Generalizability of Brief Psychiatric Rating Scale prototypical profiles and their use in evaluating treatment outcomes

GARY K. BURGER,¹ ROBERT D. YONKER,² ROBERT J. CALSYN,¹ GARY A. MORSE,³
W. D. KLINKENBERG⁴

1 Psychology Department, University of Missouri – St Louis, USA

2 School of Business, University of Toledo, Ohio, USA

3 Community Alternatives, St Louis, USA

4 Missouri Institute of Mental Health, St Louis, USA

Abstract

The generalizability of previously isolated prototypical profiles of the Brief Psychiatric Rating Scale (BPRS) was examined in a sample of homeless individuals with both severe mental illness and substance-use problems who were part of a 24-month study that evaluated the effectiveness of various treatment interventions. These prototypical profiles (depressed, actively psychotic, and withdrawn) did generalize to the new sample, with a 59.4% coverage rate. In addition, some of the participants' BPRS profiles (10%) were characterized by negative correlations with the withdrawn profile (termed agitated) and others (17%) by minimal within-profile variability (labelled flat). Overall, with these additions, the coverage of the prototypical profiles was 86.4%. These prototypical profiles were then used to evaluate changes in profile elevation and shape over the course of the study. Generally, changes in both profile elevation and shape were moderated by the particular prototypical profile that the participants resembled. The use of these prototypical profiles in evaluating change permits a more precise analysis of what kind of individuals manifest particular effects. The clinical meaning of the BPRS profile changes observed was also discussed.

Key words: Brief Psychiatric Rating Scale, profiles, Q-type factor analysis

Introduction

The Brief Psychiatric Rating Scale (BPRS) consists of a number of rating scales that assess the degree of presence of various psychological states and symptoms (such as anxiety or depression) on a seven-point scale, with higher scores indicating greater severity of the symptom (Overall and Gorham, 1962, 1988). The instrument has been employed in a wide variety of settings, and two comprehensive reviews have summarized the psychometric properties of the BPRS and have described the various uses of the instrument (Hedlund and Viewig, 1980; Faustman and Overall, 1999). The 18-item version of the BPRS has been used to assess the effects of various interventions in a variety of populations. Scale scores that average (or sum) sets of items, are often used as outcome measures

rather than individual items. Such scales are usually more reliable than individual items and measure more broad dimensions of psychopathology than a single item. These scales have usually been based upon the results of factor analyses of the BPRS in various populations (Overall and Klett, 1972; Guy, 1976; Burger et al., 1997; Meuser et al., 1997; Lachar et al., 2001).

Burger et al. (2000) used scale scores based upon the Guy (1976) factor model to identify three prototypical BPRS profiles characteristic of the major scale score patterns (depressed, actively psychotic, withdrawn) of homeless individuals using a variant of Q-type factor analysis suggested by Skinner (1979). This procedure analysed correlations between individuals (rather than between variables as in the more familiar R-type factor analysis) over the BPRS scale scores. This approach

was similar to that of Overall and Klett (1972) in developing profiles, although they used item scores (rather than scale scores), did not employ all 18 items used in the present study, and studied a general psychiatric sample rather than a homeless sample. Of course, a variety of other procedures (such as cluster analysis) could have been used to develop the profiles. The resultant BPRS scale score profiles (prototypical profiles) from the Burger et al. (2000) study successfully classified 86% of the individuals studied and were used to compare the effectiveness of two treatments, broker case management (the control group) versus assertive community treatment. The use of the prototypical profiles permitted the differentiation between changes in profile shape and profile elevation (the overall mean of the profile) over the 24 months of the study. By way of illustration, an individual's profile (over the BPRS scale scores) could resemble one of the prototypical profiles at baseline, but during the course of treatment become more similar to another prototypical profile. Such changes in profile shape (the pattern of ups and downs of the scale scores of the profile) – the configurational aspect of the profile – could occur with or without changes in profile elevation (the overall profile mean). For instruments such as the BPRS (or the MMPI), profile elevation could be considered to be a measure of the overall degree of psychopathology, while the particular profile shape reflects a particular pattern or hierarchy of symptoms within an individual. To offer another example, the shape of a subject's profile could remain the same over treatment (reflecting the same pattern of symptoms), but profile elevation could decrease, indicating a lessening in symptom severity. The correlations between the BPRS scale score profile of an individual and the prototypical profiles also offer a convenient way to describe the shape of that profile.

The utility of the BPRS prototypical profiles, of course, depends in part on their generalizability across samples. If such profiles were only characteristic or descriptive of a specific group, then it would not be possible to employ similar analytical and descriptive procedures across studies. The profiles should be representative of major subgroups of individuals as one moves from sample to sample – they should have adequate coverage. The purpose of this paper is to evaluate the generalizability of the prototypical BPRS profiles previously isolated in a new sample of homeless individuals with mental illness and substance abuse problems (Burger et al., 2000). These profiles

will also be used to evaluate the outcomes of a 24-month treatment study. The original profiles, which characterize profile shape (and not elevation), are presented in Table 1. The profiles have been scaled to have a mean of 50 and a standard deviation of 10 to make them more easily interpretable. More complete descriptions of the profiles, their derivation, and their correlates can be found in Burger et al. (2000).

Table 1. BPRS score profiles from prior study

BPRS scale	Profile		
	Depressed	Actively psychotic	Withdrawn
Anxiety-depression	69	51	45
Hostility-suspicion	46	48	45
Thinking disorder	44	69	52
Withdrawal	50	42	68
Activity	41	40	40

Note: BPRS = brief psychiatric rating scale. Profiles have been scaled to have a mean of 50 and a standard deviation of 10.

Materials and methods

Participants

The study participants were 153 homeless individuals with both severe mental illness and a substance abuse problem. These people were culled from the initial sample of 193 because they had complete data for the entire 24 months of the study. Tests between those included for these analyses and those excluded yielded no significant demographic or BPRS scale score differences. Those included had been homeless for an average of 35.8 days in the previous three months. The sample was predominantly male (72%) and had an average age of 39.8 years. African-Americans constituted 67% of the sample; 28% were Anglo-Americans and 2% other. Only 3% of the sample were currently married and 53% had never been married. A third of the sample reported having some college education; 26% received a high school diploma, and 41% had not completed high school. All participants had a severe DSM-IV Axis I disorder, with schizophrenia (47%) being the most prevalent diagnosis followed by atypical psychosis (12%), bipolar disorder (11%), and major depression (11%). Alcohol, cocaine (usually

crack), and marijuana were the drugs abused most often, with 63% of the sample meeting criteria for a substance use disorder for one or more drugs and 47% meeting the criteria for substance dependence on at least one drug.

Treatment conditions

Participants who met the eligibility criteria were invited to participate in a randomized experiment that evaluated the effectiveness of three different interventions for helping the target population (Calsyn et al., 2000). The three interventions were: (1) treatment-as-usual control, (2) assertive community treatment (ACT), and (3) integrated treatment (IT). Participants in the control condition were simply referred to a mental health or substance abuse treatment agency in the area and provided transportation for an initial visit. Assertive community treatment provides intensive treatment using a team approach for clients with severe mental illness (Stein and Test, 1980). Staff carry small caseloads, provide a wide array of services (often in the client's home), and are available 24 hours a day. Morse et al. (1992, 1997) modified ACT for use with homeless clients. Integrated treatment adds specialized substance abuse services to the ACT approach (Drake et al., 1998). In comparing the effectiveness of the three interventions, Calsyn et al. (2000) found no significant differences between ACT and IT on any of the outcome variables. In addition, implementation analyses suggested that the substance abuse components of the IT intervention were not implemented very well. Thus, for this study we have created only two experimental conditions, control and treatment (ACT plus IT).

Procedure

Outreach workers conducted informal screening interviews with potential participants at emergency shelters, hospitals, and other social service agencies that served homeless individuals with mental health and substance abuse problems. Individuals who appeared to qualify for the project were invited to engage in a formal screening interview. This interview involved questions about current living situation and a thorough diagnostic assessment using the Structured Clinical Interview for DSM-IV (SCID) (First et al., 1996). Respondents provided informed consent for the formal screening interview and were paid \$10 for their participation.

The BPRS was administered on five different occasions (baseline, 6 months, 12, months, 18 months, and

24 months). Six different interviewers administered the BPRS for this study. Four of the interviewers had masters' degrees (social work, counselling, or gerontology). Two interviewers had only a bachelor's degree, but both interviewers had over 10 years of experience interviewing individuals with severe mental illness. Each of the interviewers received 10 hours of training in administering the BPRS. This training included watching videotapes, watching an experienced interviewer, and conducting practice interviews under the supervision of an experienced interviewer. The BPRS subscales have been shown to be relatively free of rater error given appropriate training of raters (Trusty, Burger, Calsyn, Klinkenberg, and Morse, 1996; Schutzwahl, Jarosz-Nowak, Briscoe, Szajowski, Kallert, and the Eden Study Group, 2003).

Analysis

Scores on the five BPRS scales were obtained by averaging scores on the appropriate items of the 18-item BPRS (Burger et al., 1997; Burger et al., in press). The scales are thinking disorder (grandiosity, hallucinations, unusual thought content, and conceptual disorganization), withdrawal (disorientation, blunted affect, emotional withdrawal, and motor retardation), anxiety-depression (somatic concerns, anxiety, depression, and guilt), hostility-suspicion (hostility, suspiciousness, and uncooperativeness), and activity (tension, excitement, and mannerisms and posturing). For each of the five time periods when the BPRS was administered, participants' BPRS scale score profiles were correlated with the three prototypical profiles, yielding the projections of each individual profile on the prototypical profiles. An individual profile was classified as being similar to a prototypical profile if that correlation exceeded 0.50. Profile elevation was also computed at each time period. Coverage of the prototypical profiles was evaluated at each time period, and changes in profile shape and elevation over the course of the study were studied using a variety of methods.

Results

Initially, the number of individual BPRS scale score profiles identified as being similar to one of the prototypical profiles was tabulated for each of the five time periods. Although the classification rates were quite high, a number of profiles exhibited minimal or no variation over the BPRS scale scores. Because these profiles really had no shape, they were assigned to a

'flat' category. A flat profile was defined as a profile in which none of the 5 BPRS scale scores differed from the profile mean by more than 0.5 (on a scale that ranged from 1 through 7). This is, of course, an arbitrary definition, and others would be possible. This approach rests on the judgement that a profile element would have to have a certain minimal deviation from the profile mean for it have a pattern – at least one distinctive elevation. Over all five measurement times, an average of 92.2% of the profiles resembled one of the prototypical profiles (with either a positive or negative correlation greater than 0.50) or were flat (range over the 5 periods was 90.8% to 96.7%). The mean percentage of flat profiles was 17% (range over the 5 periods was 3.3% to 25.5%). While the depressed and actively psychotic profiles accounted for a large number of the individual profiles (35.6% and 19.4% respectively), the withdrawn profile occurred with a low frequency (4.4%). Further, about 10% of the individual profiles evidenced a strong negative correlation with the withdrawn profile, indicating a profile on which the scales defining the profile are reversed in items of elevation around the profile mean. This 'mirror image' or 'negative pole' of the withdrawn profile has an elevated activity scale score coupled with a low withdrawal scale score – just the reverse of the withdrawn profile depicted in Table 1. We have labelled this negative pole agitated. Only a small number of profiles resembled the negative poles of the depressed and actively psychotic profiles (3.4% in total). Thus, 59.4% of the profiles in this study corresponded to one of the previously isolated profiles (Burger et al., 2000): 10% resembled the mirror image of the withdrawn profile from Burger et al. (2000), and 10% were flat. These rates compare favourably with the coverage of some of the major MMPI actuarial systems (Payne and Wiggins, 1968).

The BPRS item means of the three profile types (at baseline) which occurred with frequencies of over 5% of the sample are contained in Table 2. As the profile label suggests, individuals with the agitated profile are high on suspiciousness, hostility, excitement, and tension. Consistent with being the mirror image of the withdrawn profile, agitated individuals score low on motor retardation, blunted affect, and emotional withdrawal. Individuals with the depressed profile are high on anxiety and depression. Actively psychotic individuals are high on unusual thought content, hallucinations, and grandiosity. The profiles of the

BPRS items in Table 2 were correlated with the six BPRS item profiles described by Overall and Klett (1972) in order to determine the similarity of the profiles derived from a larger, general psychiatric population with the profiles derived from our more specific, dual diagnosed homeless sample. Since Overall and Klett (1972) used 16 items (rather than the 18 items utilized in the current study), only the 16 items in common were used to compute the correlations. The agitated profile of the current study correlated (-0.70) with the withdrawn-disorganized schizophrenia profile, the depressed profile of the current study correlated (0.79) with the hostile depression profile, and the present actively psychotic profile correlated (0.59) with the florid thinking disorder profile. These resemblances suggest both similarities and differences with the Overall and Klett (1972) profiles. The fact that the samples were different, the number of items different, and that the profiles of the current study were derived by analysing scale scores rather than items (the method employed by Overall and Klett) all probably contribute to the differences.

A variety of analyses were conducted to examine changes in BPRS scale score profiles over the 24 months of the study. Condition (control versus treatment) and time (baseline, 6 months, 12 months, 18 months, and 24 months) and profile type (flat, depressed, actively psychotic, agitated, and other – profiles that were unclassified or classified as low frequency prototypical profiles) were independent variables. Note that the profile type classification describes the *shape* of the profile, which is unrelated to and independent of the elevation (the dependent variable and overall mean) of the profile. Changes in profile elevation, which would measure the overall level of symptoms, were assessed by a series of MANOVAS using condition, time, and profile type as independent variables. A separate analysis was performed for differences between each of the adjacent time periods, with profile type at the start of the time period in question as an independent variable. This was necessary (rather than an analysis over all time periods simultaneously) because an individual's profile type membership sometimes varied from one time period to another.

There were no significant effects involving the condition variable in any of the analyses. While there was a significant time main effect for the period baseline to 6 months (elevation decreased in this time period and

showed little change in subsequent time periods), and significant type effects for all analyses except the 18 to 24 month period, the presence of significant interaction effects dictated that these should be analysed rather than the main effects. Significant time $\times$ profile type interactions were found for baseline to 6 months ($F(4,144) = 2.99, p < 0.02, \eta^2 = 0.08$), from 6 months to 12 months ($F(4,144) = 2.56, p < 0.04, \eta^2 = 0.067$), and from 12 months to 18 months ($F(4,144) = 3.13, p < 0.02, \eta^2 = 0.081$). There were no significant effects of any kind for the 18 to 24-month time period. For all mean comparisons described hereafter in this paper, Tukey's HSD test was used with α set to 0.05. From baseline to 6 months, the agitated profiles evidenced a significant decrease in elevation (2.73 to 1.99), the depressed profiles showed a significant decrease (2.29 to 1.82), and the other profiles significantly declined from 2.41 to 2.01. From 6 months to 12 months, the actively psychotic profiles significantly decreased from 2.62 to 2.32. In the 12 to 18 month period, the elevation of the flat profiles significantly increased (from 1.26 to 1.60), and the actively psychotic profiles decreased significantly from 2.36 to 2.11. These results indicate that there is some utility in looking at elevation changes in terms of profile type, as elevation changes occurred differentially as a function of these types. Profile type (the shape of the profile) moderated the effects of time on elevation change (increase or decrease of symptoms) over the course of the study.

Changes in profile shape were evaluated in two ways. First, differences in profile shape between each adjacent time period were assessed by computing the distance moved by the profile in the three-dimensional space of the prototypical profiles (the square root of the sum of the squares of the differences between the correlations with the three prototypical profiles at the two times). These distances (Euclidean) were then analysed in four separate analyses, each involving the amount of change from one adjacent time period to another (for example, baseline to 6 months, 6 months to 12 months, and so forth). Each of these analyses consisted of a conditions (control versus treatment) by profile type (flat, depressed, actively psychotic, agitated, and other) ANOVA. Significant profile type effects were found for the first three of time periods, and no significant effects were found in the period from 18 months to 24 months. Mean differences in profile change were tested using Tukey's HSD

test, with $p = 0.05$. For the period baseline to 6 months ($F(4,144) = 3.92, p < 0.001, \omega^2 = 0.07$), the depressed profiles changed the least of all the profiles, and showed significantly less change than both the flat and other profiles. From 6 months to 12 months ($F(4,144) = 7.11, p < 0.001, \omega^2 = 0.14$), the depressed profiles had the lowest amount of change, and evidenced significantly less change than the flat and other profiles. The actively psychotic profiles also showed significantly less change than the other and flat profiles. For the time period 12 months to 18 months ($F(4,144) = 4.66, p < 0.001, \omega^2 = 0.09$), the depressed profiles again showed significantly less change than did the other and flat profiles. During the last period, the depressed profile continued to evidence the least amount of change, although the differences with the other profile types were not significant. The results were fairly consistent over all four analyses, with the depressed profiles showing the lowest amount of change in profile shape, and the flat and others profile grouping showing the larger amount of profile shape change. There were no main effects of condition or condition by profile type interactions.

Another way to look at change in profile shape involves examining changes in profile type classification from one time period to the next. This is a measure of the degree to which a profile tended to resemble some other prototypical profile to a greater extent at the end of a particular time period, as opposed to the overall amount of distance between the individual profiles from the beginning to the end of a particular time period (as assessed by the previous dependent variable). The average (over the four time changes) percentage of profiles of a given type that changed to some other type in adjacent time periods is depicted in Table 3. The percentage of profiles that remained the same can be readily obtained by subtracting the table entries from 100%. The depressed profile tended to change less than the other profile types.

Of the agitated profiles that changed, an average of 46.7% (over the four time period changes) became depressed profiles. An average of 40.6% of the depressed profiles that changed became flat profiles, and an average of 29.5% of the flat profiles that changed became depressed profiles. No particular pattern of changes was noted for the actively psychotic profiles.

Table 2. Mean BPRS item scores of prototypical profiles

	Agitated (N = 22)	Depressed (N = 56)	Actively psychotic (N = 30)
Somatic concern	2.95	2.75	2.40
Anxiety	3.81	4.28	3.10
Depression	3.82	4.55	2.63
Guilt	3.18	3.35	1.66
Hostility	3.86	3.19	2.60
Suspiciousness	3.90	2.60	3.43
Unusual thought content	2.59	2.01	4.73
Grandiosity	2.31	1.44	3.40
Hallucinations	3.50	3.03	4.50
Disorientation	1.77	1.38	1.90
Conceptual disorganization	2.18	1.35	2.76
Excitement	3.63	1.39	2.10
Motor retardation	1.04	1.67	1.43
Blunted affect	1.68	2.76	2.00
Tension	3.63	2.30	2.06
Mannerisms and posturing	1.68	1.07	1.00
Uncooperative	2.04	1.28	1.46
Emotional withdrawal	1.54	1.92	1.70

Table 3. Average percentage of profile classification changes between adjacent time periods

Profile type	Average percentage change
Agitated	72.4
Depressed	44.3
Actively psychotic	48
Flat	64.3
Others	59.5

Discussion

The fact that the prototypical BPRS profiles showed a reasonably good classification rate argues that they are generalizable to other homeless samples and can be used to evaluate and describe profile shape in other studies that employ the BPRS with similar samples. Hopefully, this taxonomy will prove useful to other investigators. The typing operation is quite simple: correlate each individual's profile with the prototypical profiles, and classify each individual on the basis of which prototypical profile it correlates at least 0.50

with (profiles correlating less than 0.50 are regarded as unclassified). This type of membership variable then can be used as a moderator variable to look at other relationships between variables of interest in the study. Clearly, more empirical work is needed to determine if the profiles identified in Burger et al., (2000) and in this study generalize to other populations. Obviously, one would expect that the percentage of individuals exhibiting each of the prototypical profiles would vary across samples.

The results of this study also clearly demonstrated that some method should be employed to screen flat profiles. The procedure used in this study seems reasonable (at least one scale deviating from the profile mean by 0.5 or greater), but others (such as at least a difference of 1 or 2 between a pair of scales) could also be employed. The widespread availability of statistical packages such as SPSS make such a screening relatively simple. While such flat profiles were not present in Burger et al. (2000), their presence in this sample suggests that such a procedure should be routinely used when one is employing profile shape as an analytical measure. Indeed, in their classic paper on profiles, Cronbach and Gleser (1953) made precisely that suggestion. Failure to do so means that such profiles could be regarded as either unclassified, or classified into a profile type when the profile shape is really flat. The fact that 10% of the profiles in this study resembled the negative pole of one of the prototypical profiles indicates that five BPRS profile types occur in homeless samples with some frequency – flat, depressed, actively psychotic, withdrawn, and agitated.

The emergence of the agitated profile in this study is consistent with both clinical observations and data collected by other investigators (Swann et al., 1993; Peruge et al., 1997; Lindenmayer, 2000; Benazzi et al., 2002). Lindenmayer (2000: 5) defines agitation as follows: 'Agitation is a nonspecific constellation of relatively unrelated behaviours that can be seen in a number of different clinical conditions, usually presenting a fluctuating course.' Motor restlessness, irritability, verbal aggressiveness, and physical hostility are typical symptoms listed under the rubric of agitation – symptoms that are very similar to BPRS items that are elevated on the agitated profile. Agitated depression, agitated dementia, and agitated psychosis are three examples of clinical syndromes for which the agitation symptoms complicate the treatment of what is seen as the more pervasive pathology – depression,

dementia, or psychosis (Lindenmayer, 2000). Not only do agitation symptoms increase treatment difficulty, but individuals with the same underlying disorder may actually need a different treatment regimen depending on whether agitation symptoms are present or not. For example, some research indicates that SSRIs may be more effective in treating agitated depression than other antidepressants (Filteau et al., 1995). Similarly, valproic acid has been reported as an effective anti-agitation agent with dementia patients (Lindenmayer, 2000).

The data also revealed considerable variability in profile stability over time. The agitated profile was the least stable profile. This finding is consistent with the research of Coryell et al. (1994) which found that agitated depression was less stable than other types of depression. It is also interesting to note that when the profile of agitated individuals changed, the most frequent new profile to emerge was the depressed profile, suggesting that, at least for this sample, depression was the more pervasive problem that needed treatment. Individuals with the flat profile also exhibited a significant amount of profile change over the course of the study. When individuals with a flat profile changed, their new profile was more likely to resemble the depressed profile than any other profile. This finding also underscores the pervasiveness of depression in this sample of homeless persons suffering from severe mental illness.

Consistent with our prior study, individuals with a depressed profile exhibited the greatest profile stability (Burger et al., 2000). When individuals with the depressed profile changed, their new profile was more likely to resemble the flat profile than the other profiles. Profile stability was only slightly less for the actively psychotic profile than the depressed profile. In the prior study (Burger et al., 2000) individuals with the actively psychotic profile who changed were more likely to change to the depressed profile than the other profiles. In this study, individuals with the actively psychotic profile did not display any consistent pattern in how their profiles changed over time. The most obvious difference in the two samples is the level of substance abuse. All individuals in the current sample met the criterion for substance use disorder and/or substance dependence, whereas only 24% of the earlier sample (Burger et al., 2000) had a substance abuse diagnosis. The presence of substance abuse problems often exacerbates other symptoms, reduces reliable reporting of symptoms, and makes it difficult to render

an accurate diagnosis. Determining whether psychotic symptoms are endogenous or caused by substance abuse is particularly problematic. Thus, the greater unpredictability of profile change in individuals with the actively psychotic profile in this sample versus the earlier sample (Burger et al., 2000) may be a consequence of the greater use of alcohol and drugs by this sample.

The significant amount of profile instability observed in this study also has important clinical implications. Clinicians may be well advised to adjust their drug regimens and other interventions according to the symptom profile that their clients are currently displaying. Periodic assessment of clients using the BPRS profiles may be a non-burdensome, yet systematic, method to monitor symptom variability during the course of treatment. For example, as noted above, individuals with the agitated profile frequently changed to the depressed profile during the course of the study. The medications that work for non-agitated depression may be less effective with agitated depression (Filteau et al., 1995). Similarly, clients who move between the actively psychotic profile and the agitated profile may need a different drug regimen.

The lack of any effects involving the condition variable (treatment versus control) means that the interventions that were being evaluated did not differ from the more standard treatment. Still, the inclusion of profile type as an independent variable in the analyses indicates that the changes that did occur often were a function of profile type, as manifested in the profile type $\times$ time interactions with elevation and the profile type effects in the analysis of profile change. That is, the type membership variable acted as a moderator variable in a number of the analyses. For instance, with respect to elevation, the significant decreases observed from baseline to 6 months were primarily present among the agitated and depressed types, and not all profile types. In the time periods 6 months to 12 months and 12 months to 18 months, the actively psychotic types evidenced significant elevation decreases, but not other profile types. This is consistent with the clinical observations of the case managers who believed that it took longer to have an impact on the symptoms of clients who were the most actively psychotic. It took longer to find a drug regimen that provided symptom relief for actively psychotic clients than other clients. In addition, the environmental interventions (housing and financial

assistance) that the case managers were able to provide for their clients may have had a greater impact on depression symptoms than psychotic symptoms.

In summary, the prototypical profiles described in Burger et al. (2000) clearly generalized to another homeless sample, indicating that they can be safely used with such a population. Investigators should be careful, however, to screen for flat profiles. From an analytic perspective, the use of these prototypical profiles permits a more precise analysis of what kind of individuals manifest particular effects – the profile typology can be profitably used as a moderator variable. If these BPRS profiles can be shown to generalize to other samples, they could be employed in a similar fashion to this study.

Acknowledgements

The authors thank the study participants for their cooperation in this study; we hope that their lives have improved as a result of their participation. We also appreciate the cooperation of the many agencies who provided treatment to the study participants, particularly Community Alternatives, Places for People, and Peter and Paul Community Services. The following individuals were critical to the execution of this project: Suzanne McCudden, Ruth Smith, Mary Maguire, Bill Tourville, Joris Miller, Gretchen Gerteis, Gail Saulnier, Kecia Smith, Lois Thomas, and Dorothy Gano. Financial support was provided by the National Institute of Mental Health. However, the views expressed in this paper are the sole responsibility of the authors.

References

- Benazzi F, Helmi S, Bland L. Agitated depression: Unipolar? *Annals of Clinical Psychiatry* 2002; 14(2): 97–104.
- Burger GK, Calsyn RJ, Morse GA, Klinkenberg WD, Trusty M. Factor structure of the expanded Brief Psychiatric Rating Scale. *Journal of Clinical Psychology* 1997; 53(5): 451–4.
- Burger GK, Calsyn RJ, Morse GA, Klinkenberg WD. Prototypical profiles of the Brief Psychiatric Rating Scale. *Journal of Personality Assessment* 2000; 75(3): 373–86.
- Burger GK, Yonker RD, Calsyn RJ, Morse GA, Klinkenberg WD. A confirmatory factor analysis of the Brief Psychiatric Rating Scale in a homeless sample. *International Journal of Methods in Psychiatric Research* 2003; 12(4): 192–6.
- Calsyn RJ, Morse GA, Klinkenberg WD, Yonker RD, Calsyn M. Evaluating the effectiveness of treatment programs for dual diagnosed clients. Paper presented at the twenty-first Latin American Congress of Psychiatry, Lima, Peru, 2000.
- Coryell W, Winokur G, Shea, T, Maser JD, Endicott J, Akiskal HS. The long-term stability of depressive subtypes. *American Journal of Psychiatry*, 1994; 151(2): 199–204.
- Cronbach LJ, Gleser GC. Assessing similarity between profiles. *Psychological Bulletin* 1953; 50: 465–73.
- Drake RE, Mercer-McFadden C, Mueser K, McHugo GJ, Bond GR. A review of integrated mental health and substance abuse treatment for patients with dual disorders. *Schizophrenia Bulletin* 1998; 24: 569–608.
- Faustman WO, Overall JE. Brief Psychiatric Rating Scale. In M Maruish (ed.) *The Use of Psychological Testing for Treatment Planning and Outcome Assessment*. 2 edn. Hillsdale NJ: Erlbaum, 1999, pp. 791–830.
- Filteau MJ, Baruch P, Lapierre YD, Bakish D, Blanchard A. SSRIs in anxious-agitated depression: A post-hoc analysis of 279 patients. *International Clinical Psychopharmacology* 1995; 10(1): 51–4.
- First MB, Gibbon M, Spitzer RL, Williams J. *Users Guide for Structured Clinical Interview for DSM-IV Axis I Disorders-Research Version*. New York: New York State Psychiatric Institute, 1996.
- Guy W. *ECDEU Assessment Manual for Psychopharmacology*, Revised. Rockville MD: US Department of Health and Human Services, 1976.
- Hedlund JL, Viewig BW. The Brief Psychiatric Rating Scale (BPRS): a comprehensive review. *Journal of Operational Psychiatry* 1980; 11: 48–65.
- Lachar D, Bailey SE, Rhoades HM, Espadas A, Aponte M, Cowan KA, Gummattira P, Kopecky C, Wassef A. New subscales for an anchored version of the Brief Psychiatric Rating Scale: Construction, reliability, and validity in acute psychiatric admissions. *Psychological Assessment* 2001; 3(3): 384–95.
- Lindenmayer JP. The Pathophysiology of Agitation. *Journal of Clinical Psychiatry* 2000; 61(14): 5–10.
- Mueser KT, Curran PJ, McHugo GJ. Factor structure of the Brief Psychiatric Rating Scale in schizophrenia. *Psychological Assessment* 1997; 9: 196–204.
- Morse GA, Calsyn RJ, Allen G, Tempelhoff B, Smith R. Experimental comparison of the effects of three treatment programs for homeless mentally ill people. *Hospital and Community Psychiatry* 1992; 43: 1005–10.
- Morse GA, Calsyn RJ, Klinkenberg WD, Trusty ML, Gerber F, Smith R, Tempelhoff B, Ahmad L. An experimental comparison of three types of case management for homeless mentally ill persons. *Psychiatric Services* 1997; 48: 497–503.
- Overall JE, Gorham DR. The Brief Psychiatric Rating Scale. *Psychological Reports* 1962; 10: 799–812.
- Overall JE, Gorham DR. The Brief Psychiatric Rating Scale (BPRS): recent developments in ascertainment and scaling. *Psychopharmacology Bulletin* 1988; 24: 97–9.
- Overall JE, Klett CJ. *Applied Multivariate Analysis*. New York: McGraw-Hill, 1972.

- Payne FD, Wiggins JS. The effects of rule relaxation and system combination on classification rates in two MMPI 'cookbook' systems. *Journal of Consulting and Clinical Psychology* 1968; 32: 734–6.
- Perugi G, Akiskal HS, Micheli C, Musetti L, Paiano A, Quilici C, Rossi L, Cassano GB. Clinical subtypes of bipolar mixed states: Validating a broader European definition in 143 cases. *Journal of Affective Disorders* 1997; 43: 169–80.
- Shutzwohl M, Jarosz-Nowak J, Briscoe J, Szajowski K, Kallert T, Eden Study Group. Inter-rater reliability of the Brief Psychiatric Rating Scale and the Groningen Social Disabilities Schedule in a European multi-site randomized controlled trial on the effectiveness of acute psychiatric day hospitals. *International Journal of Methods in Psychiatric Research* 2003; 12(4): 197–207.
- Skinner HA. Construct validation approach to psychiatric classification. In T Mellon, and GL Klerman (eds) *Contemporary Directions in Psychopathology*. New York: Guilford, 1979, pp. 307–30.
- Stein LJ, Test MA. The Training in Community Living Model: a Decade of Experience. *New Directions for Mental Health Services* series, no. 26. San Francisco: Jossey Bass, 1980.
- Swann AC, Secunda SK, Katz MM, Croughan J, Bowden CL, Koslow SH, Berman N, Stokes PE. Specificity of mixed affective states: clinical comparison of dysphoric mania and agitated depression. *Journal of Affective Disorders* 1993; 28: 81–9.
- Trusty ML, Burger GK, Calsyn RJ, Klinkenberg WD, Morse GA. Generalizability of the scales of the original and expanded versions of the Brief Psychiatric Rating Scale. *International Journal of Methods in Psychiatric Research* 1996; 6: 195–201.

Correspondence: Gary K. Burger, Psychology Department, 8001 Natural Bridge Road, St Louis, MO 63121, USA.

Telephone (+1) 314 5165383.

Fax (+1) 314 5165392.

Email Gburger@umsl.edu.