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Validating a Behavioral Health Instrument for Adults: Exploratory Factor Analysis

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ABSTRACT

Increasingly, social workers and behavioral health practitioners use assessment instruments to support service planning and to monitor progress. Following statewide implementation of the Adult Needs and Strengths Assessment (ANSA) to identify behavioral health symptoms, related functional challenges, risks, and strengths, this validation study explored the underlying structure of the instrument. An exploratory factor analysis used routinely collected information for Midwestern adults with diagnosed behavioral health disorders who participated in community-based services ($N = 46{,}013$). Five factors with adequate to good internal consistency ($\alpha = 0.733-0.880$) emerged: personal recovery, trauma and stress related problems, substance use risks, self-sufficiency, and cultural-linguistic considerations. Validation of the ANSA supports use of the instrument to engage individuals and families, to plan services, to monitor progress, and to conduct research. Implications for social work education, supervision, and practice include the importance of understanding culture, holistic assessment, and services supporting personal recovery for individuals living with mental illness or substance use disorders. Confirmation of findings requires additional research.

KEYWORDS

Adult Needs and Strengths Assessment (ANSA); exploratory factor analysis; recovery; cultural-linguistic considerations; mental health, and substance use disorders

Mental illness is widespread, affecting a significant portion of adults (United States Department of Health & Human Services, DHHS, 1999; National Institute of Mental Health, NIMH, 2017). Defined as a mental, emotional, or behavioral disorder—not including intellectual disabilities and substance use disorders—meeting American Psychiatric Association (APA, 2013) diagnostic criteria, in 2015–2016 mental illness affected 18.07% of adults aged 18 or older (NIMH, 2017) with 4.13% experiencing severe functional impairment (Substance Abuse and Mental Health Services Administration, SAMHSA, 2017). In particular, the adverse impact is critical for young adults, aged 18 to 25; 5.46% experienced severe functional impairments in education, residential stability, employment, or involvement in the criminal justice system (Cappeli et al., 2016; SAMHSA, 2017; World Health Organization, 2004).

Accurately assessing symptoms of mental illness and the impact on functioning is necessary to develop effective treatment. Most mental health assessment instruments primarily identify and measure symptoms of mental illness (Trousselard et al., 2016) and are modified over time based on theory and research to reflect current knowledge and understanding (APA, 2017). One such assessment instrument is the Adult Needs and Strengths Assessment (ANSA, Lyons, 2009b). Developed from the Severity of Psychiatric Illness rating scale (SPI; Lyons, 2009b), the ANSA has been modified and used as an instrument to assess the problems and strengths of people with mental illness. Several states and providers have implemented the ANSA as an assessment instrument, outcome measure, and quality monitoring tool.

Following statewide implementation, the psychometric properties of the ANSA were assessed (Walton, Kim, & Park, 2014). While the internal consistency reliability of four ANSA domains was in within adequate to good ranges, the Risk Behavior domain had poor internal consistency. Modifications to the Risks Behavior domain failed to improve reliability, indicating a problem with the applied structure. This study further evaluated the psychometric properties of the ANSA by examining the underlying structure with a sample of adults with diagnosed behavioral health disorders.

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Literature Review

Recovery

Emerging from the experience of individuals living with mental health problems (Anthony, 2000), recovery moved beyond diagnosis to a focus on positive outcomes. Within this concept, the mental illness was reframed as *functional recovery*, the reduction and alleviation of symptoms of mental illness (Burgess, Pirkis, Coombs, & Rosen, 2011; Cavelti, Kvrigc, Beck, Kossowsky, & Vauth, 2012; Harvey & Bellack, 2009; Resnick, Rosenheck, & Lehman, 2004; Schrank & Amering, 2007; Tse, Davidson, Chung, Ng, & Yu, 2014; Whitley & Drake, 2010).

Added was the possibility of *personal recovery*, "a process through which individuals improve their health and wellness, live a self-directed life, and strive to reach their full potential" (SAMHSA, n. d.). Similarly, the World Health Organization (2014) conceptualized mental health as more than the absence of a disorder or disease, "a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to or his community." Personal recovery involves overcoming or managing one's disease(s), living in a healthy way, physically and emotionally (Deegan, 2007; Starnino et al., 2010; Storm & Edwards, 2012), securing and maintaining housing stability (McLaughlin et al., 2011; Paxson, Fussell, Rhodes, & Water, 2012), having meaningful social relationships (McCauley, McKenna, Kenny, & McLaughlin, 2017; Paxson et al., 2012; Perry & Pescosolido, 2015; Tan et al., 2017), and pursuing purposeful involvement in community life (Alim et al., 2008; Schaefer et al., 2013; Tse et al., 2015). Personal recovery can be unrelated to functional recovery (Burgess et al.; Cavelti et al., 2012; Resnick et al., 2004).

Today, policy makers view recovery from mental illness and substance use disorders as possible through management and/or remission of symptoms (SAMHSA, 2017). Through transformational initiatives, many behavioral health service systems endorsed the recovery and began to move mental health service delivery from symptom management and acceptance of disability to service systems that actively support client-centered personal recovery (New Freedom Commission on Mental Health, 2003; Ramon, Healy, & Renouf, 2007; SAMHSA, 2017; Solomon & Giola, 2016; Ye, Pan, Wong, & Bola, 2013).

Exploring the application of recovery in practice, two recent systematic reviews examined aspects of recovery-oriented practice (ROP). Chester et al. (2016) identified key components of ROP: reducing stigma, providing recovery-supporting responses in complex social situations and health, and managing challenges inherent with ROP. They concluded that collaboration between service providers and individuals with mental health needs, fundamental in recovery-oriented services, begins with engagement and assessment of challenges and resources (Chester et al., 2016).

A second literature review examining clinicians and managers' conceptions of ROP found three perspectives on recovery (Le Boutillier et al., 2015). *Clinical recovery*, similar to functional recovery, is a deficit based focus on remission or stabilization with medication and symptom management through professional services. *Personal recovery,* consistent with the wellness-based concept, is a holistic approach with client-centered planning in partnership with professionals that measures success by social relationships and purposeful involvement with others. A new concept, *service-defined recovery*, recognized that organizational goals and financial needs influence social workers' and other practitioners' views of recovery. Despite recovery-based policy statements, a continued focus on symptom management and stabilization and inadequate funding to support community integration indicates incomplete implementation of ROP.

Building on these reviews, Piat et al. (2017) published plans for a third systemic review to synthesize the operationalization of recovery within mental health services for adults with severe mental illness. Results may inform the transformation of international services to a recovery orientation.

Behavioral Health Instruments

Many behavioral health instruments identify mental health and substance use disorders (SUD). Most adult mental health assessments focus on specific diagnoses (e.g., depression, anxiety, and substance use) or on specific types of symptoms (Van Dorn et al., 2016). Since 1968, the *Diagnostic and Statistical Manual of*

Mental Disorders (DSM; APA, 2013) has provided the primary framework for conceptualizing, identifying, and diagnosing mental health and SUDs.

During early work on the fifth edition of the DSM, researchers and academics explored alternative frameworks (Widiger, 2005). The Achenbach System of Empirically Based Assessments' (ASBEA) Adult Self-Report (ASR) and Adult Behavior Checklist (ABCL; Achenbach & Rescorla, 2003) evaluated problems, strengths, and functioning. Due to the absence of many behavioral health disorders, Widiger (2005) challenged the ASR and ABCL as possible alternatives to existing diagnostic terminology and criteria (APA, 1987). Widiger concluded that the adult ASBEA tools, based on the well-known framework of Child Behavioral Checklist (Achenbach, 1966), had limited use in practice, not informed by a representative sample of adults with a range of behavioral health problems.

Recovery Assessments

From mental health and recovery perspectives, a number of instruments emerged to measure recovery or well-being (Burgess et al., 2011; Cavelti et al., 2012; Law, Morrison, Byrne, & Hodson, 2012; Ralph, Kidder, & Phillips, 2000; Trousselard et al., 2016; Wilrycx, Croon, van den Broek, & van Nieuwenhuizen, 2012). Most instruments reflected either the traditional view of functional recovery—reduction of mental health symptoms, improved functioning, and reduced use of services (Burgess et al., 2011; Cavelti et al., 2012) or on personal recovery—adaptation to overcome negative consequences of mental illness and to pursue a meaningful life (Deegen, 2007).

An array of recovery instruments has been evaluated based on psychometric properties, inclusion of recovery concepts, and administration issues (Burgess et al., 2011; Cavelti et al., 2012; Law et al., 2012; O'Connell, Tondora, Croog, Evans, & Davidson, 2005; Ralph et al., 2000; Ramon et al., 2007). Researchers found several psychometrically sound recovery measures in early stages of development and implementation (Burgess et al., 2011; Law et al., 2012; Ralph et al., 2000). Many self-assessment recovery tools concentrated on severe mental illness without considering a broader range of mental health problems over the lifespan (Burgess et al., 2011; Cavelti et al., 2012). Some tools focused on attitudes about recovery among individuals receiving services, mental health professionals, families, and the public. Instead of a comprehensive view of recovery, other instruments explored a singular component or principle of recovery—hope, loneliness, community living skills, or empowerment (Grealish et al., 2017; Law et al., 2012).

Exploratory Factor Analysis and Behavioral Health Instruments

Exploratory factor analysis (EFA) is a frequently used method to develop, validate, and refine instruments (Flora & Flake, 2017). Now incorporated into statistical software packages, EFA is readily assessable to social scientists, but implementation of the process remains complex and confusing (Howard, 2016). Recent publications offer decision guidelines and demonstrate combining EFA with parallel analysis to support decisions in interpreting findings to determine the number of factors or constructs within an instrument (Cokluk & Kock, 2016; Flora & Flake, 2017; Howard, 2016; Wood, Gnonhosou, & Bowling, 2015). The following studies exemplify the use of EFA to develop or validate mental health and recovery tools.

Tossone, Kretschmar, Butcher, and Harris (2016) applied EFA and confirmatory factor analysis (CFA) to validate parent, youth, and worker versions of the Ohio Scales for juvenile justice youth with behavioral health problems. The researchers confirmed that that the original four-factor design (*problem severity, functioning, hopefulness*, and *satisfaction with services)* designed by Ogles et al. (2001) was a moderate fit for a juvenile justice population. Tossone and associates suggested using the Problem Severity Scale's three subscales (*internalizing, externalizing*, and *delinquency*) to monitor progress.

To identify the factor structure of psychiatric symptoms for adults diagnosed with schizophrenia, bipolar disorder, or major depressive disorder, Van Dorn et al. (2016) completed secondary EFA and CFA with well-established instruments. They used raw Positive and Negative Syndrome Scale (PANSS, Kay, Fiszbein, & Opler, 1987) and Brief Psychiatric Rating Scale (BPRS-18, Overall, 1974) data from four studies of adults with serious mental illness. The BPRS-18 reflected the presence or severity of symptoms during the interview or reported. The PANSS merged BPRS-18 with 12 additional items. Similar to previous studies, a four-factor model resulted: *Affective, Positive Symptoms, Negative Symptoms*, and *Disorganized Cognitive Processes*. Although focused primarily on

symptoms, the researchers argued that resulting latent factors reflected functional impairments, better outcome measures than diagnostic specific symptoms, and were generalizable regardless of diagnoses.

To examine the psychometric properties of the revised Sexual Coercion Inventory (SCI-R, Waldner, Vaden-Goad, & Sikka, 1999), French, Suh, and Arterberry (2017) asked 514 Midwestern high school and college students to complete the SCI-R. Consistent with related research, EFA analysis suggested that the revised 13-item scale had two distinct dimensions: 1- *Manipulation* and 2- *Substance Use and Aggression*. The revised scale's specificity provided a more nuanced reflection of sexual victimization across a continuum of experiences. Better understanding subtle verbal coercion and manipulation could inform prevention services.

McSweeney, Koch, Saules, and Jefferson (2016) analyzed new DSM-5 criteria for posttraumatic stress disorder (PTSD) with EFA. By reviewing relevant studies, researchers provided a foundation to compare new DSM criteria (negative alterations in cognition and mood) with two empirically supported four-factor models: *emotional numbing* (King, Leskin, & Weathers, 1998) and *dysphoria* (Simms, Watson, & Doebbeling, 2002). The new DSM-5 factor appeared to combine both models. EFA analysis revealed potential issues; three of four new PTSD criteria had the lowest-factor loading values across all items. Researchers cautioned practitioners about implications for practice, and suggested additional research with possible revisions in criteria.

Adult Needs and Strengths Assessment (ANSA)

Seldom have behavioral health instruments combined the concepts of well-being, mental health symptoms, and life functioning. The ANSA differs in identifying not only behavioral health needs that interfere with functioning but also usable or buildable strengths (Lyons, 2009b). Information from ASNA ratings supports management of services for adults with mental health and SUDs.

ANSA Development

The ANSA instrument evolved from the SPI rating scale (Lyons, 2009b; Lyons, Colletta, Devens, & Finkel, 1995). With seven initial items—danger to self, danger to others, severity of mental health symptoms, self-care impairment, vocational functioning, interpersonal functioning, and residential stability—the SPI helped determine who would benefit from inpatient psychiatric hospitalization (Fulop, Strain, Vita, Lyons, & Hammer, 1987; Lyons, O'Mahoney, Doheny, Dworkin, & Miller, 1995). Within inpatient psychiatric settings, residential, and intermediate care facilities, the psychometric properties of SPI were sound (Anderson & Lewis, 1999 & 2000; Anderson, Lyons, & West, 2001; Anderson, Schultz, Buckwalter, & Schneider, 2003; Leon, Lyons, Christopher, & Miller, 1997; Lyons et al., 1997; McFarland, Kovas, Haugan, Pollack, & Mahler, 2005).

Later, developers added strength items to the SPI to create a 35-item multi-dimensional scale with six domains: Problem Presentation (symptoms), Risk Behaviors, Functioning, Care Intensity, Caregiver Capacity, and Resources (Anderson et al., 2003; Anderson et al., 2001; Lyons, 2009b). In this process, researchers applied the structure of a related instrument for children and youth with or at risk of mental health problems, the Child and Adolescent Needs and Strengths (CANS, Lyons, 2009a) to create the ANSA 1.0 (Lyons, 2009b). Research found adequate psychometric properties for the ANSA with inpatient or residential populations, but recommended additional work to establish the ANSA's sensitivity with new populations (Anderson et al., 2003; Nelson & Johnson, 2008). In such settings, the ANSA tool had demonstrated utility as a service planning and delivery tool (Anderson, 2009; Anderson et al., 2001).

A young adult version of the tool, the Adult Needs and Strengths Assessment-Transition to Adulthood (ANSA-T, Lyons & Jackson, 2015) incorporated developmental tasks for transition-age youth and young adults (e.g., sustaining relationships, parenting, completing education, employment, and community involvement). In 2007, the state implementation team worked with the Praed Foundation to merge items from the ANSA 1.0 and ANSA-T, creating a recovery-focused ANSA 2.0 (Lyons & Walton, 2007). Following subsequent statewide implementation across community mental health services, the psychometric properties of the ANSA were reassessed (Walton et al., 2014). While the internal consistency was within acceptable to good ranges for most ANSA domains—Life Functioning ($\alpha = 0.826$), Emotional/Behavioral ($\alpha = 0.700$), Acculturation ($\alpha = 0.756$), and Strengths

($\alpha = 0.864$), the Risk Behavior domain's reliability was poor ($\alpha = 0.55$). Modifications to the Risks Behavior domain resulted in little improvement, suggesting a problem with the applied structure.

Despite several public mental health implementations of the ANSA (e.g., Iowa, Indiana, New York, Texas, New Hampshire, Pennsylvania), little information about the psychometric properties of the ANSA exists for community based populations. ANSA related literature remains limited, relying heavily on published articles related to the SPI, Child Severity of Psychiatric Illness (Lyons, Rawal, Yeh, Leon, & Tracy, 2002), and the expanding CANS (Lyons, 2009a) research base. Given this level of implementation, the paucity of related research and concern regarding the validity of the instrument's adopted structure, the purpose of this study was to evaluate the ANSA's validity further. Within community-based services, the study answers the related research question: What is the underlying structure of the ANSA?

Method

Study Participants

The sample consisted of 46,013 adults receiving behavioral health services in 25 publically funded community mental health centers and 10 addiction treatment agencies across a Midwest state between July 1 and December 31, 2013. Most (81.9%) received community-based services for severe mental illness; the rest (18.1%) received addiction treatment services. Eligibility criteria for services limited individual's family income to 200% of the national poverty level or eligibility for Medicaid (DMHA, Division of Mental Health and Addiction, 2017).

Table 1 reports background information for study participants. The mean age was 41.46 years (SD = 13.72), ranging from 18 to 99 years. About 56% were female, the majority (78.1%) were Caucasians, and only 19.2% were employed (either part- or full-time). Over 80% were living independently. Over 40% had mood disorder as their primary diagnosis, followed by psychotic disorders (22.9%) and SUDs (17.9%).

Table 1. Characteristics of sample ($N = 46{,}000$).

Characteristic	Frequency	Percent
Sex		
Male	20,089	43.7
Female	25,911	56.3
Race		
African American	6,005	13.1
American Indian	255	6
Asian/Pacific Islander	180	4
Caucasian	35,947	78.1
Mixed race	616	1.3
Hispanic or Latino	1,499	3.3
Employment		
Employed full time	4,236	9.2
Employed part time	4,602	10.0
Unemployed		
Looking for work	10,200	22.2
Not in labor force	26,962	58.6
Living arrangement/support		
Independent living	37,047	80.5
Supported living	3,112	6.8
Congregate care	3,330	7.2
Temporary	721	1.6
Homeless/Shelter	1,710	3.7
Primary diagnosis		
Anxiety disorders	4,695	10.2
Mood disorders	18,734	40.7
Psychotic disorders	10,517	22.9
Dissociative disorders	1,754	3.8
Substance use disorders	8,221	17.9
Impulse control disorders	1,042	2.3
Other disorders	884	1.9
Missing	165	0.4

Measure

ANSA

The Adult Needs and Strength Assessment, 2.0 (ANSA, Lyons, 2009b) is a decision support and outcome management tool with five core domains (Life Functioning, Behavioral Health, Risk Behaviors, Acculturation, and Strengths). The Life Functioning domain measures challenges in key aspects of daily living (17 items), such as Social Functioning, Physical/Medical, Recreational, Employment, Legal, Residential Stability, Independent Living Skills, and Decision Making. The Behavioral Health domain measures evidence of mental health and substance use symptoms with related impact on functioning (ten items), such as Psychosis, Impulsivity, Depression, Anxiety, Adjustment to Trauma, Anger Control, and Substance Use. The Risk Behaviors domain includes items about thoughts or actions within the last 30 days that endanger the individual or others (eight items), such as Suicide Risk, Danger to Others, Exploitation, and Criminal Behavior. The Acculturation domain measures linguistic and cultural needs which providers need to accommodate (four items), including Cultural Identity, Rituals, Cultural Stress and Language. The Strength domain measures evidence of resiliency and resources (12 items): Family Strengths, Optimism, Social Connectedness, Natural Supports, Talents/Interests, Educational, Volunteering, Job History,

Spiritual/Religious, Community Connection, Resilience, and Resourcefulness (Lyons & Walton, 2017).

Rating the ANSA

Each item is rated on a four-point scale to indicate whether rater can identify usable or buildable strengths (0 = centerpiece strength to 3 = no strength identified) for the Strength domain and whether there is evidence that the problem interferes with functioning (0 = no evidence of a problem to 3 = severe, dangerous or disabling problem) for other domains. Rating needs during the last 30 days keeps the assessment relevant to the individual's present circumstances. Ratings of 1, 2, or 3 on key core items within Life Functioning, Behavioral Health, and Risk Behaviors domains trigger additional questions in extension modules: Employment, Intellectual, Parenting/Caregiver Role, Adjustment to Trauma, Substance Use, Suicide, Danger to Others, Sexual Aggression, and Criminal Behavior. Social workers and other practitioners utilize multiple sources to rate ANSA, including information from individuals and families, referral information, record review, observation, and collateral resources. Practitioners complete the ANSA at the beginning of services and reassessed every six months.

Training and Certification

Periodic training and certification are required to use the ANSA. Practitioners access basic training and certification tests online. Certification requires demonstrated ability to accurately rate a vignette, achieving, at minimum, interrater reliability of 0.70 or higher. Each participating organization has one or more implementation coaches (SuperUsers), mid-level or higher managers who maintain reliability at a higher level (0.75). Trained and certified through additional in-person training, local coaches support implementation of the ANSA in practice.

Data Collection and Analysis

A secondary data analysis, this study examined ANSA assessment ratings, demographic, diagnostic, and provider data routinely collected by the state mental health and addiction authority. Community-based mental health and addiction agencies contracting with the state routinely collected and submitted required assessment and related federally required information into a web-based database. For this study, the state mental health and addiction authority extracted and shared deidentified from the state's database with the researchers.

With SPSS, v. 23, an EFA examined the relationship among 51 ANSA core items to identify and restructure underlying factors (Roberson, Elliott, Chang, & Hill, 2014), across prescribed domains: Life Functioning, Behavioral Health, Strengths, Risk Behaviors, and Acculturation. Prior to performing EFA, researchers assessed the suitability of the data for factor analysis with the Kaiser–Meyer–Olkin (KMO) value and Barlett's test of sphericity. Principal component analysis (PCA) with the two rotation methods—orthogonal (varimax) and oblique (promax)—established which method provided the best interpretation of the data (Roberson et al., 2014). Four criteria informed decisions about the number of resulting factors: (1) the eigenvalue, (2) scree plot, (3) parallel analysis, and (4) interpretability of the factor solution (Roberson et al., 2014; Tabachnick & Fidell, 2007). According to previous research, a cutoff of 0.32 established the appropriate minimum factor loading (Comrey & Lee, 1992; Tabachnick & Fidell, 2007). Finally, for both the full ANSA and corresponding factors, Cronbach's alpha (Cronbach, 1951, 1957) assessed internal consistency reliability.

Results

To identify underlying structure of the instrument, ANSA, inspection of the correlation matrix among 51 items was conducted, revealing the presence of a majority of coefficients of 0.3 and above. Both KMO measure (KMO = 0.927) and Bartlett's test of sphericity (X^2 (1275) = 101833.12, $p < 0.001$) indicated sampling adequacy for the factor analysis. Since the two rotation methods yielded similar results and factors were moderately correlated (see Table 2), the oblique rotation was preferred (Roberson et al., 2014).

To determine the number of factors, multiple methods were employed. Initially, eigenvalues were

Table 2. Correlation between factors.

Factor	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Factor 1	1				
Factor 2	0.540	1			
Factor 3	0.348	0.290	1		
Factor 4	0.554	0.517	0.370	1	
Factor 5	0.077	0.095	0.058	0.120	1

Note: All of the correlations are significant at a 0.01 level.

reviewed, using Kaiser's criterion. When only factors with an eigenvalue of 1.0 or higher were retained, ten factors were identified. Parallel analysis using 1,000 random correlation matrices permuted from the raw data suggested nine factors be retained (Table 3). Visual inspection of the scree plot suggested possibly five factors. The EFA was rerun with five to nine factors to determine the best conceptual and statistical fit (Tabachnick & Fidell, 2007). Of these, the research team selected the five-factor solution as it explained 40.35% of variance and had a better conceptual fit.

Factor membership was determined based on a factor loading of 0.32 or greater and five items (Educational, Physical/Medical, Gambling, Sexual Aggression, and Sexuality) that did not meet the cut-off were removed. Among remaining 46 items, only two items (Danger to Others and Impulse Control) cross-loaded on more than one factor. Because of the conceptual fit with respective factors, researchers retained the two items. After reviewing item loading and content for each factor, researchers determined factor membership and labels. Table 4 presents descriptive statistics and PCA results.

Factor 1 (*Personal Recovery*) accounted for 10.19% of the variance and included the 12 items related to community integration, relationships, purpose, and hope. Factor 2 *(Trauma-Related*) accounted for 3.15% of the variance and included 13 items related to trauma related mood, anxiety, and relational problems. Factor 3 (*Substance Use Risks*) accounted for 3.02% of the variance and included nine items related to criminal justice involvement and substance use. Factor 4 (*Self-Sufficiency*) accounted for 2.57% of the variance and included eight items related to basic life functioning challenges associated with psychosis and cognitive impairment. Factor 5 (*Cultural-Linguistic Considerations*) accounted for 1.65% of the variance and included four items related to potential cultural or linguistic issues. Cronbach's alphas for all five factors and item totals ranged from 0.73 to 0.91, indicating adequate to excellent internal consistency reliability (see Table 4).

Discussion

Despite the wider implementation of the ANSA, limited research on the tool exists. In this study, psychometric properties of ANSA were evaluated using the statewide data for a community-based population of adults with mental health and substance use challenges. A viable alternative structure of the ANSA emerged from the factor analysis. Five factors with adequate to good internal consistency reliability reflected aspects of personal recovery, cultural-linguistic considerations, and three interrelated, but distinct types of behavioral health challenges regarding trauma and stress, substance use risks, and self-sufficiency. These five new factors confirmed components of recovery identified in previous research and identified new aspects that invite further discussion.

Personal Recovery

The Personal Recovery factor corresponds to the social component of recovery. Having social support is essential for well-being (World Health Organization, 2013). Social isolation, the absence of a sense of belonging (few social contacts and/or limited social engagement) is a critical social problem with adverse consequences across the lifespan (Laurio, 2016; Lubben, Gironda, Sabbath, Kong, & Johnson, 2015). Among individuals living with mental illness, social isolation is common (Dury, 2014; Franck, Molyneux, & Parkinson, 2016). Negative symptoms of psychosis (i.e., expressive deficits and withdrawal) are associated with poor social recovery (Gee et al., 2016; Liemberg et al., 2013). Family relationships are often missing, conflicted, or characterized by family members in

Table 3. Parallel analysis: Eigenvalues greater than 1 and proportion of variance explained.

Variable	Eigenvalue	Mean of random eigenvalues	95 percentile of random eigenvalue	Proportion of variance	Cumulative proportion of variance
1	10.196	1.178	1.193	19.993	19.993
2	3.146	1.163	1.175	6.168	26.161
3	3.024	1.151	1.161	5.929	32.090
4	2.566	1.141	1.151	5.032	37.122
5	1.647	1.132	1.141	3.230	40.352
6	1.396	1.124	1.132	2.736	43.088
7	1.284	1.116	1.124	2.517	45.605
8	1.179	1.108	1.116	2.312	47.917
9	1.126	1.101	1.108	2.209	50.126

Table 4. Oblique rotation of factors with final 46 items and item reliability ($N = 46{,}103$).

			Factor 1		Factor 2		Factor 3		Factor 4		Factor 5	
Factor	M	(SD)	Pattern	Structure	Pattern	Structure	Pattern	Structure	Pattern	Structure	Pattern	Structure
Factor 1: Personal Recovery ($\alpha = 0.880$)												
Community connections	1.70	(0.98)	0.800	0.732	−0.058	0.289	−0.015	0.154	−0.075	0.272	0.010	−0.006
Natural supports	1.58	(0.97)	0.788	0.750	−0.021	0.333	−0.007	0.171	−0.054	0.310	0.010	−0.003
Talents and interests	1.56	(0.98)	0.749	0.689	−0.068	0.275	−0.047	0.122	−0.029	0.278	0.028	0.014
Resiliency	1.39	(0.86)	0.731	0.764	0.005	0.408	−0.056	0.157	0.093	0.430	0.013	0.011
Resourcefulness	1.22	(0.87)	0.729	0.736	−0.179	0.301	−0.047	0.176	0.224	0.459	0.047	0.049
Social connectedness	1.46	(0.87)	0.700	0.753	0.094	0.448	−0.030	0.169	0.029	0.409	−0.008	−0.011
Spiritual/Religious	1.61	(1.05)	0.674	0.526	−0.141	0.087	0.056	0.143	−0.194	0.065	−0.010	−0.034
Optimism	1.50	(0.88)	0.638	0.703	0.279	0.522	−0.114	0.064	−0.090	0.343	0.005	−0.003
Volunteering	2.04	(1.02)	0.629	0.555	−0.178	0.135	0.074	0.199	−0.012	0.208	−0.022	−0.032
Family strengths	1.35	(0.85)	0.515	0.593	0.312	0.463	0.099	0.218	−0.207	0.253	0.047	0.039
Job history	1.48	(0.94)	0.388	0.542	−0.034	0.353	0.049	0.240	0.330	0.508	−0.043	−0.023
Recreational	1.31	(0.99)	0.368	0.559	0.275	0.515	0.049	0.213	0.091	0.439	−0.026	−0.013
Factor 2: Trauma and stress related ($\alpha = 0.818$)												
Depression	1.49	(0.92)	0.055	0.357	0.766	0.742	−0.273	−0.137	−0.010	0.373	−0.018	−0.004
Adjustment to trauma	0.81	(0.95)	−0.058	0.212	0.758	0.607	0.012	0.056	−0.216	0.198	0.025	0.034
Anxiety	1.41	(0.92)	−0.011	0.299	0.723	0.699	−0.257	−0.130	0.042	0.373	−0.027	−0.009
Sleep	1.32	(0.98)	0.060	0.339	0.659	0.654	−0.144	−0.027	−0.017	0.346	−0.027	−0.013
Suicide risk	0.33	(0.60)	−0.089	0.171	0.589	0.507	0.034	0.084	−0.077	0.230	0.003	0.018
Anger control	0.85	(0.87)	−0.022	0.305	0.584	0.589	0.235	0.313	−0.037	0.360	−0.007	0.015
Family functioning	1.45	(0.92)	0.209	0.442	0.564	0.592	0.166	0.257	−0.177	0.300	0.013	0.020
Interpersonal problems	0.87	(0.87)	0.010	0.366	0.502	0.615	0.170	0.297	0.139	0.485	0.002	0.033
Self-injurious behavior	0.21	(0.50)	−0.123	0.154	0.476	0.453	0.122	0.178	0.028	0.284	0.047	0.068
Exploitation	0.27	(0.58)	−0.108	0.134	0.441	0.406	0.100	0.146	0.002	0.237	0.034	0.052
Danger to others	0.17	(0.45)	−0.152	0.128	0.411	0.379	0.387	0.406	−0.038	0.274	0.053	0.076
Social functioning	1.35	(0.95)	0.343	0.605	0.377	0.634	0.017	0.209	0.150	0.535	−0.035	−0.016
Eating disturbance	0.19	(0.49)	−0.075	0.116	0.351	0.346	−0.056	0.005	0.070	0.222	0.048	0.063
Factor 3: Substance use risks ($\alpha = 0.733$)												
Legal	0.99	(1.00)	0.047	0.048	−0.213	−0.169	0.769	0.691	−0.182	−0.048	0.010	0.013
Criminal behavior	0.47	(0.73)	−0.005	0.086	−0.028	−0.007	0.742	0.685	−0.169	0.038	−0.005	0.004
Substance use	1.02	(1.03)	0.106	0.131	−0.229	−0.109	0.678	0.644	−0.072	0.049	−0.064	−0.057
Antisocial behavior	0.27	(0.58)	−0.091	0.169	0.138	0.247	0.562	0.595	0.106	0.315	0.018	0.048
Other self-harm	0.31	(0.63)	−0.089	0.155	0.164	0.254	0.451	0.487	0.104	0.292	−0.011	0.016
Impulse control	0.95	(0.88)	−0.080	0.297	0.335	0.500	0.357	0.468	0.256	0.516	−0.047	−0.007
Parental/Caregiver role	0.66	(0.92)	0.144	0.297	0.161	0.275	0.341	0.397	−0.023	0.245	0.041	0.053
Involvement in recovery	0.92	(0.94)	0.288	0.427	−0.163	0.196	0.324	0.457	0.286	0.429	−0.009	0.013
Residential stability	0.65	(0.87)	0.068	0.302	0.101	0.313	0.321	0.421	0.218	0.407	0.018	0.046
Factor 4: Self-sufficiency ($\alpha = 0.795$)												
Living skills	0.55	(0.78)	−0.005	0.356	−0.052	0.416	−0.047	0.195	0.831	0.783	−0.016	0.042
Self-care	0.58	(0.77)	0.015	0.372	0.069	0.474	−0.080	0.152	0.715	0.736	−0.027	0.025
Psychosis	0.34	(0.72)	−0.079	0.218	0.014	0.339	−0.095	0.088	0.656	0.600	0.037	0.084
Intellectual disability	0.12	(0.41)	−0.037	0.130	−0.201	0.124	−0.132	0.020	0.626	0.462	0.136	0.172
Medication involvement	0.46	(0.80)	−0.057	0.243	0.035	0.332	0.104	0.258	0.535	0.559	−0.015	0.029
Transportation	0.51	(0.78)	−0.002	0.216	−0.139	0.172	0.241	0.363	0.473	0.467	0.039	0.076
Decision making	1.31	(0.87)	0.173	0.479	0.131	0.471	0.244	0.422	0.376	0.606	−0.039	−0.002
Employment	1.60	(1.32)	0.109	0.349	0.148	0.404	−0.033	0.127	0.364	0.486	−0.074	−0.045
Factor 5: Cultural-linguistic considerations ($\alpha = 0.752$)												
Cultural identity	0.03	(0.21)	0.045	0.049	0.025	0.074	0.000	0.041	0.002	0.099	0.839	0.839
Cultural stress	0.04	(0.25)	0.033	0.033	0.042	0.071	−0.011	0.024	−0.019	0.079	0.835	0.834
Ritual	0.02	(0.18)	0.042	0.047	−0.004	0.059	0.006	0.049	0.029	0.109	0.816	0.818
Language	0.03	(0.27)	0.017	−0.007	−0.045	0.002	−0.071	−0.038	0.049	0.061	0.707	0.707

Full scale $\alpha = 0.911$ 0.94 0.38

stressful caregiver roles (Bradshaw, Armour, & Roseborough, Bradshaw, Armour, & Rosenborough, 2007). Stigma and limited resources contribute to isolation and loneliness (Linz & Sturm, 2013).

In social services, behavioral-, and physical-health care, screening and assessment processes often inquire about the presence of family and friends, but seldom explore the nuances of relationships (Laurio, 2016). Understanding the nature of existing relationships is essential; establishing and sustaining positive social interactions and relationships are fundamental, but challenging components of personal recovery (Bradshaw, Armour, & Rosenborough, 2007; Leamy, Bird, Boutillier, Williams, & Slade, 2011; Murrock &

Graor, 2016; Padgett, Henwood, Abrams, & Drake, 2008; Perry & Pescosolido, 2015). Progress may be slow, have setbacks, or plateau for long periods of time (Padgett et al., 2008).

An evidenced-based practice, Illness Management and Recovery, helps increase social functioning while reducing symptoms (Tan et al., 2017). For individuals recovering from mental illness, involvement in focused social activities helps reduce social isolation and supports interpersonal relationships (Dury, 2014; Wong, Stanton, & Sands, 2014). Participation in interest groups, especially engagement in planning and delivering program activities, increases connectedness, reciprocal and interdependent relationships among individuals and their community. Participation in everyday activities facilitates personal recovery (Iwaski et al., 2014; Whitley & Drake, 2010). Finding personal fulfillment or purpose (meaning and direction in life) may be reflected through community involvement (work, school, volunteering), advocacy, peer support to others, or personal goals (Deegan, 2007; Schaefer et al., 2013).

Spirituality, optimism, and hope are also important dimensions of personal recovery (Whitley & Drake, 2010). Although many social workers and other professionals tend to view spirituality primarily as a way to relieve symptoms of mental illness and to achieve social acceptance, through spirituality, individuals living with mental illness seek peace, stability, and support (Ho, Chiu, Lo, & Yiu, 2010). Optimism, a positive view of oneself in the future, and hope for achieving goals can motivate change and active participation in clinical and support services (Yildiz, 2015).

Trauma- and Stress-Related

The Trauma- and Stress-Related factors reflect the diagnostic formulation of trauma- and stress-related disorders (APA, 2013). In the DSM-5, the nature of emotional distress and behavior, following exposure to stress or potentially traumatic events, varies from fear-based to loss of pleasure and unhappiness, anger, or dissociative symptoms (APA, 2013). Although depression, anxiety, sleep disturbances, anger, or aggression may occur in the absence of stress or trauma, research found a significant association among exposure to potentially traumatic events, current mental health symptoms, and functional impairments (Green et al., 2006; Johansen, Eilertsen, Nordanger, & Weisaeth, 2013; Leenarts et al., 2013; Spinhoven, Pennix, van Hemert, de Rooij, & Elzing, 2014). In addition to trauma-specific diagnoses, co-occurring depression, anxiety, or substance use are common among people with mental illness (APA, 2013).

Trauma-Informed Care (TIC) principles have been widely endorsed across organizations and systems that serve youth who have experienced abuse or neglect along with their families (Donisch, Bray, & Gewirtz, 2016; Hanson & Lang, 2016) and also recognized as an important principle for adults with behavioral health issues (Savage, Quiro, Dodd, & Bonavota, 2007; Wolf et al., 2016). TIC principles include screening and assessment of trauma exposure and impact as part of routine assessment of behavioral and physical health problems. TIC assessment focuses on related trauma effects, instead of on the trauma experience, and assesses coping skills (Savage et al., 2007). Creating a safe environment, verbalizing the sensitive nature of the questions, and recognizing that individuals may not be able to recall information due to feeling unsafe, memory loss, or avoidance are essential to effective TIC.

Implementing trauma informed care can be challenging, especially routine trauma informed assessment (Savage et al., 2007). Through the ANSA, the effects of trauma appear across multiple functional or risk items (e.g., Sleep, Family- and Social-Functioning, Suicide Risk, Danger to Others, Self-Injurious Behavior, and Exploitation). However, social workers and other practitioners may be concerned that introducing trauma may destabilize the individual or distract from other treatment needs. Discussing trauma may also be upsetting to staff who may be dealing with their own issues or not be professionally prepared to discuss these issues (Aparicio, Michalopoulos, & Unick, 2013; Finklestein, Stein, Greene, Bronstein, & Solomon, 2015). To effectively implement TIC and to address the impact of vicarious trauma, adequate training, supervision, and support for social workers and other clinicians are essential (Conover, Sharp, & Salerno, 2015).

Substance Use Risks

The Substance Use Risks factor includes various risks related to substance use. In 2014, the overall 12-month rate of SUDs among individuals, 12 and older across the United States, was 8.1% (Center for Behavioral Health Statistics and Quality, 2015). In America, the

12-month prevalence of alcohol use disorder was about 8.5% for adults. Men had higher rates (12.4%) than women (4.9%). Young adults (ages 18–29) had the highest alcohol use rates (16.2%). Estimated rates of opioid use disorders have grown from less than 1% among adults (APA, 2013) to an epidemic public health crisis (American Society of Addictive Medicine (ASAM), 2016).

As SUD affects an individual's life functioning, physical and mental health, relationships, productivity, legal status, and residential stability, outcome measures should go beyond reducing drug use (Tiffany, Friedman, Greenfield, Hasin, & Jackson, 2011; Thompson, Wall, Greenstein, Grant, & Hasin, 2013). To support this assertion, Tiffany et al. (2011) referred to National Institute on Drug Abuse recommended outcomes (e.g., psychosocial functioning, quality of life, and social network or social support) and identified clinically meaningful considerations for individuals with SUD (engagement, decreasing distressful symptoms, recovery, and legal involvement). As reflected in the ANSA Substance Use Risk Factors, substance use is associated with risks of legal involvement and homelessness and related to involvement in treatment.

The relationship between SUD and legal involvement—probation, parole, or incarceration—has been well documented (Cuellar & Cheema, 2014). Belenko and Peugh (2005) found that 82% of state prison inmates had drug and alcohol involvement before incarceration. Co-occurring mental health and SUDs are common in the justice system (Peters, Lurigio, & Wexler, 2015; Scott, Lewis, & Dermott, 2006). More than two-thirds of jail inmates (Karberg & James, 2005) and half of prison inmates meet diagnostic criteria for SUD (Proctor, 2012; Scott et al., 2006), compared with 9% for the general population (Cloud, 2014). About 60% of jail inmates with mental health problems, compared to 40% of other inmates, reported drug use in the month prior to the most recent arrest (Mumola & Karberg, 2007).

Engaging an individual in identifying problems, planning, and monitoring progress increases the likelihood of functional and personal recovery (Deegan, 2007). Accurately identifying SUD and risk factors (e.g., legal involvement, homelessness, and poverty) are essential components of effective SUD treatment and support services and for the successful reintegration of individuals from incarceration to the community (Drake, Bond, & Becker, 2012; Gilmer, Stefancic, Henwood, & Ettner, 2015; Poremski, Whitley, & Latimer, 2016; Thompson, Wall, Greenstein, Grant, & Hasin, 2013).

Self-Sufficiency

The Self-Sufficiency Factor is consistent with existing scales that measure negative symptoms of psychosis and activities of daily living skills, such as the PANSS (Kay et al., 1987; Kay, Opler, & Fiszbein, 2000) and the Clinical Assessment Interview for Negative Symptoms (CAINS: Kring, Gur, Blanchard, Horan, & Reise, 2013).

The Self-Sufficiency Factor corresponds to potential independent living challenges often associated with psychosis and cognitive impairment or intellectual disability. Independence relies upon basic self-care skills and living skills, involving reasoning, learning ability, adaptability, and the ability to listen and to pay attention (Allen & Williams, 2012; Hartley et al., 2011; Hustyi et al., 2012). Practical living skills include home and money management, job seeking, accessing appropriate educational opportunities, and using community resources to access needed assistance for housing and health care (Allen & Williams, 2012; Hustyi et al., 2012).

Cultural-Linguistic Considerations

Consistent with the original ANSA structure, this factor represents Cultural-Linguistic Considerations of individuals receiving services. Ideas about mental health, mental illness, obtaining support or assistance vary across cultural and ethnic groups (Zapolski, 2016). Stigma about mental illness, often resulting in shame and silence, creates a barrier to treatment among ethnic minority cultures (Briggs, Briggs, Miller, & Paulson, 2011; Shea & Yeh, 2008). As a result, a crisis, such as a suicide attempt, expulsion from school, or involvement in the criminal justice system may become the entry point for treatment.

To engage individuals in assessment and behavioral health treatment requires social workers to be knowledgeable of the cultural beliefs, values, and behavior (Bhui, Warfa, Edonya, McKenzie, & Bhugra, 2007). Recognizing that cultural competence (knowledge and skill) is challenging, Hook, Davis, Owen, Worthington, and Utsey (2013) suggested practicing

cultural humility, respectfully discussing cultural differences, being open, and nonjudgmental. From this perspective, a social worker can better understand other cultures, values, beliefs, and behavior, build trust, and be more likely to engage individuals and families in the intervention processes (Rosenberg, Almeida, & McDonald, 2012). Developing a shared understanding and an accurate assessment requires asking questions to understand the nature and impact of problems within a cultural framework.

Strengths and Limitations

The systematic adoption of the ANSA in multiple jurisdictions and agencies afforded a unique opportunity to examine the instrument using a large state data. This study's findings contributed to the knowledge base on psychometric properties of ANSA. Methodologically, using parallel analysis in addition to the traditional methods to identify the number of factors strengthens the EFA findings. Parallel analysis is considered "the best available alternative for solving the number-of-factors-to retain problem in EFA" as it shows variability and sensitivity to different factors (Ledesma & Valero-Mora, 2007, p.4).

The new five-factor structure of the ANSA from this study is consistent with the guiding principles of recovery: hope, self-direction, multiple pathways, holistic perspective, relational, trauma-informed, strength/responsibility, and respect (SAMHSA, n. d.). Combining recovery-focused items with behavioral health symptoms and functioning items creates a holistic framework for practice (Tse et al., 2014). Regardless of symptoms, functional challenges, or risks supports, the emphasis on personal recovery supports treatment services that go beyond symptom and risk reduction to include social relationships and purposeful involvement in the community.

Despite strengths highlighted above, this study has several areas that require further research. Based on a large sample of adults with a range of mental health needs who received community-based services, the EFA results provided a preliminary study of the ANSA underlying structure. Skewed toward individuals with significant to severe behavioral health needs, the sample may not reflect individuals who primarily access outpatient services. Challenges in using secondary data limited the availability of information to existing data created for administrative and management purposes (e.g., limiting the ability to filter and refine the analyses based on specific demographic characteristics). To verify this factor structure and to test the hypothesis that a relationship between observed variables and their underlying latent constructs exists requires confirmatory factory analysis.

Two ANSA Items dropped out of the factor analysis merit reconsideration: Educational Strengths and Health/Physical Needs. The ANSA includes an option to choose "not applicable" instead of rating Educational strength. With this option, only 44.8% of the individuals in the sample had Educational ratings. Identified as a core component of recovery, educational attainment potentially contributes to an individual's growth, purpose, and employment opportunities (Whitley & Drake, 2010). Given potential benefit of education in recovery, we advocate for removing the "not applicable" rating option for this ANSA item.

The Medical/Physical item did not load properly on any factor. The absence of the physical health item, Medical/Physical from the EFA was more puzzling and concerning as mental illness often co-exists with physical health conditions and/or substance use disorders (DHHS, 1999; Merrens & Drake, 2013). Research suggests that individuals living with a serious mental illness have higher mortality rates than the general population, at risk of dying at much younger age than the general population (Colton & Manderscheid, 2006; Merrens & Drake, 2013). Although the need for integrated health care has been recognized (Kilbourne, Greenwald, Bauer, Charns, & Yano, 2012; Marion et al., 2004), current data may suggest continued challenges in social workers and behavioral health providers identifying co-occurring medical problems. Implications include the need for revised practice standards, increased emphasis in assessment training, and routine integrated health screening and integrated health care.

Additional implications for social work and research

Implications of the findings for social work go beyond validating an assessment instrument. As social work integrates the use of technology into practice, valid tools, such as the ANSA, can support the use of practice-based information to plan services, to monitor progress, and to improve outcomes at direct service, supervision, program, and system levels (Lyons, 2009a; Lyons, 2009b).

Another issue that deserves more attention relates to assessing cultural issues for people with mental illness. In spite of adequate internal consistency for the Cultural-Linguistic factor, a low incidence of identifying cultural or linguistic challenges reflects the need for enhanced training and strategies to improve culturally sensitive and competent assessment.

Conclusion

This study provides additional validation of the reliability of the ANSA instrument as an assessment tool for adults with mental health problems or SUDs that adversely affect life functioning within communities. The EFA resulted in an alternative, meaningful structure that concurrently supports both personal recovery and the reduction or management of symptoms and risks. Related implications for social work education, supervision and practice emerged from this practice-based evidence include the importance of understanding culture and of holistic assessment, planning, and services supporting personal recovery for individuals living with mental illness and substance use disorders. In order to confirm and generalize findings, replication of the study and additional research are required.

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