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Positive And Negative Symptoms Questionnaire-revised

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POSITIVE AND NEGATIVE SYMPTOMS QUESTIONNAIRE-REVISED

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ABSTRACT

Previously, Iancu and Poreh (2005) constructed a measure for the assessment of Positive and Negative Symptoms Questionnaire (PNS-Q). This self-report measure was designed to clarify the insight of schizophrenic patients as well as be used to examine changes in their presenting symptoms across time. This measure was used in a variety of studies with mixed results. The current study aimed to update the PNS-Q questions, improve the content validity, and provide preliminarily psychometric properties of the revised scale. Additionally, the study examined the construct validity of the revised scale by correlating with the McEvoy's Vignettes (McEvoy, 1993), a measure of insight and acute psychopathology. The study shows that there was a linear relationship between subscales Bizarre disorganization, Alogia, Avolition, and the McEvoy scale. The study also provides partial support for the construct validity of the new measures with a high internal consistency of the overall measure at .928. Additionally, there was partial support in obtaining distinct positive and negative components within the scale. In sum, this study provides some preliminary evidence regarding the reliability and validity of the revised. However, due to the small sample size, lack of diversity, and lack of participates with the diagnosis of schizophrenia additional research is needed.

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CHAPTER I

INTRODUCTION

Schizophrenia is characterized as a severe mental disorder with an international prevalence of 0.7% (Mattila, 2015). When considering the rate of diagnosis, one hundred thousand people around the world are diagnosed annually (Insel, 2010). While only comprising a small subset of the population, it is visible across all countries and cultures. Its severe psychopathology and incessant chronic deterioration can have lifelong implications on an individual's life without early intervention and treatment. Onset normally occurs in late teens to mid-twenties for both males and females but is more prevalent in males (Messias, 2007). The etiology of schizophrenia is not known but there are risk factors that make some populations more susceptible to have a diagnosis of this disorder. Some common risk factors can be ethnicity, especially those of African descent, as well as those located in urban environments (Messias, 2007). According to the DSM-5, diagnosis is contingent on having at least 2 of the following symptoms for at least 6 months: "delusions, hallucinations, disorganized speech, grossly disorganized or catatonic behavior. This also includes negative symptoms such as alogia, avolition, and anhedonia" (American Psychiatric Association, 2013), with the requirement that one of

the symptoms must be either delusions, hallucinations, or disorganized speech. In addition to symptomatology, there must be dysfunction in their social life or work environment (American Psychiatric Association, 2013).

In its mild forms, patients with Schizophrenia can often lead regular lives as 20-25% of those diagnosed achieve remission (Brady, 2004). Patients with more severe and persistent features exhibit deficits in areas related to planning daily schedules, regulation of social behavior, and emotionality (Semkovska et al, 2004). Impulsivity, rationality, and linear organization of thoughts can become more difficult as the disorder progresses. Memory loss as well as deficiencies in verbal fluency are also common (Orellana and Slachevsky, 2013). Besides cognition, schizophrenia is also characterized by neurological soft signs that can affect both fine and gross motor skills. Symptoms can include rigidity, gait imbalances, and tremors (Varambally et al., 2012). Tardive Dyskinesia, a side effect of second generation antipsychotics, is a well-known indicator that causes stiffening of the body and or uncontrolled actions like twisting and writhing (Correll & Schenk, 2008). When considering disease management, medications are commonly used. Second-generation antipsychotics are often preferred due to their lack of side effects. In cases that patients do not respond to normally prescribed medicines like typical and atypical antipsychotics, they might be considered treatment-resistant (Conley & Buchanan, 1997). Treatment-resistant schizophrenia (TRS) can lead to decreased quality of life as there are not many alternatives (Kinon, 2019). When considering the medicinal improvements of schizophrenia, it is important to evaluate positive and negative symptoms. The use of antipsychotics in the treatment of schizophrenia increased as researchers found that positive symptoms could be mediated by the drugs (Mitra, 2016). This caused a search

for a medication that would quell both positive and negative symptoms, allowing for an increased quality of life. To understand the motivations for this quest, it is important to recognize the evolution of schizophrenia and the importance of positive and negative symptoms.

Diagnosing Schizophrenia - A Historical Background

The embodiment of schizophrenia has taken many forms throughout history. The initial nosology of schizophrenia was labeled "Dementia praecox" by Emil Kraepelin (Andreasen, 1995). Through his observations, he established "9 clinical forms" or categorizations. While he did not explicitly define his impressions into positive and negative symptoms, he founded the initial concepts that are still present in current symptomatology (Jablensky, 2010).

As the concept of Schizophrenia was developing, Hughlings Jackson (1931) was the first to define positive and negative symptoms. He distinguished positive symptoms as abnormalities within the cognitive state and believed that negative symptoms stemmed from a disease state. This initial concept impacted the research on schizophrenia decades later. In 1980, Crow was especially enthralled by the idea of positive and negative symptoms and how positive symptoms could be indicative of a chemical imbalance, a popular theory at the time (Beck et al., 2009). Notably, Andreasen (1982) noticed through clinical impressions that many patients had both positive and negative symptomology and suggested a mixed category. There are also some suggestion that positive and negative symptoms are not distinct to schizophrenia but may be present on a continuum between clinical and non-clinical patients (David, 2010). Kaiser (2011) found that negative

symptoms were also found in relatives of patients with schizophrenia, suggesting genetic etiologies.

In the current day, the concept of positive and negative symptoms is stable. The Diagnostic and Statistical Manual 5th edition (DSM-V) defines positive symptoms as hallucinations, thought disorders, disorganized speech, disorganized behavior, delusions, and movement disorders (American Psychiatric Association (APA), 2013). These symptoms can be defined as abnormal and are not normally seen. In comparison, negative symptoms are also abnormal but represent a lack of normal behavior. Negative symptoms can include alogia, flat affect, avolition, anhedonia, and loss of attention (APA, 2013).

In literature, many have suggested models to explain the causes and differences for both positive, negative, and mixed symptoms. Popular models surrounding positive symptoms aim to understand the proposed development of hallucinations and paranoid delusions. The ABC model for psychosis (Ellis & Harper, 1961) consists of 3 components: activating events, beliefs, and consequences. It specifically addresses how a patient's life status and personal beliefs may contribute to the manifestation of voices and delusions (Morrison, 2002). Another model proposed similar themes for the evaluation of auditory-verbal hallucinations. Bentall and Fernyhough (2008) discussed a model that attributes these positive symptoms to "poor source monitoring." This model focuses on how misperception of motivations from oneself and others can allow for a manifestation of unfounded beliefs and intrusive thoughts. Negative symptoms are an area of interest due to the limitations in improvements and treatment involving those symptoms. Due to these limitations, models theorize that negative symptoms are a mechanism by the body

to protect mental reserves and to safeguard from negative social consequences of schizophrenia (Rector et al., 2005). There is some suggestion for a two factor model for negative symptoms. With the recognition that negative symptoms are not one dimension but rather should be separated by avolition related symptoms and poor emotional expression symptoms (Jang et al., 2016).

Positive and Negative Symptom Outcome Studies

The evaluation of positive and negative symptoms is important when considering patient outcomes. The state of a patient's premorbid functioning can be an indicator of either negative or positive symptoms. In 1982, Andreasen discussed a relationship between negative symptoms and premorbid functioning. This idea was further evaluated by Addington and Addington (1993). They found that males had significantly worse premorbid functioning compared to females. Additionally, a longitudinal study found that those with positive symptoms had a significant reduction of symptomatology over time in contrast with patients demonstrating negative symptoms. Additionally, there was a significant difference in the amount of time spent in treatment with those displaying negative symptoms (Austin et al, 2015).

Functional and structural brain imaging techniques have become an integral part of the assessment of positive and negative symptoms. There is conflicting information available about the usefulness of these techniques. Karlsgodt and colleagues (2010) suggest that anatomical brain anomalies specific to schizophrenia patients can be revealed through brain imaging, focusing on the temporal and frontal lobe. Loss of brain matter in these areas can be associated with deficits of semantic, episodic, and short-term memory, impulsivity, and other cognitive domains (Karlsgodt et al., 2010). Large

ventricles while not unique to schizophrenia patients is a common feature and can also explain cognitive deficits (Kasai et al., 2003). In 1985, Andreasen explained that common features characterized by positive symptoms may not be shown through functional or structural imaging techniques. If anything, subjects were shown to have slightly smaller ventricles. However, when considering negative symptoms, there appeared to be common brain abnormalities listed in the previous article, suggesting that negative symptoms are related to left hemisphere abnormalities (Andreasen, 1985).

While there are certain benefits to using imaging techniques, it's not always practical in outpatient or inpatient clinical settings. While the visual impact can be reassuring to patients and can help detect other neurological anomalies, it may not be an effective measure due to insurance costs, time, and lack of qualified personnel regarding patient load (Albon et al., 2008). Some practices may order Magnetic resonance imaging and Computed tomography scans to rule any neurological damage or search for organic diseases that may be the cause for underlying psychosis but that is not always pertinent. Sommer et al. (2013) found that MRIs only found "relevant pathology" in 11% of the MRIs, implying that functional imaging is not an end-all source for those seeking a diagnosis. Patients may then be referred to qualified personnel to be assessed for their current mental functions.

Criticisms of Current Measures

While the number of those afflicted with schizophrenia is low, the severity of the condition requires attention by the medical and psychological community. A common method to attain a positive diagnosis of schizophrenia is through an assortment of psychological assessments, however, these batteries while comprehensive can be time-

consuming and require advanced clinicians to be familiar enough with these batteries to perform them (Harvey et al., 2001). The most cited and popular measures to assess for positive and negative symptoms are the Scale for the Assessment of Positive Symptoms (SAPS), Scale for the Assessment of Negative Symptoms (SANS) (Andreasen, 1980), and the Positive and Negative Syndrome Scale (PANSS) (Kay et al., 1987). A frequent criticism of SAPS and SANS is that by requiring two separate measures to give an accurate understanding of both positive and negative symptoms, it is not as helpful nor effective as would one encompassing measure. The PANSS is considered the most robust measure of use due to its ability to track patients throughout treatment (Kumari et al., 2017). While these measures are the standard in clinical research, their use in clinical patient settings has been limited. This is due in part to their lengthy administration time; the PANSS has an administration time of 45-50 minutes, the SAPS has an administration of 30 mins, and the SANS has an undefined administration time (Kumari et al., 2017). Ultimately in patient settings, evaluation needs to be streamlined to meet the needs of as many patients as possible in the least amount of time.

This study is proposing a different assessment technique that would allow for a self- report measure that would be beneficial to both patients and clinicians. The questions would encompass symptomatology such as positive and negative symptoms and motor deficits. This scale is designed with clinicians in mind. It would allow for a further understand of premorbid functioning. As well as reduce the economic burden on individuals by decreasing the need for expensive and unnecessary tests.

Insight in Schizophrenia

Similar assessments like the one this study is proposing have been overlooked in the past due to a presumed lack of insight within patients with schizophrenia. "Insight" describes the awareness of illness and recognition for the need for treatment (Lysaker & Bell, 1994). A popular scale to assess for insight in patients is the "Scale to Assess Unawareness of Mental Disorder." The major components of insight that the scale assesses are awareness of symptoms, illness, and social consequences. While individuals with schizophrenia are typically characterized as having little to no insight, Sevy (2004) found that "the percentage of patients having a lack of awareness was 58.2% for symptoms, 32.7% for illness, 41.8% for social consequences and 18.4% for treatment response." This is an indicator that insight can exist on a continuum rather than as a bimodal trait.

Understanding how a patient views their condition can allow further understanding of future treatment. Lack of insight can be an indicator of poor medication adherence, resistance to psychological treatment, and low therapeutic alliance (Bota et al., 2006). While there are conflicting studies, the consensus in the literature is that 50 – 80% of patients have inhibited insight (Bastiaens & Agarkar, 2014). It is not fully understood how insight deteriorates or how it fluctuates (Bota et al., 2006). It is often thought that poor insight acts as a psychological defense against denial and neurocognitive deficits. Other studies have theorized that poor insight could be a coping mechanism that allows the patient to survive and complete daily tasks amidst stigma derived from their disorder (Lysaker & Bell, 1994). Additionally, a 2006 study indicated

that higher insight was strongly correlated with increased levels of depression, paranoia, suicidality, and anxiety among males and females (Bota et al., 2006).

There is value in assessing individuals with schizophrenia through self-report measures. For the purpose of this study, it is important to understand the validity of self-report assessments with patients with psychosis. With any self-report assessments, there can be effects of positive impression management, performance validity, and effects of symptomatology (Bell et al., 2006). A 2007 study looked into the validity of self-assessment reports in patients with psychosis, finding patients were able to accurately reflect on their positive symptoms, agreeableness, and neuroticism. However, patients were not reliable in reporting their social functioning (Bell et al, 2007). This allows us to understand that while not every aspect can be measured by self-report, there is efficacy in having a self-report measure.

Revision of the PNS-Q

The Positive and Negative Symptoms-Questionnaire (PNS-Q) was originally developed to address the above limitations (Iancu et al., 2005). It possesses high validity with the positive effect measure, the Scale for the Assessment of Positive Symptoms, SAPS (Andreasen, 1983), and McEvoy Scale (McEvoy et al, 1993). But it was not shown to be highly correlated with negative affect scales such as the Scale for Assessment of Negative Symptoms, SANS (Andreasen, 1984). It also attained high internal consistency for both of positive and negative components. It originally consisted of 68 questions and in a later version includes an informant section for the family to further assess insight. The present study had three aims in addition to revising PNS-Q and adjusting the scale questions. The first aim intended to assess the reliability of the total scale as well as the

subscales. Assessing the reliability of the subscales was not done in the past study. The second aim assessed if there were distinct positive and negative components of the scale. The last aim intended to examine if there is a positive linear relationship between the McEvoy scale and the PNS-QR subscales. The relationship might be able to allow us to know which subscales are valuable to clinicians as far as patient insight.

CHAPTER II

METHODS & MEASURES

The Positive and Negative Questionnaire-Revised (PNS-QR)

Each question of the PNS-QR was assessed and compared to other Schizophrenia Scales. Specifically, the questions were reformed to be consistent with SAPS and SANS. The SAPS and SANS both have clear classifications and subclassifications for each assessment. The classifications for SAPS are Hallucinations, Delusions, Bizarre/Disorganized Behavior, Thought Disorder, and Inappropriate Affect (Andreasen, 1985), whereas the classifications for SANS consists of Affect Flattening, Alogia, Avolition, Anhedonia, and Attention (Andreasen 1995). These classifications are presented in a visual format below in Figure 1.

Figure 1: SAPS and SANS Classifications

When considering item generation, additional schizophrenia measures were assessed, specifically using the Scale for the Assessment of Schizotypal Personality developed by Raine (1991). While not specifically formulated for schizophrenia, the SPQ was derived from the SANS, Schedule for Affective Disorders and Schizophrenia (SADS) (Endicott and Spitzer 1978), DSM-II-R, and other similar measures. These measures are consistent with the major and minor classifications of SAPS and SANS as they include questions surrounding speech patterns, behavior, beliefs, awareness. The Brief Impression Questionnaire modeled from the PANSS (Lanser et al. 2018) was also included as it is a measure that predicts social performance in schizophrenia patients. The final revised version of the PNS-QR includes 73 questions omitting the McEvoy Vignettes. It is estimated that the questionnaire takes 20-25 minutes to complete for the average participant.

The 73 items were separated into subscales. The subscales represented the subcategories of the SAPS and SANS. Positive subscales were Hallucinations, Delusions, Thought Disorder, Bizarre Disorganization, and Inappropriate Affect.

Negative subscales included Alogia, Affective Flattening Blunting, Avolition, and Anhedonia. Subscales were developed using total score function with appropriate questions.

McEvoy Vignettes

At the end of the questionnaire 8 vignettes originally developed by McEvoy (1993) were presented. This measure was included because of its self-report nature related to insight. While this scale is not a direct measure of insight, it allows clinicians to assess patients' understanding and ability to accurately assess the problems presented in the vignettes. The original vignettes have prompts related to positive, negative, and manic symptoms (McEvoy et al., 1995). For this reason, this scale was selected as a comparable measure to the revised scale.

Procedure

This study aimed to reach individuals that self-reported being diagnosed with Schizophrenia, Schizoaffective, Bipolar Disorder, Borderline personality disorder, and/or Depression. Individuals with no self-identifying mental health history were also examined. After opting into the study, participants were given a consent form to understand the purpose of the study as well as the risks*. Following the consent form, emails were sent allowing directing participants to SurveyGizmo.com. After receiving the email, subjects were tasked to answer the set of 73 questions which included a 4 point Likert scale. Answer options included False, Mainly False, Mainly True, and True.

*Please see the appendix for reference.

Participants

For the purpose of this study, all participants were required to be at least 18 years old. Volunteers were given the opportunity to participate in this study through Researchmatch.org. Research Match is an online database that recruits participants in the United States for health-related studies. It should be noted that the participants who use this website as well as those included in the study are not random as they voluntarily chose to participate in the study. The participants were then redirected to survey gizmo to take the questionnaires. The initial sample of the study consisted of 76 participants. Regarding data screening, 14 were removed from the study if they had more than 90% incomplete forms. A total of 62 participants were included in the final analyses of this study. The ages of the participants ranged from 18 to 74 with an average age of 41.81 (SD=13.99) and a level of education ranging from High School to Doctorate Level.

Table 1: Demographics

Background Variables	Total Sample
Gender (*n*)	62
% Male	16.1
% Female	75.8
% Transgender	4.8
% Do not identify as Male, Female, or Transgender	3.2
Ethnicity	
% Caucasian	32.9
% African American	4.8
% Asian	6.5
% Hispanic/ Latino	1.6
% Other	3.2
History of Severe Psychiatric Illness	
% Anxiety	74
% Depression	80.6
% Bipolar Depression	29.0
% Bipolar Manic	16.1
% Schizophrenia	32.3
% Borderline Personality Disorder	17.7

CHAPTER III

RESULTS

Analysis

Missing values were recoded through the method of user-defined missing variables. All statistical analyses were conducted through SPSS statistical software.

Reliability

Table 2 shows the internal consistency and descriptive statistics of the PNS-QR. One sees that for the full scale, a Cronbach Alpha of .928 was attained. The alpha level for the full scale was good. The alpha level for the subscales were in the acceptable, except for Avolition. Avolition attained a .515 and this is not within the acceptable when concerning reliability.

Table 2: Reliability

PNS-QR Scale	Number of items	Mean (SD)	Cronbach Alpha
PNS-QR Full scale	73	85.95 (29.2)	.928
Positive Subscales			
Hallucinations	6	6.4 (4.6)	.760
Delusions	9	6.4 (6.14)	.846
Thought Disorder	7	7.2 (4.56)	.741
Bizarre Disorganization	8	10.65 (5.66)	.831
Inappropriate affect	10	14.01 (5.87)	.823
Negative Symptoms			
Alogia	9	13.00 (6.68)	.898
Affective flatting	8	8.033 (5.23)	.807
Avolition	10	11.91 (4.41)	.515
Anhedonia	6	8.48 (4.59)	.782

Construct Validity

A Factor Analysis was conducted on 73 questions. This analysis used a principal component analysis extraction and a varimax rotation. Two components were obtained explaining 81.71% of the variance. Component one comprises the subscales of Hallucinations, Delusions, Thought Disorder, Bizarre Disorganization, Inappropriate Affect, Alogia, Affective Flattening, and Blunting. Component one accounted for 69.83% of the variance and had a total eigenvalue of 6.285. Component two comprises Avolition and Anhedonia. It accounted for 11.88% of the variance with a total eigenvalue of 1.070. Any criteria with an eigenvalue of less than 1 were not retained. A Kaiser- Meyer- Olkin Measure of Sampling Adequacy attained a value of .834 and Bartlett's Test of Sphericity had a significance of .000. Pairwise deletion was used during this analysis. This Factor model expresses a divergence between component 1 and 2 based on variance. When considering factor loadings Hallucinations, Delusions, and Thought Disorder have high factor loadings at .820, .914, and .903, respectively. This suggests a similarity between

these 3 variables. Avolition and Anhedonia had factor loadings of .916 and .844 respectively. This suggests a similarity between these 2 variables.

Table 3: Principal Component Analysis

PNS-QR sub scales	Factor 1	Factor 2	Communality
Hallucinations	.820	.381	.818
Delusions	.914	.158	.861
Thought Disorder	.903	.159	.840
Bizarre Disorganization	.662	.636	.843
Inappropriate Affect	.747	.423	.737
Alogia	.687	.593	.824
Affective FLBL	.674	.539	.745
Avolition	.118	.916	.853
Anhedonia	.348	.844	.833

Table 4: Independent Samples Test

Independent Samples Test

		t-test for Equality of Means		
		t	df	Sig. (2-tailed)
Hallucinations	Equal variances assumed	3.802	47	.000
	Equal variances not assumed	3.976	40.613	.000
Delusions	Equal variances assumed	4.679	48	.000
	Equal variances not assumed	4.412	32.704	.000
Thought	Equal variances assumed	3.905	46	.000
Disorder	Equal variances not assumed	3.594	27.519	.001
Bizarre	Equal variances assumed	2.978	47	.005
Disorganization	Equal variances not assumed	2.748	27.862	.010
Inappropriate	Equal variances assumed	4.350	42	.000
Affect	Equal variances not assumed	4.323	25.085	.000
Alogia	Equal variances assumed	3.102	45	.003
	Equal variances not assumed	2.977	31.497	.006
Affective	Equal variances assumed	4.857	46	.000
Flattening	Equal variances not assumed	4.890	33.719	.000
Avolition	Equal variances assumed	.945	44	.350
	Equal variances not assumed	1.004	39.927	.321
Anhedonia	Equal variances assumed	1.996	48	.052
	Equal variances not assumed	2.010	41.834	.051

During the analysis of this study there were multiple groups used to access positive and negative symptoms. An independent sample t-test was performed to assess if there was difference of the scales between individuals with schizophrenia and all other groups. In this analysis all differences were significant between groups except for Anhedonia and Avolition. Anhedonia and Avolition do not appear to be different between both populations.

Table 5: Independent Samples Test- Area Under the Curve

Area Under the Curve

Test Result Variable(s)	Area
PNSQR	.878
McEvoy	.053
Hallucinations	.814
Delusions	.833
Thought Disorder	.806
Bizarre Disorganization	.865
Inappropriate affect	.780
Alogia	.797
Affective Flattening	.915
Avolition	.744
Anhedonia	.739

A test for Sensitivity and specificity was performed on the population. It indicates that the McEvoy was the least successful scale at identifying the schizophrenia population. It was the only one that could not distinguish between the two. However, the McEvoy may not have been designed for this purpose.

Table 6: Correlation of Subscales

Correlations

		HA	DE	TD	BD	IA	AG	AF	AN	AA
HA	Pearson Correlation	1	.756**	.739**	.705**	.609**	.710**	.660**	.429**	.559**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.003	.000
	N	49	48	47	48	42	46	47	45	48
DE	Pearson Correlation	.756**	1	.816**	.641**	.648**	.550**	.605**	.253	.396**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.093	.005
	N	48	50	47	48	43	46	47	45	49
TD	Pearson Correlation	.739**	.816**	1	.662**	.631**	.614**	.632**	.276	.349*
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.067	.015
	N	47	47	48	47	41	45	47	45	48
BD	Pearson Correlation	.705**	.641**	.662**	1	.666**	.772**	.746**	.638**	.707**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000	.000
	N	48	48	47	49	42	45	47	45	48
IA	Pearson Correlation	.609**	.648**	.631**	.666**	1	.880**	.629**	.323*	.578**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.045	.000
	N	42	43	41	42	44	40	41	39	43
AG	Pearson Correlation	.710**	.550**	.614**	.772**	.880**	1	.743**	.506**	.639**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.000	.000
	N	46	46	45	45	40	47	45	46	46
AF	Pearson Correlation	.660**	.605**	.632**	.746**	.629**	.743**	1	.532**	.572**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000	.000
	N	47	47	47	47	41	45	48	45	47
AN	Pearson Correlation	.429**	.253	.276	.638**	.323*	.506**	.532**	1	.706**
	Sig. (2-tailed)	.003	.093	.067	.000	.045	.000	.000		.000
	N	45	45	45	45	39	46	45	46	45
AA	Pearson Correlation	.559**	.396**	.349*	.707**	.578**	.639**	.572**	.706**	1
	Sig. (2-tailed)	.000	.005	.015	.000	.000	.000	.000	.000	
	N	48	49	48	48	43	46	47	45	50

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Name Abbreviations: Hallucinations (HA), Delusions (DE), Thought Disorder (TD), Inappropriate Affect (IA), Alogia (AG), Affective Flattening (AF), Avolition (AN), Anhedonia (AA)

A correlation was done between the subscales of the revised positive and negative symptom scale. To see if there were any similarities between the scales. Avolition and Anhedonia seem to be the most different compared to other scales. They both often attain a lower Pearson Correlation in comparison to other subscales. Except for Bizarre

Disorganization which is similarly correlated with all the subscales ranging between .6 and .7.

Table 7: Multiple Regression Between the PNS-QR and McEvoy Scales.

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1277.908	1	1277.908	58.092	.000[b]
	Residual	879.925	40	21.998		
	Total	2157.833	41			
2	Regression	1406.692	2	703.346	36.518	.000[c]
	Residual	751.141	39	19.260		
	Total	2157.833	41			
3	Regression	1490.116	3	496.705	28.268	.000[d]
	Residual	667.717	38	17.572		
	Total	2157.833	41			

a. Dependent Variable: McEvoy

b. Predictors: (Constant), Bizarre disorganization

The final portion of the study was to examine the construct validity of the PNS-QR by correlating it with the McEvoy scale. The regression equation produced, $F(3, 38) = 28.268$, $p < .001$ with an R^2 value of .658. Pairwise deletion was used during this analysis.

Table 8: Excluded variables

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance
1	Hallucinations	-.124[b]	-.704	.486	-.112	.334
	Delusions	-.081[b]	-.459	.649	-.073	.334
	Thought Disorder	-.099[b]	-.639	.526	-.102	.431
	Inappropriate Affect	-.332[b]	-2.426	.020	-.362	.484
	Alogia	-.411[b]	-2.586	.014	-.383	.353
	Affective Flattening	-.150[b]	-.830	.412	-.132	.314
	Avolition	-.321[b]	-2.429	.020	-.362	.521
	Anhedonia	-.341[b]	-2.366	.023	-.354	.440
2	Hallucinations	.008[c]	.048	.962	.008	.302
	Delusions	.025[c]	.147	.884	.024	.314
	Thought Disorder	.010[c]	.063	.950	.010	.395
	Inappropriate Affect	-.143[c]	-.626	.535	-.101	.174
	Affective Flattening	-.008[c]	-.045	.965	-.007	.280
	Avolition	-.276[c]	-2.179	.036	-.333	.509
	Anhedonia	-.247[c]	-1.678	.101	-.263	.393
3	Hallucinations	-.062[d]	-.368	.715	-.060	.291
	Delusions	-.075[d]	-.442	.661	-.072	.291
	Thought Disorder	-.084[d]	-.555	.582	-.091	.364
	Inappropriate Affect	-.200[d]	-.915	.366	-.149	.172
	Affective Flattening	.017[d]	.101	.920	.017	.279
	Anhedonia	-.106[d]	-.608	.547	-.100	.272

a. Dependent Variable: McEvoy
b. Predictors in the Model: (Constant), Bizarre Disorganization
c. Predictors in the Model: (Constant), Bizarre Disorganization, Alogia
d. Predictors in the Model: (Constant), Bizarre Disorganization, Alogia, Avolition

CHAPTER IV

DISCUSSION

The purpose of this study was to revise the original PNS-Q as well as adjust scale questions. The first aim assessed reliability of the total scale as well as the subscales. The second aim assessed if there were distinct positive and negative components of the scale. The last aim intended to examine if there was a linear relationship between the McEvoy scale and the PNS-QR subscales.

When reflecting on the first aim, a minimum Cronbach Alpha of .70 was the minimum acceptable value for internal consistency. The only scale that did not meet this minimum criterion for internal consistency was the subscale Avolition. The low alpha might suggest that the items represent a wider construct than perhaps just one. Representative nature is related to validity. Well defined nature would be related to factor analysis. or are not well defined from the other subscales within the revised positive and negative symptoms scale. To optimize the usefulness of the scale it might be imperative that these items be removed or rewritten in a way that reflects Avolition. To understand whether this scale truly encompassed a binary positive and negative component, a factor analysis was completed. This aim was partially supported by the findings of this analysis. There were two components, one that composed of the positive

scales with the addition of Alogia and Affective Flattening. The other component included Avolition and Anhedonia. Component 1 aligns with the awareness of abnormal cognition and behavior, while component 2 is defined by loss of interest and motivation in previously pleasurable activities. While these two components are not indictive of completely separate positive and negative scales it might support a mixed symptomatology among the participants in the study.

There were also partial findings to a linear relationship between the McEvoy scale and the PNS-QR subscales. The model that was most closely related to the McEvoy scale included Bizarre Disorganization, Alogia, and Avolition. As the McEvoy scale is a scale that assesses awareness and the ability to recognize the need for treatment (McEvoy et al, 1993), these findings can help explain what symptomologies are most correlated with insight. This may imply that when experiencing forms of severe psychiatric illness one can understand more evident additions of strange behaviors or lack of ability to speak or be motivated. While further examination would be needed, these subcategories may be the most useful as a self-report measure in a clinical setting.

When considering the choice of analyses used in this study there were considerations to be made. The internal consistency analysis was essential to confirm construct validity. Similarly, the multiple regression to confirm a relationship between the McEvoy scale and the PNS-QR subscales was important to establish a frame of reference for insight in those scales. However, for the principal component analysis, there was a choice between an exploratory factor analysis and a confirmatory factor analysis. The confirmatory factor analysis was considered because there was an initial idea of how the data should present itself. As there were preconceived concepts of

positive and negative components as well as which questions belonged in a subscale. However, for a preliminary analysis of this revised scale, it was important just to examine the data in an unconfined analysis. This would allow for initial information as to what concepts were accurately defined and could allow for later exploration of a confirmatory factor analysis.

With this idea of a preliminary analysis it is important to understand what could have been improved. There would need to be further examination and revisions to understand how internal consistency would be affected with fewer questions. It is also important to examine the inherent difficulties with self-report measures. Other self-report measures have embedded scales to assess for response bias, positive impression management, and/or negative impression management (van de Mortel, 2008). A future study where a response bias measure is included may allow for exploration between positive and negative symptoms and how its implicated in schizophrenia.

Lastly, there may have been limitations associated with the sample used in this study. When considering the invariants from this preliminary analysis there might not be evidence to suggest the findings may be applicable in other groups. The sample was mostly Caucasian at 32.9%, majority female at 75.8%, with high rates of depression and anxiety. This is in contrast to epidemiologic findings that state that schizophrenia is often diagnosed in minority groups such as African American, Latino/Hispanic groups, and various immigrants (Schwartz & Blankenship, 2014), as well as a relatively equal prevalence between men and women (Li et al., 2016). The size of the study may have affected findings as well. The sample size of 62 may not

have been large enough for some of the analyses conducted. According to de Winter (2009), the minimum recommended sample size of a factor analysis is 50. There would need to be another analysis with more participants to understand if the findings would be similar to other groups.

While further analysis needs to be obtained to assess the real-life implications and uses of this measure, there were some promising findings. There was some partial support of subscales Bizarre Disorganization, Alogia, and Avolition that were more likely to be useful with individuals with improved insight, as well as partial findings of distinct positive and negative symptoms within the scale. When considering future research, this study would explore increasing diversity and examine the test questions for definitive use and precision.

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APPENDIX

CLEVELAND STATE UNIVERSITY

Cleveland State University
Department of Psychology
2300 Chester Avenue, Room 158
Cleveland, OH 44115-2214
Positive and Negative Symptoms Questionnaire Revised (PNS-QR)
Sponsor: N/A
PI: Amir Poreh Ph.D. PHONE #: (216) 687-3718

Informed Consent

You are being asked to take part in a research study which consists of answering a series of questions.

You must be 18 years of age or older to take part. Please confirm that you are 18 years or older.

☐Yes, I am 18 years or older

☐No, I am not 18 years or older

ABOUT THE RESEARCH

The purpose of the study is to update self-report measure PNS-QR that will available for use by clinicians to measure individuals who may be candidate for diagnoses of severe psychopathology. This research is attempting to establish a reliable measure that can accurately access and predict schizophrenia. This will be done by updating and correcting questions on the original PNS-QR and adding additional questions. This is done with the intention of giving clinicians more informed insight into the schizophrenic symptoms of their patients.

What is involved if you decide to take part in this research study?

Taking part in the study includes completing the questions on the PNS-QR. It takes about 30 minutes to complete. The questions cover a wide range of behaviors. It also has questions about the use of alcohol and other drugs. Prior to completing the measure, you will be asked (if applicable) about your mental health history. Also, you will be asked what kind of medications you're currently being prescribed. The questionnaire can be taken at any time after you agree using the web link. The results of the PNS-QR will be stored in a HIPPA protected website and then the downloaded and identified to secure encrypted hard drive. Once you complete the PANS-QR you will be asked if you are

willing to retake the PNS-QR in a year. You may or may not chose to participate in this follow-up study.

RISKS:
There are no physical risks involved with this study. Some people might find certain questions distressing. If you experience such a distress you should call 211. The website [/]http://www.211.org will help you locate mental health agencies in your region. You may choose not to answer any question if you wish or discontinue the questionnaire. You may end the study with no repercussions. There is a risk that an unauthorized data breach might occur but we will make every effort to keep your answers safe.

BENEFITS
There are no direct benefits or compensation from completing this study.

COSTS & PAYMENT
There are no costs or payments to you for taking part in this study aside from participating in a raffle.

PRIVACY
What will happen to your information collected for this research?
Personal names will not be collected during the study. However the volunteers emails will be collected and be used to recruit them for the study. Toward the end of the study volunteers will be asked if they're willing to retake the questionnaire at another time. If they great to do the emails will remain within the HIPPA compliant system until they complete the questionnaire once more. The email information will then be removed from the database. Data will be collected on the HIPPA compliant web service and then stored on a military grade hardware encrypted hard drive - APICRON A25-3PL256)

CONFLICT OF INTEREST
There are no conflicts of interest to report.

QUESTIONS
Who do you call if you have any questions or problems?
If you have any questions or problems, please contact Amir Poreh, PhD at (216) 687-3718 or a.poreh@csuohio.edu

TAKING PART IS OPTIONAL
What are your rights?
Taking part in this study is completely up to you. You may choose not to take part or may leave the study at any time with no penalty.
Please read the following: "I understand that if I have any questions about my rights as a research subject, I can contact the Cleveland State University Institutional Review Board at (216) 687-3630.

Consent:

Do You consent to participate in this study?

☐ Yes, I consent to participate in this study.

☐ No, I do not consent to participate in this study.

Initial call for volunteers:

This study is looking to assess the validity and reliability of a new measure of Severe Psychopathology. We are inviting volunteers with and without mental health history to participate in the study. The result of the PANS-QR will be stored in a HIPPA protected website and then the downloaded and identified to secure encrypted hard drive. This study is open to men and women between the ages of 18 and 65. The questionnaire consists of 65 multiple choice questions and takes approximately 30 minutes to complete and includes questions regarding mental health history as well as currently prescribed medications

Email for the questionnaire link

A short time ago you received a request to participate in a study regarding the validity and reliability of a new measure of personality functioning. The purpose of this study is to gain better understanding of the reliability and validity of a new Schizophrenia scale. We are inviting volunteers with and without mental health history to participate in the study. The result of the personality inventory will be stored in a HIPPA protected website and then the downloaded to secure encrypted hard drive. This study is open to men and women between the ages of 18 and 65. The questionnaire consists of 65 multiple choice

questions takes approximately 30 minutes to complete and includes questions regarding mental health history as well as currently prescribed medications. Below is a link to the questionnaire. If you agree to retake the questionnaire in a later time, we will keep you email address. If not, we will remove your email once the study is completed.

Email for 1 year follow up

About a year ago you received a request to participate in a study regarding the validity and reliability of a new measure of Schizophrenia. We are inviting volunteers with and without mental health history to participate in the study. The result of the personality inventory will be stored in a HIPPA protected website and then the downloaded and identified to secure encrypted hard drive. This study is open to men and women between the ages of 18 and 65. The questionnaire consists of 65 multiple choice questions takes approximately 30 minutes to complete and includes questions regarding mental health history as well as currently prescribed medications. Below is a link to the questionnaire.