

## Dysfunctional Attitudes and Expectancies in Deficit Syndrome Schizophrenia

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The deficit syndrome was proposed over 20 years ago as a separate negative symptom syndrome within schizophrenia with a distinct neurobiological pathophysiology and etiology. Recent research, however, has indicated that psychological factors such as negative attitudes and expectancies are significantly associated with the broad spectrum of negative symptoms. Specifically, defeatist beliefs regarding performance mediate between neurocognitive impairment and both negative symptoms and functional outcome. Additionally, asocial beliefs predict asocial behavior and negative expectancies regarding future pleasure are associated with negative symptoms. The present study explored whether these dysfunctional beliefs and negative expectancies might also be a feature of the deficit syndrome. Based on a validated proxy method, 22 deficit and 72 nondeficit patients (from a pool of 139 negative symptom patients) were identified and received a battery of symptom, neurocognitive, and psychological measures. The deficit group scored significantly worse on measures of negative symptoms, insight, emotion recognition, defeatist attitudes, and asocial beliefs but better on measures of depression, anxiety, and distress than the nondeficit group. Moreover, the deficit group showed a trend for higher scores on self-esteem. Based on these findings, we propose a more comprehensive formulation of deficit schizophrenia, characterized by neurobiological factors and a cluster of psychological attributes that lead to withdrawal and protect the self-esteem. Although the patients have apparently opted-out of participation in normal activities, we suggest that a psychological intervention that targets these negative attitudes might improve their functioning and quality of life.

*Key words:* deficit syndrome/negative symptoms/defeatist beliefs/schizophrenia

### Introduction

A weakening of those emotional activities which permanently form the mainsprings of volition... The result of

this part of the morbid process is emotional dullness, failure of mental activities, loss of mastery over volition, of endeavor, and of ability for independent action. The essence of personality is thereby destroyed, the best and most precious part of its being... torn from her. (p. 74)

Taking a cue from Kraepelin's<sup>1</sup> description of negative symptoms and aiming to reduce the heterogeneity of schizophrenia, Carpenter and colleagues<sup>2</sup> proposed the deficit syndrome, a symptom complex characterized by primary and enduring negative symptoms caused by a specific disease process that is separable from the genetic and neurobiological factors that contribute to nondeficit schizophrenia. Since the first description of the deficit syndrome in the 1980s, over 300 studies have examined its clinical and neurobiological correlates.<sup>3</sup> Research has shown that deficit patients, as compared with nondeficit patients, have poorer premorbid functioning,<sup>4</sup> more severe neurocognitive impairment,<sup>5</sup> worse functional outcome,<sup>6</sup> and substantially lower rates of remission and recovery.<sup>7</sup> Yet, despite a worse prognosis, deficit patients experience less overall negative affect,<sup>8</sup> have a lower risk for suicide,<sup>9</sup> and abuse substances less than nondeficit patients.<sup>10</sup>

Whereas neurobiological research has identified anomalies associated with the deficit syndrome in the areas of eye tracking,<sup>11</sup> olfaction,<sup>12</sup> event-related potentials,<sup>13</sup> and neuroanatomy,<sup>14</sup> these findings have not translated into improved treatments. In fact, the poor prognosis of deficit patients may be due, in large part, to their poor response to both psychotropic medications<sup>15</sup> and psychosocial interventions such as social skills training.<sup>16</sup> In sum, the literature suggests that the deficit syndrome has its own specific biological basis but no effective treatment.

Within the relatively large number of studies of the deficit syndrome,<sup>3,4</sup> there have been investigations of psychological processes such as self-reported stress<sup>17</sup> and emotion labeling<sup>18</sup>; however, none of the studies has reported on psychological variables such as dysfunctional

attitudes, negative expectancies (regarding future pleasure, future success, etc.) and self-esteem. In contrast, an emerging body of research has indicated that these psychological variables are associated with negative symptoms. A conceptualization of negative symptoms has been proposed according to which these newly identified psychological factors, including beliefs and expectations, contribute to the maintenance of negative symptoms and disability in schizophrenia.<sup>19</sup> For example, defeatist beliefs about performance (eg, If you cannot do something well, there is little point in doing it at all) have been found to mediate the relationship between neurocognitive impairment and both negative symptoms and functional outcome.<sup>20</sup> Similarly, asocial beliefs (eg, I prefer hobbies and leisure activities that do not involve other people) predicted both concurrent and future asocial behavior better than neurocognitive or emotion recognition tasks.<sup>19,21</sup> Negative expectancies regarding satisfaction were also shown to be associated with negative symptoms: these patients experienced more pleasure than they anticipated.<sup>22</sup> Consistent with Kraepelin's aforementioned emphasis on the importance of loss of volition in schizophrenia, Granholm and colleagues<sup>23</sup> have demonstrated that patients with negative symptoms do not show the normal pupillary response to performance tasks, a physiological marker of performance effort. Further, they have demonstrated that defeatist attitudes contribute significantly to this diminished pupillary response in negative symptom patients,<sup>24</sup> thus establishing the crucial link between defeatist attitudes and deficient behavior in this group.

In view of the findings showing the association of negative attitudes and expectancies with negative symptoms in general, we considered it useful to determine whether these psychological factors play a role in the deficit syndrome, which is composed of negative symptoms that are both *enduring* (lasting more than 1 year) and *primary* (not secondary to positive symptoms, depression, or medication side-effects). Specifically, it would be of considerable interest to determine whether deficit syndrome patients also endorse dysfunctional beliefs, attitudes, and negative expectancies. Given that previous research on these patients has focused upon clinical, neurobiological, and neurocognitive factors to the relative neglect of psychological factors, the principal aim of the present study was to redress the lack of investigation of dysfunctional beliefs and attitudes in the deficit syndrome literature. Accordingly, deficit syndrome patients were compared with nondeficit patients with negative symptoms on a variety of psychological measures, including negative beliefs, expectations, and self-esteem, as well as measures of symptoms, functioning, and neurocognition. Based upon the literature on negative symptoms, we hypothesized that (1) the deficit group would endorse defeatist beliefs regarding performance to a greater extent than the nondeficit group, (2) the deficit group would

endorse asocial beliefs to a greater extent than the nondeficit group, and (3) the deficit group would have lower expectations of future enjoyment than the nondeficit group. Support for these hypotheses may lead to a more complete understanding of the deficit syndrome and inform psychosocial treatments for this treatment-resistant population.

We included measures of symptoms and neurocognition in order to replicate the findings in the deficit syndrome literature and thereby establish the validity of our means of identifying deficit patients. Accordingly, we also predicted that the deficit group would show more severe negative symptoms, less anxiety and depression, greater neurocognitive impairment, and worse emotion recognition than the nondeficit group.<sup>5,6,8</sup> Additionally, we predicted that given an expected lower score on a depression measure, the deficit group would show higher self-esteem than the nondeficit group. In view of the presumed lower anxiety scores, we also predicted that the deficit group would score lower on a measure related to concern about negative evaluations than the nondeficit group.

## Methods

### *Participants*

Participants were 94 adult outpatients (table 1). Recruitment occurred at the University of Pennsylvania (Schizophrenia Research Center and the Psychiatric Outpatient Clinic), as well as community mental health centers in Philadelphia. Recruitment contacts were made blind to deficit vs nondeficit status. All patients met *Diagnostic and Statistical Manual of Mental Disorders, fourth edition* (DSM-IV-TR) criteria for schizophrenia. Diagnosis was determined on a consensus best-estimate basis by research personnel (PhD and MD) based upon a structured interview<sup>25-27</sup> conducted by an assessor trained to criterion (intraclass correlation > .80).

*Deficit Syndrome.* Patients were classified as deficit or nondeficit by way of a proxy method designed for established datasets where use of the gold standard measure, Schedule of the Deficit Syndrome (SDS),<sup>28</sup> is not possible. The validated proxy approach<sup>29</sup> involves examining clinical subscales for the content of negative symptoms necessary for, and prognostic of, the deficit syndrome—typically outward emotional expression and diminished emotional experience. Proxy cut off scores are defined so that the size of the deficit group is gauged to the prevalence of the deficit syndrome in outpatient samples (20–25%), while the size of the comparison nondeficit group is set to the 50% of the sample with brighter emotional expression and greater emotional distress. Previous research has for the most part validated the proxy method: most studies (for exceptions see<sup>8,30,31</sup>)

**Table 1.** Participant Characteristics Including Validating Data for the Proxy for the Deficit Syndrome (PDS)

Variable	Deficit Syndrome, ( <i>n</i> = 22)		Nondeficit, ( <i>n</i> = 72)		Effect Size, ( <i>d</i> ) D vs ND <sup>a</sup>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
<b>Age (years)</b>	<b>39.9</b>	<b>11.1</b>	<b>39.4</b>	<b>12.2</b>	
Race/ethnicity (% African-American)	68	( <i>n</i> = 15)	51	( <i>n</i> = 38)	
Age of onset <sup>b</sup> (years)	20.2	8.1	22.4	9.1	
Length of illness <sup>b</sup> (years)	20.3	12.3	17.2	13.2	
<b>Gender (% male)</b>	<b>91</b>	<b>(<i>n</i> = 20)</b>	<b>71</b>	<b>(<i>n</i> = 51)</b>	
<b>Marriage history<sup>b</sup> (% Yes)</b>	<b>0</b>	<b>(<i>n</i> = 0)</b>	<b>22</b>	<b>(<i>n</i> = 16)</b>	
<b>Negative symptoms</b>	<b>36.4</b>	<b>8.0</b>	<b>25.8</b>	<b>11.7</b>	<b>-0.89**</b>
<b>Positive symptoms</b>	<b>9.6</b>	<b>13.5</b>	<b>18.0</b>	<b>17.8</b>	<b>-0.50*</b>
<b>Distress due to psychosis<sup>b</sup></b>	<b>3.2</b>	<b>3.0</b>	<b>6.6</b>	<b>5.4</b>	<b>-0.66**</b>
<b>Disorganized symptoms</b>	<b>2.5</b>	<b>4.4</b>	<b>3.5</b>	<b>4.5</b>	<b>-0.23</b>
<b>Depression</b>	<b>8.1</b>	<b>7.4</b>	<b>19.3</b>	<b>12.4</b>	<b>-0.91**</b>
<b>Anxiety</b>	<b>5.6</b>	<b>5.7</b>	<b>16.7</b>	<b>12.8</b>	<b>-0.89**</b>
Total psychiatric symptoms	32.9	9.5	40.4	10.9	-0.68**

Note: (PDS, please see text for details). Negative symptoms = total score, Scale for the Assessment of Negative Symptoms; Positive symptoms = total score, Scale for the Assessment of Positive Symptoms; Distress due to psychosis = subscale, Psychotic Symptom Rating Scales; Disorganized symptoms = subscale, Scale for the Assessment of Positive Symptoms; Depression = total score, Beck Depression Inventory II; Anxiety = total score, Beck Anxiety Inventory; Total psychiatric symptoms = total score, Brief Psychiatric Rating Scale.

<sup>a</sup>D = deficit; ND = nondeficit.

<sup>b</sup>Missing data: distress—nondeficit (*n* = 4); Age of onset and length of illness—deficit (*n* = 2) and nondeficit (*n* = 2); Marriage history—deficit (*n* = 1).

**Bold text:** variables that validate the PDS classification of patients into deficit and nondeficit.

\**P* < .05. \*\**P* < .01.

find it identifies groups of deficit and nondeficit patients who have similar demographic and clinical features as patients classified as deficit and nondeficit with the SDS, with the case identification properties being stable over time.<sup>29</sup>

We employed the most frequently used<sup>8</sup> proxy method (the Proxy for the Deficit Syndrome or PDS<sup>29</sup>) which is based upon Brief Psychiatric Rating Scale (BPRS)<sup>32</sup> items. Specifically, the PDS index was computed as follows: 4 BPRS emotion experience items were summed (depressed mood + anxiety + guilty feelings + hostility) and subtracted from the BPRS outward emotional expression item (blunted affect) in a larger sample of patients diagnosed with schizophrenia who have negative symptoms (*n* = 139). Following the established procedure, we selected a PDS index cut off of -2 or higher (the top 16%) to identify the deficit group (*n* = 22) and selected the lower 2 quartiles on the index as the nonoverlapping nondeficit group by setting the PDS value at -6 or lower (lowest 51%, *n* = 72). The PDS cut off of -2 is the same as was used in the original article on the proxy method.<sup>29</sup> Since all patients in the larger sample had negative symptoms, there were no asymptomatic patients falsely classified as deficit patients.

Only the first contact assessments are reported for all participants. The exclusion criteria were (1) evidence of a neurological disorder, (2) mental retardation, (3) limited fluency in English, and (4) age less than 18 years.

### Procedure

All participants attended a single research session lasting 2–4 hours. Trained clinicians (Master-level or PhD) administered clinical, performance, and belief measures. Collateral information from family members, treating psychiatrists, and medical records was factored into clinician ratings of symptoms and functioning, as well as in determining eligibility. After the procedure was fully explained, written informed consent was obtained from all participants. Institutional Review Boards at the University of Pennsylvania and the City of Philadelphia both approved this procedure. All participants were compensated for completing study assessment procedures.

### Study Measures

**General Battery.** Participants were administered measures of negative symptoms (The scale for the Assessment of Negative Symptoms),<sup>33</sup> positive symptoms (The Scale for the Assessment of Positive Symptoms<sup>34</sup> and The Psychotic Symptom Rating Scales),<sup>35</sup> depression (The Beck Depression Inventory II, BDI),<sup>36</sup> anxiety (The Beck Anxiety Inventory),<sup>37</sup> total psychiatric symptomatology (BPRS), clinical insight (The Positive and Negative Syndrome Scale, PANSS),<sup>38</sup> cognitive insight (The Beck Cognitive Insight Scale, BCIS),<sup>39</sup> functional skills (University of California San Diego Performance-

Based Skills Assessment-Brief, UPSA-B),<sup>40</sup> and functional outcome (The Quality of Life Scale, Abbreviated, QOLA).<sup>41</sup> Additionally, all participants completed a computerized neurocognitive battery that included tests of abstraction and mental flexibility, verbal memory, attention/vigilance, and emotion recognition.<sup>42</sup> The tests were programmed in Flash media, displayed in a window within a web browser (Mozilla Firefox) on either a laptop or desktop computer, and were presented in a fixed order. Following previously established procedures, (1) accuracy was computed from raw scores of each neurocognitive test and converted to *z*-scores using normative data; (2) abstraction/mental flexibility, attention, verbal memory, and emotion recognition domain scores were computed by averaging the appropriate standardized values; and (3) neurocognitive performance was computed as the average of the domain scores for abstraction/mental flexibility, attention, and verbal memory.

*Defeatist Beliefs.* The Defeatist Attitudes Scale is a 15-item measure derived from the Dysfunctional Attitude Scale.<sup>43</sup> Responses are made on a 7-point scale ranging from 1 (agree totally) to 7 (disagree totally). Sample items include “If I fail partly, it is as bad as being a complete failure” and “Taking even a small risk is foolish because the loss is likely to be a disaster.” Higher scores indicate greater endorsement of defeatist beliefs. Construct validity (defeatist beliefs correlate with negative symptoms and functional outcome but not positive symptoms) in outpatient samples diagnosed with schizophrenia has been established.<sup>20,44</sup> The Defeatist Attitudes Scale showed good internal consistency ( $\alpha = .85$ ) in the current sample.

*Asocial Beliefs.* The Asocial Beliefs Scale is a 10-item scale derived from the Revised Social Anhedonia Scale<sup>45</sup> that taps beliefs related to social isolation. The response categories for each item are “true” or “false.” Sample items include “I prefer watching television to going out with other people” and “People sometimes think I am shy when I really just want to be left alone.” Test-retest reliability, construct validity (cross-sectional correlation with social functioning), and predictive validity (scale predicts reduced social behavior longitudinally) have both been demonstrated.<sup>21</sup> The Asocial Beliefs Scale demonstrated adequate internal consistency ( $\alpha = .63$ ) in the present sample.

*Low Expectations.* Future expectancies were assessed via 3 items derived from the theoretical work of Gard and colleagues.<sup>22</sup> Each item is scored on a 7-point scale ranging from 0 (strong pleasure expected) to 6 (no pleasure expected). Social activity, physical sensation, and recreational/vocational pursuits were all assessed for anticipated enjoyment. The 3 items were summed into a total score indexing low expectation of future pleasure;

higher values indicate lower expectation. The total score had good internal consistency ( $\alpha = .88$ ) in the current sample.

*Self-Esteem.* The Beck Self-Esteem Scales-Short Form (BSES-SF) is a 12-item measure assessing beliefs about the self and beliefs about others’ impressions of the self. Each item is rated on a 10-point scale. Sample items include “Superior” (10)–“Inferior” (1); “Likable” (10)–“Unlikeable” (1); “Powerful” (10)–“Powerless” (1). BSES-SF was shortened from the full BSES<sup>46</sup> to capture the essence of self-esteem, and 7 of 12 adjectives were modified to better suit the schizophrenia population. The 12 items were summed into a total score, with higher values indicating greater self-esteem. The total score had good internal consistency ( $\alpha = .93$ ) in the present sample.

*Fear of Negative Evaluation.* The Brief Fear of Negative Evaluation Scale II-Revised<sup>46</sup> is a 12-item instrument querying attitudes regarding unfavorable social feedback. Responses are made on a 5-point scale ranging from 0 (does not describe me at all) to 4 (describes me extremely well). Sample statements include “I am afraid that others will not approve of me” and “It bothers me when people form an unfavorable impression of me.” The scale had good internal consistency ( $\alpha = .91$ ) in the current sample.

### Data Analysis

The principal aims of the analyses were (1) to determine if the PDS accurately identified deficit patients and (2) to test the primary study hypotheses. For the PDS hypotheses (deficit patients will have greater negative symptoms, lower distress, etc.), we employed *t* tests for continuous variables and chi-square for categorical variables (gender). To evaluate the primary hypotheses (deficit patients will have higher defeatist beliefs, asocial beliefs, etc.), ANCOVA models were estimated in which a significant group difference (deficit vs nondeficit) was tested controlling for levels of depression (BDI). If depression was not significant, it was dropped from the model. Two-tail tests were employed throughout with a significance level of .05.<sup>46</sup> All data were analyzed via SPSS version 18.0, including ANCOVAs and *t* tests, as well as the calculation of summary statistics and effect sizes. Missing data were accounted for by the use of pairwise deletion. We followed Cohen<sup>47</sup> in categorizing effect sizes (*d*) of 0.2 as small, 0.5 as medium, and 0.8 as large.

## Results

### Validation of the PDS Classification of Patients

Table 1 contains demographic and symptom data for the deficit and nondeficit groups. The group difference for

**Table 2.** Group Differences: Beliefs and Attitudes

Variable	Deficit Syndrome, ( <i>n</i> = 22)		Nondeficit, ( <i>n</i> = 72)		Effect size, ( <i>d</i> ) D vs ND <sup>a</sup>
	<i>M</i> <sub>adj</sub> / <i>M</i>	<i>SE</i> / <i>SD</i>	<i>M</i> <sub>adj</sub> / <i>M</i>	<i>SE</i> / <i>SD</i>	
Defeatist beliefs <sup>b</sup>	62.7	3.3	53.1	1.8	0.63**
Asocial beliefs <sup>b</sup>	7.2	0.7	5.4	0.4	0.58**
Low expectations <sup>bd</sup>	5.5	0.9	4.3	0.5	0.30
Self-esteem <sup>bd</sup>	86.1	5.5	74.5	3.0	0.57*
Fear of negative evaluation <sup>cd</sup>	17.1	2.9	19.7	1.6	-0.45

*Note:* Defeatist beliefs = subscale, Dysfunctional Attitude Scale; Asocial beliefs = subscale, Revised Social Anhedonia Scale; Low expectations = sum of 3 future pleasure questions; Fear of negative evaluation = total score, Brief Fear of Negative Evaluation Scale II-Revised; Lack of clinical insight = item, Positive and Negative Syndrome Scale; Self-esteem = subscale, Beck Self-Esteem Scales-Short Form.

<sup>a</sup>D = deficit; ND = nondeficit.

<sup>b</sup>Adjusted means and SE, ANCOVA, controlling for depression.

<sup>c</sup>Means and SD.

<sup>d</sup>Missing data: fear of negative evaluation—deficit (*n* = 8) and nondeficit (*n* = 11); Low expectations—nondeficit (*n* = 1); Self-esteem—deficit (*n* = 8) and nondeficit (*n* = 11).

\* $10 < P < .05$ , \*\* $P < .05$ .

gender was a nonsignificant trend,  $\chi^2(1, N = 94) = 3.68, P = .06, \phi = 0.20$ , with the deficit group having a greater number of males than the nondeficit group. The deficit group also showed greater severity of negative symptoms and lesser severity of positive symptoms than the nondeficit group. These group differences were statistically significant and had a large effect size estimate for negative symptoms ( $t[92] = 3.98, P < .01, d = 0.89$ ) and a medium effect size for positive symptoms ( $t[92] = -2.04, P < .05, d = -0.50$ ). The deficit group also reported being less distressed by their psychotic symptoms than the nondeficit group,  $t(88) = -2.80, P < .01, d = -0.66$ . Disorganized symptoms were not statistically different across the 2 groups,  $t(92) = -.99, P > .3, d = -0.23$ . In terms of depression and anxiety, deficit patients reported minimal-to-mild levels, while nondeficit patients described mild-to-moderate levels. The group comparison achieved statistical significance for depression ( $t[92] = -4.01, P < .01, d = -0.91$ ) and anxiety ( $t[92] = -3.94, P < .01, d = -0.89$ ). Finally, the deficit group had less severe overall psychiatric symptoms on the BPRS as compared with nondeficit patients ( $t[92] = -2.93, P < .01, d = -0.68$ ). In sum, consistent with reports based on the gold standard measure (SDS),<sup>3,4,8</sup> the deficit group identified by the PDS has more males, greater negative symptom levels, fewer psychotic symptoms, less distress due to their psychotic symptoms, as well as less depression and anxiety than the nondeficit group.

### Beliefs and Attitudes

Table 2 contains belief and attitude data for the 2 groups.

**Defeatist Beliefs.** Deficit patients endorsed defeatist beliefs to a greater degree than nondeficit patients

when depression was statistically controlled. Accordingly, in the ANCOVA model, the term for depression was statistically significant,  $t(90) = 2.61, P < .05$ , and consistent with our hypothesis, the group difference between deficit and nondeficit patients was statistically significant,  $t(90) = 2.46, P < .05, d = 0.63$ , and had a medium effect size.

**Asocial Beliefs.** The same pattern of means can be seen with asocial beliefs: deficit patients endorsed the beliefs to a greater degree than nondeficit patients when depression was statistically controlled. Within the ANCOVA model, depression was statistically significant,  $t(90) = 3.42, P < .01$ . The difference between deficit and nondeficit groups was statistically significant and a medium effect size,  $t(90) = 2.28, P < .05, d = 0.58$ .

**Low Expectations.** While the pattern of the means suggests that deficit patients have lower expectations for future pleasure than nondeficit patients, this pattern was not statistically significant. Thus, in the ANCOVA model, depression was statistically significant,  $t(90) = 4.40, P < .01$ , but the group difference between deficit and nondeficit patients was not statistically significant and a small effect size,  $t(90) = 1.18, P > .20, d = 0.30$ .

**Self-Esteem.** Deficit patients scored higher on self-esteem than did the nondeficit patients. Within the ANCOVA model, depression was significant,  $t(58) = -2.06, P < .05$ , and the deficit vs nondeficit group difference in self-esteem was a nonsignificant trend and a medium effect size,  $t(58) = 1.80, P = .07, d = 0.57$ .

**Fear of Negative Evaluation.** The deficit patients reported less fear of being evaluated by others than

**Table 3.** Group Differences: Performance, Functional, and Insight Measures

Variable	Deficit syndrome, ( <i>n</i> = 22)		Nondeficit, ( <i>n</i> = 72)		Effect size, ( <i>d</i> ) D vs ND <sup>a</sup>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Neurocognitive performance <sup>b</sup>	−1.30	1.19	−0.98	1.22	−0.26
Emotion recognition <sup>b</sup>	−1.80	1.18	−1.03	1.18	−0.67*
Behavioral skills <sup>b</sup>	64.3	18.7	68.6	15.8	−0.26
Functional outcome	18.0	7.2	20.9	7.3	−0.40
Lack of clinical insight <sup>b</sup>	4.5	1.7	3.4	1.4	0.70**
Cognitive insight	1.6	4.8	6.4	7.1	−0.70**
Self-reflectiveness	11.4	4.0	13.4	6.1	−0.35
Self-certainty	9.9	3.9	7.1	3.7	0.72**

*Note:* Neurocognitive performance = averaged standardized domain scores; Emotion recognition = standardized domain scores; Behavioral skills = total score, UCSD Performance-Based Skills Assessment-Brief; Functional outcome = total score, Quality of Life Scale, abbreviated; Cognitive insight = total score, Beck Cognitive Insight Scale (BCIS); Self-reflectiveness = subscale, BCIS; Self-certainty = subscale, BCIS.

<sup>a</sup>D = deficit; ND = nondeficit.

<sup>b</sup>Missing data: neurocognitive performance—deficit (*n* = 2) and nondeficit (*n* = 4); Emotion recognition—deficit (*n* = 2) and nondeficit (*n* = 6); Behavioral skills—deficit (*n* = 1) and nondeficit (*n* = 2); Lack of clinical insight—deficit (*n* = 1) and nondeficit (*n* = 2); Cognitive insight, self-reflectiveness, and self-certainty—nondeficit (*n* = 1).

\**P* < .05. \*\**P* < .01.

did the nondeficit patients. Because depression was not a significant predictor of fear of negative evaluation, it was dropped from the model. This group difference was not significant and had a medium effect size estimate,  $t(57) = -1.50$ ,  $P = .14$ ,  $d = -0.45$ .

#### *Neurocognition, Skills, Functioning, and Insight*

Table 3 presents the means, SDs, and group difference effect sizes for the performance, functioning, and insight measures. On the tests of neurocognition, the group difference (deficit patients performed more poorly than the nondeficit patients) was not statistically significant and had a small effect size ( $t[86] = -1.03$ ,  $P = .31$ ,  $d = -0.26$ ). Deficit patients showed a statistically significant greater impairment in recognizing emotions of others than nondeficit patients ( $t[84] = -2.57$ ,  $P < .05$ ,  $d = -0.67$ ). In terms of functioning, group differences were not statistically significant, though the deficit patients performed somewhat more poorly (small effect size) than the nondeficit patients on role-play tasks of everyday living ( $t[87] = -1.05$ ,  $P = .30$ ,  $d = -0.26$ ) and evidenced worse (medium effect size) functional outcome on the QOL ( $t[92] = -1.61$ ,  $P = .11$ ,  $d = -0.40$ ).

The deficit group showed greater impairment in clinical and cognitive insight as compared with the nondeficit group. The group difference on the PANSS lack of clinical insight was statistically significant and had a medium-large effect size estimate,  $t(85) = 2.84$ ,  $P < .01$ ,  $d = 0.70$ . The group difference in cognitive insight was also statistically significant and had a medium-large effect size estimate,  $t(91) = -2.95$ ,  $P < .01$ ,  $d = -0.70$ . Of note, the 2 groups did not differ statistically on the self-reflectiveness subscale of the BCIS,  $t(91) = -1.45$ ,

$P = .15$ ,  $d = -0.35$ ; the deficit patients demonstrated significantly more self-certainty in their thinking than the nondeficit patients, the group difference being a medium-large effect size,  $t(91) = 3.09$ ,  $P < .01$ ,  $d = 0.72$ .

#### **Discussion**

The present investigation is the first, to our knowledge, to determine the specific psychological features such as negative beliefs and expectancies that are characteristic of patients with deficit syndrome schizophrenia. The proxy method identified a deficit patient group with a profile (more males, higher negative symptoms, lower positive symptoms, lower affective symptomatology) that resembled the results of research conducted with the gold standard measure (the SDS).<sup>5,8</sup> Importantly, we found, when depression was statistically controlled, that deficit patients endorsed defeatist and asocial beliefs to a greater degree than nondeficit patients and had higher self-esteem (at a trend level). The deficit patients also showed a greater impairment in emotion recognition, poorer clinical insight, and worse cognitive insight than the nondeficit patients.

The findings from the different domains can be drawn together into a profile of the typical patients with the deficit syndrome. They present a bleak picture, strikingly so in comparison to patients in the nondeficit group, especially as the latter also have elevated negative symptoms. As information gathered from family and treatment providers confirmed, the deficit patients are impoverished in practically every aspect of their lives: they are more likely to live with their family, to be unemployed, to have never been married, and to have few or no friends at all. They

are apathetic, speak very little, and have minimal or no recognition that they are ill. Finally, they are deficient in the most basic skills of everyday life.

Although the study was cross-sectional in nature, the clinical examination and findings can cast some light on the severely compromised condition of patients in the deficit group. A hypothetical formulation of the deficit syndrome provides a road map for further research. We propose that there is a progression in severity of the neurocognitive, functional, and clinical variables from the nondeficit to the deficit groups that might account for the trend of greater impairment in the practical skills in the deficit group. Given the combination of severe neurocognitive impairment and severe negative symptoms, it might be expected that patients with deficit schizophrenia would be more distressed than those in the nondeficit group. Notwithstanding the greater severity of these impairments, the negative subjective experiences of the deficit group were less intense and less frequent than in the nondeficit group. Specifically, the deficit group had a lower level of depression and anxiety than did the nondeficit group, had fewer delusions and hallucinations, and experienced less distress associated with these symptoms. In addition, they reported higher self-esteem and a suggestion of less fear of negative evaluation.

We speculate that the explanation of this disconnect between the various impairments and the subjective state in the deficit group may be found in their negative attitudes, beliefs, and expectations. Previous research has shown that asocial beliefs predict social withdrawal but neurocognitive impairment does not.<sup>21</sup> Moreover, deficit patients' difficulty in recognizing facial emotions, eg, would likely interfere with their engaging socially. Because the patients with the deficit syndrome are not very much invested in other people, they may be less concerned about negative evaluation. Their milder fear of negative evaluation and relative indifference to other people could account for their lower level of anxiety compared with the nondeficit group. Their relative lack of concern about social evaluation may also be reflected in their apparently higher self-esteem. The relative indifference of deficit patients to social evaluation may insulate them from the negative impact of social marginalization and stigmatization, thus enabling a higher comfort level than nondeficit patients. They evidently have developed a protective shield of dysfunctional attitudes that devalue the importance of social relations, perhaps in response to social adversities earlier in life (such as rejection and stigmatization). The deficit patients might be less likely to be disappointed or frustrated. In contrast to patients with depression, they appear to be complacent about their life situation.

The patients' very low level of productivity and relative inactivity may be explained in terms of their defeatist attitudes about performance. Previous research has demonstrated that defeatist attitudes are a key component

linking deficits in neurocognitive performance to deficits in functional outcomes.<sup>20</sup>

The deficit patients' significantly lower insight into their condition and relative obliviousness to the nature of their bizarre experiences also may help to protect their self-esteem. In a sense, the deficit patients have found a safe haven within their state of social withdrawal, protected from experiencing failure and disappointment by their negative attitudes about performance, social relations, and their reduced insight into their disability.

In view of the findings that these patients are relatively complacent about their lot in life, what interventions could improve their quality of life and reduce the burden on their families and on society? There is a question whether medications or remedies directed at the neurocognitive impairment would substantially change the patients' behavior given that these problems are too remote from the dysfunctional behaviors. Hence, a cognitive-behavioral program that addresses the more proximal defeatist and asocial attitudes might be expected to make an impact on the poor performance and social withdrawal. A program for implementing this intervention has already been described and presented in a detailed manual.<sup>48</sup> This approach consists of engaging patients, establishing specific goals, and designing behavioral and cognitive techniques that neutralize the defeatist and asocial attitudes and negative expectancies. Specific interventions are tailored to the patients' level of functioning, with social skills training being provided for patients lacking in social competencies. Although the patients perform at a relatively low level on neurocognitive tests, a preliminary trial suggests that they appear to have latent capacities that have been obscured by their profound negative symptoms.<sup>49</sup>

A limitation of the current study is the use of a proxy measure to determine deficit status. While our findings suggest the proxy measure was appropriate, future studies can overcome this potential limitation by employing the Schedule for the Deficit Syndrome.<sup>28</sup> Another limitation is the particular measures employed, and it is entirely possible that an unmeasured factor is an important causal contributor or confound. It should be noted that several of the observed differences between the deficit and nondeficit groups were in the predicted direction but failed to achieve statistical significance due to missing data (self-esteem and fear of negative evaluation) and/or small-medium effects sizes (neurocognition, functional skills, functional outcome, negative expectations, and fear of negative evaluation). A larger sample size of deficit patients might be more sensitive to detecting differences between these groups. Larger samples would also allow a discriminant function analysis to ascertain how much each measure loads on the deficit syndrome and discriminates between the groups. The findings of less severe positive symptoms and lower total psychiatric symptoms in the deficit group relative to the nondeficit group require

further investigation. Whereas negative symptoms and mood appear to consistently differ between deficit and nondeficit groups across studies, differences in positive and total symptoms have been more variable.<sup>8</sup> It would be useful to determine factors that predict this variability in observed symptomatology across studies. Whereas finding that more males were categorized as deficit than nondeficit strengthens the validity of our use of the PDS, it also introduces the possibility that gender rather than deficit/nondeficit status is driving the observed group differences. We are not aware of any evidence that gender contributes to the study measures independently of schizophrenia, though this would be a fruitful line of future inquiry. Finally, the cross-sectional methodology constrains causal inferences. It would be valuable for future investigations to test the specific predictions arising from the current study (including the findings of more extreme defeatist and asocial attitudes but decreased fear of negative evaluation and higher self-esteem) in a longitudinal design. Confirmation of these results would be an important complement to the neurobiological findings in the deficit syndrome and would point the way to better treatment outcomes for a severely disabled psychiatric patient group.

### Funding

National Alliance for Research on Schizophrenia and Depression; Heinz Foundation (to Dr Beck).

### Acknowledgments

We express our gratitude to the patients who participated in this research and thereby made it possible. We also thank the City of Philadelphia Department of Behavioral Health and Raquel and Ruben Gur, Greg Strauss, Robert Steer, Christian Kohler, Steve Siegel, Mahendra Bhati, Jennifer Greene, LaRiena Ralph, Jan Richard, Mary Tabit, Kara Devers, Sean Gallagher, Jason Cha, Carol Quinn, and 4 anonymous reviewers for their assistance with this project. The authors have declared that there are no conflicts of interest in relation to the subject of this study.

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