symptom severity. While the current study did have a slightly larger sample size than the Moore et al. study, the sample size is still modest and therefore we cannot completely rule out the

possibility that Type II errors contributed to the lack of significant findings in the current study. Although the denial theory argues a causal relationship between awareness, denial, and mood, the current study includes only cross-sectional data from which no causal conclusions can be drawn. There is also an inherent potential limitation to the use of self-report measures in a study attempting to examine the hypothesis that patients with impaired awareness will deny their symptoms. If this hypothesis were true, self-report measures may prove unreliable for some patients depending on their level of awareness. However, a recent study (Bell et al., 2007) found that regardless of their illness awareness and attribution, patients with schizophrenia were able to accurately report most of their personality and symptom characteristics on self-report questionnaires, providing some support for the validity of the current results. In addition, our results showed that IM was unrelated to awareness in this population, suggesting that none of the groups were more likely than others to “fake good” or attempt to present an inaccurate self-portrayal. Finally, as the PDS does not attempt to measure the *accuracy* of reporting per se, but rather the *style* of reporting, unawareness actual symptoms or behaviors would not interfere with the validity of this measure to the same extent as it might with measures relying more on the accuracy of self-report. However, it does remain the case that such self-report items may be difficult for some respondents with psychiatric illness, and future research using an alternate means of measuring self-deception seems necessary.

The current study attempted to replicate and extend the findings of Moore et al. (1999) using a larger sample, additional measures of awareness and mood, and a model for examining both awareness and attribution through the use of categorical analyses. Our findings do not, however, support a psychological denial explanation for the relationship between mood and awareness. This does not rule out the possibility that self-deception may be one contributing factor in a more complex interaction between different psychological defenses, cognitive deficits and neural mechanisms. Indeed, a recent study failed to find a relationship between denial and insight, but did find a more complex interaction between insight, distress, and different coping styles (Cooke et al., 2007). In addition, previous researchers have found an interaction between unawareness, denial, and executive functions (Lysaker et al., 2003), and have also found that both an externalizing attributional bias (the tendency to blame others for negative circumstances rather than oneself) and impairments in theory of mind were both associated with poor insight (Langdon et al., 2006). Future research into different ways of measuring these psychological factors and the exploration of theoretical models regarding possible interactions between psychological, cognitive and neural mechanisms will continue to inform our understanding of the etiology and consequences of unawareness in mental illness, as well as point to directions for treatment options for individuals with schizophrenia spectrum disorders.

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Table 1

Participant Demographic and Clinical Characteristic Data

Variables	Control (n = 25)		Patient (n = 40)		Two Group		Three Group				
	Mean (SD)	t (P)	FA (n = 20)	Mean (SD)	IA (n = 20)	F (P)	FA (n = 20)	AM (n = 10)	U (n = 10)	F (P)	
Age	36.16 (11.28)	39.80 (11.28)	-1.27 (0.21)	40.85 (12.44)	38.75 (10.19)	0.34 (0.56)	40.85 (12.44)	37.90 (11.44)	39.60 (9.32)	0.22 (0.80)	
Parental Education	14.20 (2.67)	13.28 (3.50)	1.07 (0.29)	13.78 (2.80)	12.78 (4.10)	0.73 (0.40)	13.78 (2.80)	13.44 (3.44)	12.11 (4.78)	0.68 (0.51)	
SANS	n/a	11.03 (3.88)		11.50 (3.35)	10.55 (4.38)	0.59 (0.45)	11.50 (3.35)	11.10 (4.53)	10.00 (4.40)	0.49 (0.62)	
SAPS	n/a	7.13 (3.59)		6.35 (2.46)	7.90 (4.38)	1.91 (0.18)	6.35 (2.46)	7.30 (4.55)	8.50 (1.38)	1.23 (0.31)	
BPRS	n/a	45.10 (11.30)		43.15 (10.28)	47.05 (12.18)	1.20 (0.28)	43.15 (10.28)	47.20 (10.34)	46.90 (14.36)	0.59 (0.56)	
N Males/Females			χ ² (P)	N Males/Females			χ ² (P)	N Males/Females			χ ² (P)
Gender	11/14	27/13	2.60 (0.11)	14/6	13/7	0.00 (1.00)	14/6	7/3	6/4	3.42 (0.84)	

Note. FA = Fully Aware; IA = Impaired Awareness; AM = Aware but Misattributing; U = Unaware; SANS = Schedule for the Assessment of Negative Symptoms; SAPS = Schedule for the Assessment of Positive Symptoms; BPRS = Brief Psychiatric Rating Scale.

Table 2

Correlations between Awareness Measures and Self-Report Data

	SUMD Q1	SUMD Q2	SUMD Q3	Awareness	Attribution	Pos. Aware	Neg. Aware
PDS Subscales							
IM	0.12 ($P = 0.45$)	-0.11 ($P = 0.50$)	0.06 ($P = 0.70$)	0.20 ($P = 0.21$)	-0.08 ($P = 0.66$)	0.29 ($P = 0.09$)	0.18 ($P = 0.26$)
SDE	-0.13 ($P = 0.41$)	-0.23 ($P = 0.15$)	-0.04 ($P = 0.81$)	-0.05 ($P = 0.75$)	-0.06 ($P = 0.73$)	-0.12 ($P = 0.48$)	0.03 ($P = 0.86$)
Mood Measures							
BDI	-0.23 ($P = 0.16$)	-0.14 ($P = 0.41$)	-0.30 ($P = 0.06$)	-0.39* ($P = 0.02$)	-0.26 ($P = 0.12$)	-0.16 ($P = 0.35$)	-0.46* ($P = 0.003$)
STAI State	-0.04 ($P = 0.79$)	-0.05 ($P = 0.78$)	-0.12 ($P = 0.45$)	-0.41* ($P = 0.01$)	-0.03 ($P = 0.84$)	-0.14 ($P = 0.42$)	-0.34* ($P = 0.03$)
STAI Trait	-0.26 ($P = 0.11$)	-0.09 ($P = 0.56$)	-0.34* ($P = 0.03$)	-0.31 ($P = 0.05$)	-0.18 ($P = 0.28$)	-0.24 ($P = 0.17$)	-0.34* ($P = 0.04$)

Note. SUMD Q1 = Question 1, Awareness of Mental Disorder; SUMD Q2 = Question 2, Awareness of the Achieved Effects of Medication; SUMD Q3 = Question 3, Awareness of the Social Consequences of Mental Disorder; Awareness = Average awareness score on SUMD; Attribute = Average attribution score on SUMD; Pos. Aware = Average awareness of positive symptoms on SUMD; Neg. Aware = Average awareness of negative symptoms on SUMD; IM = Impression Management; SDE = Self-Deception Enhancement; BDI = Beck Depression Inventory; STAI State = State Anxiety as measured on the Spielberger State-Trait Anxiety Index; STAI Trait = Trait Anxiety as measured on the Spielberger State-Trait Anxiety Index.

* Significant at $P < 0.05$ (uncorrected for multiple comparisons).

Table 3

Means, Standard Deviations, Medians and Interquartile Ranges

Variables	Two Group				Three Group		
	Controls (n = 25)	Patient (n = 40)	FA (n = 20)	LA (n = 20)	FA (n = 20)	AM (n = 10)	U (n = 10)
Median IM Scores (quartiles)	55.0 (47.0:65.0)	55.0 (50.0:62.0)	56.0 (50.25:61.5)	55.0 (47.0:65.0)	56.0 (50.25:61.5)	52.5 (44.5:62.75)	62.5 (50.75:70.0)
Median SDE Scores (quartiles)	57.0 (46.0:61.0)	49.0 (46.0:53.0)	49.0 (46.0:53.0)	49.0 (42.0:64.25)	49.0 (46.0:53.0)	49.0 (45.0:50.75)	47.5 (42.0:69.25)
Mean BDI (SD) ⁺			16.8 (13.33)	9.5 (9.25)	16.8 (13.33)	13.4 (10.99)	5.50 (5.02)
Mean STAI State (SD)			40.1 (11.12)	34.5 (10.55)	40.1 (11.11)	35.4 (11.36)	33.5 (10.20)
Mean STAI Trait (SD) [*]			47.3 (12.38)	38.1 (12.44)	47.3 (12.38)	39.5 (14.38)	36.6 (10.73)

Note. FA = Fully Aware; IM = Impaired Awareness; AM = Aware but Misattributing; U = Unaware.

^{*} Significant Two Group difference, $t(38) = 2.35$, $P = 0.02$.

⁺ Significant Three Group difference, $F(2, 36) = 3.37$, $P = 0.04$.