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Psychopathological and Functional Correlates of Behavioral Activation and Avoidance in Schizophrenia

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Abstract

Behavioral activation and avoidance are well studied in depression, yet the relationship of these constructs to symptoms, cognitive ability and functioning in schizophrenia is poorly understood. In a sample of 73 middle-aged and older outpatients with schizophrenia (mean age=50.3, sd=6.3), we examined the relationship of the Activation and Avoidance subscales of the Behavioral Activation for Depression Scale with measures of psychopathology (Positive and Negative Symptoms, Depression), global cognitive ability, and global cognitive ability, and functioning (observer-rated, performance-based, and subjective functioning). Neither activation nor avoidance related to sociodemographic variables, age of onset, or anti-psychotic dose. Although activation and avoidance were significantly inter-correlated, only behavioral activation was significantly associated with depression and subjective functioning, whereas only avoidance related to negative symptoms. Avoidance accounted for significant variation in observer-rated functioning after adjusting for cognitive ability. These results suggest that activation and avoidance may be important therapeutic targets in schizophrenia, with somewhat divergent pathways among psychopathologic features to functional impairment.

Keywords

Schizophrenia; psychosis; activation; avoidance; depression; functioning

Introduction

There is increasing interest in affective and motivational aspects of schizophrenia, given their relevance to goal-directed behavior and functional impairments (Diego, 2010; Horan et al, 2008). In addition to the traditional symptom clusters of hallucinations, delusions, and negative symptoms, people with schizophrenia experience, on average, higher trait negative affectivity and, less consistently, lower positive affect when compared to normal comparison subjects (Horan et al, 2008). A large body of research has posited two motivational systems underlying affective vulnerability across psychopathological conditions, which are activation and avoidance (Carver, 2001; Johnson et al, 2003). Activation is linked with positive affect and entails goal-directed behavior and completion of activities. Avoidance aligns with negative affect and to behaviors related to escaping aversive stimuli and feeling states; these behaviors may be negatively reinforcing in the short-term yet may produce

functional impairment over time. People with schizophrenia frequently exhibit deficits in activation, such as anhedonia and passivity, as well as avoidance behaviors, such as emotional and social withdrawal (Horan et al, 2008).

Whereas a number of studies have linked behavioral activation (Armento and Hopko, 2007; Hopko et al, 2003) and high avoidance behavior (Mausbach et al, 2006; Ottenbreit and Dobson, 2004; Penley et al, 2002) with depression, only a handful of studies have examined constructs related to activation and avoidance in schizophrenia. Sholten et al. (2006) administered a scale measuring the Behavioral Inhibition /Behavioral Activation Systems (BIS/BAS) to 42 patients with schizophrenia, and found that behavioral inhibition (BIS, e.g., sensitivity to threat) was higher among patients than a normal comparison sample, whereas activation (e.g., reward seeking) did not differ from controls. Behavioral inhibition was negatively associated with negative symptoms on the PANSS and positively correlated with longer duration of illness and older age. Activation was positively correlated with dosage of antipsychotic medication, but not with measures of psychopathology.

Activation and avoidance may thus correspond to different illness features in schizophrenia, and they may be differentially impaired relative to normal comparison subjects. However, a number of questions remain. One, it is unclear to what extent “core” psychopathological symptoms of schizophrenia versus depression relate to activation and avoidance behaviors, particularly given the overlap in some symptoms (e.g., social withdrawal). Rather than exclude patients with symptoms of depression who represent a large proportion of patients with schizophrenia (Zisook et al, 1999), the Calgary Depression Scale for Schizophrenia (CDSS) (Addington et al, 1990) enables the assessment of depressive symptoms that are discrete from negative symptoms; thus, the CDSS provides an opportunity to measure the relative impact of activation and avoidance on depression or negative symptoms. Second, the functional correlates of activation or avoidance are unclear, particularly in regard to whether either of these constructs impact cognitive ability and functional capacity (what individuals can do), functional impairment (what others observe them to actually do), or subjective functioning (how individuals perceive their functioning). Understanding the motivational contributors to disability may aid in determining how best to target rehabilitation approaches.

In a sample of 73 community dwelling outpatients with schizophrenia, we investigated the psychopathologic and functional associations with behavioral activation and avoidance, by use of the Behavioral Activation for Depression Scale, BADS (Kanter et al, 2007) - a newly developed scale that, to our knowledge, has not previously been evaluated in schizophrenia. The goals of our study were to examine the associations between BADS subscales and positive and negative symptoms of schizophrenia and depressive symptoms, and to examine the associations between activation and avoidance with measures of cognitive ability, functional capacity, observer-rated functioning, and perceived functioning. We hypothesized that avoidance would correspond to negative symptoms as in a previous study (Scholten et al, 2006), and that activation would be associated with depressive symptoms (Johnson et al, 2003). We also explored the relationships between activation and avoidance with positive symptoms, cognitive ability, and indicators of functioning.

Methods

Participants

Participants were 73 middle-aged and older patients with schizophrenia or schizoaffective disorder who were enrolled in a randomized trial to examine efficacy of two skills-based interventions to improve functioning. Findings reported here derive from baseline data obtained prior to randomization. To be eligible for the parent study, participants were

required to be 40 years or older and have a DSM-IV chart diagnosis of schizophrenia or schizoaffective disorder. Participants were excluded from the study if they had a DSM-IV diagnosis of dementia, expressed suicidal ideation or intent, could not complete the assessment battery, or were participating in any other psychosocial intervention or drug research at the time of intake. Written informed consent was obtained from participants prior to enrollment. Patients were recruited from a variety of community-based agencies in San Diego County, including Board and Care (B&C) facilities, day treatment centers, and clubhouses.

Medication information, obtained from a review of medical records, showed that 65 were currently taking antipsychotic medications (89%). Of these, 43 (66%) were taking atypical antipsychotics, 8 (12%) were taking typical antipsychotics, and 14 (22%) were taking both typical and atypical antipsychotics. Medication dosages were obtained for 59 participants, with a mean chlorpromazine equivalent of 608.45 mg/day (SD = 500.95 mg/day), which we calculated using the formulae published by Andreasen and colleagues (2010).

Measures

Behavioral Activation and Avoidance—Both behavioral activation and avoidance were measured using the Behavioral Activation for Depression Scale (Kanter et al, 2007). A research associate read 25 statements and asked the participant to indicate the extent to which each statement was true for them during the previous week. Response options were given using a seven-point scale ranging from 0 (not at all) to 6 (completely). The two subscales that were of particular interest in this study comprised 15 of the 25 items; the other two subscales (*Work/School Impairment* and *Social Impairment*) were deemed to be duplicative of the established functional measures described below and so were not included. The *Behavioral Activation* subscale includes 7 items assessing goal-directed activation and completion of planned activities. Example items from this subscale are “I was an active person and accomplished the goals I set out to do” and “I rewarded myself in some way for doing things that were good for me.” The *Avoidance* subscale consists of 8 items assessing avoidance of negative aversive states and engagement in rumination rather than active problem solving. Example items from this subscale are “I tried not to think about certain things” or “Most of what I did was to escape from or avoid something unpleasant.” Both of the subscales are scored by summing responses, with higher scores indicating reduced activation and greater avoidance, respectively. Chronbach’s alpha for the *Activation* subscale was 0.731 and for the *Avoidance* subscale was 0.812.

Depressive symptoms—The 9-item Calgary Depression Scale for Schizophrenia (CDSS) (Addington et al, 1990) was administered by a trained observer and ratings are made on a 0 to 3-point scale. The CDSS is a brief measure of depressive symptomatology developed to be separate from positive, negative and extra-pyramidal symptoms in patients with schizophrenia. Scores of 7 and above were shown to have an 82% specificity and 85% sensitivity for predicting the presence of major depressive episodes (Addington et al, 1990).

Positive and negative symptoms—Participants were administered the Positive and Negative Syndromes Scale (PANSS) (Kay et al, 1987). The subscales used in this study were the 7-item Positive Symptoms Scale (e.g., presence of symptoms such as delusions, hallucinatory behavior and suspiciousness; and the 7-item Negative Symptoms Scale (e.g., blunted affect, passive/apathetic social withdrawal and difficulty in abstract thinking). All items are rated on a 7-point severity scale, with higher values indicating greater severity of symptoms.

Global Cognitive Ability was assessed with the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS). The RBANS is a brief battery of neuropsychological tests assessing immediate and delayed memory, attention, language, and visuospatial skills. The global score on this instrument, a standard score with a mean of 100 and standard deviation of 15, was used in the analyses.

Functional Capacity was assessed with the University of California, San Diego Performance-Based Skills Assessment (UPSA)(Patterson et al, 2001). The UPSA was designed to evaluate the abilities of individuals to perform everyday tasks that are considered necessary for independent functioning in the community. The UPSA uses role-playing situations to evaluate skills in five areas: household chores, communication, finance, transportation, and planning recreational activities. Total scores range from 0 to 100 points; higher scores reflect better performance.

Observer-Rated Functioning was assessed with the Specific Level of Functioning Scale (SLOF)(Schneider and Struening, 1983). The SLOF is rated by an individual who is familiar with the participants everyday living abilities and includes five subscales, Physical Functioning, Personal Care Skills, Interpersonal Relationships, Work Skills, and Activities. As with prior study (Harvey et al, 2009), we summed three of the five subscales that represent higher-order functional abilities to form a single total score and Physical Functioning and Personal Care Skills were not included (due to the ceiling effects observed on these subscales).

Subjective Functioning was examined with the Recovery Assessment Scale (Giffort et al, 1995), which is a 41-item scale on which respondents described themselves using a five-point agreement scale (5 = strongly agree; 1 = strongly disagree). Sample items include "I have a desire to succeed" and "I can handle it if I get sick again."

Statistical Analyses

All variables were checked for normality and transformed when necessary. We examined Pearson correlations between Activation, Avoidance and continuous study measures, along with t-tests for binary variables. The differences in the strength of association between activation and avoidance and study measures was calculated via r-to-z transformation and compared using within-subjects adjustments (Steiger, 1980). Finally, we conducted three hierarchical regression analyses to determine whether, after entering psychopathologic symptoms (positive and negative symptoms, and depressive symptoms) in the first step, Activation and Avoidance accounted for significant variance in the three indicators of functioning. For all analyses, the alpha level was set to 0.05. Instances of missing data were minimal and handled with listwise deletion.

Results

Sample Characteristics

The mean age of the 73 participants was 50.3 years (sd=6.3, range 40 to 72), with a mean age of onset of schizophrenia at 25.6 years (sd=11.7). A total of 47% were female. The racial/ethnic distribution included 45% white, non-Hispanic, 26% African-American, non-Hispanic, 15% Hispanic, and 8% Asian or Native American. The mean level of educational attainment was 12.3 years (sd=2.1). A total of 62% of participants had never married, and only 3% were currently working for pay. In regard to living situation, 70% of participants were in some sort of supervised living (e.g., board and care home) with the remainder in private residences. In terms of psychopathology, the mean PANSS Positive Syndrome Score was 14.6 (6.2), PANSS Negative Syndrome Score was 15.5 (5.2), and the Calgary Depression Rating Scale was 4.4 (4.5). Symptom severity on the PANSS subscales was in

the mild-moderate range. In terms of the severity of depression in the sample, 23.3% of patients had scores on the CDSS of 7 or greater, which is indicative of the presence of a major depressive episode.

Behavioral Activation and Avoidance

The mean score on the Behavioral Activation subscale was 23.2 (sd=7.8) and the Avoidance subscale was 21.0 (sd=10.4). Avoidance and Activation subscales were significantly correlated with each other ($r=0.345, p=0.003$), such that greater avoidance was associated with reduced activation. With regard to demographic and basic illness characteristics, there were no significant relationships between Activation or Avoidance scales and age, education, gender, ethnicity, or marital status. Similarly, there were no significant relationships with either age of onset of illness or medication dose (Chlorpromazine equivalents).

With respect to psychopathologic symptoms, Activation and Avoidance revealed somewhat different patterns of association. High severity on PANSS Positive and PANSS Negative subscales were each significantly and positively correlated with the Avoidance scale, but not Activation. In contrast, greater severity of depressive symptoms (CDSS Scores) was correlated with the Activation subscale, but not Avoidance. Using r -to- Z transformations, the differences in correlations for PANSS Negative Score ($z=2.49, p=0.012$) and CDSS Score ($z=4.33, p<0.001$) were significant, but not PANSS Positive ($z=1.09, p=0.273$).

As with symptoms, Activation and Avoidance were differentially related to aspects of functioning. Higher scores on global cognitive ability (RBANS score), functional capacity (UPSA score) and observer-rated functioning (SLOF Score) associated with lower Avoidance, but no significant relationships were evident with Activation. In contrast, better subjective functioning, as measured by the RAS was associated with greater Activation but not Avoidance. The difference between correlations, via r -to- Z transformation, was significant for RAS Scores ($z=5.17, p<0.001$), but not for RBANS Scores ($z=1.13, p=0.259$), SLOF-Functioning ($z=1.51, p=0.129$) or UPSA Scores ($z=1.90, p=0.057$).

Multivariate Analyses

We examined whether Avoidance and Activation were significant predictors of the three functional indicators (UPSA, SLOF-Functioning, and RAS Scores) in three hierarchical regressions; in each, the first step included the PANSS Negative Scale Score, PANSS Positive Scale Scores, and CDSS Scores, and the second step included the Activation and Avoidance subscales. With UPSA as the dependent variable, additional variance accounted for by Activation and Avoidance was not significant [r^2 Change = 0.018, F -change(2,67)=0.889, $p=0.412$]. With SLOF as the dependent variable, the additional variance was non-significant [r^2 Change = 0.065, F -change(2,67)=2.52, $p=0.089$]. However, with RAS Scores, the second block was significant [r^2 Change = 0.079, F -change(2,67)=6.92, $p=0.002$], and within this block, Behavioral Activation was a significant predictor (Beta=0.197, $t=2.2$, $p=0.033$) of subjective functioning (RAS Score) beyond that associated with symptoms but Avoidance was not (Beta=-0.2, $t=-0.3$, $p=0.793$).

Finally, we examined whether Activation and Avoidance predicted significant variation in observer-rated functioning, using two separate hierarchical regressions adjusting for functional capacity (UPSA Scores) and cognitive ability (RBANS Total Score). In the model with UPSA entered in the first step, the second step with both Activation and Avoidance was not significant [r^2 Change = 0.043, F -change(2,67)=1.5, $p=0.228$]. In a second regression analysis, we adjusted for global cognitive ability in the first step (RBANS score) and found that the addition of Behavioral Activation and Avoidance in the second step

was associated with a significant change in variance accounted for ($[r^2 \text{ Change} = 0.100, F\text{-change}(2,67)=3.3, p=0.045]$). Inspection of the subscales revealed that Avoidance was a significant predictor of SLOF scores after adjusting for cognitive ability ($\text{Beta}=-0.351, t=2.5, p=0.015$) and Behavioral Activation was not significant ($b=0.137, \text{s.e.}=0.239, t=0.572, p=0.569$).

Discussion

Examining behavioral activation and avoidance in a sample of outpatients with schizophrenia, we found that, despite being significantly related to each other, activation and avoidance had unique associations with psychopathology and functioning. Avoidance was more related to the “core” psychopathological aspects of schizophrenia, particularly negative symptoms, as well as to global cognitive ability, functional capacity and observer-rated real-world functioning. On the other hand, activation was associated with depressive symptoms and to subjective functioning. Overall, behavioral activation and avoidance might, given their divergent associations with psychopathology and functioning, be relevant constructs to target with cognitive behavioral interventions.

There are a number of limitations in this study. This was a modest-sized sample comprised of middle-aged and older outpatients who were stably treated and who were experiencing, on average, mild-moderate levels of symptoms. Therefore, these findings may not generalize to acutely psychiatrically ill, first episode, or hospitalized patients. We lacked a normal comparator group so that it was not possible to determine the degree to which activation and avoidance were aberrant in this sample. In comparison to prior work in undergraduate students and patients with depression, the means for behavioral activation and avoidance were closer to that reported by the depressed sample (although not as severe) than the undergraduate sample (Kanter et al., 2007; Kanter et al., 2009). Moreover, the study was cross sectional, and therefore, the directionality of influence between activation/avoidance, symptoms, and functioning, as well as the stability of activation and avoidance, deserves further study. Although the self-report scale used to measure activation and avoidance predicted variation in features of schizophrenia, it may be particularly fruitful to develop more objective experiential tasks that tap into these constructs to understand the neurobiological and environmental influences on their expression (Horan et al, 2006).

Nevertheless, the study is consistent with other reports using similar instruments to suggest that activation and avoidance are relevant constructs in schizophrenia (Scholten et al, 2006; Szöke et al, 2002). There were no significant relationships between activation and avoidance and gender, as had been found previously by Scholten with the BIS/BAS scale (Scholten et al, 2006), nor were there any associations with medication dose, clinical history, or sociodemographic traits. It is likely that some of the divergence between findings reported here and that in the Scholten et al. study stem from construct and item differences. Similar to a study examining rumination in schizophrenia, we found significant relationships between avoidance and negative symptoms (Halari et al, 2009), which were also related to poorer functional capacity and observer rated functioning. The identified relationship between BADS Avoidance subscale and negative symptoms suggests that motivation underlying some of the negative symptoms may be to manage negative emotions. Conceptually, the avoidance subscale of the BADS assesses the individual’s motivations and attempts to engage in behaviors to avoid feeling sad, attempts to avoid something unpleasant, or attempts at distracting oneself from feeling bad, which may in turn lead to negative symptoms such as social withdrawal, active social avoidance, and a lack of desire for social contact. Thus, our findings on avoidance dovetail with recent work on defeatist beliefs in relationship to negative symptoms (Grant and Beck, 2009), and it would be potentially

fruitful to determine if defeatist attitudes were specifically associated with avoidance and associated negative symptoms.

Why would avoidance relate to poorer objective measures of functioning, whereas activation to subjective functioning? We speculate that a history of behavioral avoidance may attenuate development of skills in functionally relevant behaviors, such as measured by the UPSA in our study. In contrast, low levels of behavioral activation may be more specifically linked with reduced positive affect, which may lead to depression that is superimposed upon the core symptoms of schizophrenia. These putative causal relationships among these variables are speculative, and future longitudinal research would be needed to examine the antecedents and functional consequences of behavioral activation and avoidance in schizophrenia. Longitudinal research would also be needed to examine the stability of behavioral activation and avoidance, in order to determine whether these constructs represent trait-like aspects of schizophrenia, or whether they are potentially modifiable states that correspond with change in symptom levels.

Conclusions

Although behavioral activation and avoidance appear to relate to different illness features in schizophrenia, both are conceptualized as modifiable (at least in the treatment of depression). Behavior activation therapy is a brief behavioral approach that is well established in the treatment of depression (Lejuez et al, 2001) that directly addresses activation through increasing participation in positively reinforcing events. Although behavioral activation is often included in cognitive-behavioral approaches to schizophrenia (Turkington and McKenna, 2003), it is unclear whether it might hold promise as a standalone treatment as has been established in depression (Dimidjian et al, 2006). In contrast, if it is established that behavioral avoidance relates to defeatist attitudes, cognitive strategies such as those that increase expectancies for success might be particularly useful (Rector et al, 2005). Finally, methods derived from affective neuroscience may help to address key unanswered questions as to the phenomenology of avoidance or activation in schizophrenia. Recent work has suggested that people with schizophrenia are relatively unimpaired in regard to experiencing emotions, yet they do exhibit deficiencies in anticipating positive experiences (Horan et al, 2006) – such failure to anticipate may increase avoidance and/or activation. In sum, our study indicates that behavioral activation and avoidance appear relevant to psychopathologic and functional measures, with somewhat unique associations to aspects of schizophrenia, and future studies should investigate their potential role as treatment targets.

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Table 1

Means and Correlations among Study Variables and Behavioral Activation and Avoidance

	Mean (SD)	Behavioral Activation	Avoidance
		Pearson Correlation (p-value)	Pearson Correlation (p-value)
Demographics			
Age	50.3 (6.3)	0.087 (0.465)	0.205 (0.083)
Educational Attainment	12.3 (2.1)	0.229 (0.058)	0.035 (0.773)
Age of Onset	25.6 (11.7)	−0.054 (0.672)	−0.184 (0.145)
Chlorpromazine Equivalent Dose	535.8 (509.9)	0.092 (0.458)	0.045 (0.720)
Psychopathologic Symptoms			
PANSS Positive	14.5 (6.3)	0.216 (0.066)	0.357 (0.002)
PANSS Negative	15.6 (5.3)	0.034 (0.776)	0.359 (0.002)
Calgary Depression Rating Score	4.4 (4.5)	−0.385 (0.001)	0.173 (0.144)
Global Cognitive Ability			
RBANS Score	63.3 (12.4)	−0.089 (0.461)	−0.276 (0.020)
Functional Capacity			
UPSA Total Score	66.1 (17.8)	−0.120 (0.313)	−0.319 (0.006)
Observer-Rated Functioning			
SLOF- Functioning	100.2 (14.2)	−0.065 (0.614)	−0.316 (0.012)
Subjective Functioning			
Recovery Assessment Scale Total	91.0 (12.4)	0.432 (p<0.001)	−0.222 (0.059)