Schizophrenia Research xxx (2017) xxx–xxx

Contents lists available at ScienceDirect

Schizophrenia Research

journal homepage: www.elsevier.com/locate/schres

Development and psychometric properties of the Multidimensional Schizotypy Scale: A new measure for assessing positive, negative, and disorganized schizotypy

Thomas R. Kwapil [a,b,*], Georgina M. Gross [b], Paul J. Silvia [b], Michael L. Raulin [c], Neus Barrantes-Vidal [b,d,e,f]

[a] University of Illinois at Urbana-Champaign, United States
[b] University of North Carolina at Greensboro, United States
[c] Youngstown State University, United States
[d] Departament de Psicologia Clínica i de la Salut, Universitat Autònoma de Barcelona, Spain
[e] Sant Pere Claver – Fundació Sanitària, Spain
[f] CIBERSAM, Instituto de Salud Carlos III, Spain

ARTICLE INFO

Article history:
Received 26 February 2017
Received in revised form 30 June 2017
Accepted 1 July 2017
Available online xxxx

Keywords:
Schizotypy
Schizophrenia-spectrum
Multidimensional
Scale development

ABSTRACT

This article reports on the development of a new self-report questionnaire measure of schizotypy – the Multidimensional Schizotypy Scale (MSS). Schizotypy offers a useful and unifying construct for understanding schizophrenia-spectrum psychopathology. Questionnaire measures have been widely used to assess schizotypy and have greatly informed our understanding of the construct. However, available measures suffer from a number of limitations, including lack of a clear conceptual framework, outdated wording, unclear factor structure, and psychometric shortcomings. The MSS is based on current conceptual models and taps positive, negative, and disorganized dimensions of schizotypy. The derivation sample included 6265 participants sampled from four universities and Amazon Mechanical Turk. A separate sample of 1000 participants from these sources was used to examine the psychometric properties of the final subscales. Scale development employed classical test theory, item response theory, and differential item function methods. The positive schizotypy and negative schizotypy subscales contain 26 items each, and the disorganized schizotypy subscale contains 25 items. The psychometric properties were almost identical in the derivation and validation samples. All three subscales demonstrated good to excellent reliability, high item-scale correlations, and good item and test curve characteristics. The MSS appears to provide a promising measure for assessing schizotypy.

1. Introduction

1.1. Schizotypy and schizophrenia

Schizotypy is thought to represent the phenotypic manifestation of the underlying vulnerability for schizophrenia-spectrum psychopathology that is expressed across a broad range from subclinical expression to the prodrome to schizophrenia-spectrum personality disorders to full-blown psychosis (Kwapil and Barrantes-Vidal, 2015; Lenzenweger, 2010). Schizotypy offers a useful and unifying construct for understanding the etiology, development, and expression of schizophrenia-spectrum psychopathology. Schizotypy, and by extension schizophrenia, is heterogeneous and this heterogeneity can be captured by a multidimensional structure. Although the exact number and nature of these dimensions is not settled, there is good support for positive, negative, and disorganized dimensions (e.g., American Psychiatric Association, 2013; Kwapil and Barrantes-Vidal, 2015; Tandon et al., 2009; Vollema and van den Bosch, 1995). The positive or psychotic-like symptom dimension is characterized by disruptions in content of thought (ranging from magical ideation to full-blown delusions), perceptual oddities (including illusions and hallucinations), and suspiciousness/paranoia. The negative or deficit dimension involves diminished experiences and expression such as alogia, anergia, avolition, anhedonia and affect. The cognitive-behavioral disorganization dimension is characterized by disturbances in the ability to organize and express thoughts and behavior (ranging from mild disruptions to formal thought disorder and markedly disorganized actions). The reliable identification of these dimensions is necessary for parsing the heterogeneity of schizotypy and schizophrenia and for understanding their origins, development, and expression.

* Corresponding author at: Department of Psychology, University of Illinois at Urbana-Champaign, 603 E. Daniel Street, Champaign, IL 61820, United States.
E-mail address: trkwapil@illinois.edu (T.R. Kwapil).

http://dx.doi.org/10.1016/j.schres.2017.07.001

1.2. Assessment of schizotypy

Numerous questionnaire measures have been developed to assess schizotypy (see reviews by Chapman et al., 1995; Kwapil and Chun, 2015; Mason, 2015; Mason et al., 1997) and have greatly informed our understanding of the construct. These measures offer several advantages including being relatively inexpensive, brief, and non-invasive to administer. They provide a valuable method for screening large numbers of participants from clinical and nonclinical samples and have greatly enhanced our understanding of schizotypy and the schizophrenia-spectrum. Nevertheless, such measures suffer from the same limitations as all questionnaires (e.g., self-report bias) and lack the precision of structured interviews. However, schizotypy questionnaires have proven to be valuable and widely-used measures (e.g., Barrantes-Vidal et al., 2013; Blanchard et al., 2011; Chapman et al., 1994; Gooding et al., 2005; Raine, 1991).

The most widely used of these measures are the Schizotypal Personality Questionnaire (SPQ; Raine, 1991), the Oxford-Liverpool Inventory of Feelings & Experiences (O-LIFE; Mason et al., 1995), and the Wisconsin Schizotypy Scales (also referred to as the Chapman Scales of Psychosis Proneness), which include the Perceptual Aberration (Chapman et al., 1978), Magical Ideation (Eckblad and Chapman, 1983), Physical Anhedonia (Chapman et al., 1976), and Revised Social Anhedonia (Eckblad et al., 1982) Scales. Raine et al. (1994) reported that the SPQ has a three-factor structure with cognitive-perceptual, interpersonal, and disorganized factors, although other studies have suggested two to four-factor models provide the best fit (e.g., Compton et al., 2009; Gross et al., 2014). The O-LIFE has four factors (unusual experiences, cognitive disorganization, introvertive anhedonia, and impulsive nonconformity). Many studies indicate that a two-factor structure with positive and negative schizotypy dimensions underlies the Wisconsin Schizotypy Scales (e.g., Kwapil et al., 2008; Chan et al., 2015). The psychometric properties and the construct validity have been widely reported for the Wisconsin Schizotypy Scales (e.g., Chapman et al., 1994), SPQ (e.g., Salokangas et al., 2013), and O-LIFE (e.g., Mason and Claridge, 2006). Note that our decision to limit our discussion of other scales to the Wisconsin Schizotypy Scales, O-LIFE, and SPQ was not intended to overlook the numerous other scales of schizotypy, psychosis proneness, and related experiences. However, we refer readers to the four comprehensive reviews cited above.

Despite the valuable contributions produced by studies employing schizotypy questionnaires, currently available measures have several limitations. First, many of these measures do not map onto current multidimensional conceptualizations of schizotypy that include positive, negative, and disorganized dimensions. Specifically, some scales fail to assess schizotypy as a multidimensional construct. Furthermore, scales that do so often differ in the number and the content of the factors – and in some cases contain subscales that either do not map onto current conceptual models (e.g., impulsive nonconformity) or do not adequately assess these factors. Likewise, scales that purport to measure the same factor sometimes appear to be measuring different constructs (see Gross et al., 2014). Effective and informative study of schizotypy requires the use of measures that map onto the theoretical model of the construct. The current study of schizotypy is hampered by the use of multiple measures that appear to be measuring different constructs.

A second limitation reflects that older scales were not able to capitalize on recent advances in measurement theory. These scales were typically developed using classical test theory (CTT), but more current tools such as item response theory (IRT) and differential item functioning (DIF) improve upon psychometric properties over and above CTT (Hambleton et al., 2000). For example, Winterstein et al. (2011) examined the Wisconsin Schizotypy Scales using IRT and DIF. They found many good items within the scales, but revealed some items had low discrimination and many had high DIF for sex and ethnicity. Many of the current scales were also developed with relatively small samples (e.g., often fewer than 1000 participants) and often using participants from a single site that lacked racial and ethnic diversity. Finally, many of the existing scales employ wording that is outdated or culturally biased.

1.3. Goals of the present study

Schizotypy appears to offer a useful and unifying construct for understanding clinical and subclinical expressions of schizophrenia-spectrum psychopathology. However, the utility of this construct requires theoretically and empirically solid measurement tools. The present study developed the Multidimensional Schizotypy Scale (MSS) - a new, conceptually based, multidimensional questionnaire assessing positive, negative, and disorganized schizotypy dimensions. Our goal in developing the MSS was to build a measure that is based upon the current three-factor conceptual model of schizotypy, that has strong psychometric properties, and that is appropriate for older adolescents and adults. In doing this, we hoped to build on the strengths of existing models and measures, and to overcome conceptual and empirical limitations of extant measures mentioned above. Specifically, we aimed to develop items that avoided outdated and biased language, employed leading measurement models including CTT, IRT, and DIF, and used large and diverse derivation and cross-validation samples drawn from multiple testing sites.

The items tap experiences that occur across the schizotypy continuum. Many of the experiences are similar, albeit milder, forms of symptoms experienced by patients with schizophrenia-spectrum disorders. The positive schizotypy items tap magical beliefs, referential thinking, mind reading and thought transmission, supernatural experiences, passivity experiences, unusual perceptual and somatic experiences, paranoia and suspiciousness, and special powers. Negative schizotypy items assess social disinterest, flat affect, anhedonia, alogia, anergia, and avolition. Care was taken to generate items that tap trait-like negative symptoms and did not simply tap episodic depressive symptoms or the experience of negative affect. Negative schizotypy items were worded to refer to trait-like, enduring characteristics, rather than episodic or momentary characteristics. For example, negative schizotypy items contain the specifiers, “throughout my life…”, “I have always…”, “almost always…”, “I rarely…”, “I typically…”, “I have little or no…”. Secondly we created items that reflected a diminution of functioning and interest in the world, but did not reflect increased negative affect. The disorganized schizotypy items assess disorganized thought and behavior, confusion, racing thoughts, loose associations, disrupted speech, difficulty following conversations, and slowness of thought.

The scale development procedures followed DeVellis' (2012) guidelines including: 1) development of trait specifications for the three schizotypy dimensions, 2) generation of a large pool of candidate items based on these specifications, 3) review of the items by expert and non-expert reviewers, 4) repeated administrations of the candidate items to large and diverse samples from multiple sources – interspersed with evaluation, modification, and dropping of items, 5) selection of final items based on content validity, CTT, IRT, and DIF, and 6) evaluation of the psychometric properties of the items and subscales in a large independent sample of participants. Our goal was to recruit at least 6000 participants for the derivation sample and 1000 participants for the validation sample. We aimed to include approximately 25 to 35 items in each of the three subscales. We expected to select items with relatively low endorsement frequency given the relative rarity of schizotypic experiences in the general population (e.g., Lenzenweger and Korfine, 1992) and to maximize discrimination at the high end of the scale.

2. Methods

2.1. Participants

A total of 8750 participants at four universities and on Amazon Mechanical Turk (MTurk) were administered the candidate items during a

Please cite this article as: Kwapil, T.R., et al., Development and psychometric properties of the Multidimensional Schizotypy Scale: A new measure for assessing positive, negative, ..., Schizophr. Res. (2017), http://dx.doi.org/10.1016/j.schres.2017.07.001