Published in final edited form as:
J Ment Health. 2010 April ; 19(2): 184–192. doi:10.3109/09638230903469277.

Negative symptoms and concomitant attention deficits in schizophrenia: Associations with prospective assessments of anxiety, social dysfunction, and avoidant coping

Jack Tsai[*,1,2], **Paul H. Lysaker**[3,4], and **Jenifer L. Vohs**[5]

[1] Department of Psychology, Indiana University-Purdue University Indianapolis, Indianapolis, IN 46202 USA

[2]Department of Psychiatry, Yale University, New Haven, CT 06520

[3] Roudebush VA Medical Center, Indianapolis, IN 46202 USA

[4] Department of Psychiatry, Indiana University School of Medicine, Indianapolis, IN 46202 USA

[5] Department of Psychological and Brain Sciences, Indiana University, Bloomington, IN 47405 USA

Abstract

Background: Negative symptoms are a significant barrier to function and may have a range of etiological roots and links to outcome. A previous study (Lysaker et al., in press) identified a subgroup of patients with schizophrenia who had both higher levels of negative symptoms and relatively poorer attentional function who had uniquely lower self-esteem and greater internalized stigma.

Aims: To determine whether participants previously classified as having High Negative/Poorer Attention would continue to have lower self-esteem, higher self-stigma, and also higher levels of anxiety and avoidant coping 5 months later.

Method: Participants were 77 (77.8%) of the original 99 participants who completed follow-up procedures.

Results: The High Negative/Poorer Attention group had significantly poorer social functioning, lower appraisal of their competence, higher levels of anxiety, and a higher preference for ignoring stressors five months after classification.

Conclusions: Negative symptoms with concomitant attention deficits may lead to more social and psychological dysfunction than negative symptoms or attention deficits alone. Individuals with both high levels of negative symptoms and poor attention may represent a meaningful subgroup with unique psychosocial difficulties that persist over time.

Keywords

Cognitive functions; Neurocognition; Positive and Negative Syndrome Scale; Schizophrenia; Negative Symptoms; Social Functioning; Subtypes

Schizophrenia is widely acknowledged to involve alterations in a range of basic emotional, perceptual, and cognitive processes. One set of difficulties which pose particular challenges for treatment and long term function are negative symptoms (Buchanan, 2006; Buckley &

*Corresponding author: Jack Tsai 950 Campbell Ave., Bldg. 36 West Haven, CT 06516 Jack.Tsai@yale.edu.

Declaration of Interest: None of the authors had a conflict of interest in this study.

Stahl, 2007; Möller, 2007). Negative symptoms include a persistent reduction in the ability to express emotion, experience pleasure, initiate activities, and follow through with a course of action (Earnst & Kring, 1997; Möller, 2007; Salvatore, Dimaggio, & Lysaker, 2007); they are functionally independent of positive and disorganized symptoms (Andreasen, Flaum, Swayze, Tyrrell, & Arndt, 1990; Foussias & Remington, in press; Harvey, Koren, Reichenberg, & Bowie, 2006).

One barrier to understanding and developing treatment for negative symptoms is that they likely have a range of etiological roots with different courses and associations with outcome. In other words, individuals may respond differently to treatment because of the heterogeneous nature of negative symptoms. Consequently, interest has arisen determining whether certain profiles of deficits can be extracted and whether those profiles have any predictive power when it comes to treatment response and psychosocial function over time. One promising factor which may be associated with a certain set of negative symptoms are impairments in attention.

Impairments in attention have been widely observed in schizophrenia and suggested as a possible casual factor in certain forms of negative symptoms (Cornblatt & Keilp, 1994; Mcghie & Chapman, 1961). For instance, social withdrawal may proceed from fundamental impairments in the processing of incoming stimuli, making it difficult to distinguish relevant from irrelevant stimuli and to interpret and respond to complex social situations meaningfully. Importantly, while some studies have found negative symptoms are linked to deficits in sustained attention (Cornblatt & Keilp, 1994; Nieuwenstein, Aleman, & de Haan, 2001), others have not (Buchanan, 2006; Cohen & Docherty, 2004). Harvey et al. (2006) recently published a conceptual review of the relationship between negative symptoms and cognitive deficits, including attention. They concluded that negative symptoms and cognitive deficits may be treated as independent domains of schizophrenia. And in fact, negative symptoms and impaired attention have been independently linked to poorer function in schizophrenia (Green, 1996; Harvey, et al., 2006), however, the possible additive effects of both has not been adequately examined.

To explore this possibility, a recent cluster analysis was conducted of 99 adults with schizophrenia spectrum disorders on the basis of their level of negative symptoms and performance on a continuous performance task (Lysaker, Vohs, & Tsai, 2009). Four groups were found: Low Negative/Better Attention, Low Negative/Poorer Attention, High Negative/Poorer Attention, and High Negative/Better Attention. Concurrent assessments revealed that the High Negative/Poorer Attention group had significantly lower levels of self-esteem and greater acceptance of stigma than the other three groups. It was speculated that this High Negative/Poorer Attention group might represent a subgroup with different outcomes over time. One limitation of this study, however, was that assessment of outcome was concurrent and thus it was unknown whether the high negative symptom groups would sustain their higher levels of negative symptoms and whether outcomes would continue to differ over time.

To address this limitation and to explore this issue further, the current study reports on the performance of a set of the originally grouped participants described above, on a set of follow-up assessments conducted five months later. In particular, we set out to test three sets of hypotheses. First, we hypothesized that the two groups with high negative symptoms would continue to demonstrate relatively higher levels of negative symptoms and poorer social function at follow-up. Second, we anticipated the High Negative/Poorer Attention group would continue to demonstrate deficits in self-esteem and stigma. Third, we anticipated that the High Negative/Poorer Attention might also show deficits in two domains not originally assessed, but which may be related to how deficits in attention are tied to negative symptoms: anxiety and avoidant coping. In particular, we predicted that the High Negative/Poorer Attention group would have a higher level of anxiety and avoidant coping than the other three groups. Here,

we reasoned that in the face of attentional deficits some may find stressors so overwhelming they avoid any attempt to cope, resulting in higher levels of anxiety.

Methods

Participants

Participants were 64 men and 13 women with diagnoses of schizophrenia (n= 51) or schizoaffective disorder (n= 26) who completed follow-up assessments five months after completing baseline assessments detailed elsewhere (Lysaker, et al., 2009). The current study was part of a larger study of vocational rehabilitation where participants were randomized to receive a cognitive-behavioral intervention and offered a 6 month work placement. In the current study, seventy-seven (77.8%) of the original 99 participants participated. The mean age was 46.73 years (SD= 8.92) and mean education was 12.80 years (SD= 2.21). Twenty-nine of the participants were White, 47 Black, and 1 Latino. Lifetime hospitalizations was 7.13 (SD= 7.92) with age of first hospitalization at 26.10 years (SD= 10.17). All participants were enrolled in a work program and had worked a mean total of 323.56 hours (SD= 184.05) and a mean total of 19.12 weeks (SD= 9.17). Criterion for inclusion in the study at baseline included being in a stable phase of their disorder, with no hospitalizations, changes in medications or housing in the last month prior to baseline. All procedures were approved by the institutional review boards of Indiana University and the Roudebush Veteran Affairs Medical Center.

Measures

Positive and Negative Symptoms—The Positive and Negative Syndrome Scale (PANSS; Kay, Fiszbein, & Opler, 1987) is a 30-item rating scale completed by clinically trained research staff at the conclusion of chart review and a semi-structured interview. For the purposes of this study, two of the five PANSS factor analytically derived components (Bell, Lysaker, Beam-Goulet, Milstein, & Lindenmayer, 1994) were utilized: Positive Symptoms and Negative Symptoms. Raters were blind to other assessments. Inter-rater reliability for the raters at baseline and follow-up were found to be excellent, with intraclass correlations ranging from . 84 to .93.

Attention—The Connors Continuous Performance Test II (CPT-II; Conners, 2002; Riccio, Reynolds, Lowe, & Moore, 2002) is a psychological test which measures sustained and selective attention and impulsivity. It is a computerized test which calls for responses to all letters presented on the screen except for the target letter. Unlike many other CPT paradigms, the Conners' CPT-II varies its inter-stimulus intervals, has a large number of targets, and requires continuous responding with occasional inhibition of response. For the purposes of this study we examined “d' ”, a score which reflects sensitivity and discrimination over time with higher scores incidating better performance.

Social Function—The Quality of Life Scale (QOLS; Heinrichs, Hanlon, & Carpenter, 1984) is a 21-item scale completed by clinically trained research staff following a semi-structured interview and chart review. For the purposes of this study, two of the four factor scores of the QOLS were used: Interpersonal Relations and Intrapsychic Foundations. Interpersonal Relations measures the frequency of recent social contacts, including separate assessments of contacts with friends and with acquaintances. Intrapsychic Foundations measures qualitative aspects of interpersonal relationships and includes assessments of empathy for others. Inter-rater reliability between blind raters observing the same interview in this study was excellent, with intraclass correlations ranging from .85 to .93. The QOLS was created to assess negative symptoms and social functioning among persons with schizophrenia (Heinrichs, et al., 1984).

Self-Esteem—The Multidimensional Self-Esteem Inventory (MSEI; O'Brien & Epstein, 1998) is a 116-item self report measure which assesses individuals' self-perception of their overall social value. Respondents rate items on a 5-point scale according to the degree or frequency with which each item applies to them, and scores are transformed to T-scores based on a community sample. This study examined the same three subscales utilized in the original study (Lysaker, et al., 2009): Competence, Likeability, and Defensive Self-Enhancement. Competence assesses the degree to which a person feels capable of learning and mastering tasks. Likeability assesses acceptance by peers. Defensive Self-Enhancement serves as a validity scale designed to detect an inflated view of self-worth instead of a willingness to acknowledge weaknesses. Scale scores are calculated with higher scores reflecting greater levels of self-esteem. Evidence of internal consistency for this scale on participants with schizophrenia has been presented elsewhere (Lysaker, Salyers, Tsai, Spurrier, & Davis, 2008).

Internalized Stigma—The Internalized Stigma of Mental Illness Scale (ISMIS; Ritsher, Otilingam, & Grajales, 2003) is a 29-item questionnaire designed to assess subjective experiences of stigma. The ISMIS presents first-person statements and asks participants to rate statements on a 4-point Likert scale from 1 (“Strongly Disagree”) to 4 (“Strongly Agree”). This study examined the same two subscales utilized in the original study (Lysaker, Vohs, & Tsai, 2009): Stereotype Endorsement and Social Withdrawal. Stereotype Endorsement reflects agreement with negative stereotypes of mental illness. Social Withdrawal reflects avoidance of others because of mental illness. Evidence of internal consistency, test-retest reliability, factorial and convergent validity are reported elsewhere (Ritsher, et al., 2003; Ritsher & Phelan, 2004).

Anxiety—The Multidimensional Anxiety Questionnaire (MAQ; Reynolds, 1999) is a 40-item self-report questionnaire designed to tap multiple domains of the experience of anxiety. It consists of four subscales: “Physiological-Panic” which assesses physiological symptoms of anxiety and the anticipation of panic; “Social Phobia” which assesses worries about social embarrassment and social avoidance; “Worries and Fear” which assesses general experiences of worry and fearfulness in daily life; and “Negative Affectivity” which assesses general affective states related to anxiety such as irritability and general distress. T scores are provided for each subscale allowing for a judgment to be made regarding whether the symptom level is at a non-anxious, subclinical, moderate, or severe level. Adequate internal consistency, test-retest reliability, and factorial validity have been found in both psychiatric and community samples (Reynolds, 1999).

Coping—The Ways of Coping Questionnaire (WCQ; Folkman & Lazarus, 1988) is a self-report instrument that asks participants to recall a recent stressor and rate how often they used 66 different behaviors to cope with that particular stressor. A rational scoring system that was previously developed (Lysaker, Johannessen, Davis, Zito, & Bell, 2004) was used to be sensitive to such coping deficits. For the purposes of this study, we were interested in the two forms of avoidant coping founding the score scheme: “Ignoring,” refers to putting the stressor out of one's mind, or choosing to “not think” about it; and “Resigning” refers to a choice to not act because it is perceived that there is nothing to be done. This scoring scheme has shown good internal consistency and predictive validity (Lysaker, et al., 2004).

Data analysis

Analyses were conducted in four phases. First, participants who completed the follow-up were placed in their original clusters and rates of attrition within each group were compared with Chi-square tests. Chi-square tests were also conducted to determine whether disproportionate numbers of participants from the four groups were randomized to receive the cognitive-

behavioral intervention. Next, demographic variables between groups were compared using analyses of variance (ANOVAs) and Chi-square. Third, to rule out the possibility that differential participation in rehabilitation may have affected outcomes, hours of work were compared between groups using ANOVAs. Fourth, ANOVAs were used to compare groups on the 5-month follow-up PANSS, QOLS, MSEI, ISMIS, MAQ, and WCQ assessments. Specific group comparisons were conducted using Fisher's Least Significant Difference (LSD) test. Of note, in order not to overly inflate the chances of spurious findings, only the MAQ total was initially analyzed and post hoc comparisons were made on its subscales only after significance on the total was found. One participant who completed the PANSS and QOLS did not complete the ISMIS and MSEI. Thus, sample sizes in analyses varied slightly.

Results

Chi-square revealed no significant differences in rates of attrition from baseline to five month follow-up: 1) Low Negative/Better Attention group: 4 (13%), 2) Low Negative/Poorer Attention: 4 (20%), 3) High Negative/Poorer Attention: 8 (28%), and 4) High Negative/Better Attention: 6 (30%). Chi-square also revealed no significant differences in frequency of assignment to receive cognitive-behavioral intervention. There were no significant demographic differences between groups and no differences on the number of hours worked in rehabilitation.

Performance on assessments collected five months after initial classification are presented in Table 1. The group initially classified as having high negative symptoms and poorer attention reported lower levels of Competence on the MSEI and poorer Intrapsychic Foundations on the QOLS than all other three groups five months later. The High Negative/Poor Attention group also reported lower levels of Interpersonal Relations on the QOLS than either of the low negative symptom groups at follow-up. No differences were found between groups on PANSS Positive Component or ISMIS scores. The High Negative/Poorer Attention group reported a significantly higher preference for ignoring stressors as a way of coping and higher overall anxiety than the other three groups on assessments five months after the original classification. Post-hoc comparisons of MAQ subscales found that the High Negative/Poorer Attention group had significantly higher scores for MAQ Social Phobia and MAQ Worries and Fears than the other three groups. No differences were found on the MAQ Physiological Panic or Negative Affectivity subscales.

Discussion

The current study sought to determine whether participants initially classified as having high levels of negative symptoms and concomitant attention deficits experienced unique psychosocial deficits over time when assessed five months later. In general, the results supported our hypotheses. Firstly, the four subgroups remained intact in their relative levels of negative symptoms. Secondly, the High Negative/Poorer Attention group continued to show lower self-esteem regarding competence than all three other groups and more social dysfunction than the two groups with low negative symptoms at 5-month follow-up. Thirdly, the High Negative/Poorer Attention group showed deficits in two domains not previously assessed at baseline. They reported significantly greater anxiety and greater preference for ignoring stressors than the three other groups. When specific forms of anxiety were considered, they reported greater difficulties specifically related to daily worries and social anxiety.

While it may not be surprising that clients with more deficits would report relatively worse psychosocial function, it cannot be assumed different problems would result in overall worse scores on the same psychosocial variables over time. The results thus contribute to the literature

by illustrating the possible additive effects of having both negative symptoms and attention deficits.

Of note, there were unexpected results. No differences were found between groups on internalized stigma, despite differences on this variable among groups when assessed five months earlier. It can be speculated that internalized stigma is a tenuous subjective experience that may fluctuate over time. Additionally, the High Negative/Better Attention group did not report higher levels of positive symptoms than all other groups as they had five months earlier. This suggests that perhaps for this group, positive symptoms present a less stable feature of illness and may be related to exposure to rehabilitation. Interestingly, the High Negative/Poorer Attention group reported the quality of their social relationships and frequency of social contacts was lower than the High Negative/Better Attention group; something not observed in the original study. In light of an absence of higher positive symptoms in the High Negative/Better Attention group, it may be that this is a group whose function fluctuates over time and may at times appear relatively less impaired.

The findings regarding coping and anxiety may also offer some interpretations to be tested in future research. The results suggest the possibility that individuals with negative symptoms and attentional dysfunction feel unable to cope with stress, so they ignore their problems. As they feel unable to cope, it can be expected they worry about their daily activities and develop a tendency to see social situations as opportunities for embarrassment. However, these possibilities must be taken as speculations for future research and certainly rival hypotheses cannot be ruled out including the possibility anxiety leads to poor attention or that other factors not measured contributed to the observed relationships. Moreover, negative symptoms were reassessed at follow-up but attention was not. Generalizability of the results may also be limited because participants were mostly African American male veterans in their 40's.

With replication, the main findings of this study may contribute to the literature on negative symptoms and impairments in attention in several ways. The results suggest our classification captures relatively enduring characteristics with differential outcomes. Negative symptoms with concomitant attentional deficits may be more closely associated with social and psychological dysfunction than negative symptoms or attention deficits alone. Moreover, this study suggests areas for future research to better understand the mechanisms in which negative symptoms and attention interact. Perhaps, individuals who suffer high levels of both negative symptoms and attention deficits not only withdraw from others because of a lack of drive or interest. But when they do interact with others, their interactions are so impoverished and difficult because of their attention deficits (Cornblatt & Keilp, 1994) that their interactions reinforce the need for social withdrawal, leading to a vicious cycle.

Finally, these findings may have implications for clinical practice. Assessing symptoms and neuropsychological deficits concurrently may help clinicians better understand some of their clients. Clients with particularly high negative symptoms and poor attention may be more isolated, have more anxiety, and engage in more maladaptive coping than others. These clients may need special attention to help them overcome this combination of challenges. As a starting point, one possible direction for future treatment research might involve the provision of a combination of cognitive remediation and social skills training, which have both shown potential in ameliorating neuropsychological impairments and negative symptoms, respectively (Kopelowicz, Liberman, Mintz, & Zarate, 1997; McGurk, Twamley, Sitzer, McHugo, & Mueser, 2007).

References

Andreasen NC, Flaum M, Swayze VW, Tyrrell G, Arndt S. Positive and negative symptoms in schizophrenia: A critical reappraisal. Archives of General Psychiatry 1990;47:615–621. [PubMed: 2360855]

Bell MD, Lysaker PH, Beam-Goulet JL, Milstein RM, Lindenmayer JP. Five-component model of schizophrenia: Assessing the factorial invariance of the positive and negative syndrome scale. Psychiatry Research 1994;52:295–303. [PubMed: 7991723]

Buchanan RW. Persistent negative symptoms in schizophrenia: An overview. Schizophrenia Bulletin 2006;32:396–400. [PubMed: 16166610]

Buckley PF, Stahl SM. Pharmacological treatment of negative symptoms of schizophrenia: therapeutic opportunity or cul-de-sac? Acta Psychiatrica Scandinavica 2007;115:93–100. [PubMed: 17244172]

Cohen AS, Docherty NM. Deficit versus negative syndrome in schizophrenia: Prediction of attentional impairment. Schizophrenia Bulletin 2004;30:827–835. [PubMed: 15954193]

Conners, CK. Conners' continuous performance test (CPT II). Multi-Health Systems; New York: 2002.

Cornblatt BA, Keilp JG. Impaired attention, genetics, and the pathophysiology of schizophrenia. Schizophrenia Bulletin 1994;20:31–46. [PubMed: 8197420]

Earnst KS, Kring AM. Construct validity of negative symptoms: An empirical and conceptual review. Clinical Psychology Review 1997;17:167–189. [PubMed: 9140714]

Folkman, S.; Lazarus, RS. Ways of coping questionnaire manual. Consulting Psychologists Press; Palo Alto, CA: 1988.

Foussias G, Remington G. Negative symptoms in schizophrenia: Avolition and Occam's razor. Schizophrenia Bulletin. in press.

Green MF. What are the functional consequences of neurocognitive deficits in schizophrenia? American Journal of Psychiatry 1996;153:321–330. [PubMed: 8610818]

Harvey PD, Koren D, Reichenberg A, Bowie CR. Negative symptoms and cognitive deficits: what is the nature of their relationship? Schizophrenia Bulletin 2006;32:250–258. [PubMed: 16221995]

Heinrichs DW, Hanlon TE, Carpenter WT. The Quality of Life Scale: An instrument for assessing the schizophrenic deficit syndrome. Schizophrenia Bulletin 1984;10:388–396. [PubMed: 6474101]

Kay SR, Fiszbein A, Opler LA. The positive and negative syndrome scale (PANSS) for schizophrenia. Schizophrenia Bulletin 1987;13:261–276. [PubMed: 3616518]

Kopelowicz A, Liberman RP, Mintz J, Zarate R. Comparison of efficacy of social skills training for deficit and nondeficit negative symptoms in schizophrenia. American Journal of Psychiatry 1997;154:424–425. [PubMed: 9054795]

Lysaker PH, Johannessen JK, Davis RS, Zito WQ, Bell MD. A rationally devised scoring scheme to assess coping in schizophrenia: Internal consistency and associations with work performance. International Journal of Psychosocial Rehabilitation 2004;8:41–51.

Lysaker PH, Salyers MP, Tsai J, Spurrier LY, Davis LW. Clinical and psychosocial correlates of two domains of hopelessness in schizophrenia. Journal of Rehabilitation Research and Development 2008;45:911–920. [PubMed: 19009477]

Lysaker PH, Vohs JL, Tsai J. Negative symptoms and concordant impairments in attention in schizophrenia: Associations with social functioning, hope, self-esteem and internalized stigma. Schizophrenia Research 2009;110:165–172. [PubMed: 19230622]

Mcghie A, Chapman J. Disorders of attention and perception in early schizophrenia. British Journal of Medical Psychology 1961;34:103–116. [PubMed: 13773940]

McGurk SR, Twamley EW, Sitzer DI, McHugo GJ, Mueser KT. A meta-analysis of cognitive remediation in schizophrenia. American Journal of Psychiatry 2007;164:1791–1802. [PubMed: 18056233]

Möller HJ. Clinical evaluation of negative symptoms in schizophrenia. European Psychiatry 2007;22:380–386. [PubMed: 17524626]

Nieuwenstein MR, Aleman A, de Haan EHF. Relationship between symptom dimensions and neurocognitive functioning in schizophrenia: A meta-analysis of WCST and CPT studies. Journal of Psychiatric Research 2001;35:119–125. [PubMed: 11377441]

O'Brien, EJ.; Epstein, S. MSEI: The multidimensional self-esteem inventory professional manual. Psychological Assessment Resources; Lutz, FL: 1998.

Reynolds, WM. Multidimensional Anxiety Questionnaire. Psychological Assessment Resources; Lutz, Florida: 1999.

Riccio CA, Reynolds CR, Lowe P, Moore JJ. The continuous performance test: A window on the neural substrates for attention? Archives of Clinical Neuropsychology 2002;17:235–272. [PubMed: 14589726]

Ritsher JB, Otilingam PG, Grajales M. Internalized stigma of mental illness: Psychometric properties of a new measure. Psychiatry Research 2003;121:31–49. [PubMed: 14572622]

Ritsher JB, Phelan JC. Internalized stigma predicts erosion of morale among psychiatric outpatients. Psychiatry Research 2004;121:31–49. [PubMed: 14572622]

Salvatore G, Dimaggio G, Lysaker PH. An inter-subjective perspective on negative symptoms of schizophrenia: Implications of simulation theory. Cognitive Neuropsychiatry 2007;12:144–164. [PubMed: 17453896]

Table 1

Positive symptoms, Social Function, Self-Esteem, and Internalized Stigma among Groups

	Group 1: Low Negative/Better attention (n= 27)	Group 2: Low negative/Poorer attention (n= 16)	Group 3: High negative/Poorer attention (n= 20)	Group 4: High negative/Better attention (n= 14)	ANOVA F=	Group Comparisons p<.05
PANSS Negative component[a]	18.63 (3.76)	18.00 (4.78)	24.50 (5.70)	22.00 (6.06)	7.34***	3, 4 > 1, 2
PANSS Positive component	14.41 (5.02)	16.62 (5.93)	17.80 (6.74)	14.64 (5.51)	1.62	ns
QOLS Interpersonal relations[b]	21.07 (8.49)	20.31 (9.71)	13.80 (8.31)	17.50 (8.46)	3.02*	1, 2 > 3
QOLS Intrapsychic foundations	22.11 (5.77)	22.81 (7.67)	14.40 (5.90)	18.79 (4.26)	8.15***	1, 2, 4 > 3
MSEI Likability[c]	30.04 (6.73)	32.25 (6.48)	27.68 (6.78)	32.00 (7.34)	1.67	ns
MSEI Competence	34.62 (7.03)	35.50 (6.78)	28.26 (7.59)	35.14 (5.92)	4.50**	1, 2, 4 > 3
MSEI Defensive Self-enhancement	48.54 (8.31)	51.50 (8.17)	49.53 (7.39)	51.64 (8.71)	0.65	ns
ISMIS Social withdrawal[d]	1.15 (0.67)	1.07 (0.51)	1.41 (0.70)	1.31 (0.57)	1.07	ns
ISMIS Stereotype endorsement	0.92 (0.55)	0.74 (0.48)	1.21 (0.63)	1.08 (0.30)	2.75	ns
MAQ total	64.96 (16.12)	59.44 (12.56)	77.65 (25.07)	63.57 (18.41)	3.26*	3 > 1, 2, 4
WCQ Ignoring[e]	0.80 (0.28)	0.82 (0.31)	1.04 (0.25)	0.86 (0.23)	3.23*	3 > 1, 2, 4
WCQ Resigning	1.01 (0.36)	1.06 (0.35)	1.12 (0.42)	1.02 (0.46)	0.29	ns

[a] PANSS= Positive and Negative Symptom Scale

[b] QOLS= Quality of Life Scale

[c] Multidimensional Self-Esteem Inventory, scores are T scores with higher scores reflecting greater self-esteem

[d] ISMIS= Internalized Stigma of Mental Illness Scale, scores are based on a 4-point scale with greater scores indicating greater stigma

[e] WCQ= Ways of Coping Questionnaire, scores are relative scores with higher scores reflecting a greater preference for a way of coping

* p<.05,

** p<.01,

*** p<.001