

# Correlates of Treatment-Related Decision-Making Capacity Among Middle-Aged and Older Patients With Schizophrenia

Barton W. Palmer, PhD; Laura B. Dunn, MD; Paul S. Appelbaum, MD; Dilip V. Jeste, MD

**Background:** Antipsychotic medications constitute the backbone of treatment for schizophrenia. Current guidelines require clinicians to obtain patients' informed consent for treatment, but few empirical studies of the capacity of patients with schizophrenia for meaningful consent in this context exist. This issue may be particularly relevant for middle-aged and older patients, as the cognitive changes associated with normal aging may have an adverse impact on decision-making processes. We examined the range, stability, and correlates of treatment-related decisional capacity in this patient population.

**Methods:** Participants included 59 middle-aged and older patients with schizophrenia or schizoaffective disorder and 38 normal comparison subjects. Baseline measures included the MacArthur Competence Assessment Tool for Treatment (MacCAT-T), psychopathology rating scales, and the Mattis Dementia Rating Scale. Patients also completed a neuropsychological test battery. The MacCAT-T was readministered to patients at a 1-month follow-up.

**Results:** Relative to the comparison subjects, the patients had worse understanding of disclosed material; however, a wide range of performance was observed among patients. Variability in MacCAT-T performance was not predicted by demographic characteristics; there were no significant correlations between psychopathology ratings and MacCAT-T scores. Cognitive test scores were often significant correlates of capacity, particularly in terms of understanding and reasoning. The MacCAT-T scores were stable during the 1-month follow-up.

**Conclusions:** Overall, middle-aged and older outpatients with schizophrenia had worse understanding of disclosed information than did normal comparison subjects, but such group comparisons obscure remarkable heterogeneity among patients. Differences in capacity appeared more related to cognitive functions than to severity of psychopathology. Such information about barriers to capacity may help in developing more effective methods of providing informed consent.

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From the Departments of Psychiatry, University of California–San Diego (Drs Palmer, Dunn, and Jeste), the Veterans Medical Research Foundation (Dr Palmer), Veterans Affairs San Diego Healthcare System (Dr Jeste), San Diego; and the University of Massachusetts Medical School, Worcester (Dr Appelbaum).

**A**NTIPSYCHOTIC MEDICATIONS form the backbone of effective treatment of chronic psychotic disorders such as schizophrenia.<sup>1-3</sup> Current guidelines require clinicians to obtain patients' informed consent for treatment with these medications, but reports have suggested that some psychiatric patients may not sufficiently understand treatment-relevant information as commonly disclosed.<sup>4-8</sup> Such findings raise the question of decisional capacity, which is widely considered to require more than just understanding of disclosed information. It also involves the capacity to appreciate the significance of the information for one's own condition and situation, to reason with the information, and to express a choice about whether to accept or reject the proposed treatment.<sup>9</sup>

Decisional capacity may be of particular relevance as patients age, because the risk-benefit ratios of treatments tend to become more complex. At the same time, cognitive changes associated with normal aging may make it more difficult for some patients to understand, appreciate, and/or reason about the relative risks and benefits of a particular treatment being proposed. Little is known about the effects of aging on the capacity of patients with schizophrenia to consent to treatment.

Although there has been recent debate and some empirical research regarding the capacity of patients with schizophrenia to make informed decisions when consenting to research participation,<sup>10-14</sup> little empirical attention has focused on factors associated with better or worse treatment-related decisional capacity among patients with schizophrenia, with a few notable exceptions.<sup>15,16</sup>

One of the most comprehensive studies of treatment-related decisional capacity was the MacArthur Treatment Competence Study conducted by Appelbaum and Grisso and colleagues.<sup>9,15,17</sup> These investigators examined treatment-related decisional capacity among predominantly younger inpatients with schizophrenia or depression compared with medical inpatients who were hospitalized for coronary heart disease and community-dwelling normal comparison (NC) subjects. As a group, the patients with schizophrenia showed worse understanding, appreciation, and reasoning relative to the other groups. Severity of psychopathology was significantly correlated with worse understanding of disclosed material.

A second study by Grisso and Appelbaum<sup>16,18</sup> was conducted as part of the validation for a standard instrument for assessing decisional capacity, the MacArthur Competence Assessment Tool for Treatment (MacCAT-T). In that study, they compared MacCAT-T performance among 40 predominantly younger patients hospitalized for schizophrenia with that among 40 NC subjects. Relative to the NC subjects, the patients with schizophrenia had significantly worse scores on the MacCAT-T understanding and reasoning subscales, but even among patients there was a wide range of performance observed on each MacCAT-T subscale.

A series of studies by Marson and colleagues<sup>19-21</sup> and Dymek et al<sup>22</sup> of patients with Alzheimer and Parkinson diseases suggest that specific cognitive deficits may differentially relate to specific aspects of decision-making capacity, particularly executive functions and verbal memory. Such findings may be relevant to schizophrenia and aging, as these are among the most frequently impaired ability areas in individuals with schizophrenia and in adults undergoing normal aging. However, only a few studies have specifically examined the relationship of cognitive test performance to decisional capacity. The only cognitive testing in the MacArthur Treatment Competence Study<sup>9,15,17</sup> was a composite score consisting of the vocabulary, similarities, and digit symbol subtests from the Wechsler Adult Intelligence Scale-Revised. This composite score was significantly correlated with understanding of treatment-relevant information. In an investigation of capacity to consent to research participation involving a sample of predominantly younger patients with schizophrenia, Carpenter et al<sup>12</sup> found that understanding and reasoning were each strongly correlated with overall performance on a brief neurocognitive battery.

Another important aspect of decisional capacity is the degree to which it may be stable over time. There is general consensus that consent is not synonymous with having a patient sign a form, but rather is a process resulting from an ongoing dialogue between the provider and patient. Appelbaum et al<sup>23</sup> recently examined the stability of capacity to consent to research participation among women with depression, and found stable appreciation and reasoning from baseline to an 8- to 10-week follow-up, with a slight improvement in understanding scores. We have found no published studies of the stability of decisional capacity among patients with schizophrenia.

The aims of the present study were to examine the level, range, correlates, and stability of treatment-

related decisional capacity among middle-aged and older patients (age,  $\geq 40$  years) with schizophrenia or schizoaffective disorder. We hypothesized that patients would have lower levels of decisional capacity than NC subjects, and that the patients' level of capacity would be stable during the 1-month follow-up. However, we also expected substantial variability within the patient group and that this variability would be strongly associated with psychopathology and cognitive deficits, particularly in the cognitive domains of learning/memory and abstraction/cognitive flexibility.

The following unique features of the present study may be worth highlighting. (1) This study focused on 4 dimensions of treatment-related decisional capacity measured with the MacCAT-T, whereas much of the recent literature has focused on capacity to consent to research, and/or has been primarily focused on the understanding dimension of capacity. (2) This study focused on middle-aged and older patients with schizophrenia or schizoaffective disorder and NC subjects, rather than younger adults who were the focus of most earlier studies. (3) The patients in our study underwent evaluation with a comprehensive neuropsychological test battery. (4) We examined the stability of the patients' decisional capacity during a 1-month interval.

## METHODS

### SUBJECTS

Participants included 59 middle-aged and older community-dwelling outpatients with schizophrenia ( $n=49$ ) or schizoaffective disorder ( $n=10$ ). Fourteen of the patients provided limited baseline data for a preliminary report.<sup>24</sup> The study was conducted through the Advanced Center for Interventions and Services Research (ACISR) at the University of California-San Diego (UCSD), which focuses on studies of psychosis in older persons. The ACISR recruits patients through a variety of outpatient settings, including the UCSD Psychiatry Services, the Veterans Affairs San Diego Healthcare System Psychiatry Service, referrals from individual psychiatrists and physicians, and direct recruitment at San Diego-area board-and-care facilities. Most of the patients are residents of privately run, community-based assisted living facilities (board-and-care homes). These facilities provide patients with an intermediate level of care (including lodging, meals, and medication management) between independent living and institutionalized care. The focus of our study was on the correlates and stability of decision-making capacity among patients with schizophrenia or schizoaffective disorder. However, we also collected limited data from 38 middle-aged and older NC subjects. The NC subjects were individuals without major DSM-IV psychiatric disorders who were recruited from the general San Diego area community.

Because we were interested in decision-making capacity among patients likely to be independently responsible for providing consent, we did not enroll patients with designated conservators or those whose physicians had diagnosed them as having Alzheimer disease or other dementias. Other exclusion criteria included physical or medical problems interfering with the patient's ability to complete the assessments or a lack of fluency in English. All participants reviewed and signed an informed consent form approved by the institutional review board before participation. Less than 10% of those who reviewed the consent form declined enrollment.

## MEASURES AND PROCEDURES

### Decision-Making Capacity

We assessed 4 dimensions of treatment-related decision-making capacity using the corresponding subscale scores of the MacArthur Competence Assessment Tool for Treatment (MacCAT-T).<sup>16,18</sup> These subscales included (1) understanding (the ability to comprehend disclosed information regarding the condition [schizophrenia] and proposed treatment [rated from 0-6]); (2) appreciation (the ability to appreciate the significance of the disclosed information for one's own condition and situation [rated from 0-4]); (3) reasoning (the ability to manipulate the relevant information rationally, eg, in comparing the risks and benefits of treatment options and the likely consequences of one's choices [rated from 0-8]); and (4) expression of a choice (the ability to arrive at and communicate a choice regarding the proposed treatment [rated from 0-2]). In the present study, the MacCAT-T disclosures and items referred to treatment of schizophrenia or schizoaffective disorder with atypical antipsychotic medications. Consistent with the way the MacCAT-T was developed and used by its authors,<sup>16,18</sup> our focus was on the subscale scores. A MacCAT-T total score is not calculated because deficits in one dimension might translate into incompetence, even when the other dimensions are intact. Also, as with the NC subjects in the original MacCAT-T validation study,<sup>16,18</sup> we omitted the appreciation subscale for NC subjects, as the concept of appreciating one's own condition and need for treatment does not apply to people who do not have that condition. As in the MacCAT-T validation study, the NC subjects in the present study were told to imagine that they had the condition being described in the MacCAT-T disclosure/interview.

The MacCAT-T was administered and scored as described in the MacCAT-T manual<sup>16</sup> and the training videotape.<sup>25</sup> Administration and scoring were conducted by 1 of 3 trained research assistants who were kept unaware of the patient's psychopathology ratings and neuropsychological scores. We initially had 2 research assistants collecting MacCAT-T data, and as reported previously,<sup>24</sup> their interscorer reliability was established by having each independently score 13 of the initial protocols. The interclass correlations were 0.85 for understanding, 0.87 for appreciation, and 0.75 for reasoning. When we subsequently hired a third research assistant, her training included sitting in with the other research assistants during MacCAT-T interviews, independently scoring each response to the MacCAT-T item, and discussing the scoring after each interview. This process continued until she achieved general consistency with each of the first 2 research assistants.

### Psychiatric Symptoms

Severity of psychiatric symptoms was assessed with the Positive and Negative Syndrome Scale,<sup>26</sup> which includes positive and negative subscale scores and incorporates the 18-item version of the Brief Psychiatric Rating Scale<sup>27</sup> to measure overall severity of psychiatric symptoms.

### Neuropsychological Functioning

Cognitive deficits were evaluated with the Mattis Dementia Rating Scale (DRS).<sup>28</sup> The DRS provides a total score (range, 0-144) and the following 5 subscale scores: attention (range, 0-37), initiation/perseveration (range, 0-37), construction (range, 0-6), conceptualization (range, 0-39), and memory (range, 0-25). Lower scores represent worse cognitive functioning.

Cognitive functioning was further evaluated in the patient sample with a comprehensive neuropsychological test bat-

tery, including those subtests from the Wechsler Adult Intelligence Scale (WAIS)—Third Edition (WAIS-III)<sup>29</sup> that are included in the WAIS-III index scores and selected measures of abstraction/cognitive flexibility and learning/memory. The individual test scores were grouped into the following cognitive ability areas: (1) Verbal Comprehension (WAIS-III vocabulary, similarities, and information subtests), (2) Perceptual Organization (WAIS-III picture completion, block design, and matrix reasoning subtests), (3) Attention/Working Memory (WAIS-III arithmetic, digit span, and letter-number sequencing subtests), (4) Processing Speed (WAIS-III digit symbol and symbol search subtests), (5) Abstraction/Cognitive Flexibility (the Wisconsin Card Sorting Test—64 Card Version,<sup>30</sup> Booklet Category Test,<sup>31</sup> and Trail-Making Test Part B<sup>32</sup>), and (6) Learning (the Hopkins Verbal Learning Test—Revised [total recall trials 1-3],<sup>33</sup> Story Memory Test [learning score],<sup>34</sup> Brief Visual-Spatial Memory Test—Revised [total recall trials 1-3],<sup>35</sup> and family pictures subtest from the Wechsler Memory Scale—Third Edition [immediate recall score]<sup>36</sup>). To place scores on a common metric so that we could create ability composite scores, raw test scores were converted to scaled scores using previously established norms,<sup>29-36</sup> wherein the mean scaled score among neurologically and psychiatrically healthy adults is 10 and the SD is 3. The scaled scores were coded such that higher scores represent better performance. We then calculated the mean scaled score within each ability area. The focus of our analyses was on these mean ability area-scaled scores, but to describe cognitive functioning in the patient sample we also calculated patients' WAIS-III index scores (normative mean of 100 and an SD of 15).

## STATISTICAL ANALYSES

Variables with significantly skewed distributions were transformed using square root, logarithmic, or inverse functions when necessary to meet the assumptions for parametric analyses. We evaluated differences between the NC and patient groups in terms of demographic characteristics, psychopathology ratings, cognitive deficits, and decisional capacity with independent samples *t* tests (2-tailed) for continuous variables and Pearson  $\chi^2$  for categorical variables. We used the Pearson correlation to evaluate associations between the patient characteristics and each of the MacCAT-T subscales. A relatively conservative  $\alpha$  level of  $P < .01$  (2-tailed) was chosen to define significance to minimize the risk for type I error. Stepwise regression analyses were used to determine the relative contribution of the various patient characteristics as predictors of each of the decisional capacity subscales. For each MacCAT-T subscale model, we used only variables that were significant bivariate correlates (at the  $P < .01$  level) of the respective MacCAT-T subscale score. Stability of MacCAT-T scores among the patients during the 1-month follow-up was evaluated in terms of the test-retest correlations (Pearson *r*) and paired-samples *t* tests. As with the other analyses, significance was defined as  $P < .01$  (2-tailed).

## RESULTS

### GENERAL CHARACTERISTICS

Baseline demographic characteristics, mean scores on the MacCAT-T subscales, psychopathology ratings, and overall cognitive deficits (DRS total score) among the NC subjects and patients are described in **Table 1**. Although recruited in the same age range (age,  $\geq 40$  years), the mean age of patients was younger than that of the NC subjects; the patients also had completed fewer years of edu-

**Table 1. Comparison of Demographic Characteristics, Severity of Symptoms, and Cognitive Deficits Among NC Subjects and Patients With Schizophrenia\***

	NC Subjects (n = 38)	Patients With Schizophrenia (n = 59)	<i>t</i> <sub>df</sub> or $\chi^2_{df}$	<i>P</i> Value
Demographic characteristics				
Age, y	56.8 (9.2)	50.2 (6.8)	<i>t</i> <sub>62,6</sub> = 3.80	<.001
Education, y	14.3 (2.1)	11.9 (2.6)	<i>t</i> <sub>95</sub> = 4.78	<.001
% Men	47.4	67.8	$\chi^2_1$ = 4.01	.045
% White	63.2	72.9	$\chi^2_1$ = 1.02	.31
Decision-making capacity, MacCAT-T scores				
Understanding	5.6 (0.7)	5.1 (1.2)	<i>t</i> <sub>90,5</sub> = 2.91	.004
Appreciation	NA†	3.5 (1.0)		
Reasoning	7.1 (1.2)	6.1 (2.4)	<i>t</i> <sub>90,0</sub> = 1.08	.28
Expression of a choice	1.9 (0.4)	1.8 (0.6)	<i>t</i> <sub>95,0</sub> = 1.30	.20
Severity of psychopathology, rating				
Positive and Negative Syndrome Scale				
Positive symptom subscale	8.9 (2.6)	13.3 (4.7)	<i>t</i> <sub>95</sub> = 6.18	<.001
Negative symptom subscale	8.1 (1.8)	13.9 (5.3)	<i>t</i> <sub>93,3</sub> = 8.94	<.001
Brief Psychiatric Rating Scale	23.0 (4.4)	32.2 (8.1)	<i>t</i> <sub>92,9</sub> = 7.23	<.001
Cognitive deficits, Mattis Dementia Rating Scale total score	138.6 (3.5)	128.6 (10.2)	<i>t</i> <sub>94</sub> = 6.69	<.001

Abbreviations: MacCAT-T, MacArthur Competence Assessment Tool for Treatment; NA, not applicable; NC, normal comparison.

\*Unless otherwise indicated, data are expressed as mean (SD).

†Appreciation subscale was not administered to NC subjects.

cation and were more likely to be male (as well as having the expected differences in terms of psychopathology and cognitive deficits). The mean MacCAT-T understanding score among the patients was significantly worse than that among the NC subjects ( $t_{90,5} = 2.91$ ;  $P = .004$ ). The latter difference remained significant when age was added as a covariate ( $F_{1,94} = 7.420$ ;  $P = .008$ ). The differences in reasoning and expression of a choice remained nonsignificant, even when age was added as a covariate. Gender generally has little demonstrable influence on cognitive tasks,<sup>34,37</sup> and we did not include education as a covariate because truncated education is often present in samples of patients with schizophrenia and may reflect an aspect of the disorder itself.<sup>38,39</sup>

The mean DRS total score among patients was 128.6 (of a total possible 144), which is near the boundary of traditional cutoff scores for defining impaired vs unimpaired performance. There was substantial heterogeneity among patients, however, as the patients' scores ranged from 97 to 142. Patients' mean WAIS-III scores were also generally in the low-average range of performance, but again with substantial heterogeneity within the sample. For example, the mean (age-corrected) WAIS-III Verbal Comprehension index score (a measure of crystallized verbal intelligence, similar to the traditional Verbal IQ) was 89.1 (SD = 17.7), but ranged from 50 (extremely low range) to 138 (very superior range).

## CORRELATES OF DECISION-MAKING CAPACITY

### General Correlates Among Patients and NC Subjects

Among the NC subjects, the only significant correlations with MacCAT-T subscale scores were the positive correlations between the DRS total score and the MacCAT-T reasoning subscale score ( $r = 0.43$ ;  $P = .008$ ) and between the DRS memory score and the MacCAT-T un-

derstanding subscale ( $r = 0.46$ ;  $P = .004$ ). The correlation between education (in years) and the MacCAT-T understanding subscale was 0.34 ( $P = .03$ ), but this was not significant at the  $P < .01$  level. Cognitive assessment of the NC subjects was limited to the DRS; they did not undergo evaluation with the comprehensive cognitive test battery.

Among patients, there were no significant correlations between patients' performance on any of the MacCAT-T subscales and their demographic characteristics or psychopathology ratings (absolute value,  $r = 0.01$  to  $r = 0.26$ ;  $P > .05$ ). However, as shown in **Table 2**, there were several significant bivariate correlations between patients' cognitive and decisional capacity scores. Those that were significant bivariate correlates at the preselected criterion of  $P < .01$  were included as potential independent variables in the multiple regression analyses.

### Multiple Regression Models of Patients' Decisional Capacity

We used stepwise multiple regression analyses to evaluate the relative contribution of each of the significant ( $P < .01$ ) bivariate correlates of patients' decisional capacity to the overall prediction of understanding, reasoning, and/or expression of a choice. For each model, the criterion for entry was set at  $P < .05$ . We did not use appreciation as a dependent variable in these models, because the only significant bivariate correlate of appreciation was the mean Attention/Working Memory scaled score ( $r = 0.37$ ;  $P = .009$ ). We also excluded the DRS total score from the list of potential independent variables (IVs), because the variance overlaps with the DRS subscales.

For models involving the MacCAT-T understanding score as the dependent variable, the IVs included the DRS initiation/perseveration and memory subscales, and the mean scaled scores for the Attention/Working

**Table 2. Bivariate Correlations Between Cognitive Scores and MacCAT-T Subscale Scores Among Patients With Schizophrenia or Schizoaffective Disorder**

Cognitive Test Score	Bivariate Correlations, Pearson <i>r</i>			
	Understanding	Appreciation	Reasoning	Expression of a Choice
Mattis Dementia Rating Scale (n = 58)*				
Total	0.49†	0.27*	0.44†	0.34‡
Attention	0.25	0.15	0.33*	0.35‡
Initiation/perseveration	0.35‡	0.14	0.16	0.002
Conceptualization	0.30*	0.17	0.45†	0.34‡
Construction	-0.02	-0.03	0.16	0.11
Memory	0.54†	0.27*	0.46†	0.33*
Specific cognitive abilities, mean scaled scores				
Verbal Comprehension (n = 49)	0.35*	0.08	0.45‡	0.26
Perceptual Organization (n = 49)	0.31*	0.22	0.47†	0.23
Attention/Working Memory (n = 49)	0.38‡	0.37‡	0.54†	0.33*
Processing Speed (n = 48)	0.30*	0.11	0.43‡	0.20
Abstraction/Cognitive Flexibility (n = 49)	0.41‡	0.24	0.39‡	0.38‡
Learning (immediate recall) (n = 45)	0.47‡	0.34*	0.45‡	0.27

Abbreviation: MacCAT-T, MacArthur Competence Assessment Tool for Treatment.

\*Nonsignificant trend,  $P < .05$  but  $P > .01$ .

† $P \leq .001$ .

‡ $P < .01$ .

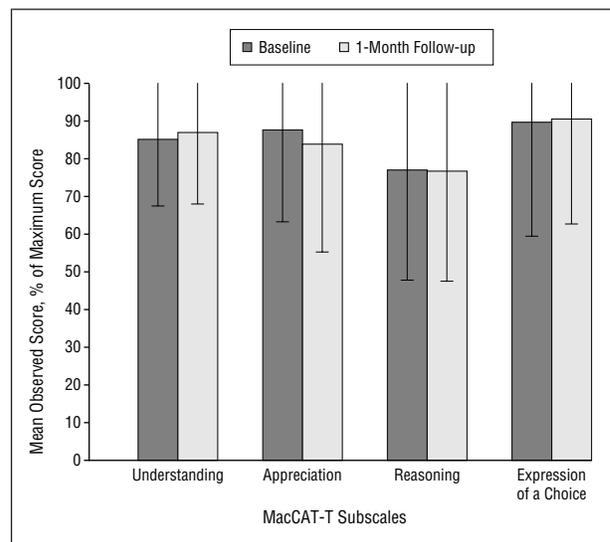
Memory, Abstraction/Cognitive Flexibility, and Learning ability areas. Only the DRS memory subscale score entered the model. The model was significant ( $R^2 = 0.27$ ;  $F_{1,42} = 15.32$ ;  $P < .001$ ); the standardized  $\beta$  for DRS memory was .517 ( $t = 3.91$ ;  $P < .001$ ). None of the other variables accounted for significant additional variance in understanding.

For models in which the MacCAT-T reasoning score was the dependent variable, the IVs included the DRS conceptualization and memory subscale scores and the mean scaled scores for the Verbal Comprehension, Perceptual Organization, Attention/Working Memory, Processing Speed, Abstraction/Cognitive Flexibility, and Learning ability areas. Only the DRS conceptualization subscale entered the model ( $R^2 = 0.22$ ;  $F_{1,42} = 11.94$ ;  $P = .001$ ); the standardized  $\beta$  for DRS conceptualization was .470 ( $t = 3.46$ ;  $P = .001$ ). None of the other variables accounted for significant additional variance.

For models in which expression of a choice was the dependent variable, the IVs included the DRS attention and conceptualization subscale scores and the mean scaled score from the Abstraction/Cognitive Flexibility ability area. The first IV to enter the model was the Abstraction/Cognitive Flexibility score. At that step, the overall model was significant ( $R^2 = 0.14$ ;  $F_{1,47} = 7.79$ ;  $P = .008$ ); the standardized  $\beta$  for abstraction/flexibility was .377 ( $t = 2.79$ ;  $P = .008$ ). The other 2 IVs did not account for significant additional variance.

#### ONE-MONTH STABILITY OF DECISIONAL CAPACITY AMONG PATIENTS

Among the 53 patients with follow-up MacCAT-T data, the test-retest correlations (Pearson  $r$ ) during the 1-month follow-up were highly significant ( $r = 0.72$  for understanding,  $r = 0.73$  for appreciation,  $r = 0.61$  for reasoning, and  $r = 0.45$  for expression of a choice;  $P < .001$ ), sug-



One-month stability of scores on the understanding, appreciation, reasoning, and expression of a choice subscales of the MacArthur Competence Assessment Tool for Treatment (MacCAT-T) among patients with schizophrenia or schizoaffective disorder ( $n = 53$ ). To ease visual comparison across the MacCAT-T subscales, each patient's score was transformed to a percentage of the maximum possible score on the respective subscale. The height of each bar represents the mean of these transformed scores; the error bars represent the standard deviations of these transformed scores.

gesting that the level of each patient's performance relative to the patient group as a whole remained fairly stable. There were no significant differences between baseline and follow-up scores for appreciation ( $t_{52} = 0.91$ ;  $P = .37$ ), reasoning ( $t_{52} = 0.42$ ;  $P = .68$ ), or expression of a choice ( $t_{52} = 0.11$ ;  $P = .91$ ). The mean understanding score changed from 5.1 (SD = 1.0) to 5.2 (SD = 1.1) ( $t_{52} = 2.02$ ;  $P = .048$ ). The stability in MacCAT-T performance during the 1-month retest interval is also illustrated in the **Figure**. For the sake of visual comparison in the Figure, each patient's score on each MacCAT-T subscale was trans-

formed to a percentage of the maximum possible score on that respective subscale.

## COMMENT

To our knowledge, ours is the first study to examine multiple dimensions of treatment-related decisional capacity (understanding, appreciation, reasoning, and expression of a choice) among middle-aged and older patients with schizophrenia. We found that understanding of treatment-related disclosures among middle-aged and older patients with schizophrenia or schizoaffective disorder, as a group, was lower than that seen among the NC subjects, but such group comparisons hide the considerable heterogeneity among older patients with schizophrenia. The patients' level of capacity was not associated with age, or (contrary to our hypothesis) with severity of psychopathology. However, consistent with our hypotheses, level of decisional capacity was strongly associated with cognitive test performance. In our previous preliminary report,<sup>24</sup> we found no significant correlation between the DRS total and MacCAT-T performance, but the sample size in that report was only 16. The patients' level of decisional capacity was stable during the 1-month follow-up.

In stepwise regression analyses, once any single cognitive variable entered the prediction of a MacCAT-T subscale, the other cognitive variables generally did not predict significant additional variance. For example, DRS memory was the only IV to enter the model of understanding, although in bivariate analyses, DRS initiation/perseveration and the Attention/Working Memory, Abstraction/Cognitive Flexibility, and Learning ability areas were also significantly correlated with understanding. There was a large number of cognitive correlates of reasoning, although in stepwise regression analysis, DRS conceptualization entered the model first. Abstraction/Cognitive Flexibility was the only IV to enter for the model of expression of a choice, but the DRS attention and conceptualization subscales were also significant bivariate correlates. Overall, while showing the general importance of cognitive functions to decisional capacity, these findings do not suggest the presence of strong differential relationships among specific cognitive abilities to specific aspects of decisional capacity.

Although cognitive test scores were the best predictors of treatment-related decisional capacity, even the strongest correlations explained about 25% of variance. This highlights the likelihood that decisional capacity is a multiply determined construct, reflecting the interaction of a number of patient characteristics and contextual or environmental factors.

Previous studies have reported significant correlations between psychopathology and some aspects of decisional capacity.<sup>7,12,15,40</sup> Although the present study focused on treatment-related decisional capacity among middle-aged and older outpatients, most previous studies have involved predominantly younger patient samples and many have focused on hospitalized patients and/or assessed capacity in terms of consenting to research participation. The reasons for different findings may in part rest in one of these factors. However, the pattern we have

observed is consistent with the overall findings in the functional outcome literature in schizophrenia. Severity of psychopathology tends to have minimal demonstrable impact on everyday functioning, whereas performance on neuropsychological tests tends to be among the best predictors of everyday functioning.<sup>41-46</sup>

Although patients' mean levels of decisional capacity impairment were relatively mild, and we observed remarkable stability in decisional capacity during the 1-month follow-up, it should be noted that capacity was evaluated in a specific context (treatment with atypical antipsychotic medications), and that participants were clinically stable outpatients (although many were living in board-and-care homes, where at least some of their daily functional needs were met by the board-and-care staff). It is likely that worse impairments in decisional capacity would be evident in settings with higher proportions of patients with worse cognitive impairment (eg, chronic institutionalized settings). Also, patients in acute psychotic phases might show more difficulty making meaningful choices about their own treatment. The observed stability may provide clinicians with some assurance that if a patient initially understood a treatment disclosure, and there has been no significant change in mental status, he or she may retain that intact capacity. The context or content relevant to the decision may also be important in that patients may have difficulty understanding some types of treatments and their risks and benefits, while showing better understanding (or appreciation or reasoning) regarding other treatment decisions.

As clinicians discuss treatment options with their patients, it is helpful to attend to possible difficulties that patients may have in understanding, appreciating, and reasoning with the information being disclosed (regardless of the patient's age or diagnosis). We are not suggesting that the MacCAT-T must be routinely used to screen capacity in all middle-aged and older patients with schizophrenia. It is important that patients make meaningful informed choices when consenting to or refusing treatment, but when defining the border of what constitutes "capable," it is also important to avoid arbitrarily holding those with psychiatric disorders to a higher standard than that which can be expected from the general population. Also, capacity should not be viewed as an unmodifiable trait. Patients having difficulty with initial understanding of disclosed material can often benefit from educational efforts designed specifically to teach them the relevant information.<sup>12-14</sup>

Our effort to clarify factors associated with worse or better capacity is in part motivated by a desire to facilitate more effective informed consent procedures. Such facilitation may come by improving the way treatment disclosures are delivered.<sup>12-14</sup> An additional avenue, however, is the possibility of directly ameliorating the underlying cognitive deficits that have an impact on decisional capacity. Controversy remains regarding whether the second-generation antipsychotic medications actually improve cognitive functioning in patients with schizophrenia. However, there is recent interest in developing interventions that directly target the cognitive deficits of schizophrenia, rather than medications that may or may not aid cognition as a by-product of their antipsy-

chotic effects. The relative importance of cognition to decisional capacity and, in turn, the importance of decisional capacity to fully effective and ethical treatment, should provide further impetus for efforts to develop interventions that may enhance cognitive functioning.

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Corresponding author: Barton W. Palmer, PhD, Geriatric Psychiatry Research Center 116A-1, Veterans Affairs San Diego Healthcare System, 3350 La Jolla Village Dr, San Diego, CA 92161 (e-mail: bpalmer@ucsd.edu).

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