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The inferiority complex in paranoia readdressed. A study with the Implicit Association Test

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Introduction. It has been theorised that patients with persecutory delusions contain a lack of covert self-esteem (formerly termed the 'inferiority complex'), while at the same time displaying normal or even heightened levels of explicit self-esteem. However, the empirical basis for this assumption is inconsistent.
Methods. In view of apparent shortcomings of prior studies to assess implicit self-esteem, the Implicit Association Test was utilised to readdress this theory. The Rosenberg scale served as an index of overt self-esteem. A total of 23 schizophrenic patients, 13 of whom showed current symptoms of persecutory delusions, participated in the study; 41 healthy and 14 depressed participants served as controls.
Results. Schizophrenic patients showed decreased levels of both implicit and explicit self-esteem relative to healthy controls. In line with recent studies, patients with current ideas of persecutory delusions displayed greater explicit self-esteem than nonparanoid patients.
Conclusions. The present study lends partial support for the notion that persecutory delusions serve as a defence against low implicit self-esteem, although the explicit self-esteem of these patients is still lower than in normal participants. Apart from abnormalities of attributional style, which have been assumed to convert low into high self-esteem, the assumption that a 'feeling of personal significance' heightens self-esteem in paranoid schizophrenia deserves further consideration.

Delusions of persecution are a core feature of schizophrenia, although not restricted to this psychiatric disorder. Dominant themes are feelings of being observed, spied on, and/or being physically or psychologically harmed by other people, organisations or supernatural forces. Whereas in some individuals persecutory delusions are the sole observable psychopathological feature (so-called

delusional disorder), fixed, false beliefs are frequently accompanied by additional psychiatric symptoms (e.g., ideas of reference, ego-dysfunction), which are typically interwoven with the patient's belief system and sometimes serve as maintenance factors for the patient's belief system (i.e., formal thought disorder is often self-perceived as evidence that some force is inserting or withdrawing thoughts).

A number of theories have been put forward to explain the emergence of delusions, in particular ideas of persecution (for reviews see Bentall, Corcoran, Howard, Blackwood, & Kinderman, 2001; Garety & Freeman, 1999). Since Alfred Adler (1914/1929), a number of authors, most recently Bentall and Kinderman (Bentall et al., 2001), have argued that delusions, specifically persecutory delusions, serve the psychological purpose of masking a deep-rooted feeling of inferiority and maintaining a normal level of explicit self-esteem. As Adler writes: ''One of the presuppositions of this attitude [paranoia] is shown to consist in a profound feeling of dissatisfaction with life, felt to be unalterable and which compels the patient to try to conceal his lack of success both to himself and others in order not to wound his pride or self-consciousness'' (p. 256). It is claimed that patients with persecutory delusions have a low implicit (hidden, covert) self-esteem, while showing normal or even enhanced levels of overt self-esteem. However, studies that have tested this account have produced conflicting findings. For example, Freeman et al. (1998) found that threequarters of their psychotic patients had low self-esteem compared to a normative sample. Furthermore, an investigation on subclinical paranoid ideation even showed a negative correlation between paranoid ideation and self-esteem (Martin & Penn, 2001). On the other hand, in agreement with Kinderman and Bentall (1996), it has been observed (Lyon, Kaney, & Bentall, 1994) that patients with persecutory delusions obtained normal scores on a measure of explicit self-esteem. In addition, another study (Candido & Romney, 1990) found that paranoid patients without comorbid depression showed normal levels of self-esteem when compared to a normative sample (see discussion in Garety & Freeman, 1999, p. 138).

Effort has also been made to address the question of whether patients show implicit low self-esteem (i.e., an inferiority complex). A number of techniques (i.e., the opaque pragmatic inference task, emotional Stroop task) have been applied, which have produced equivocal results (for reviews see Blackwood, Howard, Bentall, & Murray, 2001; Garety & Freeman, 1999). A problem with the pragmatic inference task is that it measures attributional style rather than self-evaluation (see Garety & Freeman, 1999). A limitation of the emotional Stroop task is that it is not necessarily self-referent, as the subject is presented with negative words, and may therefore rather tap depression than implicit self-esteem.

Due to the shortcomings of these instruments, the present study employed the Implicit Association Test (IAT; Greenwald & Farnham, 2000; Greenwald,

McGhee, & Schwartz, 1998) to obtain a more valid index of implicit self-esteem. The IAT is a method developed in social psychology to measure implicit (i.e., unadmitted, hidden) associations between concepts. It has been broadly utilised to measure to unadmitted/hidden attitudes (e.g., prejudice, such as racism, ageism, or sexism), which an individual might seek to conceal due to, for example, conflicts with social conventions or norms. A further area of application of the IAT is the measurement of implicit self-evaluation. Despite controversial appreciation since its introduction in 1998 (see conclusion), a large body of literature has supported the validity of the IAT (Banse, Seise, & Zerbes, 2001; Cunningham, Preacher, & Banaji, 2001; McConnell & Leibold, 2001) making it a promising candidate to resolve the above-mentioned controversies (for evidence of the validity of the self-esteem IAT see Greenwald & Farnham, 2000; Rudman, Greenwald, & McGhee, 2001). Unlike projective tests, the IAT is objective in terms of administration and scoring. Attempts to manipulate the outcome by the participants are controlled for by means of a responses window technique (see methods section).

As in Lyon et al. (1994), the Rosenberg scale (German translation by Von Collani & Herzberg, in press; Rosenberg, 1965) was employed to explore explicit self-esteem participants.

The present study explores whether patients with persecutory delusions show a discrepancy between implicit and explicit self-esteem. Specifically, we tested whether patients with persecutory delusions have normal levels of explicit self-esteem (as measured with the Rosenberg scale), while showing lower levels of implicit self-esteem (as measured with the Implicit Association Test). Second, we wanted to test whether this pattern of results would be confined to patients with persecutory delusions or may also be found in patients with schizophrenia that do not currently display paranoid symptoms. We tested 23 schizophrenic patients (13 with current persecutory delusions, 10 currently without paranoid symptoms), 41 healthy, and 14 depressed controls.

METHODS

Participants

A total of 23 inpatients diagnosed with schizophrenia according to DSM-IV criteria entered the study. The SCID schizophrenia section and the MINI interview (Sheehan et al., 1998) were administered to verify diagnoses. The Brief Psychiatric Rating Scale (BPRS; Overall & Gorham, 1988) was filled out by the clinician-in-charge, whereby the BPRS item 11 (suspiciousness/paranoid ideas) served as an index for delusions of persecution (BPRS 11 $\geq$ 3 points (mild symptoms)). Thirteen inpatients showed evidence of persecutory delusions at the time of testing. As psychiatric controls, 14 inpatients with a major depressive disorder were recruited. The extent of the depressive symptomatology was determined via the depression item of the BPRS (item 9). All

psychiatric patients were drawn from the University Hospital for Psychiatry and Psychotherapy in Hamburg. Severe substance abuse and any form of documented or suspected brain damage were exclusion criteria. All schizophrenic patients were receiving atypical neuroleptic medication at the time of testing. All depressed control patients were medicated with antidepressant agents at the time of testing.

A total of 41 participants, drawn from undergraduate students, hospital staff and the general population, served as healthy control group. Some healthy subjects were recruited via advertisement or gained from an established subject pool. Healthy controls were screened for absence of mental illness. Written informed consent was obtained from all participants prior to baseline assessment. Sociodemographic and psychopathological characteristics of the sample are displayed in Table 1. The healthy control group was significantly younger than the clinical groups. Therefore, subsequent analyses controlled for age as a possible confound.

Procedure

Prior to the experiment and each block, test instructions were displayed on the screen. The experimenter was available to answer questions throughout the entire session. Before starting the IAT, personal details of the participants were entered in the computer (e.g., their first name, country of birth and month of birth), which served as stimuli for the category *self* in the actual experiment. For the category *other*, the computer created unrelated alternative stimuli (e.g. another Christian name, country and month). After the participants had provided these details, the computer automatically started the experimental procedure.

In agreement with recent versions of the IAT (e.g., Greenwald, Nosek, & Banji, 2003; Werner & Von Collani, 2004), the present experiment consisted of seven experimental blocks, where the compatible and the incompatible blocks (see below) were repeated once. Two groups of participants were formed. The first group started with the compatible condition, while the other group started with the incompatible condition. We describe here the procedure for the first group only. The procedure for the second group was the same except for the order of the combined conditions.

In the first block, the subjects had to perform a target discrimination task. In this phase, participants were requested to classify words as *self* versus *other* (target categories) by pressing the appropriate response button (located on their left side for *self* and on their right side for *other*). The two target categories consisted of 13 stimuli each. The next block was an attribute discrimination task (left button for *positive* and right button for *negative* words). The *positive* and *negative* attribute categories were again defined by 13 stimuli each. Subsequently, a combined categorical decision (left button for *self* and *positive*, right button for *other* and *negative*; compatible condition) was demanded. This

TABLE 1
Sociodemographic, psychopathological, and experimental variables in the schizophrenic (S), healthy (H), and depressed (D) participants

Variable	*Schizophrenia* ($n = 23$)	*Healthy* ($n = 41$)	*Depressed* ($n = 14$)	*Statistics; post hoc tests*[a]	*Paranoid* (P) ($n = 13$)	*Nonparanoid* (NP) ($n = 10$)	*Statistics, post hoc tests*
Age	34.13 (10.68)	23.37 (6.93)	31.71 (11.28)	$p < .001$; S, D > H (both $p < .005$)	34.15 (12.29)	34.10 (8.80)	$p < .001$, NP, P, D > H (all $ps < .005$)
Gender	14/10	13/28	7/7	$p > .1$; NS	7/6	6/4	$p > .2$; n.s.
BPRS depression	3.00 (1.67)	–	4.46 (1.37)	$p = .003$	3.15 (1.41)	2.80 (0.79)	$p = .01$; D > P, NP ($p = .02$, $p = .005$)
BPRS paranoid	2.87 (1.63)	–	2.09 (1.64)	$p > .2$	4.08 (1.04)	1.30 (0.48)	$p < .001$; P > D, NP (both $ps < .001$)
BPRS total	41.30 (8.78)	–	44.10 (15.52)	$p > .5$	44.08 (9.38)	37.73 (6.39)	$p > .3$; n.s.
Length of illness (years)	4.90 (5.66)	–	7.48 (6.54)	$p > .2$	3.95 (5.66)	6.13 (5.70)	$p > .3$
IAT-effect practice in ms (blocks 3 & 6)	98.61 (175.39)	232.83 (111.42)	168.64 (130.27)	$p = .001$; H > S ($p < .001$)	87.08 (225.38)	113.60 (83.82)	$p < .005$; H > NP, P ($p = .02$, $p = .001$)
IAT-effect in ms (blocks 4 & 7)	104.26 (152.43)	192.00 (115.45)	182.08 (126.02)	$p = .03$; H > S ($p = .01$)	98.92 (199.10)	111.20 (62.01)	$p < .07$; H > P ($p = .03$)
IAT-effect in ms (*D*-algorithm)	.03 (0.75)	0.84 (0.67)	0.61 (0.67)	$p < .001$; H, D > S ($p < .001$, $p = .02$)	−0.03 (0.72)	0.10 (0.84)	$p = .001$; H, D > P ($p < .001$, $p = .02$), n.s. ($p < .01$, $p < .1$)
Rosenberg total	15.43 (5.90)	22.65 (4.14)	14.86 (5.97)	$p < .001$; H > D, S (both $p < .001$)	17.58 (5.16)	12.56 (5.85)	$p < .001$; *H* > P, D, NP (both $ps < .005$); P > NP ($p = .02$)

Notes: BPRS, Brief Psychiatric Rating Scale; IAT, Implicit Association Test; [a]Fisher's LSD was taken as post hoc test.

combined condition was repeated once in the following block. In the fifth block, the category assignment of the attributes was reversed (left button for *negative* and right button for *positive* words). The sixth and seventh blocks consisted of a reversed combined discrimination task (left for *self* and *negative*, right button for *other* and *positive*; incompatible condition). The blocks of the IAT are summarised in Table 2.

The stimuli were presented in a random order for each participant. Each stimulus within a category (attributes and targets) was presented once. In the combined response conditions (blocks 3, 4, 6, and 7), every target and attribute stimulus appeared once in random order. Reaction times and error rates were analysed for combined response conditions only (compatible and incompatible conditions).

Upon the appearance of a stimulus (always presented in the centre of the computer screen), participants had to press the appropriate key as fast as possible. To prevent participants from putting too much emphasis on speed relative to accuracy, an error message appeared above the target after a wrong classification. The stimuli remained on the screen until the subject responded correctly. Throughout the entire experiment, the category labels (i.e., *self* vs. *other* or *positive* vs. *negative*) appeared in the upper left or right area of the screen.

A response window version of the IAT was used. Through this procedure participants were forced to respond within a limited response window, in our case within 2000 ms. A longer than usual response window was set due to expected response slowing in the psychiatric groups. Throughout this period the stimulus was visible, and the stimulus presentation was accompanied by a red bar on the upper screen edge. After the red bar had disappeared from the screen, answers could still be given, but these data were not included in the analysis.

TABLE 2
Experimental Conditions of the IAT

	Task sequence 1	
Blocks	*Left button*	*Right button*
1	Self	Other
2	Positive	Negative
3	Self/Positive	Other/Negative
4	Self/Positive	Other/Negative
5	Negative	Positive
6	Self/Negative	Other/Positive
7	Self/Negative	Other/Positive

Note: Blocks 3 and 4 represent the compatible condition, blocks 6 and 7 represent the incompatible condition.

At the end of the experiment, all participants completed the Rosenberg scale (Rosenberg, 1965; German translation by Von Collani & Herzberg, 2003a). Global self-esteem as measured by the Rosenberg scale can be considered as a unitary construct representing a single latent dimension (Von Collani & Herzberg, 2003b). The participants gave their answers on a 4-point Likert scale (0–3). The end-points of the scale were labelled as ''agree completely'' and ''totally disagree''.

Following a brief explanation about the purpose of the experiment and after answering their questions, the participants were dismissed.

RESULTS

Due to the exploratory nature of the present study all analyses were two-tailed but without Bonferroni correction.

In accordance with previous suggestions (Greenwald et al., 2003; Rudmann, Greenwald, & McGhee, 2001) reaction times less than 300 ms as well as responses beyond the response window were omitted from analysis. A significant difference ($p < .001$) between the error rate in the compatible condition ($M = 11.97$; $SD = 13.47$) and the incompatible condition ($M = 19.86$; $SD = 18.51$) occurred in the data. Whereas psychiatric patients overall committed more errors ($p = .006$), the interaction of Group × Trial Type (compatible, incompatible) failed to reach significance ($p > .2$). As suggested by Greenwald et al. (2003) latencies from error trials were included and individual reaction times were log-transformed and then averaged for the standard algorithm. The data of blocks 3 and 6 are treated as practice blocks. Computation of the conventional IAT-effect relied on data from blocks 4 and 7. Apart from this standard procedure for analysing data (Greenwald et al., 1998; Werner & Von Collani, 2004), we also adopted a new algorithm for computing the IAT (Greenwald et al., 2003), which, however, has not yet been validated for the self-esteem IAT.

For this so-called *D*-algorithm (Greenwald et al., 2003), all trials of the blocks 3, 4, 6, and 7 were used. No extreme values were excluded from the analyses or allocated to other values except error latencies, which were replaced with block mean plus an error penalty of 500 ms was added. For each participant the difference between the mean in the incongruent and the congruent task was divided by its associated pooled trials standard deviation.

IAT-effect

As described, we counterbalanced the order of the compatible and incompatible conditions so that one group of participants received the compatible condition (*self* & *positive*) first, while the other group of participants received the incompatible condition first (*self* & *negative*). This manipulation, however, yielded no significant effect in any of the groups ($p = .50$).

The results of the standard algorithm are presented first. Prior to splitting the schizophrenic group into currently paranoid and nonparanoid patients, we performed a 2×3 mixed ANOVA with IAT condition (compatible, incompatible) as within-subject and Group (schizophrenic, healthy, depressed) as between-group variable. Reaction times (RTs) served as the dependent variable. As expected, a large main effect for IAT condition occurred, $F(1, 75) = 101.52$, $p < .001$, indicating that reaction times were faster for compatible trials (i.e., *self* and positive vs. *other* and *negative*) relative to incompatible trials (i.e., *other* and *positive* vs. *self* and *negative*). The Group effect also yielded significance, $F(2, 75) = 6.48$, $p = .003$, which is attributable to a greater response delay in the patient groups (at least $p < .005$ in comparison to healthy controls). The interaction achieved significance, $F(2, 75) = 3.68$, $p = .03$. Post hoc explorations revealed that this reflects a significantly enhanced IAT-effect in the healthy sample compared to the schizophrenic group (see Table 1).

To explore whether paranoid and nonparanoid schizophrenic patients show a distinct profile of implicit self-esteem, a 2×4 mixed ANOVA with IAT condition (compatible, incompatible) as within-subject and Group (paranoid, nonparanoid, healthy, depressed) as between-group variable was calculated. Results comparable to the previous analysis were yielded, except for the interaction, which only achieved borderline significance ($p = .06$). Despite this barely significant overall effect, we would like to report that paranoid and nonparanoid schizophrenic patients displayed a smaller IAT-effect relative to healthy controls (see Table 1). The post hoc difference between paranoid and healthy participants approached significance ($p = .03$).

Computation of the *D*-algorithm revealed a significant effect of Group, $F(3, 75)=6.29$, $p = .001$. Schizophrenic patients showed a decreased IAT-effect relative to both healthy ($p < .001$) and depressed ($p = .02$) controls. Division of the schizophrenia sample confirmed that both schizophrenic subsamples, particularly currently paranoid patients, achieved decreased scores in comparison to healthy and depressed controls (see Table 1). When age and sex (the latter being treated as a continuous variable) were entered as covariates, all results remained essentially unchanged.

Performance on the discrimination tasks

It has been put forward that patients with schizophrenia may have a problem differentiating between self and others, which could decrease the validity of the self-esteem IAT in this patient group (Dirk Wentura, personal communication see conclusions). To address this competing interpretation, we computed a subsidiary analysis on the first two discrimination tasks (*self* vs. *other*, *positive* vs. *negative*). A two-way mixed ANOVA with Block (block 1, block 2) as within-subject, Group (paranoid, nonparanoid, healthy, depressed) as between-group variable and reaction time as the dependent variable was conducted. The group effect was highly significant, $F(3, 73) = 10.39$, $p < .001$, which is attri-

butable to greater overall slowing in the patient groups relative to healthy controls (all post hoc tests at least $p < .01$). However, neither the effect of Block ($p > .05$) nor the interaction of Group $\times$ Block achieved significance ($p > .6$). This suggests that subject groups did not respond differently to the two discrimination tasks.

Correlational analysis

Greenwald et al. (2003) have reported that data from blocks 3 and 6—excluded according to the conventional algorithm—are usually more highly correlated with explicit measures than the difference score obtained from blocks 4 and 7. To confirm this pattern of results, separate IAT measures were computed from practice blocks (3 and 6) and test blocks (4 and 7). In line with the observations made by Greenwald et al. (2003), the Rosenberg scale showed a somewhat higher correlation with the practice blocks (rho = .23, $p = .05$) than with the test blocks (rho = .18, $p = .12$). Further, the BPRS total score was significantly correlated with the IAT-effect of the practice blocks (rho = —.37, $p = .03$) and at trend level with the IAT-effect of test blocks (rho = —.32, $p = .06$). No significant relationship emerged between depression and paranoia severity and the IAT-effects ($p > .1$). Also, age and length of illness (patients only) did not correlate with the IAT-effect (rho = —.12; $r = .00$; rho = —.18, $p > .3$). Gender did not moderate the IAT-effect, $t(76)=0.32$, $p > .7$.

The *D*-algorithm correlated significantly with the Rosenberg scale (rho = .45, $p < .001$) and the BPRS total score (rho = —.37, $p = .03$).

Rosenberg scale

As can be seen in Table 1, explicit self-esteem was significantly larger for healthy subjects compared to depressed patients and both schizophrenic subgroups, $F(3, 75)=16.51$, $p < .001$. On all post hoc comparisons, healthy participants displayed higher Rosenberg scores compared to all psychiatric groups (at least $p < .01$). At closer inspection, paranoid patients showed more explicit self-esteem than nonparanoid patients (post hoc comparison: $p = .02$). Group differences remained unchanged when age and sex (treated as a continuous variable) were included as covariates. While the BPRS depression score was related to decreased explicit self-esteem at trend level (rho = —.30, $p = .1$), paranoid ideation correlated significantly with the total score (rho = .39, p = .03). Neither BPRS total score (rho = .09, $p > .6$) nor length of illness correlated significantly with the Rosenberg scale (rho = .04, $p > .8$).

CONCLUSIONS

In the present study, healthy participants showed significantly higher levels of explicit self-esteem than schizophrenic and depressed patients. While the two schizophrenic subsamples were indistinguishable from depressed patients,

paranoid patients showed higher explicit self-esteem than currently nonparanoid patients. In addition, a significant relationship emerged between severity of delusions and explicit self-esteem, while there was an inverse trend for depressive symptoms. Results lend support to the claim that paranoid ideas apparently raise explicit self-esteem (Kinderman & Bentall, 1996, 1997), although normal levels of self-esteem are not achieved according to our results. It is noteworthy that this finding is also compatible with findings obtained by Freeman et al. (1998) as well as Bowins and Shugar (1998) who found attenuated levels of explicit self-esteem in patients suffering from delusions relative to reference data from healthy controls.

As expected, implicit self-esteem, as assessed with the IAT, was highest in healthy controls. Schizophrenic patients, especially patients with current paranoid symptoms, revealed less implicit self-esteem for both the first (practice) and second (test) IAT-effect as well as a new algorithm (*D*-algorithm). Results also accord to a recent finding by Cai (2003), who found in a Chinese population that depressed patients displayed normal implicit but decreased explicit self-esteem.

An advantage of the present methodology over previous investigations on implicit self-esteem in paranoia is that it provides a rather direct estimate of implicit self-esteem, whereas prior studies have used instruments that assessed related constructs but presumably not self-esteem, such as covert depression (as assessed, for example, with the emotional Stroop task) and covert attributional style (as assessed with the pragmatic inference task; see Garety & Freeman, 1999). Inconsistent findings that have plagued past research may partly be due to measurement problems. Nevertheless, a straightforward interpretation of the IAT in terms of implicit attitudes has recently been questioned (e.g., Rothermund & Wentura, 2001). Alternatively, it has been proposed that the IAT-effect mirrors figure-ground asymmetries. Applied to the present study, one could argue that an attenuated IAT-effect in the schizophrenic group may reflect a less clear figure-ground asymmetry for *self* and *other* in this group (Dirk Wentura, personal communication). Currently, we are collecting data to directly put this account to test. Notwithstanding this, we would like to raise two arguments favouring the initial account. First, patients with paranoid and nonparanoid schizophrenia were not differentially slowed on simple trials, where words had to be assigned according to *self* versus *other*. If patients had problems distinguishing *self* versus *other*, higher reaction times would be expected relative to the block with *positive* versus *negative*. Second, from a theoretical point of view, one might expect rather an increased separation of *self* and *other* in paranoid patients, as other persons are typically misconceived as hostile, while the self is absolved from blame.

After the present study was conducted another challenge to the IAT's validity came to our attention and deserves discussion. Karpinski (2004) has argued that because of the bipolar nature of the IAT (*self* vs. *other*), the IAT measures not

only how we perceive ourselves, but also how we perceive others. For this reason, the IAT should not be regarded a pure measure of self-esteem. In his article Karpinski suggests that the *other* category may not be neutral for participants so that a high IAT score may not be due to high self-esteem but due to comparing oneself to a very negative other. Pinter and Greenwald (in press), in their reply to Karpinsky, show that the *other* category in the self-esteem IAT is in fact nearly neutral in valence. The authors also cite new (unpublished) studies that have provided further evidence for the convergent validity of the self-esteem version of the IAT. Although Karpinski's criticism may not apply well to standard versions of the self-esteem IAT, he is right to emphasise that experimenters using the IAT must provide neutral baseline conditions before making monocausal inferences. For example, substituting the ''other'' category by ''Hitler'' led to a marked increment of the IAT-effect in Karpinsky's study.

The present results lend preliminary support to the notion by Greenwald and colleagues that the so-called *D*-algorithm, which unlike the conventional algorithm for computing the IAT considers data from all blocks with combined attributes and targets, is superior as it was more strongly correlated with explicit self-esteem as well as psychopathology, which according to Greenwald is a major criterion of validity. However, more stringent methodological studies are needed to decide between the different types of algorithms.

An interesting, but yet unresolved, question concerns the causal relationship between self-esteem and persecutory delusions. For example, Bowins and Shugar (1998) found a strong correlation between content of delusions and self-esteem. The authors assume that the level of self-esteem forms delusional content. While the authors concede that the cross-sectional design of their study does not allow a direct inference about causality, Bowins and Shugar regard it as more likely that delusional content is secondary given the waxing and waning status of delusions as opposed to greater resilience to change in self-esteem. Alternatively, it has been argued (Bentall et al., 2001) that persecutory delusions serve as a means to raise implicit low self-esteem. According to Bentall and Kinderman (e.g., Kinderman & Bentall, 1996), this relationship is achieved via a so-called self-serving attributional response bias, that is, paranoid patients excessively attribute failure to others and take credit for success (Bentall, 1994). In this view, persecutory delusions are the pathological expression of a general tendency to externalise and particularly to personalise blame. By enhancing the self and diminishing others, individual self-esteem is raised and protected at the expense of being deluded.

While the latter account has received some empirical support, an own empirical effort was unable to confirm the attributional bias account (Moritz et al., submitted). In our study, schizophrenic patients, irrespective of delusional status, showed a self-serving bias comparable to that of healthy controls. Neither an external nor more specifically an external-personal attribution style for blame was found.

If the claim that ideas of persecution raise low self-esteem holds true, what then is the underlying cognitive mechanism? Apart from attributional style, another possibility is that the delusional content is more important for self-esteem than the status of being persecutory per se. For example, it may be more frightening for patients to be observed by an organisation, such as the FBI, than by a single person, for example, a neighbour. At the same time, a powerful enemy raises the importance of the subject in the sense of: ''The more danger, the more honour''. In this respect, many persecutory delusions may contain a self-enhancing element and provide the patient with a meaning in life (Roberts, 1991). In line with this argument, a case study (Garety, 1992) describes a patient who is convinced that planes are following him. The patient is described as apparently ambivalent towards the objects of his delusions. On the one hand, he at times feels suicidal due to the threat, on the other, he sometimes missed the planes when he spotted fewer of them, as ''they made him feel important'' (p. 289).

In conclusion, the present study offers some support for the notion that persecutory delusions serve as a defence against low implicit self-esteem: Patients with persecutory delusions were found to have a decreased implicit self-esteem, while at the same time showing evidence for a higher explicit self-esteem, at least compared to nonparanoid patients. Explicit self-esteem, however, was still markedly lower than in healthy controls. The present findings may therefore help to clarify the conflict between studies that did and those that did not find preserved explicit self-esteem in persecutory delusions. For future research, the assumption that a ''feeling of subjective significance'' may give rise to higher explicit self-esteem in paranoid than in nonparanoid schizophrenia needs further testing.

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