

# Relationships Between Youth and Caregiver Strengths and Mental Health Outcomes in Community Based Public Mental Health Services

Marleen Radigan · Rui Wang

Received: 31 March 2011 / Accepted: 29 November 2011 / Published online: 11 December 2011  
© Springer Science+Business Media, LLC 2011

**Abstract** To examine relationships between youth and caregiver strengths and behavioral health outcomes for youth in community service settings. Strengths and behavioral health needs of youth ( $N = 793$ ) receiving Home and Community Based Services Waiver from 2002–2008 were characterized using the child and adolescent needs and strengths mental health assessment. Comparisons of assessment scores at admission and program completion were conducted using Chi-square, repeated measures ANOVA and Cohen's  $d$  effect size. Associations between strengths at admission and having behavioral health needs met were examined using multivariable logistic regression. Youth had high levels of needs on mental health, risk and functioning dimensions at admission. All needs improved significantly over the course of the service episode. Youth and caregiver strengths at admission were associated with significant improvements in youth behavioral needs areas at discharge. The findings support the importance of assessing and incorporating youth and caregiver strengths in planning and delivering public mental health services.

**Keywords** Youth and caregiver strengths · Mental health outcomes · Behavioral health outcomes

## Introduction

Mental health services for youth have increasingly been focused on the provision of services in community based

settings and on the inclusion of youth and caregiver voice in service choices (Stroul and Friedman 1994; Duncan et al. 2006). In support of this policy shift, the New York State Office of Mental Health (OMH) found that youth served at inpatient levels of care were clinically similar to youth served in the community (Lyons et al. 2001; Fazio 2009). In response, OMH created a Medicaid funded Home and Community Based Services Waiver (Waiver) as a diversion for out-of-home placements for youth with a serious emotional disturbance who would otherwise have been placed in psychiatric institutional settings.

Waiver includes six 'wrap-around' type services not otherwise funded through Medicaid: individualized care coordination, crisis response services, intensive in-home services, respite care, family support services and skill building services (Burchard et al. 2002). Waiver also requires providers to assess youth using the child and adolescent needs and strengths mental health assessment (CANS-MH) which allows evaluation of youth emotional/behavioral needs as well as youth coping behaviors and strengths of the caregiver system (Lyons and Weiner 2009).

Previous studies have examined demographic, treatment and clinical factors related to mental health outcomes in youth. Although strengths are acknowledged as important contributors to stabilization and improvement for youth, few studies have looked at the contributions of strengths to mental health outcomes. Lyons et al. (2000) found that strengths were associated with symptoms, risk behaviors, and functioning for youth in residential placement for their mental health needs. Level of strengths predicted success in the reduction of risk behaviors during the child/adolescent's stay and was independently associated with good dispositional outcomes. Sieracki et al. (2008) found that youth whose caregivers had higher needs at admission showed greater rates of mental health improvement over

---

M. Radigan (✉) · R. Wang  
NYS OMH, 44 Holland Avenue, Albany, NY 12229, USA  
e-mail: Marleen.Radigan@omh.ny.gov

R. Wang  
e-mail: Rui.Wang@omh.gov.ny

the course of treatment. The authors hypothesized that caregiver issues may exacerbate youth problems and be more amenable to change by the intervention services provided.

The relative lack of research on the association between strengths and behavioral health outcomes led to the current study which examines the strengths base of this high mental health needs population and the associations between strengths and having successful behavioral health outcomes in this intensive community based services program model. The CANS-MH was used to examine youth and caregiver strengths across 17 dimensions and youth needs across 21 dimensions encompassed by three domains: problems (emotional/behavioral areas-e.g., Depression/Anxiety), risk behaviors (e.g. suicide risk) and functioning (e.g., intellectual). The three study questions addressed were: (1) what is the prevalence of youth and caregiver strengths and needs? (2) how do strengths and needs change during a service episode? (3) are youth and caregiver strengths at admission associated with problem, risk and functional improvements at the end of a service episode?

## Method

### Participants

This is a retrospective study using administrative data submitted by OMH service providers to the web-based OMH Child and Adult Integrated Reporting System (CAIRS). A large population of youth completed an episode of Waiver services ( $N = 4,027$ ) during the study period (1/1/2002–12/31/2008). All Waiver providers are required to complete CANS-MH assessments for the youth served, however, not all providers submit the assessments into CAIRS. Of the youth who completed a Waiver episode, 22% ( $n = 886$ ) had

at least one CANS-MH entered into CAIRS. The current study included youth ( $N = 793$ , 90%) who had at least two CANS-MH assessments entered in CAIRS. The demographic characteristics of youth included in the study population did not differ significantly from the overall Waiver population who were 64% male, 43% within the ages of 5–12 and 57% within the ages of 13–18 (Table 1).

### Assessment

The CANS-MH was used in this study to measure child and family strengths and needs on CANS-MH problem, risks behaviors, and functioning dimensions. This assessment tool consists of 44 dimensions encompassed by the following six domains: mental health problem, risk behavior, functioning, care intensity and organization, caregiver strengths and child strengths. Providers complete the CANS-MH utilizing information that is available in most standard mental health clinical records and/or via youth and family interview. CANS-MH dimensions have anchored definitions that are worded in terms of the level of intervention needed. The information collected is intended to be instantly relevant for service planning and translated as action levels (Lyons 2009). The anchored definitions for need/strengths are as follows: ‘0’ no need for action/focal strength, ‘1’ need for watchful waiting/useful strength, ‘2’ need for action/potential strength and ‘3’ need for immediate or intensive action/no strength identified. Outcomes are measured as the percent of actionable needs (score of 2 or 3) or useable strengths (score of 0 or 1) at the initiation and end of a service episode or as a comparison of change in average domain scores on a thirty-point scale over the course of a service episode (Lyons 2009).

The CANS-MH is not a diagnostic tool, but because diagnoses also play a role in communicating youth mental health needs, the CANS-MH was designed to be consistent with the Diagnostic and Statistical Manual of Mental

**Table 1** Comparisons of NYS OMH Waiver population to study cohort

	Overall population: youth with completed Waiver episodes <sup>a</sup>		Avg LOS (days)	Study population: youth with at least 2 CANS-MH <sup>b</sup>		Avg LOS (days)
	n	%		N	%	
Overall	4,027	100	333	793	100	309
Male	2,552	63.4	349	510	64.3	320
Female	1,475	36.6	306	283	35.7	287
Age 5–12	1,715	42.6	367	338	42.6	339
Age 13–18	2,312	57.4	309	455	57.4	287

<sup>a</sup> OMH Waiver population

<sup>b</sup> Youth whose Waiver episodes that included at least two child and adolescent needs and strengths-mental health assessment (CANS-MH)

Chi-square comparisons of gender and age proportions between the total and study population were not significant at the  $P < .05$  level

Disorders (DSM-IV) (American Psychiatric Association 2000). Levels of ‘2’ or ‘3’ on CANS-MH problem presentation dimensions translate to meeting DSM-IV diagnostic criteria for the specific mental health disorders indicated in the CANS-MH definition. For example, for the Attention Deficit/Impulse control dimension on the CANS-MH a level ‘2’ indicates the child meets DSM-IV diagnostic criteria for ADHD or impulse control disorder and a level of ‘3’ indicates a child has severe impairment of attention or impulse control (Lyons et al. 2004).

The psychometric properties of the CANS-MH were reviewed in a recent publication (Lyons et al. 2004). The concurrent and predictive validity of the CANS-MH were established by comparison with the Child and Adolescent Functional Assessment Survey (CAFAS; Hodges and Wotring 2000; Lyons et al. 2004). This study found the correlation between the CAFAS and CANS-MH was 0.63 on the total score comparison. In terms of internal consistency within domains, the Cronbach’s alpha for CANS-MH scale scores was 0.70 or greater (Lyons et al. 2002). The inter-rater reliability (intraclass correlation) of the CANS-MH tested between caseworkers and researchers was 0.81 (Anderson et al. 2003). Training on the CANS-MH requires a 0.70 reliability cut-off (intraclass correlation) on practice vignettes for certification.

## Analysis

Youth demographic characteristics (age and gender), Waiver length of stay and the first and last CAN-MH assessments completed during a Waiver episode were extracted from CAIRS administrative data. The first CANS-MH assessment completed (Avg. 4.6 days between CANS-MH and admission date) and the last CANS-MH assessment (Avg. 5.2 days between CANS-MH and discharge date) were analyzed. The first and last assessments selected for these analyses were also at least 31 days apart.

CANS-MH dimensions were defined dichotomously as strengths (0, 1) versus needs (2, 3). CANS-MH strengths on admission and discharge were compared using independent Chi-square analyses ( $\chi^2$ ). Similarly, CANS-MH problem, risks behavior, and functioning needs on admission and discharge were compared using independent Chi-square analyses ( $\chi^2$ ). Comorbidity in terms of CANS-MH problem dimensions were characterized in terms of the number of problem dimensions with scores of 2 or 3 (corresponds to a DSM-IV disorder) at admission compared to discharge. Specific patterns of comorbidity were described.

Changes in mean domain scores were examined at admission compared to discharge using repeated measures ANOVA and Cohen’s *d* test of effect-sizes (Cohen 1988). Mean domain scores were calculated as the sum of raw

scores on dimensions divided by the number of dimensions in each domain and multiplied by ten. For example, a mean on the risk domain would be a sum of the non-missing scores on the dimensions danger to other, elopement, sexually abusive behavior, social behavior and crime/delinquency divided by the number of non-missing items and multiplying by a factor of 10 to standardize the score to a maximum total of 30 (Lyons 2009).

The associations between youth and family strengths at admission and CANS-MH outcomes of having needs met on problem, risk or functioning dimensions were examined using stepwise multivariable logistic regression. The dependent variables in each model were having needs met (or not) (a change from 2, 3 at admission to 0, 1 score at program completion = Yes) on CANS-MH problem, risk and functioning dimensions. Independent variables were strengths (0, 1 vs. 2, 3) (or not) on CANS-MH youth and family strength dimensions at admission. Waiver length of stay was included as a continuous variable in each model. Age (13–18 vs. 5–12) and gender (M vs. F) were included as stepwise contributors to each model.

Stepwise selection of parameters was performed with a cut-off at the  $P < .05$  level (95% CI). Models were selected based on the model likelihood ratio test global null hypothesis significance level of  $P < .0001$  and the Hosmer and Lemeshow Goodness-of-Fit test significance level of  $P > .01$  (Long 1997). All analyses were performed using the Statistical Analysis System (SAS)<sup>®</sup> statistical software version 9.1 (SAS Institute: SAS Release 9.1, Cary (North Carolina) 2002). The OMH Institutional Review Board determined that the quality improvement activities described in this manuscript do not constitute human subjects research and therefore IRB review was not required.

## Results

Table 2 displays comparisons of the proportions of youth and caregiver strengths on CANS-MH strengths dimensions at enrollment and at the end of a Waiver service episode. The top 5 youth strengths were: family (61%), educational (59%), relationships (54%), spiritual/religious (49%) and talents (49%). The greatest improvement in youth strengths was in the area of well-being, increasing from 24% of youth at enrollment to 42% of youth with strengths at program completion (43% improvement). Caregivers displayed strengths in a number of areas, including: residential stability (93%), safety (90%), involvement (86%) and organization (81%). The greatest improvement for caregivers was in the area of resources which increased 13% from enrollment to program completion.

**Table 2** Comparisons of youth and caregiver strengths at enrollment and at completion of Waiver episode (N = 793)

CANS-MH strength domains	N	Strengths at enrollment		Strengths at program completion <sup>a</sup>		% Change in strengths <sup>b</sup>
		n	%	n	%	
Youth strengths						
Family	791	482	60.9	466	58.9	−3.4
Interpersonal	789	361	45.8	461	58.4	21.7
Relationship	792	431	54.4	502	63.4	14.1
Educational	776	461	59.4	502	64.7	8.2
Vocational	381	136	35.7	172	45.1	20.9
Wellbeing	787	191	24.3	332	42.2	42.5
Spiritual/religious	666	325	48.8	329	49.4	1.2
Talent	762	371	48.7	451	59.2	17.7
Inclusion	779	278	35.7	401	51.5	30.7
Caregivers strengths						
Physical/behavioral	786	614	78.1	602	76.6	−2.0
Supervision	790	602	76.2	605	76.6	0.5
Involvement	791	678	85.7	630	79.6	−7.6
Knowledge	790	526	66.6	562	71.1	6.4
Organization	786	638	81.2	610	77.6	−4.6
Resources	789	433	54.9	496	62.9	12.7
Residential stability	792	736	92.9	715	90.3	−2.9
Safety	778	697	89.6	693	89.1	−0.6

Proportions of youth and caregivers with ratings of 0 or 1 on caregiver strengths or youth strengths items of the child and adolescent needs and strengths-mental health assessment (CANS-MH) scale at enrollment compared to rating on last assessment completed during the Waiver episode. Sample sizes may differ from 793 due to missing data. Vocational strengths applies to youth 12 and older only

<sup>a</sup> Last measurement during Waiver episode was utilized

<sup>b</sup> % Change is displayed, comparisons were conducted using Chi-square comparisons, all tests were significant at the  $P < .0001$  level

Table 3 displays comparisons of proportions of youth with needs on CANS-MH risk behavior, mental health problem, and life functioning dimensions at enrollment and at the end of a Waiver service episode. The most prevalent risk behavior needs at enrollment were danger to others (66%) and social behavior (49%). Needs on danger to others and social behaviors improved 46 and 48% respectively. In the mental health problem area, the most prevalent needs were for ADHD (70%), oppositional behavior (67%) and depression (63%). Youth needs in these mental health areas decreased 23% (ADHD), 27% (oppositional behavior) and 32% (depression) from enrollment to program completion.

CANS-MH mental health problems were also examined in terms of comorbidity—defined as having at least two mental health problem areas scored as ‘needs’ (2 or 3 level) (Table 3). The majority of youth (87%) had one or more comorbid disorder at admission. In terms of the numbers of comorbid disorders, 25% of youth had one comorbid disorder, 30% had two comorbid disorders and 32% had three or more comorbid disorders (Table 3). The most common disorders for youth with no comorbidity were: depression

( $n = 28$ ), ADHD ( $n = 25$ ) and oppositional disorders ( $n = 20$ ) (results not shown). The most common patterns of comorbidity were: ADHD and oppositional behavior disorders ( $n = 74$ ), and ADHD, depression and oppositional disorders ( $n = 66$ ) (results not shown).

Table 4 displays comparisons of the CANS-MH assessments from program enrollment to completion at the domain level. Repeated measures ANOVA and effect size comparisons of mean total score change from enrollment to program completion were used to measure change. Mean scores on the CANS-MH domains of youth strengths, mental health problems, youth risk behavior and youth life functioning significantly improved (lower score on the scale is improvement) ( $P > F < .0001$ ). The largest effect size of 0.33 (95% CI: 0.23–0.43) for the CANS-MH mental health problem domain can be interpreted as an approximate 21.3% non-overlap of the distribution of the mean scores at admission and discharge, or as the mean score at admission falling at the 62 percentile of the score at discharge.

The relationships between youth and caregiver strengths at enrollment and having needs met on CANS-MH risk behavior, mental health problem and life functioning

**Table 3** Comparisons of youth needs on CANS-MH risk behavior, mental health problem, and functioning dimensions at enrollment and at completion of Waiver episode (N = 793)

	n	Needs enrollment		Needs program completion <sup>a</sup>		% Change <sup>b</sup>
		n	%	n	%	
Youths risk behaviors						
Danger to self	790	247	31.3	169	21.4	−46.15
Danger to others	791	523	66.1	358	45.3	−46.09
Elopement	788	139	17.6	120	15.2	−15.83
Sexually abusive behavior	783	60	7.7	39	5.0	−53.85
Social behavior	792	390	49.2	264	33.3	−47.73
Crime/delinquency	786	70	8.9	76	9.7	7.89
Youths mental health problems						
Psychotic symptoms	787	124	15.8	85	10.8	−45.88
ADHD/impulse control	793	553	69.7	448	56.5	−23.44
Depression/anxiety	788	499	63.3	377	47.8	−32.36
Oppositional behavior	791	528	66.8	416	52.6	−26.92
Substance abuse	781	25	3.2	28	3.6	10.71
Adjustment to trauma	776	344	44.3	254	32.7	−35.43
Attachment	523	104	19.9	82	15.7	−26.83
Anti-social behavior	790	179	22.7	134	17.0	−33.58
Life functioning						
Intellectual/development	781	74	9.5	60	7.7	−23.33
Physical/medical	793	59	7.4	49	6.2	−20.41
Family functioning	790	478	60.5	409	51.8	−16.87
School achievement	771	445	57.7	308	39.9	−44.48
Sexual development	783	72	9.2	42	5.4	−71.43
School behavior	348	175	50.3	136	39.1	−28.68
School attendance	346	86	24.9	90	26.0	4.44
	n	Enrollment		Program completion <sup>b</sup>		% Change <sup>b</sup>
		n	%	n	%	
Comorbidity						
Primary MH condition	793	90	11.3	178	22.4	49.44
2 MH conditions	793	199	25.1	158	19.9	−25.95
3 MH conditions	793	235	29.6	140	17.7	−67.86
4 or more MH conditions	793	255	32.2	198	25.0	−28.79
No MH problem indicated	793	14	1.8	119	15.0	88.24

Proportions of youth with ratings of 2 or 3 on risk behavior, individual problem, and functioning items of the Child and Adolescent Needs and Strengths-Mental Health Scale at enrollment and program completion (N = 793). Sample size may differ from 793 due to missing data. School Behavior and school attendance items were added in 2006 so fewer youth have these items completed

<sup>a</sup> Last measurement during Waiver episode was utilized

<sup>b</sup> % Change is displayed, comparisons were conducted using Chi-square comparisons, all test were significant at the  $P < .0001$  level

dimensions at the end of a Waiver service episode were explored using multivariable logistic regression (Table 5). In terms of mental health problems, needs met in three mental health areas (ADHD/impulse control, depression/anxiety and oppositional behavior) were associated with youth and caregiver strengths at enrollment. For example, needs met on ADHD/impulse control was positively

associated with youth interpersonal strengths (OR: 1.67; 95% CI: 1.08–2.58), caregiver supervision (OR: 1.82; 95% CI: 1.07–3.10) and caregiver resources (OR: 1.57; 95% CI: 1.01–2.46) and inversely associated with caregiver physical/behavioral needs (OR: 0.45; 95% CI: 0.27–0.76). Needs met on depression was positively associated with youth educational strengths (OR: 1.66; 95% CI: 1.08–2.55),

caregiver knowledge (OR: 1.60; 95% CI: 1.01–2.52) and caregiver residential stability (OR: 2.96; 95% CI: 1.08–8.06). Age (13 and older vs. 12 and younger) was a significant factor in predicating needs met in the areas of risk of danger to others (OR: 1.7; 95% CI: 1.10–2.64) and ADHD/impulse control (OR: 1.9; 95% CI: 1.21–2.99) (Table 5).

## Discussion

This study found that youth and families receiving intensive community based services as an alternative to

treatment at an inpatient level of care have important areas of strengths. Caregivers in this group exhibited high levels of strengths at the beginning of a Waiver service episode and showed little change over time. Youth strengths were moderate and improved over time. Youth made significant gains in functioning, risk behavior and mental health problem areas over the course of a Waiver service episode. The level of mental health comorbidity also decreased over the course of a Waiver episode. Youth and caregiver strengths at the start of a Waiver episode were associated with particular gains in mental health, functioning and risk behavior outcomes.

**Table 4** Comparisons of mean scores on CANS-MH domains at enrollment and at the end of Waiver service episode (N = 793)

CANS-MH domain	Enrollment		Program completion		Cohen's d effect size <sup>a</sup>				ANOVA (repeated measures analysis of variance)		
	Mean	SD	Mean	SD	d	SD	CI		F value	df	P > F
Youth strengths	15.2	4.3	13.9	5.0	0.285	0.050	0.187	0.384	64.27	1	<.0001
Caregiver strengths	8.3	4.7	8.5	5.6	−0.035	0.050	−0.133	0.063	1.09	1	0.2975
Youth mental health problems	11.5	3.7	10.1	4.6	0.333	0.051	0.234	0.432	80.48	1	<.0001
Youth risk behaviors	9.4	3.7	7.9	5.0	0.331	0.051	0.231	0.430	73.95	1	<.0001
Life functioning	9.9	4.0	8.7	4.5	0.276	0.050	0.177	0.375	55.68	1	<.0001

Mean calculated as sum of dimension raw scores/number of dimensions in each domain times 10

<sup>a</sup> Cohen's d =  $M_1 - M_2 / \sigma_{\text{pooled}}$ , where  $\sigma_{\text{pooled}} = \sqrt{[(\sigma_1^2 + \sigma_2^2)/2]}$ ,  $\sigma^2(d) = (2/N) + d^2/(4 N)$

**Table 5** Summary of multivariable logistic regression results: estimating the effect of youth and family strengths on having CANS-MH needs met

Stepwise multivariable logistic regression was performed entering youth and family strengths at $P < .05$ (95% CI). Only models with adequate fit statistics were displayed ( $P < .0001$ level on likelihood ratio test on Global null hypothesis and Hosmer–Lemeshow fit $< .01$ ). All models controlled for length of stay in Waiver program	Needs met: CANS-MH youth risk behaviors				
	Social behavior	Youth talent	1.93	1.18	3.19
	Danger to others	Age: 13–18 versus 12–5 (ref)	1.70	1.10	2.64
		Youth family	1.87	1.20	2.94
		Youth educational	1.73	1.12	2.67
		Caregiver involvement	0.50	0.27	0.90
	Needs met: CANS-MH youth mental health problems				
	ADHD/impulse control	Age: 13–18 versus 12–5 (ref)	1.90	1.21	2.99
		Youth interpersonal	1.67	1.08	2.58
		Caregiver physical/behavioral	0.45	0.27	0.76
		Caregiver supervision	1.82	1.07	3.10
		Caregiver resources	1.57	1.01	2.46
	Depression/anxiety	Youth educational	1.66	1.08	2.55
		Caregiver knowledge	1.60	1.01	2.52
		Caregiver residential stability	2.96	1.08	8.06
	Oppositional behavior	Youth family	1.64	1.05	2.57
		Caregiver supervision	1.94	1.14	3.28
	Needs met: CANS-MH youth life functioning				
	Family	Caregiver supervision	1.88	1.11	3.18
		Caregiver organization	2.63	1.42	4.87
	School achievement	Youth family	1.81	1.16	2.82

<sup>a</sup> Needs met indicates that the dimension score changed from a 2 or 3 (needs) at admission to 0 or 1 (needs met) at last assessment



This study reaffirms that youth with serious mental health problems and their caregivers have measurable strengths when they enter a service episode. Youth with high mental health needs are too often viewed in a deficit framework. Research has suggested that caregiver strengths should also be considered in the development of treatment goals (Hoagwood et al. 2009). The CANS-MH is uncommon in terms of providing a tool which can be used to communicate readily with youth and caregivers to develop treatment goals and to shape the decision making that occurs in the service delivery setting (Lyons and Weiner 2009). Identifying individual strengths and weakness profiles allows incorporation of strengths as building blocks in the treatment process.

In terms of service provision, NYS OMH Waiver program providers are required to address youth needs at a needs level (2 or 3 score) with specific goals in service plans. How to incorporate strengths in the service plan to affect change has been more challenging for providers. This study helps to identify patterns of strengths that may be important to understand to help youth overcome their challenges.

### Limitations

Youth included in this study were required to have at least two CANS-MH assessments entered into the NYS OMH administrative data system. This resulted in a lack of information for a large portion of youth served in this program which may limit generalizability of study results. However, the authors did determine that the study population did not differ from the larger population of youth served in Waiver in terms of demographics. This lack of data also limited the analytical methods utilized. Continued quality improvement efforts within the OMH should yield more complete data in the future and more sophisticated statistical methods such as trajectory analysis may be applied to understand youth change over time (Martinovich and Stallings 2009).

An additional limitation was the use of CANS-MH as the only outcome measured in the study. Although Waiver providers are trained in the use of CANS-MH and the instrument has been demonstrated to have sufficient reliability and validity (Lyons et al. 2002) additional outcome measures could be explored in the future such as whether the youth remained in the community at the end of Waiver or was moved to a higher level of care. In addition, no comparison group was included in this study so the associations found between youth and caregiver strengths may only be interpreted as correlational rather than causal. However, these analyses do provide a description of the changes in scores for individuals who received Waiver and thus offer a valuable characterization at baseline and at the close of treatment.

### Conclusions

This study reaffirms the usefulness of the CANS-MH as an effective retrospective tool for system planning. Future work will focus on the prospective use of the CANS-MH to better understand how child and family strengths are incorporated into service planning to achieve better child outcomes during the course of intensive services such as the Waiver.

### References

- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author. (text rev.).
- Anderson, R., Lyons, J., Giles, D., Price, J., & Estle, G. (2003). Reliability of the child and adolescent needs and strengths-mental health (CANS-MH) scale. *Journal of Child and Family Studies*, 12(3), 279–289.
- Burchard, J., Bruns, E., & Burchard, S. (2002). The wraparound approach. In B. Burns & K. Hoagwood (Eds.), *Community treatment for youths: Evidence-based interventions for severe emotional and behavioral disorders*. New York: Oxford University Press.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Earlbaum Associates.
- Duncan, B., Sparks, J., Miller, S., Bohanske, R., & Claud, D. (2006). Giving youths a voice: A preliminary study of the reliability and validity of a brief outcome measure for youths, adolescents, and caretakers. *Journal of Brief Therapy*, 5(2), 71–87.
- Fazio, M. (2009). Implications of needs-based planning in New York for the children's public mental health services system. In J. Lyons & D. Weiner (Eds.), *Behavioral health care: Assessment, service planning, and total clinical outcomes management*. Kingston, NJ: Civic Research Institute.
- Hoagwood, K., Cavaleri, M., Olin, S., Burns, B., Slaton, E., Gruttadaro, D., et al. (2009). Family support in children's mental health: A review and synthesis. *Clinical Child and Family Psychology Review*, 13(1), 1–45.
- Hodges, K., & Wotring, J. (2000). Client typology based on functioning across domains using the CAFAS: Implications for service planning. *Journal of Behavioral Health Services and Research*, 27, 257–270.
- Long, J. S. (1997). *Regression models for categorical and limited dependent variables*. Thousand Oaks, California: Sage.
- Lyons, J. (2009). CANS and ANSA instruments: History and applications. In J. Lyons & D. Weiner (Eds.), *Behavioral health care: Assessment, service planning, and total clinical outcomes management*. Kingston, NJ: Civic Research Institute.
- Lyons, J., Lee, M., Carpinello, S., Rosenberg, L., Zuber, M. Fazio, M., & MacIntyre, J. (2001). *Assessing the needs and strengths of youths and adolescents in a state public mental health system in New York State*. New York State Office of Mental Health, Bureau of Youths and Family Services, Youths' Plan for Action (unpub).
- Lyons, J., Rawal, P., Yeh, I., Leon, S., & Tracy, P. (2002). Use of measurement audit in outcomes management. *Journal of Behavioral Health Services and Research*, 29, 75–80.
- Lyons, J., Uziel-Miller, N., Reyes, F., & Sokol, P. (2000). Strengths of youths and adolescents in residential settings: Prevalence and

- associations with psychopathology and discharge placement. *Journal of the American Academy of Child and Adolescent Psychiatry*, 39(2), 176–181.
- Lyons, J., & Weiner, D. (2009). An introduction and overview of total clinical outcomes management and communimetrics. In J. Lyons & D. Weiner (Eds.), *Behavioral health care: Assessment, service planning, and total clinical outcomes management*. Kingston, NJ: Civic Research Institute.
- Lyons, J., Weiner, D., & Lyons, M. (2004). Measurement as communication in outcomes management: The child and adolescent needs and strengths (CANS). In M. E. Maruish (Ed.), *The use of psychological testing for treatment planning and outcomes assessment* (3rd ed., Vol. 2). Mahwah, NJ: Lawrence Erlbaum Associates.
- Martinovich, Z., & Stallings, J. (2009). Applications of trajectory analysis in total clinical outcomes management. In J. Lyons & D. Weiner (Eds.), *Behavioral health care: Assessment, service planning, and total clinical outcomes management*. Kingston, NJ: Civic Research Institute.
- SAS Institute: SAS Release 9.1., Cary (North Carolina), 2002.
- Sieracki, J., Leon, S., Miller, S., & Lyons, J. (2008). Individual and provider effects on mental health outcomes in child welfare: A three level growth curve approach. *Youths and Youths Services Review*, 30, 800–808.
- Stroul, B., & Friedman, R. (1994). *A system of care for youths and youths with severe emotional disturbances (revised edition)*. Washington, DC: Georgetown University Child Development Center, CASSP Technical Assistance Center.