

# DEVELOPMENT OF A MEASURE OF SENSE OF COMMUNITY FOR INDIVIDUALS WITH SERIOUS MENTAL ILLNESS RESIDING IN COMMUNITY SETTINGS

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*The psychological sense of community is one of the most commonly investigated constructs in community psychology. Sense of community may be particularly important for individuals with serious mental illness (SMI) because they often face societal barriers to participation in community living, including stigma and discrimination. To date, no published studies have investigated the psychometric qualities of sense of community measures among individuals with SMI. The current study tested a series of confirmatory factor analyses using the Brief Sense of Community Index (Long & Perkins, 2003) in a sample of 416 persons with SMI living in community settings to suggest a model of sense of community for individuals with SMI and other disabilities. The resulting scale, the Brief Sense of Community Index-Disability, demonstrated good model fit and construct validity. Implications are discussed for how this scale may be used in research investigating community integration and adaptive functioning in community settings. © 2009 Wiley Periodicals, Inc.*

Seymour Sarason (1974) argued that the psychological sense of community constitutes the defining feature of community life. Sense of community (SOC) has been linked to increased psychological well-being (Pretty, Conroy, Dugay, Fowler, & Williams, 1996; Prezza, Arrici, Roberti, & Tedeschi, 2001), perceptions of belonging and community

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connectedness (Sonn, 2002; Sonn & Fisher, 1996), and participation in a community (Chavis & Wandersman, 1990). Sense of community has been investigated and argued to be relevant for many populations (e.g., Garcia, Giuliani, & Wiesenfeld, 1999; Perkins, Florin, Rich, Wandersman, & Chavis, 1990; Pretty, Bishop, Fisher, & Sonn, 1996; Sonn, 2002); however, there has been little research and no sense of community measure development for individuals with serious mental illness living in community settings. It may be particularly important to bolster the psychological sense of community for persons with serious mental illness because they often face societal barriers to community living, including stigma and discrimination (Cook & Jonikas, 2002; Cummins & Lau, 2003; Prince & Prince, 2002). As mental health policy for individuals with serious mental illness (SMI) continues to shift from hospitalization to community-based care, developing ways to measure and better understand what can increase the psychological sense of community for this population may make a critical contribution to efforts to assist persons with SMI move from being marginalized, undervalued members of society to becoming actively involved community members and agents of their own recovery.

This study utilized confirmatory factor analysis to test the utility of a commonly used sense of community measure with this population—the Brief Sense of Community Index (BSCI; Long & Perkins, 2003). Furthermore, it tested the value of adding unique items that address the importance of community acceptance of disability for individuals with serious mental illness. Multiple models and factor solutions were statistically tested and compared, and suggestions were offered for the use of a new measure, the Brief Sense of Community Index-Disability (BSCI-D). This study has implications for future measurement of sense of community for individuals with mental illnesses and can be utilized to enhance community mental health research, particularly community integration and housing research.

## **SENSE OF COMMUNITY ORIGINS AND DEFINITIONS**

Sense of community is one of the most investigated constructs of community psychology, and it represents one of the most original and meaningful contributions to scientific psychology. Sarason (1974) first conceptualized the psychological sense of community (PSOC) to describe the phenomena that one belongs to and is an integral part of a larger collectivity. He used the concept to represent the strength of bonding among community members and argued that it was important for personal and collective well-being. Sarason argued that the psychological sense of community should be the defining principle of community research and action, despite the fact that it may be difficult to convince mainstream psychology of its importance (Pretty, Bishop, Fisher, & Sonn, 2006). Sarason considered the absence of a psychological sense of community to be the single most disintegrating aspect of contemporary life and associated its absence with loneliness, alienation, psychological distress, and a feeling of impotence regarding social forces.

Although Sarason established the theoretical basis for sense of community research, the proliferation of empirical research in this area must be credited to the framework proposed by David McMillan and David Chavis. As conceptualized by McMillan and Chavis (1986), sense of community is “a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members’ needs will be met through their commitment to be

together” (p. 9). The following four components are vital to this definition of sense of community: (a) *membership*, feelings of emotional security, belonging, and identification; (b) *influence*, by which the community influences the individual and the individual influences the community, in turn; (c) *integration and fulfillment of needs*, physical and psychological needs met, thereby reinforcing one’s commitment to the group; and (d) *shared emotional connection*, positive affect and shared history related to community membership (McMillan & Chavis, 1986; Pretty, Bishop, Fisher, & Sonn, 2006).

The most widely used measure of sense of community, the Sense of Community Index (SCI), follows this theoretical framework (Perkins, Florin, Rich, Wandersman, & Chavis, 1990), with items loading onto the four dimensions of SOC proposed by McMillan and Chavis (1986). Despite the proposed 4-factor structure, however, sense of community is typically measured as a single construct. It has been found to be associated with length of residence, neighboring, satisfaction, and informal social control (Perkins et al., 1990); political participation and community involvement (Hughey, Speer, & Peterson, 1999); safety (Ziersch, Baum, MacDougall, & Putland, 2005); loneliness (Pretty, Andrews, & Collett, 1996); life satisfaction (Prezza, Arrici, Roberti, & Tedeschi, 2001); and mental health/malaise symptoms (Ellaway, Macintyre, & Kearns, 2001).

## **CRITIQUE OF THE SCI AND DEVELOPMENT OF THE BSCI**

Though popular, the McMillan and Chavis theoretical framework (1986) and the SCI (Perkins et al., 1990) have been subject to critique and revision (e.g., Kingston, Mitchell, Florin, & Stevenson, 1999; Long & Perkins, 2003; Peterson, Speer, & Hughey, 2006). Researchers have raised numerous questions about the adequacy of the SCI’s psychometric properties. For example, Long and Perkins (2003) criticized previous research that used exploratory factor analytic techniques rather than confirmatory factor analysis. Chipeur and Pretty (1999) noted weak reliabilities for the overall SCI scale, ranging from 0.64 to 0.69; and even weaker reliabilities for the subscales, ranging from 0.07 to 0.72. Both Long and Perkins (2003) and Obst and White (2004) found that the hypothesized factor structure of the SCI did not fit their data, again calling the validity of the SCI into question (Peterson, Speer, & Hughey, 2006). Other potential weaknesses of the SCI include systematic error from the use of negatively worded items and a lack of variability, sensitivity, and internal reliability due to a true/false response-format (Long & Perkins, 2003; Peterson et al., 2006).

One of the most-often cited critiques of the SCI gave rise to a new measure of sense of community, the BSCI (Long & Perkins, 2003). Analyzing data gathered from the study from which the Sense of Community Index (SCI) was originally developed (Perkins et al., 1990), Long and Perkins (2003) found that neither a 1-factor nor the theoretically based 4-factor model fit their data. Therefore, they used confirmatory factor analysis to create a new scale based on the original SCI, but with numerous modifications, including three new factors: (a) social connections, (b) mutual concerns, and (c) community values. Although some researchers have criticized the BSCI for not adhering to the original McMillan and Chavis (1986) theoretical framework (Obst & White, 2004; Tarraglia, 2006), it was found to have enhanced psychometric qualities compared to the original Sense of Community Index (SCI).

## **SENSE OF COMMUNITY RESEARCH AND MEASUREMENT FOR INDIVIDUALS WITH SERIOUS MENTAL ILLNESS**

Serious mental illness (SMI) is a term used to classify persistent psychiatric conditions that can greatly affect a person's behavior, thinking, emotions, and relationships (Kloos, 2005). Diagnoses typically considered to be serious mental illnesses include schizophrenia, bipolar disorder, and severe and persistent depression. Traditionally, individuals with serious mental illness have received a high amount of intervention, often in specialized settings dedicated to the treatment of their problems. The prevailing model of such mental health care has been to take people out of community settings for care in institutional, residential treatment or hospital settings aimed at rehabilitating the patient and eventually readmitting her or him into the community (Nelson, Lord, & Ochocka, 2001). This system of removing individuals with mental illness from their familiar communities likely increases their feelings of being rejected by society for being "different." Above all else, it serves to destroy any sense of belonging that they may possess, making recovery from mental illness far more difficult to achieve.

As mental health care has shifted from deinstitutionalization to models that emphasize more independent community-based residence and care, fostering a psychological sense of community may be particularly beneficial for numerous reasons. Perhaps most important, sense of community may help to reduce feelings of stigmatization and marginalization as people with SMI integrate into neighborhoods and broader community environments. There is some empirical support for this idea. Prince and Prince (2002) examined the relationship between perceived stigma and community integration in 95 clients of assertive community treatment (ACT) teams and found that clients' perceptions of stigmatization were inversely related to their sense of community, as measured by the SCI. Sense of community may also be directly beneficial to well-being and recovery from mental illness. For example, Prince and Gerber (2005) found sense of community to be significantly related to subjective well-being in a sample of 92 persons with serious mental illness. Finally, sense of community may help to promote successful community integration of persons with SMI by increasing their feelings of relatedness and interdependence with fellow neighbors and community members (e.g., Wong & Solomon, 2002; Yanos, Felton, Tsemberis, & Frye, 2007).

It is likely that some aspects of sense of community theory and measurement operate in a similar manner among individuals with SMI as they do for nonmentally ill persons; however, some aspects may be quite unique given the stigma and discrimination described by many persons with SMI (e.g., Deegan, 1996). For instance, the membership and influence dimensions of the sense of community theoretical framework are likely to be quite difficult for individuals with serious mental illness to achieve given community stigma and potential feelings of impotence in regard to exerting influence over the community. In a qualitative article aimed at illustrating the manner in which individuals with serious mental illness experience sense of community within their neighborhoods, Townley and Kloos (under review) found perceptions of community stigma and acceptance of mental illness to be a salient component of individuals' experiences. For example, one participant said, "The police treat me like I'm mentally ill. They stop me on the way to Winn Dixie." Another participant said, "There is a stigma for living in this complex. Some people ride by slow and stare." A third participant had a more positive experience, yet one that impacts sense of community nonetheless: "The neighbors here are very understanding about mental illness, as opposed to other neighborhoods." From this

qualitative study, it seems likely that community acceptance of mental illness/disability is a relevant component of sense of community for this population that is not currently captured in any preexisting sense of community measures.

## RESEARCH QUESTIONS

This study tested a series of confirmatory factor analysis models to develop a measure of sense of community that can be used among mentally ill and other disabled populations. The items used in the CFA include eight items from the BSCI (Long & Perkins, 2003) and three new items assessing community acceptance of disability (see Appendix for a list of items and their respective factors). First, a model was tested to determine if the items would load onto one common SOC factor based on the common conceptualization and measurement of sense of community as a unidimensional construct. Second, it was important to see if the items would load onto the 3-factor structure proposed by Long and Perkins (2003) or if the new items assessing community acceptance of disability would form their own unique fourth factor. Third, a second-order factor model was tested to capture sense of community as a global construct, while also retaining the underlying first-order factors. Finally, it was important to test the predictive capability of the new proposed measure to assess its validity and utility.

## METHODS

### *Participants*

The participants in this study come from a sample of 424 residents of South Carolina who have serious mental illness and live in supported housing affiliated with the South Carolina Department of Mental Health (SCDMH). Each of the 17 mental health centers throughout South Carolina participated in the study and case managers at each center recruited participants. Clients who received a housing subsidy and utilized services from the SCDMH were eligible to participate, but participation was entirely voluntary. Housing subsidies held by participants included Section 8 and HUD benefits; and service utilization varied widely depending on the nature of the supported housing program and participants' needs. The participants in this study completed two waves of data collection, each one year apart.

The 424 participants were nearly evenly divided by sex, with 51% of the sample being female, and the remaining 49% being male. The racial composition of the sample was as follows: 51% of the participants were Black, 40% were White, 3% reported being biracial, and 4% reported other races. The average age of the participants was 46 ( $SD = 10$ ), with 5% being married and 50% having children. The predominant diagnosis (approximately 70%) for this sample was a thought disorder (e.g., schizophrenia), with the remaining participants having such diagnoses as major depression and bipolar disorder. Approximately 31% of the participants completed high school or obtained their general equivalency diploma (GED) as their highest level of education, and 32% had at least some college. The vast majority, 84% of participants, received Supplemental Security Income (SSI) or Social Security Disability Income (SSDI), and 17% were working in paid employment at the time of the interview.

A history of homelessness is a common issue for this population, and 40% of the sample had been homeless at some point in their lives. Finally, 13% of the sample resided in rural settings, whereas 87% lived in urban settings.

### **Measures Used in the Confirmatory Factor Analysis**

*Sense of community.* The sense of community measure used in the current study was the BSCI, developed by Long and Perkins (2003). The BSCI is an 8-item scale adapted in part from the original 12-item Sense of Community Index (Perkins et al., 1990). The BSCI was used in the current study because it was found to have enhanced psychometric properties from the original scale (Long & Perkins, 2003). It consists of three factors: (a) social connection, (b) mutual concerns, and (c) community values. On five items, participants indicate true or false responses about sense of community in their neighborhoods; on three items, participants answer questions on a 3-point Likert scale. The Cronbach alpha for the entire scale in this dataset was 0.78.

*Community acceptance of disability.* To assess community acceptance of disability and propose a new factor to be added to the BSCI, a subscale from the Neighborhood Social Climate (HES-NSC) scale was used (Kloos & Shah, in press; Wright & Kloos, 2007). Developed through a series of studies (Kloos & Shah, in press; Kloos, Frisman, Green, Rodis, & Lin, 2008), this subscale consisted of three questions assessing participants' perceptions of how tolerant and accepting their neighbors are toward their disability status. Specifically, items assessed the extent to which neighbors accept them, fear them, and give them a hard time because of their disabilities. Response choices ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). The Cronbach alpha for the scale in this dataset was 0.83.

### **Measures Used to Assess Construct Validity**

*Psychiatric distress.* Psychiatric distress was assessed using the Brief Symptom Inventory (BSI; Derogatis & Savitz, 1999). The 53-item BSI provides a measure of symptom severity, which is a commonly used outcome variable in housing research with SMI populations (e.g., Evans, Wells, & Moch, 2003). Response choices for the BSI ranged from 0 (*not at all*) to 4 (*extremely*). Cronbach's alpha for the BSI-GSI in this dataset was 0.96. The Global Severity Index (GSI) was used in the current analysis. The GSI is the most sensitive indicator for the BSI, and it measures participants' global distress level by combining information about the number of symptoms experienced and their intensity (Derogatis, 1993).

*Loneliness/isolation.* Loneliness and isolation was measured using the UCLA Loneliness Scale (UCLA-LS). This scale was comprised of four questions relating to isolation from others (Russell, Peplau, & Cutrona, 1980). Participants responded on a scale of 1–4, where 1 indicates *Never* and 4 indicates *Always*. The Cronbach alpha for the UCLA in this dataset was 0.71.

*Neighbor relations.* The Neighbor (HES-NBR) scale included seven items assessing neighboring behavior, including amount of contact with neighbors and material/social support provided by neighbors (Kloos, Frisman, Green, Rodis, & Lin, 2008). Responses were presented on a Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*).

agree). The Cronbach alpha for the scale in this dataset was 0.73 and the 1-week test-retest Pearson correlation coefficient was 0.75.

*Adaptive functioning.* Mental health professionals working with research participants completed case managers' ratings of Adaptive Functioning (CM-F; Chinman, Symanski, Johnson, & Davidson, 2002). The CM-F was a seven-item survey of case manager ratings of a client's functioning in various domains. The CM-F inventory evaluated the participants' occupational and social functioning and their ability to cope with life stressors and mental illness. The inventory included items about substance abuse, social participation, symptom severity, compliance with treatment, clinical stability, and housing stability. The inventory used a five-point Likert response set. The Cronbach alpha for the scale in this dataset was 0.75.

### ***Design and Procedure***

This study was part of a larger research project conducted by the Housing and Adaptive Functioning (HAF) Lab at the University of South Carolina (Kloos & Shah, in press; Wright & Kloos, 2007). The HAF lab is interested in studying housing environments of people with serious mental illness (SMI) to improve housing quality, neighborhood conditions, and public perceptions of mental illness. In the first wave of data collection, 533 individuals were interviewed in 99 different supported housing sites across the state of South Carolina. In the second wave, follow-up interviews were administered among 424 of the original sample. Reasons for people not being interviewed during the follow-up phase included moving, being hospitalized, and declining to participate. Data from the second wave of the study were used for this report.

Before interviewing began, 24 graduate students and research assistants underwent rigorous training to learn interviewing techniques and skills for working with people with serious mental illness. Specifically, individuals learned how to administer the Housing Environment Survey (HES; Kloos & Shah, in press). The survey included scales and items aimed at assessing the impact of housing environments on daily functioning. The protocol was approved by the institutional review boards (IRBs) at the University of South Carolina and the South Carolina Department of Mental Health.

## **DATA ANALYSIS**

### ***Missing Data***

Missing data were addressed using the FIML procedure in MPLUS (Muthén & Muthén, 2007). The FIML procedure in MPLUS allows for the estimation of unrestricted mean and covariance models of missing data. However, the FIML procedure cannot estimate values for missing data if they are to be used as predictor variables. Therefore, eight persons were dropped from the analyses due to missing data for one or more predictor variables, resulting in a sample of 416 persons.

### Data Clustering

Because these data were collected in 68 neighborhoods throughout South Carolina, potential bias may be introduced by the shared variance between participants living in the same neighborhoods. The Huber Sandwich Estimator (Freedman, 2006) was used to account for potential clustering in the standard errors of the observed variables used in the CFA. This was achieved by using the TYPE = COMPLEX option in MPLUS with “neighborhood” as the cluster variable (Muthén & Muthén, 2007). A multi-level modeling design was not employed for two reasons. First, although sense of community has been often conceptualized as a component of groups or communities, it has been typically measured at an individual-level of perception and interpreted accordingly. Second, examination of item-level intraclass correlation coefficients for the items used in the CFA were relatively low, ranging from 0.01 to 0.06 (mean ICC = 0.03) (see Table 1). Thus, on average, no more than 3% of the variance in any of the items was due to the neighborhood cluster.

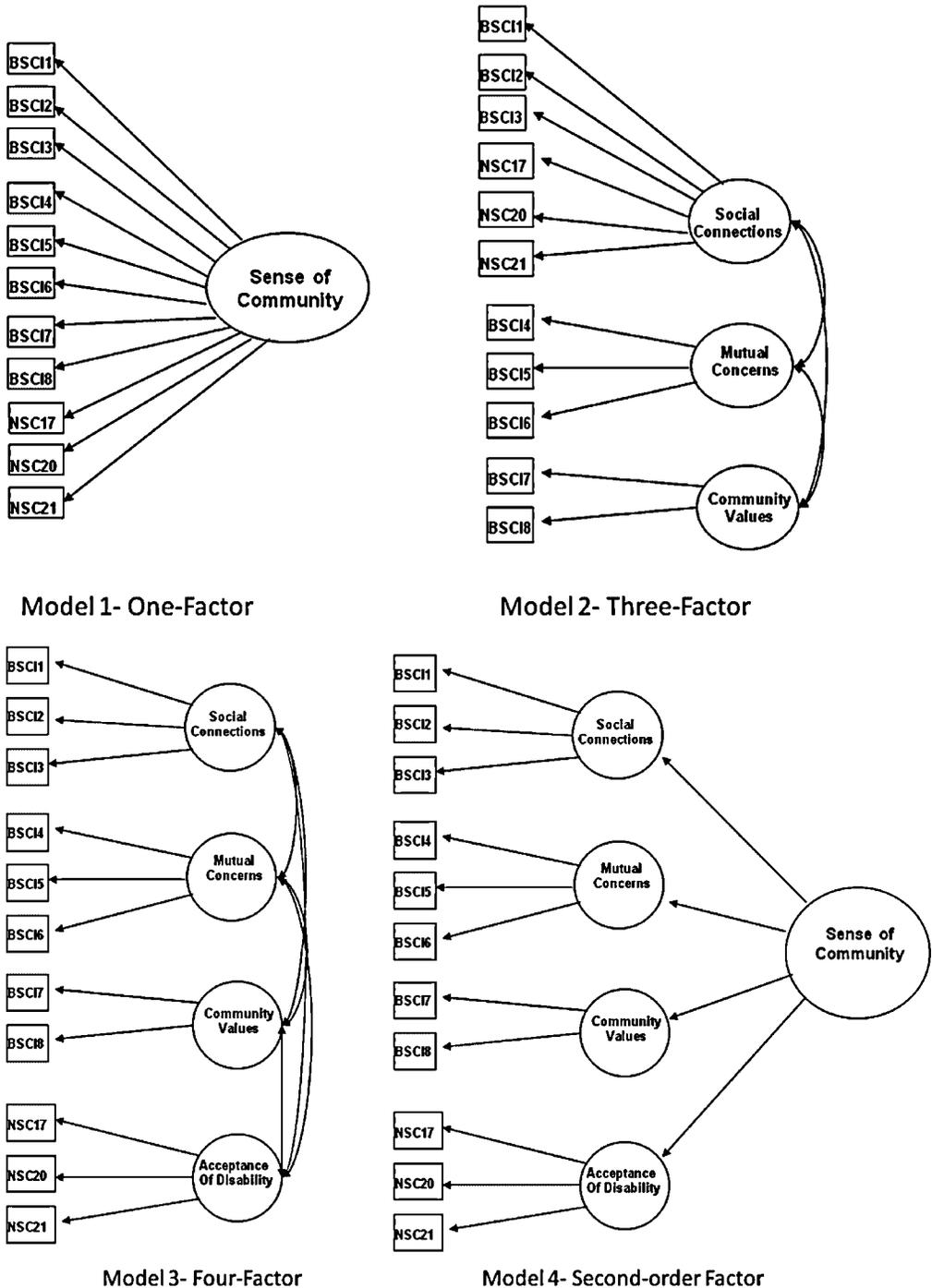
### Measurement Models

A series of confirmatory factor models were specified and estimated using MPLUS 4.21 (Muthén & Muthén, 2007). Three models were tested in a progressive series building up to the most complex, least restrictive model. The models are presented in Figure 1. The figures use the conventions of path diagrams where the latent variables, or factors, are represented as circles. The items, or observed scores, are represented as boxes. The arrows between the latent variables and the items are factor loadings, and double-headed arrows between the factors represent correlations.

Model 1, the most constrained model, specified a single factor model. Model 2 specified the three BSCI factors proposed by Long and Perkins (2003; social connections, mutual concern, and community values), with the three items assessing community acceptance of disability loading on the social connections factor due to their theoretical similarity. Finally, Model 3, the least constrained model, specified a correlated 4-factor model in which the items assessing community acceptance of disability loaded onto a unique factor, community acceptance of disability. Because sense of community is typically conceptualized and measured as a global construct, a fourth model was tested that retained the first-order 4-factor structure and added a

**Table 1. Means, Standard Deviations, and Intraclass Correlations (ICCs) by Neighborhood for Items in the Brief Sense of Community Index-Disability (BSCI-D)**

<i>Item</i>	<i>M</i>	<i>SD</i>	<i>ICC</i>
BSCI1	1.18	0.38	0.05
BSCI2	1.57	0.49	0.05
BSCI3	1.47	0.50	0.04
BSCI4	1.21	0.41	0.01
BSCI5	1.17	0.38	0.02
BSCI6	2.17	0.62	0.06
BSCI7	2.49	0.59	0.05
BSCI8	2.21	0.63	0.03
NSC17	2.45	0.99	0.02
NSC20	2.21	0.85	0.03



**Figure 1.** Alternative factor models of the Brief Sense of Community Index-Disability (BSCI-D).

higher-order sense of community factor. Important to note, Model 4 is more constrained than Model 3, but it is presented last in the series of analyses for methodological clarity.

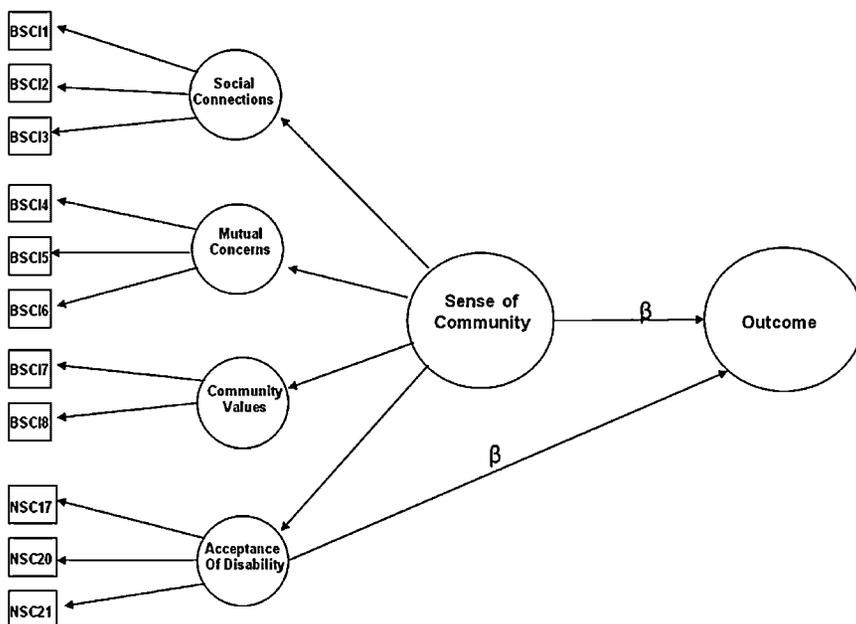
### Assessing Model Fit

Multiple methods were used to assess global model fit. First, standardized residuals were examined for values greater than  $|.10|$ . Second, global model fit indices were examined. The WLSMV estimator was used to obtain the model chi-square, Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA). This study utilized the fit indices and cut-off values suggested by Hu and Bentler (1999). Thus, for sample sizes greater than 250, RMSEA values less than 0.06 and TLI values greater than 0.95 are considered acceptable for model fit.

To statistically compare alternate nested models, chi-square difference tests were performed. The DIFFTEST option in MPLUS was used to obtain a correct chi-square difference test because the WLSMV estimator was used (Muthén & Muthén, 2007). The chi-square difference test compares the H0 analysis model to a less restrictive H1 alternative model in which the H0 model is nested. A significant chi-square difference test value indicates that the H1 model fits significantly better than the H0 model.

### Construct Validity

To assess construct validity of the suggested model, four regressions were performed in MPLUS in which theoretically related outcomes were regressed on the proposed second-order factor model (Model 4). A primary goal of this study was to examine the utility of adding new items proposed to constitute a fourth factor (community acceptance of disability) to the BSCI. Therefore, each outcome was regressed on both the second-order global sense of community factor and also the first-order disability factor (see Figure 2 for a model illustrating this technique). Significant beta weights between the disability factor and the outcomes after controlling for the global sense of



**Figure 2.** Model illustrating the construct validity test of the Brief Sense of Community Index-Disability

community factor indicated that the residuals in the disability factor were large enough to still be related to the outcome. This helps to provide evidence for the utility of adding the disability factor to the original BSCI model. It also helps to validate the new measure proposed in this study.

## RESULTS

### *Confirmatory Factor Analysis*

Table 1 presents means, standard deviations, and ICCs for the individual items used in the confirmatory factor analyses. Table 2 reports the fit indices for Models 1 through 3. The 1-factor model (Model 1) did not fit the data well ( $\chi^2 = 158.94$ ,  $df = 17$ ,<sup>1</sup>  $p < .001$ ; TLI = 0.856, RMSEA = 0.14). The 3-factor model (Model 2) represents a significant improvement from the 1-factor model ( $\chi^2_{diff} = 68.15$ ,  $df = 2$ ,  $p < .001$ ). However, the fit indices revealed poor fit to the data ( $\chi^2 = 84.28$ ,  $df = 17$ ,  $p < 0.001$ ; TLI = 0.913, RMSEA = 0.10). The fit indices for the 4-factor model (Model 3) indicated a good fit of the proposed model with these data:  $\chi^2 = 23.45$ ,  $df = 17$ ,  $p = .124$ ; TLI = 0.994, RMSEA = 0.03. Additionally, the 4-factor model fit the data significantly better than the 3-factor model ( $\chi^2_{diff} = 50.118$ ,  $df = 2$ ,  $p < .001$ ). Thus, adding a unique factor for the items assessing community acceptance of disability is preferable to adding the items to one of the three proposed factors. If the data had fit into the 3-factor model, it would indicate that it is not important to have a fourth unique disability factor.

Fit indices for the second-order factor model assessing sense of community as a higher order construct indicated a good fit of this proposed model with these data:  $\chi^2 = 23.71$ ,  $df = 18$ ,  $p = .154$ ; TLI = 0.994, RMSEA = 0.028. The second-order factor model fit the data as well as the first-order factor model ( $\chi^2_{diff} = 1.61$ ,  $df = 2$ ,  $p = 0.334$ ), indicating that sense of community can be measured as a global construct (i.e., second-order factor), while also retaining the four first-order factors. This model will be referred to throughout the remainder of the article as the BSCI-D. Figure 3 includes the standardized first-order factor loadings and second-order factor loadings of the BSCI-D. All factor loadings are positive, reasonably high, and statistically significant. The polychoric correlation matrix between items in the BSCI-D is included in Table 3. Table 4 shows intercorrelations among the four first-order latent factors, ranging from  $r = 0.48$  to 0.70. Internal consistency coefficients were also calculated for each of the four first-order latent factors. Cronbach's alpha coefficients for each factor were as follows: 0.75 for social connections, 0.73 for mutual concerns, 0.61 for community values, and 0.83 for community acceptance of disability.

### *Construct Validity*

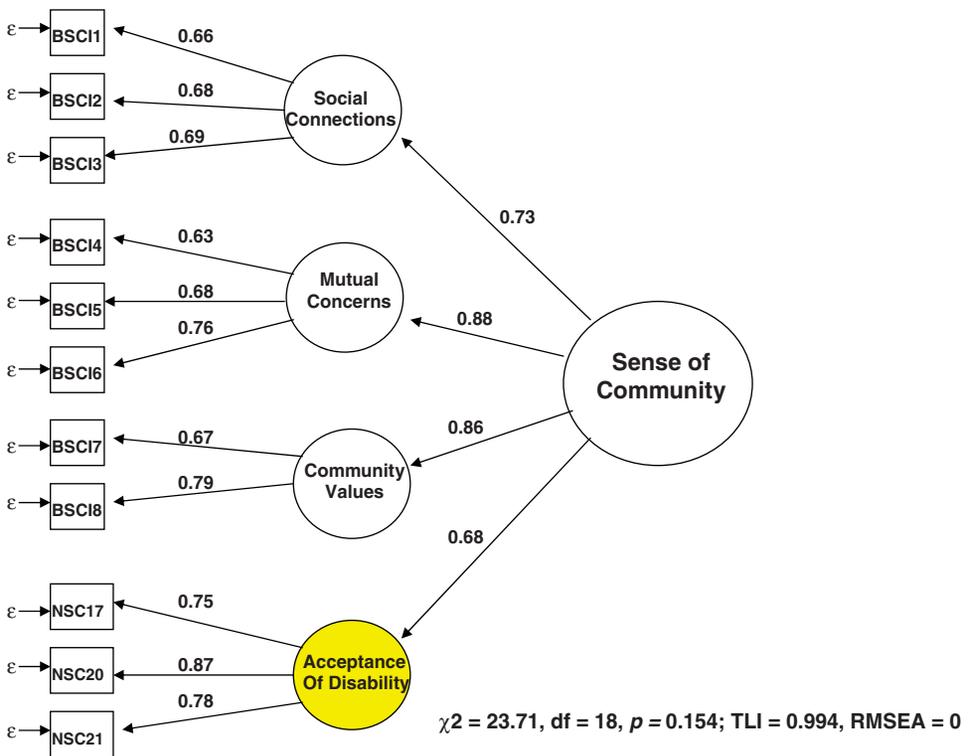
Results from the tests of construct validity are included in Table 5. The community acceptance for disability factor was significantly related to each of the outcomes, even after controlling for the influence of the second-order sense of community

<sup>1</sup>The WLSMV estimator calculates degrees of freedom according to a formula found in the technical appendix of Mplus ([www.statmodel.com](http://www.statmodel.com)). This leads to some values that may appear counter-intuitive (e.g., nested models where the estimated degrees of freedom for the constrained model are the same or fewer than for the unconstrained model). The chi-square is adjusted to obtain an accurate  $p$ -value and it is the  $p$ -values that are relevant in this situation (Muthén & Muthén, 2007).

**Table 2. Measures of Fit and  $\chi^2_{diff}$  Tests for the 1-Factor, 3-Factor, and 4-Factor Models of the Brief Sense of Community Index-Disability (BSCI-D)**

Model	1-factor	$\chi^2$	df*	p Value	TLI	RMSEA	$\chi^2_{diff}$	df	p Value
Model 1:	1-factor	158.94	17	<0.001	0.856	0.142			
Model 2:	3-factor	84.26	17	<0.001	0.913	0.098	68.15	2	<0.001
Model 3:	4-factor	23.45	17	0.124	0.994	0.030	50.12	2	<0.001

Note. The WLSMV estimator calculates degrees of freedom according to a formula found in the technical appendix of Mplus (www.statmodel.com). This leads to some values that may appear counterintuitive (e.g., nested models where the estimated degrees of freedom for the constrained model are the same or fewer than for the unconstrained model). The chi-square is adjusted to obtain an accurate p value and it is the p values that are relevant in this situation (Muthén & Muthén, 2007).



**Figure 3.** First-order factor loadings and second-order factor loadings of the Brief Sense of Community Index-Disability (BSCI-D).

factor. The unique effect of the disability factor on psychiatric distress was  $-0.32$  ( $p < 0.001$ ),<sup>2</sup> on loneliness/isolation was  $-0.19$  ( $p < 0.01$ ), on neighbor relations was  $0.24$  ( $p < 0.001$ ) and on functioning, as reported by case managers, was  $0.15$  ( $p < 0.05$ ).

<sup>2</sup> Beta regression weights are reported.

**Table 3. Polychoric Correlation Matrix of Items in the Brief Sense of Community Index-Disability (BSCI-D)**

Items	BSCI1	BSCI2	BSCI3	BSCI4	BSCI5	BSCI6	BSCI7	BSCI8	NSC17	NSC20	NSC21
BSCI1											
BSCI2	0.418										
BSCI3	0.389	0.433									
BSCI4	0.322	0.284	0.234								
BSCI5	0.337	0.205	0.209	0.456							
BSCI6	0.325	0.226	0.311	0.434	0.536						
BSCI7	0.281	0.228	0.190	0.261	0.262	0.346					
BSCI8	0.290	0.253	0.313	0.281	0.414	0.442	0.549				
NSC17	0.260	0.285	0.298	0.230	0.235	0.263	0.246	0.276			
NSC20	0.235	0.211	0.268	0.216	0.229	0.226	0.234	0.252	0.625		
NSC21	0.228	0.204	0.321	0.217	0.211	0.264	0.268	0.221	0.553	0.678	—

**Table 4. Intercorrelations Among the Four First-Order Latent Factors of the Brief Sense of Community Index-Disability (BSCI-D)**

Factor	1	2	3	4
1. Social connections	—			
2. Mutual concerns	0.582	—		
3. Community values	0.647	0.697	—	
4. Disability tolerance	0.531	0.482	0.468	—

Note. All correlations are significant at the  $p < .001$  level.

## DISCUSSION

These results provide evidence that a sense of community can be an important component of experience for persons with serious mental illness. However, the results also indicate that the unique challenges of mental illness stigma and related discrimination require SOC measures to be adapted for persons with psychiatric disabilities. Our proposed modification to the BSCI appears to meet the need for a new measure that incorporates disability experiences in community living with traditional approaches to measuring SOC. This new measure has adequate psychometric properties, is relatively brief, and was accessible to the participants in the study. We suggest that this BSCI-D can advance research and aid in the investigation of efforts that promote participation in community life for persons with SMI.

A series of confirmatory factor analyses were tested using the BSCI (Long & Perkins, 2003) and adding three items assessing community acceptance of disability. CFA revealed that a 1-factor sense of community model did not fit the data, nor did a factor model using the three factors (social connections, mutual concern, community values) proposed by Long and Perkins (2003). This does not contradict the findings of Long and Perkins (2003), but rather suggests that their factor structure does not operate similarly among individuals with serious mental illness. A 4-factor model using

**Table 5. Results of the Construct Validity Test of the Brief Sense of Community Index-Disability (BSCI-D)**

Factor	Psychiatric distress			Outcome Loneliness/isolation			Neighbor relations			Adaptive functioning		
	B	SE	$\beta$	B	SE	$\beta$	B	SE	$\beta$	B	SE	$\beta$
Sense of community (second-order)	-0.28**	0.10	-0.22**	-1.98***	0.43	-0.37***	4.61***	1.50	0.33***	0.301	0.41	0.06
Community acceptance of disability (first-order)	-0.25***	0.04	-0.32***	-0.51**	0.16	-0.19**	1.48***	0.41	0.26***	0.52*	0.16	0.15*
Model $R^2$	0.18			0.24			0.26			0.05		

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

the three proposed factors and adding a fourth factor entitled community acceptance of disability fit the data quite well, as evidenced by highly acceptable fit indices and moderate to high factor-loadings of items on their respective factors. To capture sense of community as a higher-order global construct, as it is often conceptualized and used in the literature and in practice, a second-order factor model was tested and was found to also fit the data quite well.

The fact that the 4-factor model fit significantly better than the 3-factor model highlights the importance of this new measure in examining a unique aspect of sense of community for individuals with serious mental illness. If the new items assessing community acceptance of disability had loaded onto the 3-factor structure proposed by Long and Perkins (2003), then it would suggest that there is little need to add the disability factor to the model. However, the CFA revealed that these items do in fact comprise a unique aspect of sense of community that was not previously captured in any preexisting sense of community measures.

Analysis of construct validity produced a pattern of results that highlight the unique contribution of the community acceptance of disability factor to this new measure of sense of community. In four regressions, the disability factor was significantly related to a variety of outcomes (neighbor relations, loneliness/isolation, psychiatric distress, and adaptive functioning) after controlling for the influence of the higher-order sense of community factor. Thus, the disability factor plays a role in the broader sense of community construct, while also being able to predict theoretically related outcomes. The relationship between the disability factor and adaptive functioning is particularly meaningful for two reasons. First, a different source of data was used (i.e., case manager reports), thus any potential bias introduced by shared variance between multiple self-report measures is not an issue. Second, if the disability factor was not in the model, sense of community would have no relationship with adaptive functioning, as reported by case managers. The information obtained from these tests of construct validity is important because it illustrates the ways in which the disability factor functions both as part of sense of community and uniquely from sense of community. They also help to validate the BSCI-D and illustrate its potential utility in research and practice.

### ***Limitations and Recommendations***

There are limitations to the interpretation of these findings. First, although the data are taken from a larger longitudinal study, only one wave of data was included in these analyses. Attributions of what may lead to perceptions of neighborhood sense of community cannot be made. However, there appears to be enough evidence to warrant continued research with this new measure to investigate sense of community and its relationship with well-being and community integration for individuals with serious mental illness.

Given ethical considerations in the research, the study only included people who agreed to be interviewed. Accordingly, generalizability may be restricted because we may not have been able to interview people who were lower functioning or unstable at the time of the interview. Another potential problem with generalizability is that the findings may only represent the experiences of persons living in supported housing in the southeastern United States. However, given the fact that the sample was drawn from the entire state and included individuals in diverse housing sites (e.g., rural,

urban, scattered, congregate, large complex, single units), the findings are likely to be fairly representative.

It is possible that the items which we suggest relate to a specific difference (i.e., mental illness) may actually assess the extent to which the respondents experience their environments as being accepting of diversity in general. This is an important question because it relates directly to whether one needs to design variations of the measure for each diverse characteristic (e.g., mental illness, ethnicity, sexual orientation, and so forth) or whether the issue is respect for diversity in general, in which case the items should be worded more generally. We are not able to empirically assess this question in the current study, but it is worthy of further examination in the future.

A final limitation of the current study is that scale and subscale reliability coefficients for the BSCI-D were marginal. Long and Perkins (2003) discussed this limitation with the BSCI, and they suggested that low reliability coefficients may be due to the restricted range of responses available to respondents on the eight items of the BSCI. They recommended that future applications of the BSCI use a 5-point Likert-type responses format to increase variability and sensitivity (Long & Perkins, 2003). We support this recommendation for future applications of the BSCI-D.

### ***Future Uses and Conclusions***

The current study suggests that the BSCI-D provides a valid measure of sense of community for individuals with serious mental illness. A few theoretical articles and empirical studies of individuals with serious mental illness residing in the community have suggested the importance of sense of community (e.g., Aubry & Myner, 1996; Prince & Prince, 2002; Wong & Solomon, 2002). However, to date, there have been no published studies analyzing the measurement of sense of community for individuals with SMI. People who are marginalized in some way likely have concerns about participation in community life that are not measured by the SCI or BSCI. However, it is part of the tradition of community psychology to include the perspectives of persons who have been marginalized. The use of the BSCI-D may help monitor how sense of community is affected by community experiences and participation in services.

One unique aspect of sense of community for individuals with SMI that this study specifically tested is the importance of community acceptance of disability. Items assessing this disability related community experience loaded onto a unique factor that can be used as part of the sense of community construct or as its own separate subscale. In terms of the original McMillan and Chavis (1986) theoretical sense of community framework, the items in this new factor are most similar to the membership/belonging dimension. This provides converging evidence to the qualitative findings suggesting that belonging is a challenge for persons with SMI living in community settings (Townley & Kloos, 2008).

The research area in which this new measure may be most beneficial is in community integration research, particularly in measuring psychological integration, which is defined as individuals with SMI feeling a sense of belonging in their communities (Aubry & Myner, 1996; Wong & Solomon, 2002). Traditionally, the SCI has been used in community integration research; however, the author of the current study encourages the use of the BSCI-D. The items in this scale that assess community acceptance of disability refer to disability in a general sense (e.g., "People in this neighborhood are afraid of me because of my *disability*") rather than "People in this

neighborhood are afraid of me because of my *mental illness*”). Perhaps this scale can be useful among individuals with diverse disabilities, including traumatic brain injuries, physical disabilities, and developmental disabilities.

In summary, these results suggest that the psychological sense of community is one of the most important features of community life for persons regardless of abilities. Given the diversity of community memberships and experiences, it is important to make certain that our measures accurately reflect the needs and concerns of group members. The BSCI-D appears to be a measure that captures the unique experience of community life for individuals with serious mental illness, and perhaps other disabilities.

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## APPENDIX

### Brief Sense of Community Index-Disability (BSCI-D)

Item	Factor
1. I can recognize most of the people who live in my neighborhood.	Social connections
2. Very few of my neighbors know me.	Social connections
3. I have almost no influence over what this neighborhood is like.	Social connections
4. My neighbors and I want the same thing for the neighborhood.	Mutual concerns
5. If there is a problem in the neighborhood people who live here can get it solved.	Mutual concerns
6. In general, would you say that people in your neighborhood watch after each other and help out when they can, or do they pretty much go their own way?	Mutual concerns
7. Would you say that it is very important, somewhat important, or not important to you to feel a sense of community with the people in your neighborhood?	Community values
8. Would you say that you feel a strong sense of community with others in your neighborhood, very little sense of community, or something in between?	Community values
9. Sometimes I feel unwelcome in my neighborhood because of my disability.	Community acceptance of disability
10. Some people in my neighborhood give me a hard time because of my disability.	Community acceptance of disability
11. People in this neighborhood are afraid of me because of my disability.	Community acceptance of disability