

Validation and use of the Children's Hope Scale-Revised PTPB Edition (CHS-PTPB): High Initial Youth Hope and Elevated Baseline Symptomatology Predict Poor Treatment Outcomes

Sarah E. Dew-Reeves · M. Michele Athay ·
Susan Douglas Kelley

Published online: 11 March 2012
© Springer Science+Business Media, LLC 2012

Abstract The present study examined the relationship between initial youth hope, measured within the first 4 weeks of mental health treatment, and treatment progress over time (self-, caregiver-, and clinician-report of symptom severity) in a clinical sample of youth ages 11–18 years ($N = 356$). The psychometric properties of the CHS-PTPB, a revised version of the Children's Hope Scale, are also presented. Results indicate the CHS-PTPB is a psychometrically sound measure for use in this population. Additionally, results found that while higher levels of hope were associated with lower levels of symptom severity at baseline, initial level of hope was not significantly related to symptom improvement over time as reported by the youth and caregiver. Surprisingly, higher initial hope predicted slower treatment progress as rated by clinicians. According to clinician-rated symptom severity, youth with high initial hope and high baseline symptom severity show the poorest predicted clinical outcome. Implications, future directions, and limitations of the study are discussed.

Keywords Hope · Adolescent · Mental health services · Treatment progress · Client improvement · Psychometrics · CHS-PTPB

In broad terms, hope is a way of thinking about goals. More specifically, hope refers to a wish or desire for something accompanied by the expectation of obtaining it. Historically, theories about hope developed out of the motivational literature, with hope conceptualized as a cognitive motivational process (Snyder 2002). Although there is some controversy in the literature as to whether hope is predominantly a cognitive or emotional construct, most authors agree that both cognitions and emotions are involved in the experience of hope. For example, Shorey and colleagues describe hope as a process in which emotions follow cognitive appraisals and then interact with future appraisals (Shorey et al. 2002). This suggests that both thoughts and feelings are important to the ongoing experience of hope. Snyder et al. (1999) define hope as the perceived ability to produce pathways to attain goals (pathway thinking) and move on the path toward those goals (agency thinking).

Hope is an important process that relates to self-esteem, psychological adjustment, and problem solving (e.g., Elliott 2002; see Snyder 2002 for review). Hope has also been theorized to be an important characteristic that may influence clients' mental health and subsequent mental health treatment. Research suggests that higher hope at pre-treatment is associated with greater well-being, better functioning, and fewer symptoms at intake and is associated with greater well-being and fewer symptoms throughout treatment (e.g., Irving et al. 2004). Similarly, studies suggest that lower levels of hope are associated with increased depressive and anxiety symptoms in adults

S. E. Dew-Reeves (✉)
HIV Mental Health Services, Children's National Medical
Center, 111 Michigan Avenue, NW, Washington,
DC 20010, USA
e-mail: sdew@cnmc.org

M. Michele Athay · S. D. Kelley
The Center for Evaluation and Program Improvement,
Peabody College, Vanderbilt University, Nashville, TN, USA

(e.g., Snyder 1995), more depressive symptoms in children (e.g., Snyder et al. 1997) as well as higher levels of internalizing and externalizing symptoms in adolescents (e.g., Valle et al. 2004). This is closely related to research findings reporting that adolescents with an emotional diagnosis or mental impairment who are in residential treatment have the lowest levels of hope as compared to non-clinically referred adolescents, who have the highest levels of hope (see Hinds et al. 1999 for review). Thus, not only does mental illness relate to levels of hope, the severity of that illness also matters.

Hope also relates to symptom improvement. For example, Snyder (2002) used meta-analysis data and found that both agency effects and pathway effects (two components of hope) made unique contributions in predicting patient outcomes. In a non-clinical study of adolescents, hope at the initial data collection predicted life satisfaction and internalizing symptoms one year later (Valle et al. 2006). That relationship was not found for externalizing symptoms. In a clinical sample, Irving et al. (2004) found that pre-treatment agency scores were associated with improvement in outcomes early in therapy, while pre-treatment pathway scores were associated with improvement in outcomes later in therapy.

Given that hope is a motivational process, which affects behavior, subsequent thoughts and feelings, and ultimately treatment outcomes, it represents a clinically meaningful characteristic to assess in the context of youth treatment. Despite the clinical importance of hope, several issues complicate measurement. The first issue is whether to measure hopefulness or hopelessness. While hopelessness may be an important aspect of a youth's experience, lacking negative expectations does not necessarily indicate having positive expectations (Snyder et al. 1997). These are two related, but not opposite, constructs. Further, a focus on hope rather than hopelessness is more consistent with a strengths-based approach to treatment, an important recent development aimed at not only reducing symptoms but also building strengths (Maddux 2005; Seligman and Csikszentmihalyi 2000). The second issue relates to the operational definition being utilized when assessing hope. A comprehensive assessment of hope should capture both the pathway and agency thinking asserted to be critical components of hopefulness (e.g., Snyder 1995). Thus, items related to agency thinking should assess whether one has an active stance towards the present and future (i.e., focused on doing), while items related to pathway thinking should assess perceived ability to find ways to reach one's goals, in the presence or absence of obstacles. The final measurement issue surrounds the stability of hope. While some may see it as a stable personal characteristic, in the context of mental health services, hope is seen as both a pre-treatment client characteristic and a dynamic characteristic

that may vary throughout treatment. Snyder and colleagues (2000) suggest that agency in particular is likely to elevate within the initial weeks of mental health treatment. This is consistent with the approach of recognizing common factors (such as hope or therapeutic alliance) as mechanisms of change in the treatment process (Kelley et al. 2010).

One of the most widely used measures of youth hopefulness with a clearly stated operational definition is the Children's Hope Scale (CHS, Snyder et al. 1997). Composed of six developmentally-appropriate items that ask about positive or hopeful cognitions, the CHS captures both the pathway and agency thinking components of hope. The CHS was originally designed for use with youth ages 8–16 years but subsequent validation studies suggest that it is appropriate for adolescents up to age 19 (Valle et al. 2004). Although test–retest reliability from various studies suggest moderate to strong relationships in hope scores over time (Valle et al. 2006; Snyder et al. 1997), the CHS may also be used to detect change over time.

The first aim of this study is to present the psychometric properties of the CHS-PTPB, a revised version of the CHS. The goal of the psychometric evaluation was to explore the possibility of shortening the measure to enhance utility for frequent administration throughout treatment as part of the larger Peabody Treatment Progress Battery (PTPB; Bickman et al. 2007, 2010). Inclusion in such a battery requires that measures be brief, clinically meaningful, and psychometrically sound (Kelley and Bickman 2009).

Given that hope is a youth characteristic that relates to clinical outcomes, it is important to further examine hope in youth receiving mental health treatment. Because of this, the secondary aim of this study is to examine the relationship between initial youth hope and treatment progress over time. It is hypothesized that initial youth hope will significantly relate to baseline symptom severity as well as rate of symptom improvement.

Method

Participants

Participants in the current study participated in a larger study that evaluated the effects of a measurement feedback system (Contextualized Feedback Systems; CFS™) on youth outcomes. Participants were from a national provider of home-based mental health services and represented 28 sites in 10 states. The treatment provided by this decentralized organization included services such as individual and family in-home counseling, intensive home-based services, crisis intervention, substance abuse treatment, life skills training, and case management. No specific modality of evidence-based treatment was reported to be in regular

use by this organization. This type of treatment is referred to in the literature as “treatment as usual.” Vanderbilt University’s Institutional Review Board granted study approval.

This paper utilizes two different but overlapping samples for the psychometric and longitudinal analyses. All data were from the larger CFS™ evaluation study. However, when CFS™ was implemented at each site, youth currently receiving treatment, as well as youth who began treatment during the two-and-a-half year data collection period, were entered into the system. For youth already in treatment upon implementation, their initial data does not reflect the beginning of their treatment. These youth contributed data for psychometric purposes only. Only youth who began treatment after implementation and whose data were collected from the beginning of their treatment were included in the evaluation. For the psychometric analyses, all youth who completed the CHS were included. In this case, a CHS is completed if at least 85% of items were answered. If more than 15% of item responses were missing, the score was counted as missing. Thus, the psychometric sample includes a total of 521 youths. For youth with more than one completed CHS, the first completed CHS was used. The sample for the longitudinal analyses included only youth included in the evaluation sample (i.e., they began treatment after the implementation of CFS™), which resulted in a sample of 356 youths receiving mental health treatment. For a more detailed description of the samples used to conduct the psychometric and longitudinal analyses, please see Riemer et al. (2012) in the current issue.

Measures

Children’s Hope Scale (CHS)

The CHS (Snyder et al. 1997) measures goal-oriented thinking. Youth are asked to report on their ability to generate paths toward goals and persevere toward those goals. The six items are all positively worded with responses ranging from 1 (*None of the time*) to 6 (*All of the time*) on a 6-point Likert-type scale. Although the CHS typically uses the sum of items as the total score, the mean of youth responses across items is used here to be consistent with the scoring for the other PTPB measures. This difference in calculating the total score only affects parameter estimates in analyses and does not impact results (i.e., significance). While the scale authors (Snyder et al. 1997) found a two-factor structure (agency and pathway), the evidence for this factor structure was weak, given that they were intercorrelated factors based on a very small number of items. Later analyses of the CHS also found two factors but goodness of fit indices suggested a poor fit (Valle et al. 2004). CHS items can be found in Table 1.

Table 1 CHS items

Item number	Item
1	I think I am doing pretty well.
2*	I can think of many ways to get the things in life that are most important to me.
3	I am doing just as well as other kids my age.
4	When I have a problem, I can come up with lots of ways to solve it.
5*	I think the things I have done in the past will help me in the future.
6	Even when others want to quit, I know that I can find ways to solve the problem.

* Items marked with an asterisk are not in the CHS-PTPB version

Symptom and Functioning Severity Scale (SFSS)

The SFSS is completed by the youth, caregiver, and clinician, with each respondent rating youth emotional and behavioral functioning. The SFSS contains 26 items (27 for the clinician version) in which respondents rate the frequency of various emotional or behavioral symptoms on a 5-point Likert-type scale ranging from 1 (*Never*) to 5 (*Very often*). The SFSS yields an SFSS Total Score, that ranges from 33 to 86 for youth, 30 to 82 for caregivers, and 27 to 88 for clinicians, with higher scores indicating greater symptom severity. The SFSS has demonstrated sound psychometric qualities for all three respondent forms, including internal consistency (range Cronbach’s alpha = 0.93–0.94), test–retest reliability (range $r = 0.68$ – 0.87), construct validity, and convergent and discriminant validity. The SFSS also has established cutoffs for low, medium, and high scores. Based on youth ratings, a score above 63 is high severity, 45–63 is medium severity, and less than 45 is low severity. For the caregiver version, a score of 73 or more is considered high severity, a score between 58 and 73 is medium severity, and a score less than 58 is low severity. Clinician ratings indicate a score above 69 is high severity, a score between 57 and 69 is medium severity, and a score less than 57 is low severity. For more information about the SFSS, see Athay et al. (2012) in the current issue.

Other PTPB Measures used for Analysis of Construct Validity

Treatment Outcomes Expectations Scale (TOES)

The TOES assesses youth and caregiver expectations about the anticipated outcome of treatment. Composed of eight items, the TOES is completed by the youth and caregiver at the beginning of treatment. The TOES displays excellent

psychometric properties, including an internal consistency coefficient of 0.91 for the youth version and 0.85 for the caregiver version. For more information on the TOES, see Dew-Reeves and Athay (2012) in this issue.

Brief Multidimensional Students' Life Satisfaction Scale-PTPB version (BMSLSS-PTPB)

Youth satisfaction with life was assessed with the BMSLSS-PTPB. This measure represents a revision of the BMSLSS (Seligson et al. 2003) in which the original 7-point Likert-type response scale was changed based on prior item response analysis. Response choices for the BMSLSS-PTPB are given on a 5-point Likert-type scale ranging from 1 (*Very dissatisfied*) to 5 (*Very satisfied*). The BMSLSS-PTPB has demonstrated sound psychometric qualities. Please see Athay et al. (2012) in the current issue for more information.

Satisfaction with Life Scale (SWLS)

The SWLS, a measure of life satisfaction, was developed by Diener et al. (1985) and includes five items answered on a 7-point Likert scale from 1 (*Strongly disagree*) to 7 (*Strongly agree*). The SWLS has a reported Cronbach's alpha for internal consistency of 0.87, test-retest correlation of 0.82, and a single factor solution replicated through factor analysis (Diener et al. 1985, Neto 1993). Please see Athay (2012) in the current issue for more details.

Procedures

Measures used in this current study were part of the PTPB, the measurement battery utilized by CFS™. Clinicians administered measures at the end of each clinical session according to a measurement schedule. According to this schedule, the CHS was intended to be completed at baseline and every month thereafter, while the SFSS was to be completed at baseline and every 2 weeks (or once a month) thereafter. Completed measures were entered into the CFS application by administrative staff at the treatment sites. All data were received de-identified.

Although the CHS was intended to be completed at baseline, the data were collected in a real world setting rather than a highly controlled research setting. Therefore, the actual completion of measures varied widely and the first completed CHS did not always occur at the very beginning of treatment. Of the 356 youths in the longitudinal sample, 213 completed a CHS. Of those 213 youths, the first CHS occurred, on average, during the fourth week of treatment ($SD = 6.24$ range; 0–39) and the average total length of time in treatment was approximately 16 weeks

($M = 15.92$, $SD = 13.64$). Because the current study was particularly interested in youths' initial hope during treatment, we defined initial hope as being measured during the first four weeks of treatment. This excluded 96 youths whose first CHS measurement was more than four weeks after the start of treatment. Therefore, initial hope for these youth was set to missing as it was deemed too far into treatment to be considered an initial measure of hope. Thus, 117 youths had a valid measure of initial hope.

For those without a valid measure, multiple imputation (MI) was used. Although this amount of missing data may increase the variability in estimates, multiple imputation is preferred over discarding cases (Little and Rubin 1987). Comparisons were made between youth with ($N = 117$) and without ($N = 239$) initial CHS scores. No differences were found based on youth age, gender, racial background, or length of time in treatment. Additionally, no differences were found based on baseline symptom severity as reported by the youth, caregiver, or clinician. Following procedures suggested by McKnight et al. (2007), missing data across subjects and variables were inspected and no discernable patterns of missingness were found that would indicate non-missing at random (non-MAR). Established guidance is that five imputations suffice for MI procedures (Rubin 1987; von Hippel 2005). Thus, missing data were treated as MAR and five imputed data sets were created to use separately for analyses. Averaged results are presented.

Analyses

The psychometric analysis of the CHS evaluated each item with the aim of reducing the length of the CHS while maintaining strong psychometric qualities and measure reliability. Multiple psychometric analysis models were utilized, including classical test theory (CTT), confirmatory factor analysis (CFA), and Rasch modeling. Items were evaluated based on their distribution, relationship to the underlying construct being assessed, fit with the overall scale, and ability to discriminate between individuals. Reliability was assessed using Cronbach's alpha and item-total correlations. CFA was used to evaluate the measure's factorial validity. Additional analyses were conducted to aid in interpreting scores and resulted in establishing total score quartiles and a standard error of measurement (*SEM*). For a more detailed description of the psychometric procedures used in developing the second edition of the PTPB, please see Riemer et al. (2012) in the current issue.

Construct validity refers to the degree with which we are measuring the construct we think we are measuring. Here, construct validity is assessed based on how well this measure correlates with variables known to be related or unrelated to youth hopefulness. For example, reviews of literature indicate a theoretical and/or empirical relationship between

youth hopefulness and youth outcome expectations (Irving et al. 2004), youth symptom severity (Irving et al. 2004), and youth satisfaction with life (Proctor et al. 2009). Therefore, we expect to find a significant correlation between the CHS and a measure of youth outcome expectations (TOES), a measure of youth symptom severity (SFSS), and a measure of youth satisfaction with life (BMSLSS). Because no evidence was found indicating a relationship between youth hope and caregiver life satisfaction or caregiver treatment outcome expectations, we expect to find insignificant correlations between the CHS and a measure of caregiver life satisfaction (SWLS) and a caregiver-rated measure of treatment outcome expectations (TOES). All psychometric analyses were conducted for both the original CHS with six items and the brief version that resulted from the item evaluation.

To examine whether youth hope predicts treatment improvement, data were analyzed with hierarchical linear modeling (HLM) using SAS. This technique is appropriate given the nesting of data (multiple time points within youth) as well as the unequal number and spacing of observations (completed SFSS) per youth. One group of models was run for each of the three respondents on the SFSS: youth, caregiver, and clinician. Separate models were utilized to analyze how youth hope related to the symptom severity rating of each independent respondent. An example of the within-youth (Level-1) model is:

$$SFSS_{it} = \pi_{0i} + \pi_{1i}(Time_{it}) + e_{it} \quad (1)$$

In this equation, $SFSS_{it}$ represents the symptom severity of youth i at time t and $Time_{it}$ represents the time in weeks the youth had been in treatment. An example of the between-youth (Level-2) model is specified as follows:

$$\pi_{0i} = \beta_{00} + \beta_{01}(Youth\ CHS) + r_{0i} \quad (2a)$$

$$\pi_{1i} = \beta_{10} + \beta_{11}(Baseline\ SFSS) + \beta_{12}(Youth\ CHS) + r_{1i} \quad (2b)$$

These equations capture mean baseline symptom severity (β_{00}), monthly rate of change in symptom severity (β_{10}), and the relationship between youth baseline symptom severity and initial youth hope (β_{01}). It also captures whether the rate of change varies according to youth baseline severity (β_{11}) or initial youth hope (β_{12}). Youth initial hope and baseline symptom severity were grand mean centered to provide information about youth whose values differ from the mean. The r_{0i} and r_{1i} are Level-2 residuals, also known as random effects. While r_{0i} indicates a youth's deviation from the average baseline symptom severity, r_{1i} captures a youth's deviation from the average rate of symptom severity change for youth. These

residuals are assumed to be normally distributed with variance τ_{00} and τ_{11} , respectively.

Results

Psychometric Properties of the CHS-PTPB

A review of item characteristics for the 6-item version of the CHS indicated two items that could potentially be removed from the measure (items 2 and 5 in Table 1). Item two had a lower correlation with the total than other items ($r = 0.66$). In addition, this item appeared redundant with item 1 in terms of item difficulty (measure score for both = -0.20). Item 5 also had a lower correlation with the total score than other items ($r = 0.56$). Infit (1.59) and outfit (1.53) for item 5 were poor, indicating that youth did not respond to this item in ways that were predictable according to the model. Also, the discrimination index was far from 1 (0.45) indicating that item 5 was not able to discriminate individuals with high versus low levels of hope. Therefore, these two items were removed to create a four-item version called the CHS-PTPB.

The CHS-PTPB Total Score and comprehensive item analysis are presented in Table 2. Item difficulties (i.e., item location) ranged from -0.26 to 0.37 on a logit scale and all items demonstrated good fit to the Rasch model (i.e., infit and outfit statistics were within the desirable range of 0.6–1.4 (Wright and Linacre 1994). With discrimination indices close to 1, the CHS-PTPB items were able to discriminate between youth with high and low hope.

CHS-PTPB Total Scores were normally distributed with a mean score in the upper middle of the range, which suggests that youth in this sample were moderately hopeful on average. Endorsements of individual items were also normally distributed. The CHS-PTPB Total Score demonstrated satisfactory internal consistency (Cronbach's alpha = 0.87) with item-total correlations ranging from 0.74 to 0.82. The CHS-PTPB Total Score correlated highly with the original CHS ($r = 0.97$, $p < 0.001$).

Review of a scree plot of eigenvalues for the original CHS suggested that it is a one-factor scale, with the first eigenvalue well above one (3.74) and the second below one (0.65). The final factor structure was tested using confirmatory factor analysis (CFA), which supported a one-factor scale (Bentler CFI = 0.97, Joreskog GFI = 0.97, SRMR = 0.03). For the CFI and GFI, values greater than 0.90 indicate a good fit between a model and the data. For the SRMR, a value of 0.05 indicates a close fit, 0.08 indicates a fair fit, and 0.10 indicates a marginal fit (Browne and Cudek 1993). CFA was replicated with the CHS-PTPB, which also supported a one-factor scale

Table 2 Item and total score analysis of CHS-PTPB ($N = 521$)

Item	Mean	SD	Skew	Kurtosis	CFA	Corr	Measure	Infit	Outfit	Discrim
1	4.15	1.35	−0.25	−0.89	0.71	0.78	−0.26	0.92	0.95	1.03
2	4.04	1.50	−0.28	−1.01	0.73	0.81	−0.10	0.96	0.92	1.04
3	3.75	1.54	−0.03	−1.11	0.75	0.82	0.37	0.91	0.90	1.10
4	3.99	1.53	−0.21	−1.05	0.68	0.74	−0.01	1.17	1.14	0.87
Total	3.98	1.25	−0.13	−0.80	–	–	–	–	–	–

SD = standard deviation, CFA = confirmatory factor analysis standardized factor loadings, Corr = correlation with total, Measure = item difficulty, Discrim = discrimination

(Bentler CFI = 0.97; Joreskog GFI = 0.97; SRMR = 0.03). Standardized factor loadings ranged from 0.68 to 0.75. Overall, the results indicate that the CHS-PTPB is a psychometrically sound instrument for measuring hope in clinically referred youth.

In order to aid in interpretation, CHS-PTPB scores were classified as high, medium, and low according to the 25th and 75th percentiles based on the CHS-PTPB Total Score distribution in the psychometric sample. Thus, in this sample, a score less than 3.0 would be considered low and a score greater than 5.0 would be considered high. Scores falling at or between 3.0 and 5.0 represent medium levels of hope. Based on the standard error of the measurement ($SEM = 0.46$) and internal reliability, an index of minimum detectable change (MDC) was calculated. The MDC indicates when a change in the CHS-PTPB Total Score is not due to measurement error. The MDC for the CHS-PTPB was 0.74. This means that with 75% confidence, it can be said that a change of 0.74 points in the CHS-PTPB Total Score from one administration to the next is not due to chance in this population.

As displayed in Table 3, convergent validity for the CHS-PTPB was consistent with expectations. The CHS-PTPB was significantly correlated with youth symptom severity as rated on the SFSS by the youth, caregiver, and clinician. Additionally, the CHS-PTPB was significantly correlated with youth treatment outcome expectations (Youth TOES) and youth satisfaction with life (BMSLSS-PTPB). The CHS-PTPB was not significantly related to caregiver treatment outcome expectations (Caregiver TOES) or caregiver life satisfaction (SWLS). These results were consistent across both versions of the CHS (i.e., the revised 4-item CHS-PTPB and the original 6-item CHS) and provide evidence for the construct validity of the CHS-PTPB in this sample.

Predicting Treatment Outcome by Youth Hope

Descriptive statistics for initial youth hope and baseline symptom severity included in the analyses are found in Table 4. The average initial CHS-PTPB Total Score for the longitudinal sample was in the moderate range, similar to

Table 3 Correlations between the CHS and youth and caregiver therapy process and outcome measures

	Youth Hopefulness	
	CHS-PTPB (4 items)	CHS (6 items)
Caregiver SFSS	−0.14**	−0.14**
Clinician SFSS	−0.26**	−0.29**
Youth SFSS	−0.37**	−0.36**
Youth TOES	0.22**	0.26**
Youth BMSLSS-PTPB	0.39**	0.39**
Caregiver TOES	0.07	0.05
Caregiver SWLS	0.05	0.03

SFSS = Symptoms and Functioning Severity Scale, TOES = Treatment Outcomes Expectations Scale, BMSLSS-PTPB = Brief Multidimensional Student Life Satisfaction Scale, PTPB Version, SWLS = Satisfaction with Life Scale

** $p < .01$

Table 4 Descriptive statistics for initial youth hope and baseline symptom severity ($N = 356$)

Variable	Mean	SD
Initial Youth CHS-PTPB	3.88	1.13
Baseline Youth SFSS	51.15	10.05
Baseline Caregiver SFSS	51.31	10.18
Baseline Clinician SFSS	50.52	9.44

the level found in the sample used for the psychometric evaluation. Ratings from all three respondents suggest that they perceived a moderate level of symptom severity in youth at baseline.

Table 5 summarizes the results of the HLM fitting the data to the final growth models defined by Eqs. 1 and 2a for each SFSS respondent. Prior to fitting the final models, baseline models were conducted without Level-2 predictors. However, the final models displayed superior fit over the baseline models for each respondent based on Akaike Information Criterion (AIC) and Bayes Information Criterion (BIC) indicators. Therefore, only the results of the final models are reported. The models were also calculated using the original 6-item CHS, which yielded similar

Table 5 Parameter estimates by SFSS respondent ($N = 356$) for final two-level growth curve models with youth hope (CHS-PTPB)

	Youth SFSS			Caregiver SFSS			Clinician SFSS		
	β	SE	95% CI	β	SE	95% CI	β	SE	95% CI
Fixed effects									
Intercept (β_{00})	50.23**	0.48	49.30, 51.16	51.16**	0.54	50.11, 52.21	51.11**	0.60	49.94, 52.28
Initial CHS (β_{01})	-3.32**	0.43	-4.15, -2.49	-1.89**	0.48	-2.83, -0.96	-2.00**	0.54	-3.07, -0.94
Time									
Intercept (β_{10})	-0.24**	0.03	-0.29, -0.02	-0.13**	0.03	-0.20, -0.07	-0.18**	0.05	-0.28, -0.07
Baseline SFSS (β_{11})	-0.01**	0.00	-0.02, -0.01	-0.00	0.00	-0.01, 0.01	0.04**	0.00	0.04, 0.05
Initial CHS (β_{12})	0.03	0.03	-0.03, 0.08	0.01	0.03	-0.05, 0.07	0.15**	0.05	0.05, 0.25
Variance estimates									
Intercept (τ_{00})	58.75	5.85		67.96	7.24		74.61	8.34	
Growth (τ_{11})	0.05	0.02		0.06	0.03		0.49	0.11	
Fit statistics REML									
AIC	10138			7145			9791		
BIC	10172			7185			9824		
Intra-class correlation									
Between client	67%			71%			76%		
Residual	33%			29%			24%		

Note: Time scaled in weeks with zero corresponding to baseline. CI's were constructed using $1.96 \times SE$

** $p < 0.001$; * $p < 0.05$

REML = restricted maximum likelihood

results to those found using the CHS-PTPB. Thus, only the results with the CHS-PTPB are presented.

Holding all else constant, the average baseline severity score (β_{00}) based on the youth, caregiver, and clinician models were all in the moderate range. According to all three respondents, the average youth improved in symptom severity over time (β_{10}), evident by a decrease in SFSS Total Scores. Youth who rated themselves as having higher than average baseline symptom severity improved faster than comparable youth with average baseline SFSS Total Scores in the youth model (β_{11}). In contrast, youth whose clinicians rated them as having higher than average baseline SFSS Total Scores improved slower than comparable youth with average baseline SFSS Total Scores in the clinician model (β_{11}). Youth rate of treatment progress did not vary based on caregiver report of symptom severity.

Initial youth CHS-PTPB Total Scores (β_{01}) were significantly related to baseline SFSS Total Scores for all three respondent models, where higher youth hope corresponded with lower baseline symptom severity. For every point above the mean in initial CHS-PTPB Total Score, baseline SFSS Total Scores were lower by an average of 1.89–3.32 points.

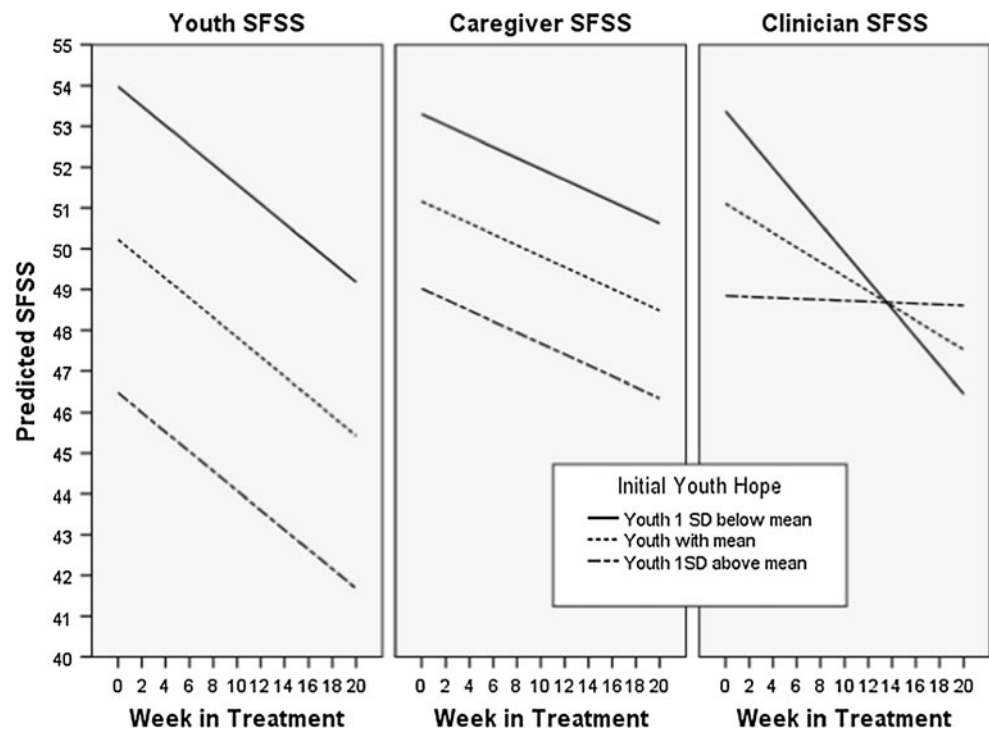
Although it was hypothesized that initial youth hope would predict treatment progress (β_{12}), the overall results did not support this relationship for the youth or caregiver models. However, initial youth hope did predict treatment progress in the clinician model. Contrary to the hypothesis,

in comparison to youth with average initial CHS-PTPB Total Scores, for every point above the average initial CHS-PTPB Total Score, clinicians rated youth improvement in symptom severity to be slower each week by 0.15 points (holding all else constant).

Figure 1 presents the predicted values based on the model parameter results for each respondent, using the mean CHS-PTPB Total Score (3.88) and standard deviation (1.13). Figure 1 demonstrates that there was no interaction between youths' initial hope and their treatment progress as seen by the youth and caregiver. There was, however, an interaction between youths' initial hope and their clinician's perception of treatment progress such that youth with higher initial hope were perceived by their clinicians as improving at a slower rate than comparable youth with average levels of initial hope.

The amount of variance explained between-youth that is accounted for by each model is represented by inter-class correlations (ICC's; see Table 4). For example, within the youth model, 67% of the variation is between-youth and the rest is within-youth (or residual). By comparing the ICC's between the final model and the baseline model (that did not include youth hope as a predictor), we can determine the amount of between-youth variation that is accounted for by initial youth hope. According to the results, initial youth hope explained 19% of the total between-youth variance in baseline SFSS Total Scores in the youth model and 6% of the total between-youth

Fig. 1 Predicted SFSS scores based on youth initial hope for all three respondents



variance in the caregiver model. The interpretation in the clinician model is slightly different given that initial youth hope was significantly related to rate of improvement (β_{12}). In this case, initial youth hope explained 6% of the total between-youth variance in baseline SFSS Total Scores and SFSS change over time.

Discussion

The present study contributed to the literature on youth hope in several ways. The psychometric properties of a revised version of an established measure of youth hope (CHS-PTPB) were presented. In addition, the prediction of treatment progress by initial youth hope was examined. These aims were addressed using a large and geographically varied sample of youth receiving home-based mental health treatment as usual.

Results of the psychometric analyses suggested that two items in the original CHS could be removed while retaining sound psychometric properties for the measure as a whole. Both the six-item CHS and four-item CHS-PTPB were found to best fit a one-factor model. While previous studies have suggested a two-factor model for the CHS, the evidence for a two-factor model was weak (Snyder et al. 1997; Valle et al. 2004). Further, the results support the construct validity and overall reliability of the CHS-PTPB as consistent with the original CHS. Additionally, the four CHS-PTPB items were able to discriminate between youth with high and low levels of hope. The CHS-PTPB Total Score

represents the average of the items (with benchmarks for low, medium, and high) and a reliable change index was calculated to indicate meaningful change from one administration to the next. Although future work is warranted to further validate the CHS-PTPB and explore scale properties, such as sensitivity to change, the CHS-PTPB represents a brief, psychometrically sound instrument for measuring hope in youth referred for mental health services.

Results of the longitudinal analyses indicated that initial youth hope, measured within the first four weeks of treatment, was significantly related to baseline symptom severity as rated by all three SFSS respondents. In general, higher initial youth hope was related to lower baseline symptom severity. This finding corresponds with existing research that higher levels of emotional and behavioral symptoms correspond to lower levels of hope in both children and adults (e.g., Snyder 1995; Snyder et al. 1997; Valle et al. 2004).

Within the current sample, youth, on average, demonstrated improvement in symptom severity over the course of treatment, as evidenced by self-report as well as caregiver and clinician report. While initial youth hope was not significantly related to rate of symptom improvement according to the youth or caregiver, results from the clinician model were intriguing. Both the clinician's rating of youth baseline symptom severity and initial youth hope were significantly related to the rate of symptom improvement. According to the clinician model, holding all else constant, youth with higher than average baseline

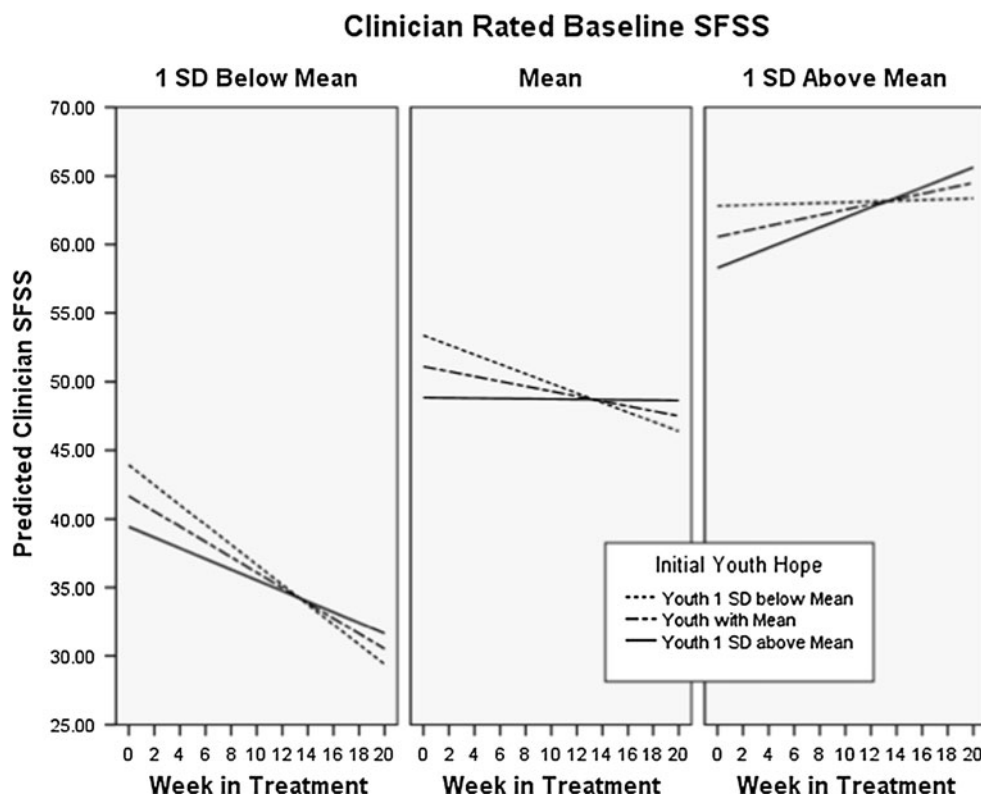
symptom severity improved slower than comparable youth with average levels, as did youth with higher than average initial hope. Looking at these two findings together paints an interesting picture, which can be seen in Fig. 2. This figure depicts the predicted clinician-rated SFSS Total Scores across time based on the youths’ baseline severity and initial hope. As can be seen in the panel on the right, on average, youth with higher than average baseline severity and higher than average initial hope had the worst predicted clinical outcome according to the clinician model. The average youth in this category would be predicted to increase in symptom severity by 7.34 SFSS points by the 20th week of treatment compared to an overall decrease of 0.20 SFSS points for youth with similarly high hope who have average baseline severity.

Initially, the negative relationship between initial hope and clinician-rated treatment progress appears to conflict with general hypotheses concerning youth hope. Although Snyder (2002) did not identify data supporting this relationship, he did note that it could be possible for one to have high hope and for that hope to be counterproductive. Further inspection of the CHS-PTPB items provides a potential explanation. All of the items on the CHS-PTPB are positively worded (e.g., “I think I am doing pretty well”, “I am doing just as well as other kids my age”; see Table 1) and do not acknowledge the presence of obstacles or problems (i.e., reasons they are receiving professional

help). In this case, extremely positive responses on the CHS-PTPB may indicate treatment resistance or lack of recognition of the current mental health problems that require the help of others (i.e., the clinician). When coupled with high baseline severity as perceived by the clinician, high-hope youth may be more difficult to treat and/or at increased risk of worsening of symptoms, as indicated by current findings. Although having hope is generally viewed as a positive and desirable attribute, it may be a detriment for youth who exhibit high baseline symptom severity to endorse high hope. Given the wording of this instrument, high initial hope in youth with high baseline symptom severity may represent denial of current problems as opposed to the genuine presence of agency and pathway thinking. This finding may in part reflect the nature of referral for youth mental health treatment. Specifically, youth do not necessarily initiate their own treatment but rather, may be referred by caregivers or outside sources (e.g., school, legal system, etc.). Such youth may not recognize their need for treatment. Additional work is needed to confirm and further understand this relationship, however it may be an important clinical aspect for clinicians to be aware of and address early in treatment.

There are several limitations of the current study. First, hope in the current study was measured within the first four weeks of treatment rather than at baseline, which could mean that youth hope had already been influenced by being

Fig. 2 Predicted clinician SFSS scores based on youth initial hope and baseline SFSS



in treatment. Snyder et al. (2000) suggested that in addition to the onset of treatment, the early stages of treatment are a key time for the relationship between hope and treatment improvement. In addition, the original CHS was developed as a dispositional measure and hope as measured by the CHS was found to be fairly constant across time (Snyder et al. 1997). However, Snyder et al. (2000) recommend that the early stages of treatment, rather than exclusively the onset of treatment, are an important time to target hope, particularly in terms of increasing a youth's sense of agency. It will be important for future research to further explore the stability of hope and the effect of mental health treatment on improving hope. Another potential limitation of the current study is that data were collected in the context of a larger evaluation study. Although unlikely, it is possible that the effects of the intervention confounded or impacted the current results. Finally, the current study was conducted with a sample of youth ages 11–18 receiving home-based mental health treatment and, thus, the results may not generalize to younger children or to youth in other treatment settings (e.g., residential or inpatient settings). Thus, it will be important to replicate these findings within non-experimental samples. Despite these limitations, the current study established the utility of initial hope of youth in home-based treatment for predicting treatment progress.

Acknowledgments This research was supported by NIMH grants R01-MH068589 and 4264600201 awarded to Leonard Bickman. In addition, the authors are extremely grateful for the discussion with and helpful insights of Lisa Bailey.

References

- Athay, M. M. (2012). Satisfaction with Life Scale (SWLS) in caregivers of clinically-referred youth: Psychometric properties and mediation analysis. *Administration and Policy in Mental Health and Mental Health Service Research*. doi:10.1007/s10488-011-0390-8.
- Athay, M. M., Kelley, S. D., & Dew-Reeves, S. E. (2012). Brief Multidimensional Students' Life Satisfaction Scale-PTPB version (BMSLSS-PTPB): Psychometric properties and relationship with mental health symptoms over time. *Administration and Policy in Mental Health and Mental Health Service Research*. doi:10.1007/s10488-011-0385-5.
- Athay, M. M., Riemer, M., & Bickman, L. (2012). The Symptoms and Functioning Severity Scale (SFSS): Psychometric evaluation and discrepancies among youth, caregiver, and clinician ratings over time. *Administration and Policy in Mental Health and Mental Health Service Research*. doi:10.1007/s10488-012-0403-2.
- Bickman, L., Athay, M. M., Riemer, M., Lambert, E. W., Kelley, S. D., Breda, C., et al. (Eds.) (2010). *Manual of the Peabody Treatment Progress Battery, 2nd ed.* [Electronic version]. Nashville: Vanderbilt University. <http://peabody.vanderbilt.edu/ptpb/>.
- Bickman, L., Riemer, M., Lambert, E. W., Breda, C., Kelley, S. D., Vides de Andrade, A. R., et al. (Eds.) (2007). *Manual of the Peabody Treatment Progress Battery* [Electronic version]. Nashville: Vanderbilt University. <http://peabody.vanderbilt.edu/ptpb/>.
- Browne, M. W., & Cudek, R. (1993). Alternative ways of accessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136–162). Newbury Park: Sage.
- Dew-Reeves, S. E., & Athay, M. M. (2012). Validation and use of the youth and caregiver Treatment Outcomes Expectations Scale (TOES) to assess the relationship between expectations, pretreatment characteristics, and outcomes. *Administration and Policy in Mental Health and Mental Health Service Research*. doi:10.1007/s10488-012-0406-z.
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, 49, 71–75.
- Elliott, T. R. (2002). Psychological explanations of personal journeys: Hope for a positive psychology in theory, practice, and policy. *Psychological Inquiry*, 13, 276–288.
- Hinds, P. S., Quargnenti, A., Fairclough, D., Bush, A. J., Betcher, D., Rissmiller, G., et al. (1999). Hopefulness and its characteristics in adolescents with cancer. *Western Journal of Nursing Research*, 21, 600–620.
- Irving, L. M., Snyder, C. R., Cheavens, J., Gravel, L., Hanke, J., Hilberg, P., et al. (2004). The relationships between hope and outcomes at the pretreatment, beginning, and later phases of psychotherapy. *Journal of Psychotherapy Integration*, 14, 419–443.
- Kelley, S. D., & Bickman, L. (2009). Beyond outcomes monitoring: Measurement feedback systems in child and adolescent clinical practice. *Current Opinion in Psychiatry*, 22, 363–368.
- Kelley, S. D., Bickman, L., & Norwood, E. (2010). Evidence-based treatments and common factors in youth psychotherapy. In B. L. Duncan, S. D. Miller, B. E. Wampold, & M. A. Hubble (Eds.), *The heart and soul of change: Delivering what works in therapy* (2nd ed., pp. 325–355). Washington, DC: American psychological association.
- Little, R. J. A., & Rubin, D. B. (1987). *Statistical analysis with missing data*. New York: Wiley.
- Maddux, J. E. (2005). Stopping the “madness:” Positive psychology and the deconstruction of the illness ideology and the DSM. In C. Snyder (Ed.), *Handbook of positive psychology* (pp. 13–25). Cary: Oxford University Press.
- McKnight, P. E., McKnight, K. M., Sidani, S., & Figueredo, A. J. (2007). *Missing data: A gentle introduction*. New York: Guilford.
- Neto, F. (1993). The satisfaction with life scale: Psychometric properties in an adolescent sample. *Journal of Youth and Adolescence*, 22(2), 125–134.
- Proctor, C., Linley, P. A., & Maltby, J. (2009). Youth life satisfaction measures: A review. *Journal of Positive Psychology*, 4, 128–144.
- Riemer, M., Athay, M. M., Bickman, L., Breda, C., Kelley, S. D., & Vides de Andrade, A. (2012). The Peabody Treatment Progress Battery: History and methods for developing a comprehensive measurement battery for youth mental health. *Administration and Policy in Mental Health and Mental Health Services Research*. doi:10.1007/s10488-012-0404-1.
- Rubin, D. B. (1987). *Multiple imputation for nonresponse in surveys*. New York: Wiley.
- Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist*, 55, 5–14.
- Seligson, J., Huebner, E. S., & Valois, R. F. (2003). Preliminary validation of the Brief Multidimensional Students' Life Satisfaction Scale (BMSLSS). *Social Indicators Research*, 61, 121–145.
- Shorey, H. S., Snyder, C. R., Rand, K. L., Hockemeyer, J. R., & Feldman, D. B. (2002). Somewhere over the rainbow: Hope theory weathers its first decade. *Psychological Inquiry*, 13, 322–331.

- Snyder, C. R. (1995). Conceptualizing, measuring, and nurturing hope. *Journal of Counseling and Development*, 73, 355–360.
- Snyder, C. R. (2002). Hope theory: Rainbows in the mind. *Psychological Inquiry*, 13, 249–275.
- Snyder, C. R., Hoza, B., Pelham, W. E., Rapoff, M., Ware, L., Danovsky, M., et al. (1997). The development and validation of the Children's Hope Scale. *Journal of Pediatric Psychology*, 22, 399–421.
- Snyder, C. R., Ilardi, S. S., Cheavens, J., Michael, S. T., Yamhure, L., & Simpson, S. (2000). The role of hope in cognitive-behavior therapies. *Cognitive Therapy and Research*, 24(6), 747–762.
- Snyder, C. R., Michael, S. T., & Cheavens, J. S. (1999). Hope as a psychotherapeutic foundation of common factors, placebos, and expectancies. In M. A. Hubble, B. L. Duncan, & S. D. Miller (Eds.), *The heart and soul of change: What works in therapy* (pp. 179–200). Washington, DC: American Psychological Association.
- Valle, M. F., Huebner, E. S., & Suldo, S. M. (2004). Further evaluation of the Children's Hope Scale. *Journal of Psychoeducational Assessment*, 22, 320–337.
- Valle, M. F., Huebner, E. S., & Suldo, S. M. (2006). An analysis of hope as a psychological strength. *Journal of School Psychology*, 44, 393–406.
- Von Hippel, P. T. (2005). How many imputations are needed? A comment on Hershberger and Fisher (2003). *Structural Equation Modeling*, 12, 334–335.
- Wright, B. D., & Linacre, J. M. (1994). Reasonable mean-square fit values. *Rasch Measurement Transactions*, 8, 370. Retrieved March 10, 2011 from www.rasch.org/rmt/rmt83b.htm.