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Task Order #18
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Casual Relationships between Service Utilization,
Consumer Satisfaction, and Service Outcomes:
Structural Equation Modeling (SEM)
FY 2006-2007

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Executive Summary

Purpose of Study

This study aims to advance the examination of casual relationships among the factors, which is service utilization, consumer satisfaction and service outcomes, by applying higher-level of statistical analytic methods in Structural Equation Modeling (SEM), such as Confirmatory Factor Analysis (CFA) and Structural Regression Modeling (SR).

Data

The population is children and youth with a serious emotional disturbance (SED) who receive services at Community Mental Health Centers (CMHCs) in Kansas. The sample is derived by matching three data sources: (1) Medicaid billing data for children receiving services from Kansas CMHCs (MMIS) (2) Kansas Youth Satisfaction Survey data (KYSS), and (3) Children's Status Report (CSR) data.

Table 1. Data Source

Data Sets	Periods
Medicaid Billing Data (MMIS)	April, 2004-September 2004
Consumer Satisfaction Survey Data (KYSS) Round 8	October, 2004-July, 2005
Children's Status Report (CSR)	July, 2005-December, 2005

Methodology

Research Questions: 1) What factors of service utilization affect consumer satisfaction and outcomes of young consumers, when controlling for consumer demographic characteristics? 2) Does consumer satisfaction mediate the relationship between service utilization and service outcome?

Research Design: The model hypothesizes that service utilization and satisfaction can directly affect outcome, when controlling the effects of consumer demographic characteristics on service outcome. In this schematic diagram, consumer satisfaction is hypothesized to mediate service utilization, resulting in better clinical outcomes, when controlling the effects of consumer demographic variables.

Data Analysis: Data Analysis includes descriptive statistics, multiple regression, exploratory factor analysis, confirmatory factor analysis and structural regression modeling. Extensive preliminary logical and statistical analyses were used to select variables by using SPSS (the statistical package for social science) and LISREL (The linear structural relations).

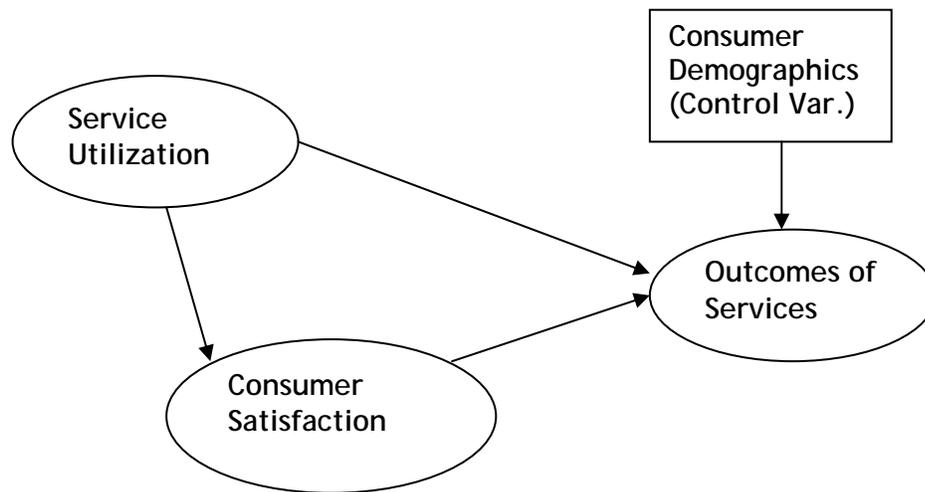


Figure 1 Conceptual Model

Sample Characteristics

Two hundred ninety three youth, aged between 12 and 18, are used for this research. The mean age for total sample is 14.3 years. 65.2% of youth are male and 34.8% of youth are female. 84.3% of youth are Caucasian. The largest minority population is African American with 8.9%. Among other minority youth, Hispanic is 5.5%, Asian is 1.7%, but there was no Native American Youth in the sample.

Measurement Model

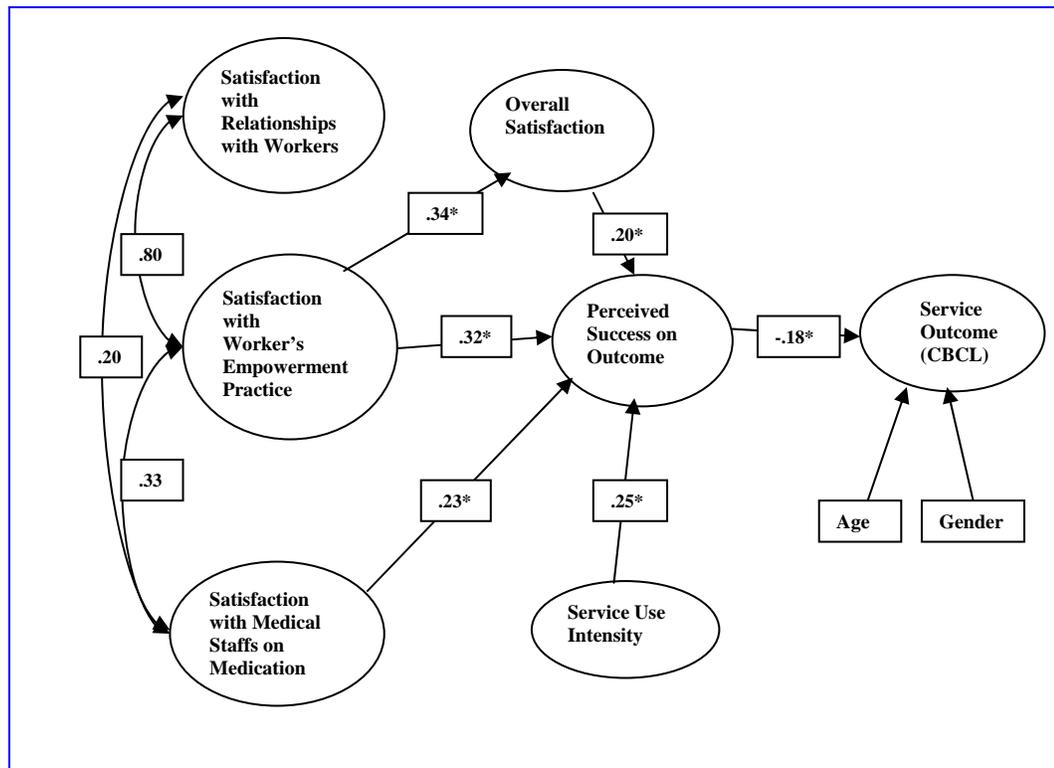
- Based on preliminary analyses of multiple regression analysis, exploratory factor analysis, and confirmatory factor analysis, 9 latent factors models were proposed and confirmed with their multiple indicators.
- Among these latent factors and their indicators are: **1) Demographics-Age**, **2) Demographics-Gender**, **3) Service Utilization**: Psychosocial Treatment, Case Management, **4) Consumer Satisfaction with Relationships with Worker**: Trust (Q4), Availability (Q18), Reliability (Q19), Respectful (Q21), **5) Consumer Satisfaction with Worker's Empowerment Practices**: Self-Esteem Building (Q06), Overall Helping Skills (Q9), Relations with Parents (Q11), Planning for Future (Q12), Problem Handling (Q13), Focusing on Issues (Q14) **6) Satisfaction with Medical Staffs' Services with Medications**: Reason for Medication (Q26), Side Effects of Meds (Q27), Overall Effects of Meds (Q28), **7) Overall Satisfaction with Services** (Q62), **8) Perceived Success on Outcome**: Better handling daily life (Q63), Better with family (Q64), Better with friends (Q65), Better at school (Q65), Better able to cope (Q67), **9) Service Outcomes (CBCL)**: Internalizing Scores, Externalizing Scores.

The Proposed Model and Path Identification

- Structural Regression analysis model is proposed to examine causal relationships among latent factors.

- The model fit indices showed acceptable fit of model with observed data.
- The result of the proposed structural regression model indicates that there are five paths that are statistically significant among total of thirteen paths. Those are: (1) Path from Satisfaction with Workers Empowerment Practices Factor to Perceived Success on Outcome Factor (2) Path from Satisfaction with Medical Staff's Services with Medication Factor to Perceived Success on Outcome Factor (3) Path from Service Use Intensity Factor to Perceived Success on Outcome Factor (4) Path from Overall Satisfaction Factor to Perceived Success on Outcome Factor (5) Path from Perceived Success on Outcome Factor to CBCL.
- Based on this statistical significance test, the paths that were not statistically significant were removed to see if respecified model still fits the observed data.

. The Respecified Model –Accepted Model



* p < .05, **p < .001

Figure 2. Accepted Causal Model

- The respecified model was evaluated via LISREL 8.80, using maximum likelihood methods for the estimation of parameters.
- The result of analysis showed that Chi-square is significant, but other indexes that are not influenced by sample size indicated acceptable fit. The RMSEA was .06, and CFI was .93. Overall, model fit was not drastically improved, but showed still acceptable fit between the model and observed data.
- In addition, all paths produced z-score greater than $|\pm 1.96|$, meaning that all regression coefficients achieved practical significance and statistical significance at $p < .05$.

Conclusions and Implications

- This study developed a causal model that shows service use intensity and consumer satisfaction can directly affect outcome, when controlling the effects of consumer demographic characteristics on service outcome. Satisfaction with workers played major role in predicting perceived success on outcome and service outcome.
- More specifically, satisfaction with relationships with workers and workers' empowerment practice skill turned out to be very important factors in improving service outcome. Therefore, ongoing supervision and training for workers would be needed to improve worker's empowerment practice skills and relationship building skills with young clients.

These satisfactions with workers' job performances included medical staff's services on medication as well as case manager and therapeutic service providers. When young consumers were satisfied with doctors or nurse' services, especially services related with medication, they showed increased level of perceived success on outcome, and it directly affected their behavior outcome. Therefore, regular training for these medical staffs would be needed, especially in order to cultivate the consumer-centered practice skills among these staffs. This training should include encouraging staffs to explain the reason for medication, and their side effects, and to check in with consumers how medication is working for them.

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1. The purpose of the study

In children's mental health services, a System of Care (SOC) program model has been suggested as one of core service model for past few decades. SOC has been characterized as three core values, which is child-centered and family-focused, community-based and culturally competent services. Consistent with this prevalent service model, the evaluation of consumer satisfaction in community-based mental health services has been a more popular research strategy along with the emphasis on service outcome studies. In Kansas, several research projects have been conducted on consumer satisfaction with community mental health services and their impact on outcomes. This work has much emphasized children and youth's satisfaction on services as well as on caregiver's satisfaction in Kansas (Cheon & Chamberlain, 2004; Cheon & Kapp, 2005; Martin, Petr & Kapp, 2003). However, much less attention was devoted to the factors that contribute to the relationships between service outcomes, consumer satisfaction, service utilization and consumer's demographic characteristics. Toward that end, a research project was conducted to examine causal relationships among consumer's demographic characteristics, their service utilization in community mental health centers across the states, satisfactions with services and their service outcomes by applying Path Analysis (Cheon & Kapp, 2006).

This study is the second phase of the previous path analysis study with the same population, Children and Youth Consumer with SED who utilized community mental health center services in Kansas. Based on the results of the previous study, current research aims to advance the examination of casual relationships among the factors, which is service utilization, consumer satisfaction and service outcomes, by applying higher-level of statistical analytic methods in Structural Equation Modeling (SEM), such as Confirmatory Factor Analysis (CFA) and Structural Regression Modeling (SR). CFA and SR are characterized as statistical methods to make it possible for researchers to examine causal relationships among factors comprised of multiple-indicators so that they can avoid the measurement error associated with other statistics techniques that are limited to a single indicator model.

2. Literature Review

2.1 Demographics

Among consumer's characteristics, age has been reported as significantly correlated with mental health service utilizations and service continuation (Greenspan & Kulish, 1985). Specifically, some studies showed that younger age was associated with significantly increased likelihood of using mental health services (Goodwin, Hoven, Lyons & Stein, 2002). In other studies, older children showed some decline in mental functioning and older consumers were less likely to receive mental health therapeutic approaches (Garfield, 1994).

Gender is also one of the significant demographic variables in children's mental health studies. Children with SED are more likely to be male (Wagner, 1995), and male consumers received more mental health services than females (Leslie, et al., 2000). Gender difference in mental health service use may have

been one critical factor to cause girls to perform in an academically different manner from that of their male counterparts (Kataoka, Zima & Dupre, 2001).

Race and ethnicity is another important factor, especially causing significant difference in types and severity of needs for mental health services. For instance, African American youth displayed the highest level of mental health needs compared to Caucasian and Hispanic youth (Rawal, Romansky, Jenuwine & Lyons, 2004). On the other hand, Caucasian children were more likely to receive services than African American children (Kolko, Seleyo & Brown, 1999)

2.2 Consumer Satisfaction with mental health services

Consumer satisfaction has become more a popular research strategy with the emphasis on outcome studies (Martin, Petr & Kapp, 2003; Shikiar & Rentz, 2004). In children's mental health studies, more research has been warranted, especially on youth satisfaction with services as well as parents' satisfaction. Some studies showed little or no agreement between parents/carers and children/adolescents on satisfaction, including the levels of satisfaction with staff and their treatment, and with lower level of satisfaction in child/adolescent clients than parents (Barber et al., 2006). The examination of parent-child differences is a relatively new development as many previous studies of satisfaction have relied solely on parent satisfaction ratings (Shikiar, et al., 2004)

Another way of satisfaction has been studied, which was satisfaction with service providers. For instance, the role of case managers and their service impact on children's ability has been emphasized in service satisfaction studies (Measelle, Weinstein & Martinez, 1998). Children's satisfaction has been reported to depend on their relationship with a significant adult worker and doctor or nurse (Hennessy, 1999).

2.3 The relationship between consumer satisfactions and service outcomes

Previous studies have focused on two different kinds of service outcomes, one is functional and the other is clinical outcomes. For functional outcome measures, the most widely used ones are stability of living arrangements, contact with law enforcement and educational placement and performance. Studies show that a link between services and more stabilized children's living arrangement, specifically significant decrease in out-of-home placement (Mantueffel et al., 2002) Also, more satisfaction with services lead to better school performances and school attendances (Berg, 1992; Kupersmidt & Coie, 1990). Along with this educational outcome, more satisfied youth consumers were involved in fewer suspension and juvenile system (Cook, et al., 2004).

For clinical outcomes, the Child Behavior Check List (CBCL) is one of the most widely used outcomes. Studies showed a positive association between consumer satisfaction and CBCL (Manteuffel et al., 2002). Another outcome measures used along with CBCL was The Child & Adolescent Functional Assessment Scale (CAFAS). Some studies showed that more satisfied youth consumers showed significant improvement in CAFAS scores. For instance, one research showed that 49.5% of children exhibited clinically significant change in CAFAS scores from intake to 2 years, with largest decline in total CAFAS scores occurring during the first 6 months after intake into services for both boys and girls (Manteuffel et al, 2002).

2.4 The first phase of SEM study in 2006, Kansas

In Kansas, a study has been conducted to examine causal relationships among variables from multiple sources of dataset collected from children/youth consumers of community mental health centers throughout the state by applying Path Analysis. (Cheon & Kapp, 2006) The main purpose of this study was to identify which variables impacted service outcomes of children/youths with SED. The results of analysis showed that, among various variables, consumer's age, service intensity, their satisfaction with workers, and their perceived success directly or indirectly affected these consumers' school performance in terms of their grades, which is one of functional outcomes for children with SED.

More specifically, the results suggested that increased worker satisfaction and overall consumer satisfaction leads to an increase in perceived success and this, in turn, increases in school grade. On the other hand, service intensity had negative indirect effect on school performance, as measured by perceived success. Although negatively impacting outcome, this indirect of service intensity variable on school outcome was quite small. Among demographic variables, only age had indirect effect on outcome. The younger age of the child affects school performance indirectly through worker satisfaction and perceived success variable.

3 Methodology

3.1 Data Sources

The population is children and youth with a serious emotional disturbance (SED) who receive services at Community Mental Health Centers (CMHCs) in Kansas. The sample is derived by matching three data sources: (1) Medicaid billing data for children receiving services from Kansas CMHCs, (2) Kansas Youth Satisfaction Survey (KYSS) data, and (3) Children's Status Report (CSR) data (for outcome variables). Since the KYSS has been conducted during October, 2004 – July, 2005, the CSR outcome data between July 2005 and December 2005 is utilized to predict the service outcomes by levels of satisfaction.

Table 3-1. Data Sources

Data Sets	Periods
Medicaid Billing Data (MMIS)	April, 2004-September 2004
Consumer Satisfaction Survey Data (KYSS) Round 8	October, 2004-July, 2005
Children's Status Report (CSR)	July, 2005-December, 2005

The analysis sample is consisted of 293 youth who are 12 to 18 years of age. For missing data, Multiple Imputation (MI) technique was applied using PRELIS version in LISREL program, in order to avoid the loss of substantial amount of data and some significant bias caused by adoption of other missing data correction methods, such as, Mean Substitution and Regression Imputation. MI accounts for missing data by restoring not only the natural variability in the missing data, but also by incorporating the uncertainty caused by estimating

missing data. MI technique maintains the overall variability in the population while preserving relationships with other variables. Further MI has been shown to be robust to departures from normality assumptions and provides adequate results in the presence of low sample size or high rates of missing data (Wayman, 2003)

3.2 Research Questions

This research hypothesizes that specific casual relationships exist between service outcomes and consumer satisfaction, service utilization of children and youth who receive services from CMHCs . The specific research questions are as follows;

- 1) What factors of service utilization affect consumer satisfaction and outcomes of young consumers, when controlling for consumer demographic characteristics?
- 2) Does consumer satisfaction mediate the relationship between service utilization and service outcome?

3.3 A Conceptual Model

A conceptual model for this study is basically very similar as one in previous study except the fact that this study includes consumer's demographic variables as control variables to service outcome in the analysis. Figure 1 suggests that service utilization and satisfaction can directly affect outcome, when controlling the effects of consumer demographic characteristics on service outcome. In this schematic diagram, consumer satisfaction is hypothesized to mediate service utilization, resulting in better clinical outcomes, when controlling the effects of consumer demographic variables.

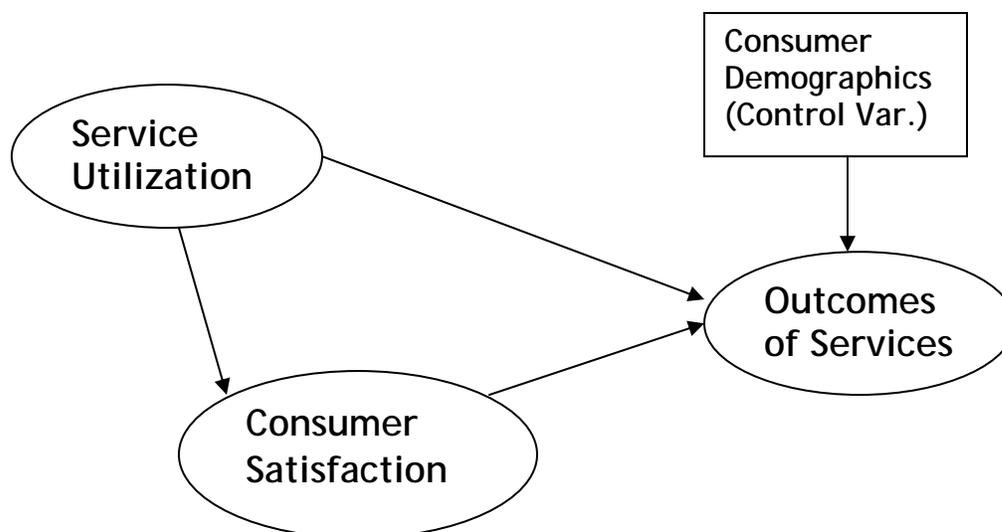


Figure 1. Conceptual Model

3.4 Data Analysis

Data Analysis includes descriptive statistics, multiple regression, exploratory factor analysis, confirmatory factor analysis and structural regression modeling. Extensive preliminary logical and statistical analyses were used to select variables by using SPSS (the statistical package for social science) and LISREL (The linear structural relations). First, preliminary regression analyses were conducted to ascertain which variables of consumer satisfaction predict which variables of service outcomes. Second, exploratory factor analysis were also performed to explore and extract possible factors from indicators from consumer satisfaction studies. Regression analysis and exploratory factor analysis was conducted by SPSS.

Based on the results of preliminary regression analysis and exploratory factor analysis, significant factors and their indicators were identified. With these factors, confirmatory factor model and subsequent structural regression model was proposed and tested by LISREL.

4. Sample Characteristics

4.1 Demographic Characteristics

Two hundred ninety three youth, aged between 12 and 18, are used for this research. The mean age for total sample is 14.3 years. Among the age group, 15 years olds is the highest (21.8%) and age 18 is the lowest as 2.7%. 24.9% of youth are over 16 years old. As shown in Table 4-1, 65.2% of youth are male and 34.8% of youth are female. 84.3% of youth are Caucasian. The largest minority population is African American with 8.9%. Among other minority youth, Hispanic is 5.5%, Asian is 1.7%, but there was no Native American Youth in the sample.

Table 4-1 Demographic Characteristics of Sample (n=293)

Variables		N(%)
Age	12	47(16.0)
	13	62(21.2)
	14	47(16.0)
	15	64(21.8)
	16	46(15.7)
	17	19(6.5)
	18	8(2.7)
	Total	293(100.0)
	Mean (SD)	14.3 (1.6238)
Gender	Male	191(65.2)
	Female	102(34.8)
	Total	293(100.0)
Race/Ethnicity	Caucasian	46(84.3)
	African American	26(8.9)
	Hispanic	16(5.5)
	Asian	5(1.7)
	Native	0(0.0)
	Total	293(100.0)

The demographic characteristics of client population in the CSR data and consumer satisfaction survey, from which the sample in this study was drawn, are shown in Table 4-2. There were little differences in demographic characteristics between the sample and the data sources which the sample was drawn. For instance, the mean age of the sample is 14.3 years old, and the mean of the data sources is 14.5 years old. Therefore, the drawn sample can be said to be representative of the client population in the multiple data sources.

Table 4-2. Demographics of Client Participants in CSR/Satisfaction Study

Variables		N(%)	Data Source
Age	12	102(12.5)	Consumer
	13	154(18.9)	Satisfaction
	14	150(18.5)	Study
	15	147(18.1)	(KYSS, Round8)
	16	139(17.1)	
	17	82(10.1)	
	18	31(3.8)	
	Missing	8(1.0)	
	Total	813(100.0)	
	Mean (SD)	14.54 (1.677)	
Gender	Male	4172(64.8)	Client Status
	Female	2265(35.2)	Report (CSR)
	Missing	3(.0)	(July2005-
	Total	6640(100.0)	December2005)
	Male	480(59.0)	Consumer
	Female	322(39.6)	Satisfaction
	Missing	11(1.4)	Study
	Total	813(100.0)	(KYSS, Round8)
Race/Ethnicity	White	5918(91.9)	Client Status
	Non-White	392 (6.2)	Report (CSR)
	Missing	130 (2.0)	(July2005-
	Total	6440(100.0)	December2005)
	Caucasian	671(82.5)	Consumer
	African American	78(9.6)	Satisfaction
	Hispanic	48(5.9)	Study
	Asian	14 (1.7)	(KYSS, Round8)
	Native American	20(2.5)	
Missing	12(1.3)		
Total	813 (100.0)		

4.2 Service Utilization

Eight mental health services are chosen from the Medicaid billing data collected between April, 2004 and September 2004. The number of youth using case management is the highest (233, 79.5 %). The percentage of using Psychosocial Treatment and Individual psychotherapy are 53.6% and 45.1%. The percentage of medication service user is 50.5%. Wraparound service is used by 25.9% of participants and 17.4% of youth used Parent Support service. Only 7.2% of youth used Group Therapy and 3.4% of consumer used Respite Care.

Table 4-3 Service Utilization

Type of Services	Service User (%)	Non User (%)
Case Management	233(79.5)	60(25.5)
Psychosocial Treatment	157(53.6)	136(46.4)
Group Therapy	21(7.2)	272(92.8)
Individual Therapy	132(45.1)	161(54.9)
Parent Support	51(17.4)	242(82.6)
Medication Service	148(50.5)	145(49.5)
Respite Care	10(3.4)	283(96.6)
Wraparound Service	76(25.9)	217(74.1)

4. 3 Consumer Satisfaction

4.3.1 Overall Satisfaction

96.9% of youth were satisfied with the overall satisfaction question, which asked for an overall rating of all services they received. Mean score was 3.38. Tables that show the result of consumer satisfaction study are shown in Appendices A.

4.3.2 Perceived Success on Outcome Satisfaction

Agreement with the “Perceived Success on Outcomes” questions ranged from mean scores of 3.59 to 3.29 as shown in Table 4-4. Youth were most agreed with the question that “As a result of the services I received, I am satisfied with my family life right now.” The lowest reported agreement was the statement, “As a result of the services I received, I get along with my family members.” According to responses, youth were satisfied with family life; however, they agreed less often that they get along with family members. On the other hand, 83.6% of youth agreed that they get along better with friends and other people. Youth also perceived that they were better at handling daily life (3.43) and better able to cope when things go wrong (3.41). However, they were less likely to agree with the statement that “I am doing better at school.” with the mean score of 3.37.

4.3.3 Worker Satisfaction

63.5% of the youth referred to their case manager and 20.5% of youth referred to their individual therapist when answering Worker Satisfaction questions. Other workers they referred were Attendant Care Worker (7.5%), Psychiatrist (3.4%), Family Therapist (1.4%) and Respite Care Worker (0.7%)

Table 4-4 Professionals

Professionals	N	%
Case Manager	186	63.5
Individual Therapist	60	20.5
Attendant Care Worker	22	7.5
Psychiatrist	10	3.4
Other	9	3.1
Family Therapist	4	1.4
Respite Care Worker	2	0.7
Total	293	100.0

Among the Worker Satisfaction questions, 92.8% of youth were answered that they trust their workers (Mean=3.81). 95.9% of youth were satisfied with how their worker did not blame them for things that weren't their fault (Mean=3.87). The lowest reported satisfaction were with worker does not tell things to your parents that were going to be private (Mean=3.55).

4.3.4 Satisfaction with Medication

90.7% of youth agreed to the question, "did doctor/nurse explain why you should take the medications?" Highest reported satisfaction were with medical staffs asked about how the medications are working for them (Mean=3.87). However, the youth agreed less often to the question "how satisfied are you with how medications are working for your?" with the means of 3.15.

4.4 Service Outcomes

Total six service outcomes were chosen based on Children's Client Status Reports, CMHC Reports FY06Q3, January-March, 2006.

4.4.1 Educational Outcomes

4.4.1.1 School Attendance

"School Attendance" variable is summated scale of the frequencies of "Excused Absence" and "Unexcused Absence" variables. Over a half of the youth (56%) were showing only less than 2 absences. However, over one-fourth of youth (26.6%) were absent in school more than six times for three months.

Table 4-5 School Attendance

Absences	N	%
6 or more absences	88	26.6
3 to 5 absences	51	17.4
0 to 2 absences	154	56.0
Total	293	100.0

4.4.1.2 School Performance

The percentage of youth averaging C or above grade was 74.7%. Only 5.5% of youth were failing in their academic performances.

Table 4-6 School Performance (Academic Grade)

Grades	N	%
Failing (F)	16	5.5
Below Average (D)	58	19.8
Average (C) or Above Average (B)	219	74.7
Total	293	100.0

4.4. 2 Residential Outcome

92.8% of youth were living with their biological or adoptive families and were considered as being placed in permanent home residential setting.

Table 4-7 Residential Settings

Residential Setting	N	%
Permanent Home Placement	272	92.8
Others	21	7.2
Total	293	100.0

4.4.3 Juvenile Justice Outcome

Frequency of law enforcement contacts were chosen among variables related with juvenile justice outcome. 91.8% of youth had never been contacted with law enforcement personnel as shown in Table 4-10.

Table 4-8 Juvenile Justice Outcome

Law Enforcement Contact	N	%
0	269	91.8
1-4	24	8.2
Total	293	100.0

4.4.4 Child Behavior Outcomes

Internalizing and Externalizing Scores among CBCL scores were chosen for child behavior outcomes in this study. 67.6 % of youth were reported to mark Internalizing Scores in clinically significant range. For externalizing scores, 78.2% of youth were reported to mark the scores in clinically significant range.

Table 4-9 CBCL Scores

Clinically Significant CBCL (Above 63)	%
Internalizing Scores	67.6
Externalizing Scores	78.2

5. Preliminary Multiple Regression Analysis

The Primary multiple regression analysis was conducted to investigate the associations between interested variables. Variables and measures are shown in Table 5-1 with data sources. Also, tables that show the result of Multiple Regression Analysis are shown in Appendices B.

Table 5-1 Variables and Measures

Variable	Measures	Sources
Demographics (Independent)		AIMS
Age	Numbers: 12-18	
Gender	Male=1, Female=2	
Race/Ethnicity	Non-white=1, White=2	
Service Intensity (Independent)		MMIS
Case Management	Minutes, Zscore:-1.3~ -4.70	
Psychosocial Treatment	Minutes, Zscore:-.98~-6.84	
Consumer Satisfaction (Independent and Dependent)	Yes-always=4, Most of time=3, Sometimes=2, No-never=1.	KYSS
<u>Worker Satisfaction</u>		
Q4 Trust Worker		
Q5 Not Blame		
Q6 Help You See Good Things		
Q7 Not Tell Things to Parents		
Q9 Knows How to Help		
Q11 Help Parent See Good Things	Yes-always=4, Most of time=3, Sometimes=2, No-never=1.	
Q13 Help to Keep Problem from Getting Big		
<u>Satisfaction with Medication</u>		
Q26 Explain the Reason of Medication		
Q27 Explain the Side Effect		
Q28 Ask about Medication's Working		
Q29 Satisfied with Medications	Yes-always=4, Most of time=3, Sometimes=2, No-never=1.	
<u>Perceived Success on Outcome</u>		
Q63 Better at Handling Daily Life		
Q64 Get Along with Family		
Q65 Get Along with Friends		
Q66 Doing Better at School		
Q67 Better Able to Cope		
Q68 Satisfied with Family Life	Very Satisfied=4, Satisfied=3, Dissatisfied=2, Very Dissatisfied=1	
<u>Overall Satisfaction (Q62)</u>		
Service Outcomes (Dependent)		
School Attendance	The number of absences: 0-31 F=1, D=2, C=3, A or B=4	
School Performance	Permanent Home=1, Others=0	
Permanent Home Placement	Numbers:0-4	CSR
Law Enforcement Contact	Numbers: 33-97	
CBCL (Internalizing)	Numbers: 34-97	
CBCL (Externalizing)		

5.1 Association between Satisfaction and Demographics:

A multiple regression analysis was conducted to evaluate how well the demographic variables predicted satisfaction variables. The predictors were age, gender, and race/ethnicity.

Age variable is significantly related to Satisfaction with Medication, in particular, to the question, "Doctor/Nurse explained about the side effect of medication," ($p < .05$) and to the question, "Doctor/Nurse asked about how medication works", ($p < .05$). Younger youth are more likely to be satisfied with medical staffs' explanation about side effects of medication, and with medical staffs' checking on how their medications work.

Gender variable is significantly related to the answer of question, "Get along better with Family members" ($p < .05$), and the question, "Satisfied with Family Life", ($p < .05$). Female youth are less likely to be satisfied with the Perceived Success on Outcome questions. In other words, female youth are less likely to perceive that they are getting along better with family members, and also they are less likely to be satisfied with family life. Gender variable is also significantly related to the question, "Doctor/Nurse explained the side effects of medication" ($p < .05$). Female Youth are more likely to be satisfied with medical staff's explanation about the side effects of medication.

However, race/ethnicity variable is not statistically significant in the prediction of all satisfaction variables.

5.2 Associations between Satisfaction and Service Utilization:

Throughout the regression analyses with all satisfaction variables, some utilization of case management or psychosocial treatment are significantly related to the perceived success on outcomes, worker satisfaction and medication management satisfaction.

5.2.1 Perceived Success on Outcomes

Psychosocial treatment variable is significantly related to the question, "Doing better at school and/or work" ($p < .001$) indicating that youth who received more psychosocial treatment services are more likely to perceive that they are doing better at school and/or work. Case management variable is significantly related to the question, "Better able to cope" ($p < .05$). Youth who received more case management services are more likely to perceive that they are better able to cope when things go wrong.

5.2.2 Satisfaction with Medication Services

Psychosocial Treatment variable is significantly related to the question, "Doctor/Nurse Staffs explained why you should take medications" ($p < .05$), and to the question, "They asked about how the medications are working for you" ($p < .05$). Therefore, youths who received more psychosocial treatment services are more likely to be satisfied with medical staffs' services related to mediations, especially in terms of their explanations about medications, and their checking on youth about how medications work.

5.2.3 Worker Satisfactions

Psychosocial treatment variable is significantly related to the question, “the worker does not blame you for things” ($p < .05$). Youth who received more psychosocial treatment services are more likely to be satisfied with their workers, in terms that their worker does not blame them for things that happen that aren’t their fault. On the other hand, case management variable is negatively related to the question, “the worker knows how to help” ($p < .05$), indicating youth who received more case management services are less likely to think that their workers know how to help with their issues.

5.3 Prediction of Outcomes by Satisfaction

5.3.1 School Attendance and School Performance Outcomes

Multiple regression analyses were implemented to evaluate how well the satisfaction variables predicted service outcomes. The results of multiple regression analyses show that only overall satisfaction variable ($p < .05$) indicates statistically significant and negative relations to school performance. In other words, youth consumers who were overall satisfied with services are more likely to get lower grades at school. Other than overall satisfaction variable, there were no satisfaction variables that significantly predicted school attendance and school performance outcomes.

5.3.2 Permanent Home Placement and Law Enforcement Contacts

Among satisfaction variables, the answers of the question, “I get along better with family members as a result of services I received” significantly predicted permanent home placement outcome ($p < .05$). Youths who perceived success on getting along with family members as a result of services they received were more likely to be placed at home permanently. However, overall satisfaction with services, medication services and worker satisfaction variables were not significantly related with permanent home placement outcome.

For law enforcement contact outcome, one perceived success on outcomes variable and one worker satisfaction variable were significantly related. Youth who perceived that they are better at handling daily life as a result of the services they received tended to have more law enforcement contacts ($p < .05$). Also, youth consumers who were more satisfied with their workers’ ability to help them see good things about themselves were more likely to be contacted by law enforcement ($p < .05$). None of variables for satisfaction with medication services were significantly related to law enforcement contacts outcomes.

5.3.3 Child Behavior Outcomes

For internalizing scores, there was no significant relation with overall satisfaction variable. However, regression results indicate that an overall model for Perceived Success on Outcomes of six predictors significantly predict CBCL Internalizing Scores, $R^2 = .092$, $F(6, 286) = 4.853$, $p < .001$. Among these five predictors, the question, “get along with my friends” and the question, “satisfied with family life” were significantly related to internalizing scores at $p < .05$ level. In other words, youth who perceived that they are getting along better with friends and are more satisfied with family life as a result of services they received showed better

behavior outcome in CBCL internalizing scores, which means that they showed improvement in their behaviors mainly in terms of anxious/depressed, withdrawn, and somatic complaints.

There was no overall significant relationship between satisfaction with medication services variables and CBCL internalizing scores. However, among predictors, the question, “ask about how medication working” were significantly, but positively related with this outcome. In other words, youth who are satisfied with medication services since their medical staff asked about how their medications work showed higher scores in CBCL scores, which means deteriorating in their internalizing behavior outcome.

There were no relationships between satisfaction with workers and CBCL internalizing scores.

For CBCL Externalizing Scores, there was no relationship between overall satisfaction variable and this outcome variable. However, regression results indicate that an overall model for Perceived Success on Outcomes of five predictors significantly predict CBCL Externalizing Scores, $R^2=.066$, $F(6, 286) = 3.363$, $p < .05$. Among these six predictors, the question, “get along with my family members” was significantly related to internalizing scores at $p < .05$ level. In other words, youth who perceived that they are getting along better with their family members as a result of services they received showed better behavior outcome in CBCL Externalizing Scores, which means that they showed improvement in their behaviors mainly in terms of aggressive and delinquent behaviors.

Also, regression results indicate that an overall model for Satisfaction with Medication services of four predictors significantly predict CBCL Externalizing Scores, $R^2=.054$, $F(4, 288) = 4.092$, $p < .05$. Among these four predictors, the question, “explained why they should take meds” was significantly related to Externalizing Scores at $p < .05$ level. In other words, youth who are satisfied with medical staff’s explanation why they should take medication showed better behavior outcome in CBCL Externalizing Scores, which means that they showed improvement in their behaviors mainly in terms of aggressive and delinquent behaviors.

However, there were no significant relationships between worker satisfaction variables and CBCL externalizing scores.

5.4 Variable Identification

Among demographic variables, only age and gender variable were related with consumer satisfaction variables, specifically some predictors for Perceived Success on Outcomes and Satisfaction with medication. Race/Ethnicity variables showed no significant relations with satisfaction variables.

Among service utilization variables, duration of both psychosocial treatment and case management services were significantly related with some predictors for Perceived Success on Outcomes and Satisfaction with Medication and Workers. However, the relationships of case management services and Perceived Success on Outcomes were negative, which means longer they received these services, the less satisfied with services.

Among outcome variables, school attendance showed no significant relations with any of satisfaction variables. For school performance, only overall satisfaction variable were significantly related, but their relationships were negative, which means the more satisfied, the poorer outcomes.

Permanent Home Placement outcome variable was significantly related with only one predictor of six from Perceived Success on Outcomes variable. Law Enforcement Contacts were significantly related with one predictor of six Perceived Success on Outcomes variables, and one Worker Satisfaction variable, but their relationships were positive, which means in this case that the more satisfied, the poorer outcomes.

CBCL Internalizing and Externalizing scores were significantly related with predictors of Perceived Success on Outcomes and Satisfaction with Medication Services.

Based on these preliminary analyses of multiple regression analysis, several variables are identified as significant variables for the investigation of casual relationship among factors in this study using SEM analysis.

Among these variables are:

- Demographics: Age, Gender
 - Service Utilization: Psychosocial Treatment, Case Management
 - Outcome Variables: CBCL Internalizing Scores, CBCL Externalizing Scores
- For worker satisfaction variables, separate Exploratory Factor Analysis (EFA) will be conducted to extract possible factors from indicators from Consumer Satisfaction study. This is a preliminary EFA in order to move toward Confirmatory Factor Analysis with other factors in the data, and ultimately toward Structural Equation Modeling analysis.

6. Exploratory Factor Analysis (EFA) with Consumer Satisfaction Data

EFA was conducted to explore possible factors from indicators from consumer Satisfaction Data other prior to moving on to Confirmatory Factor analysis with whole data set. This EFA is more extensive analysis than preliminary regression analysis conducted above in terms that almost every indicator related with consumer satisfaction including ones used for regression analysis would be included for each statistically extracted factor.

The variables used for this EFA were indicators from Consumer Satisfaction Data which are directly related with outpatient-services. Those variables are shown in Table 6-1.

Table 6-1 Variables for EFA

Q4. Do (Did) you trust this worker?
Q5. Does (Did) this worker blame you for things that happen that aren't your fault?
Q6. Does this worker help you see the good things about yourself?
Q7. Does (Did) this worker tell things to your parents or others that you thought the worker was going to keep private?
Q9. Does (Did) this worker know how to help you with your issues?
Q11. Does (Did) this worker help your parents see the good things about you?
Q12. Does (Did) this worker help you plan for the future?
Q13. Does (Did) this worker help to keep problems from getting too big?
Q14. Does (Did) this worker ask you to help decide which issues to focus on?
Q15. Does (Did) this worker tell you that you are doing things just to get attention?
Q16. Does (Did) this worker usually listen to what you want, not just what your parents want?
Q17. Does (Did) this worker talk too much about your past and what happened a long time ago?
Q18 Does this person meet with you as often as you need them to?
Q19 Is this person dependable; do they do what they say they will do?
Q20 If you are dissatisfied or have a complaint, can you talk to this worker about it?
Q21 Does this worker treat you with respect and dignity?
Q22. Have you ever tried to get hold of any of your workers between appointments?
Q26. Does (Did) this doctor/nurse explain why you should take the medications?
Q27. Did s/he explain what the side effects might be?
Q28. Does (Did) this doctor/nurse ask you about how the medications are working for you?
Q29 How satisfied are you with how the medications are working for you?
Q37. Case management
Q38. Individual Therapy
Q63 As a result of the services I received, I am better at handling daily life.
Q64 As a result of the services I received, I get along better with family members
Q65 As a result of the services I received, I get along better with friends and others.
Q66 As a result of the services I received, I am doing better at school and/or work.
Q67 As a result of the services I received, I am better able to cope when things go wrong.
Q68 As a result of the services I received, I am satisfied with my family life right now.

For factor extraction, Common Axis Factoring (CAF) Analysis, also known as Principal Factor Analysis was applied. As a preliminary EFA for SEM, Common Axis Factoring Analysis is generally preferred to Principal Components Factor Analysis, since CAF takes only common variances into factoring extraction process (Brown, 2006). For determining the appropriate number of factors, total variance, Eigenvalues, and Screeplot methods were applied. Through initial and replicate EFA, total four factors were extracted from indicators from Consumer Satisfaction Study.

Table 6-2 Pattern Matrix with loadings of indicators for each factor

	Factor			
	1	2	3	4
q04	.802	.002	.017	.007
q06	.298	.540	-.097	-.047
q09	.235	.533	.097	-.123
q11	.115	.502	.033	.089
q12	-.054	.745	.024	.023
q13	.047	.731	.025	-.075
q14	-.054	.580	-.001	.058
q18	.549	.134	.008	.074
q19	.605	.220	-.076	.081
q21	.842	-.080	.032	-.014
q26	-.239	.202	-.012	.702
q27	.114	-.101	.034	.638
q28	.200	-.094	-.005	.595
q63	-.041	-.036	.755	.020
q64	-.113	.130	.484	.011
q65	.025	.006	.552	.017
q66	.041	.030	.541	-.062
q67	.097	-.047	.570	.038

Extraction Method: Principal Axis Factoring.

Rotation Method: Promax with Kaiser Normalization.

a Rotation converged in 6 iterations.

Those factors are 1) Satisfaction with Workers' Dependability, 2) Satisfaction with Workers' Empowerment Skills, Satisfaction with Medical Staffs' Services with Medication, and Perceived Success on Outcomes. Other than one factor, three factors were related with Worker Satisfaction. Extracted four factors and their indicators, and labels for each factor from the interpretation are shown in Table 6-3.

Table 6-3 Four Factors Extracted from Consumer Satisfaction Data (EFA)

Factors	Indicators	Labels
Factor 1 (4 indicators)	Q4. Do (Did) you trust this worker? Q18 Does this person meet with you as often as you need them to? Q19 Is this person dependable; do they do what they say they will do? Q21 Does this worker treat you with respect and dignity?	Satisfaction with Relationships with Workers
Factor 2 (6 indicators)	Q6. Does this worker help you see the good things about yourself? Q9. Does (Did) this worker know how to help you with your issues? Q11. Does (Did) this worker help your parents see the good things about you? Q12. Does (Did) this worker help you plan for the future? Q13. Does (Did) this worker help to keep problems from getting too big? Q14. Does (Did) this worker ask you to help decide which issues to focus on?	Satisfaction with Worker's Empowerment Practices
Factor 3 (3 indicators)	Q26. Does (Did) this doctor/nurse explain why you should take the medications? Q27. Did s/he explain what the side effects might be? Q28. Does (Did) this doctor/nurse ask you about how the medications are working for you?	Satisfaction with Medical Staffs Services with Medication
Factor 4 (5 indicators)	Q63 As a result of the services I received, I am better at handling daily life. Q64 As a result of the services I received, I get along better with family members Q65 As a result of the services I received, I get along better with friends and others. Q66 As a result of the services I received, I am doing better at school and/or work. Q67 As a result of the services I received, I am better able to cope when things go wrong.	Perceived Success on Outcome of Services

7. Structural Equation Modeling (SEM) Analysis

This study is the second phase of study series that aim to examine casual relationships among youth consumer's service utilization, satisfaction and service outcomes in Kansas. First phase of study applied the Path Analysis to examine direct and indirect casual relationships among significantly identified variables through preliminary Multiple Regression Analysis. However, a limitation of path analysis is the use of a single measure of each construct represented in the model. Basically any single indicator is susceptible to measurement error. An alternative is to use multiple measures of each construct, which tends to reduce the effect of measurement error in any individual indicator on the accuracy of the results. Confirmatory Factor Analysis (CFA) and Structural Regression Modeling (SR) provide distinction between indicators and the underlying latent variables (factors). In measurement models evaluated by CFA, the factors are simply assumed to covary with each other: that is all of their association are specified as unanalyzed. On the other hand, in SR models, some unanalyzed associations between factors are replaced by direct causal effects, which give the model a structural as well as a measurement component.

The aim of this study is to examine casual relationships among constructs, not just single indicators, which is consumer service utilization, satisfactions with services, and service outcomes. Therefore, first CFA will be conducted based on the results of lit review, conceptual modeling, preliminary multiple regression analysis, and Exploratory Factor Analysis to confirm measurement model with data of this study. Next, SR models will be proposed and tested using LISREL software to examine direct and indirect casual relationships among these factors in identified measurement model through CFA.

7.1 Confirmatory Factor Analysis (CFA)

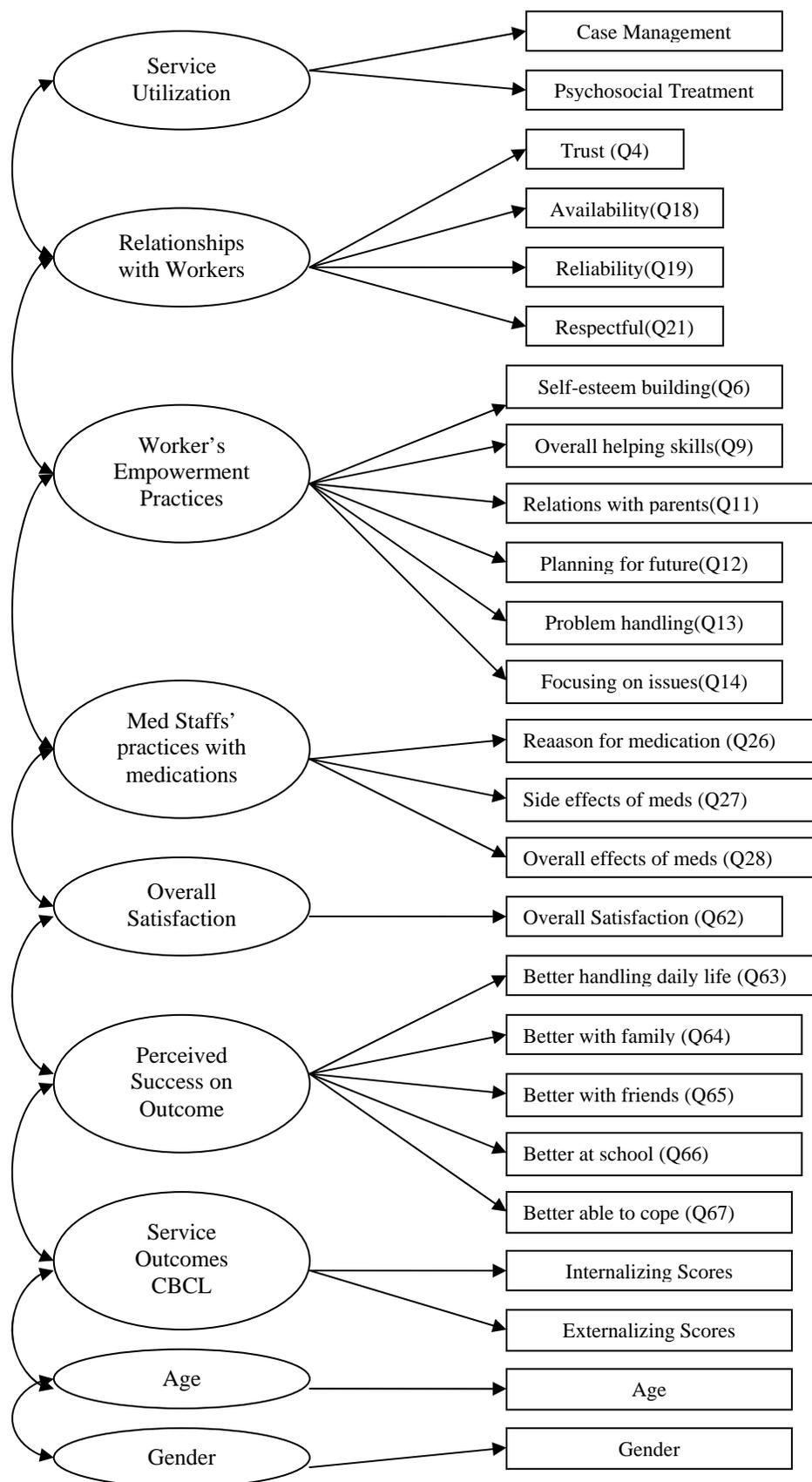
7.1.1 Measurement Model Specification

CFA requires specification of a measurement model that is well grounded by prior empirical evidence and theory. In this study, a measurement model is proposed based on the result of previous path analysis, preliminary multiple regression analysis and EFA with consumer satisfaction data.

The measurement model in this study is aimed to confirm whether each indicator would be an appropriate measure for each construct of interest, which is consumer satisfaction, service utilization, and service outcomes in this study. Figure 7-1 depicts the complete specification of the nine-factor model. Among factors, Overall Satisfaction, Age, and Gender were included as single-indicator factors. The measurement model contained no double-loading indicators and all measurement error was presumed to be uncorrelated. The latent factors were permitted to be correlated on prior evidence of significant relationships between these dimensions, although due to space limit, all the correlations among the latent factors are not presented in Figure 7-1.

To test a measurement model, the model has to be just-identified, or over-identified, which means that the number of knowns (i.e., number of variances and covariances in the input matrix) equals or exceeds the number of freely estimated model parameters (Brown, 2006). The proposed measurement model is over-identified with 244 degrees of freedom (*df*)

Figure 7-1 the Proposed Measurement Model



7.1.2 Model Estimation and Evaluation

7.1.2.1 Overall Goodness of Model Fit

The sample variance-covariance matrix was analyzed using LISREL 8.80, and a maximum likelihood minimization function. The sample covariance matrix is provided in Appendices C (Table C-1)

Goodness-of-fit provide a global descriptive summary of the ability of the model to reproduce the input covariance matrix. In other words, the overall fit of the model is how well the model explains the data. For our CFA model, goodness-of-fit was evaluated using chi-square statistics, the root mean square error of approximation (RMSEA) and its 90% confidence interval, and the test of comparative fit index (CFI). Table 7-1 shows that the value of model fit indices for the proposed measurement model. Other model fit indices are provided in Appendices C (Figure C-1)

Table 7-1. Model Fit Statistics of the Proposed Measurement Model

For Acceptable Model Fit	The Proposed Measurement Model
Chi-Square, Df>1, p>.05	Chi-Square =495.60, df=244, p<.001
RMSEA<.08	RMSEA=0.06 (90% CI=0.479-0.0633)
CFI>.90	CFI=.97

First, the chi-square statistic is used to test the difference between the predicted and the observed relationships (correlations), and a non-significant chi-square is desired. In this result, the chi-square value was significant, indicating a poor match between the proposed model and the observed data. However, chi-square is overly influenced by sample size (Brown, 2006). Therefore, given too much power, any model will be rejected, meaning that even meaningless differences between the implied covariances and observed covariances may be significant. In this study, the sample size (n=293) comprises ample power to test of model fit as shown in Table 7-2. According to this power table, for 100 degrees of freedom, over 64 cases are needed for power of .80, and over 78 for power of 90. Given relatively much power in this study, we should consider focusing more on other fit indices that are not influenced by sample size.

Second, the Room Mean Square Error of Approximation (RMSEA) is the most commonly used absolute fit indices, meaning that it yields a direct measure of model fit without comparison to a null model. The following classification is considered: 1) less than .08 is good fit, 2) .08 to .1 indicates a mediocre fit, 3) greater than .1 indicates poor fit. In this model, the RMSEA is 0.056, indicating good fit.

Third, CFI are measures assessing the fit of the proposed model relative to the independent model, which assumes that there are no relationships in the data. Values of .90 to .95 are deemed acceptable. Values of greater .95 indicate close fit. In this model, the CFI is .936, indicating acceptable fit.

Figure 7-1 Power Tables

Power of a test of poor fit and sample sizes needed for powers of .80 and .90					
df	100	N 300	500	N needed for power of .80	N needed for power of .90
1	0.07	0.15	0.26	2475	3427
2	0.10	0.27	0.43	1289	1763
3	0.13	0.36	0.56	891	1206
4	0.15	0.44	0.66	690	927
5	0.18	0.51	0.75	569	758
6	0.20	0.58	0.81	487	646
7	0.22	0.64	0.86	428	564
8	0.24	0.69	0.90	384	503
9	0.26	0.73	0.93	349	455
10	0.28	0.77	0.95	320	417
20	0.46	0.96	~1.00	188	239
30	0.61	0.99	~1.00	141	177
40	0.72	~1.00	~1.00	115	144
50	0.81	~1.00	~1.00	99	123
60	0.87	~1.00	~1.00	88	109
70	0.91	~1.00	~1.00	80	98
80	0.94	~1.00	~1.00	73	90
90	0.96	~1.00	~1.00	68	83
100	0.97	~1.00	~1.00	64	78

From: Loehlin, J.C. (1988). *Latent Variable Models* (3rd ed.). Mahwah, NJ: Erlbaum

7.1.2.2 Statistical Significance of the Parameter Estimates

Estimated unstandardized factor loadings (Lamda Y) for this measurement model indicated that indicators loaded significantly on the each latent factor (See Table C-2 in Appendices for the estimated unstandardized values for each factor loading for latent factors) Every z score of factor loadings were greater 1.96, which is the critical value at alpha level of .05.

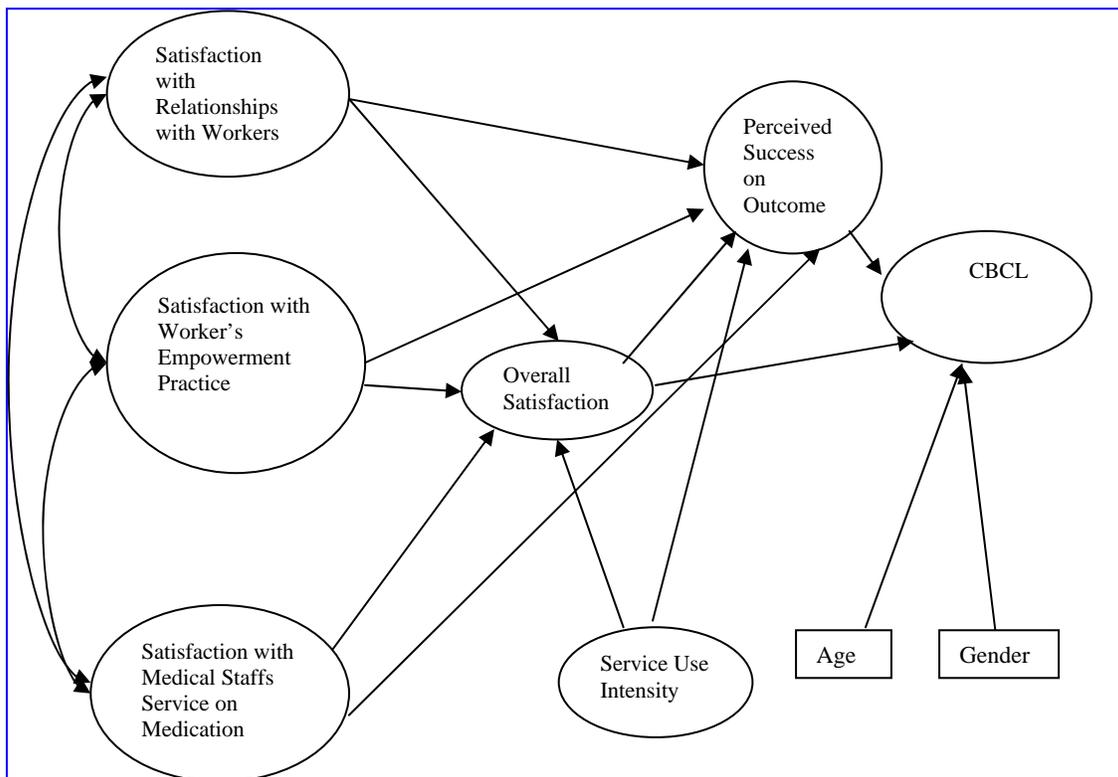
Standardized factor loadings estimates revealed that the indicators were moderately related to their purported latent factors (range of R²s=.17-70), consistent with the position that these scales are reliable indicators of the constructs of consumer satisfactions, service utilization, and service outcomes. (See Table C-3 in Appendices for the Completely Standardized estimated values for each factor loading for latent factors)

7.2 Structural Regression (SR) Modeling

7.2.1 The Proposed Causal Model

Based on preliminary analyses conducted above, a structural regression model was proposed as shown in Figure 7-2. In figure 7-2, the two-headed arrows in the model represented unanalyzed covariances among factors. For example, the two-headed arrow between Satisfaction with Relationships with Workers and Satisfaction with Worker's Empowerment Practice signifies a covariance between two factors.

Figure 7-2 Proposed Casual Model



Overall Satisfaction, Age, and Gender were included single-indicator factors. Also, Age and Gender are analyzed as control variables on Service Outcome Factor, CBCL scores, since this study explores causal relationships among satisfaction, service utilization, and service outcome factors when controlling for demographic characteristics, which is gender and age.

Overall Satisfaction and Perceived Success on Outcome Factors were hypothesized to mediate three factors related with worker and staffs satisfaction, which are Satisfaction with Worker's Dependability, Worker's Empowerment Practices, and Medical Staffs' service on Medication. Service Intensity Factor was hypothesized to have direct effect on Overall Satisfaction and Perceived Success on Outcome factors.

7.2.2 Results of the Proposed Model

Casual relationships among the nine factors were examined by using the statistical package LISREL 8.80, using maximum likelihood methods for the estimation of parameters.

7.2.2.1 Overall Goodness of Model Fit

For this structural regression model, goodness-of-fit indexes were produced and shown in Table 7-2 below. Complete model fit statistics are provided in Figure D-1 in Appendices.

Table 7-2. Model Fit Statistics of the Proposed Structural Regression Model

For Acceptable Model Fit	The Proposed Structural Regression Model
Chi-Square, Df>1, p>.05	Chi-Square =498.64, df=264 p<.001
RMSEA<.08	RMSEA=.06 (90% CI=.0477-.0625)
CFI>.90	CFI=.93

The chi-square value was significant, indicating a poor match between the proposed model and the observed data. However, given relatively large sample size (n=293) in this study, we should consider focusing more on other fit indices that are not influenced by sample size as in the case of model fit estimation for measurement model. The RMSEA is 0.055, indicating good fit and CFI is .93, indicating acceptable fit. Thus, it can be concluded that the model-fit indexes indicate overall good fit between proposed model and observed data.

7.2.2.2 Paths Estimates

The parameter of each path in the proposed model was also examined to identify statistically significant and non-significant paths in the proposed model. LISREL 8.80 produced Beta (regression coefficients among factors), Standard Errors, and z-score. For statistical significance test, ± 1.96 for z score would be critical value at an alpha level of .05 (two-tailed). Path that produces z-score less than $|\pm 1.96|$ would be interpreted as statistically non-significant path.

Table 7-3 Path Estimates – The Proposed Model

From	To	BETA	S.E.	z -score
Relationship with Workers	Overall Satisfaction	.17	.15	1.17
Relationship with Workers	Perceived Success	-.07	.05	-1.30
Worker's Empowerment	Overall Satisfaction	.20	.15	1.35
Worker's Empowerment	Perceived Success	.43*	.10	4.18
Medical Staffs Services	Overall Satisfaction	.09	.08	1.09
Medical Staffs Services	Perceived Success	.29*	.10	2.76
Service Use Intensity	Overall Satisfaction	.08	.09	.91
Service Use Intensity	Perceived Success	.33*	.13	2.63
Overall Satisfaction	Perceived Success	.22*	.08	2.64
Overall Satisfaction	CBCL	-.05	.07	-.71
Perceived Success	CBCL	-.13*	.06	-2.04
Age	CBCL	-.02	.07	-.29
Gender	CBCL	-.01	.06	-.12

* p <.05, **p<.001

Based on these criteria, the result of the proposed structural regression model indicates that there are five paths that are statistically significant shown in Table 7-3. Those are:

- (1) Path from Satisfaction with Workers Empowerment Practices Factor to Perceived Success on Outcome Factor
- (2) Path from Satisfaction with Medical Staff's Services with Medication Factor to Perceived Success on Outcome Factor
- (3) Path from Service Use Intensity Factor to Perceived Success on Outcome Factor
- (4) Path from Overall Satisfaction Factor to Perceived Success on Outcome Factor
- (5) Path from Perceived Success on Outcome Factor to CBCL

Based on this statistical significance test, the paths that were not statistically significant were removed to see if respecified model still fits the observed data.

7.2.3. The Respecified Causal Model

In order to respecify the model, several significant paths are eliminated in the respecified model, based on ability to make statistical contribution to the model. However, in this respecification, age and gender is not removed because they are control variable on outcome services even though the paths from these factors to outcome factor were not statistically significant. Also, among non-significant paths, one path that proved to be the closest to statistical significance are included in the respecified model to see if the Beta value of this path can change from test of different configuration in paths in the model. This path is from Satisfaction with Worker's Empowerment Practices factor to Overall Satisfaction Factor.

The respecified model was evaluated via LISREL 8.80, using maximum likelihood methods for the estimation of parameters.

7.2.3.1 Overall Goodness of Model Fit

To evaluate the model fit of respecified model, the following indexes were used: 1) the chi-square test, 2) the root mean square error of approximation (RMSEA) and 3) the comparative fit index (CFI).

Table 7-4 Model Fit Statistics of the Respecified Model

For Acceptable Model Fit	The Respecified Structural Regression Model
Chi-Square, Df>1, p>.05	Chi-Square =504.70, df=269 p<.001
RMSEA<.08	RMSEA=.06 (90% CI=0.047-0.062)
CFI>.90	CFI=.93

As shown in Table 7-4, the Chi-square is still significant, but other indexes that are not influenced by sample size indicated acceptable fit. The RMSEA was .06, and CFI was .93. Overall, model fit was not drastically improved, but showed acceptable fit between the model and observed data. Complete model fit statistics are provided in Figure E-1 in Appendices.

7.2.3.2 Paths Estimates

The paths parameters were assessed for statistical significance at $p < .05$. Table 7-3 indicates that all paths produced z-score greater than $|\pm 1.96|$, meaning that all regression coefficients achieved practical significance and statistical significance.

Table 7-3 Path Estimates – The Respecified Model (Unstandardized Estimates)

From	To	BETA	S.E.	z-score
Worker's Empowerment	Overall Satisfaction	.37*	.07	5.43
Worker's Empowerment	Perceived Success	.40*	.10	3.99
Medical Staffs Services	Perceived Success	.29*	.10	2.83
Service Use Intensity	Perceived Success	.32*	.13	2.53
Overall Satisfaction	Perceived Success	.23*	.08	2.93
Perceived Success	CBCL	-.15*	.06	-2.48

* $p < .05$, ** $p < .001$

7.2.3.3 Respecified Model Interpretation

When age and gender of clients were controlled, client's perceived success on outcomes causally effected client's behavior outcome that were manifested in CBCL internalizing and externalizing scores in this model. In other words, when youth perceived that they were doing better at school, getting along with other people, including family members, or coping better as a result of services they received, they tended to show improvement in their behavior outcome. When young consumers were satisfied with services in terms of their daily lives and family lives, they tended to show improvement in their behaviors mainly in terms of anxious/depressed, withdrawn behaviors and aggressive and delinquent behaviors that are manifested in CBCL internalizing score and externalizing score.

In this SEM model, several factors caused young consumers' perceived success on outcomes. First, overall satisfaction with services directly affected their perceived success on outcome ($\beta = .20$). Youths who were overall satisfied with services they received in community mental health center were more likely to predict their success on their functioning in their lives, in terms of school work, family life, and other social interaction.

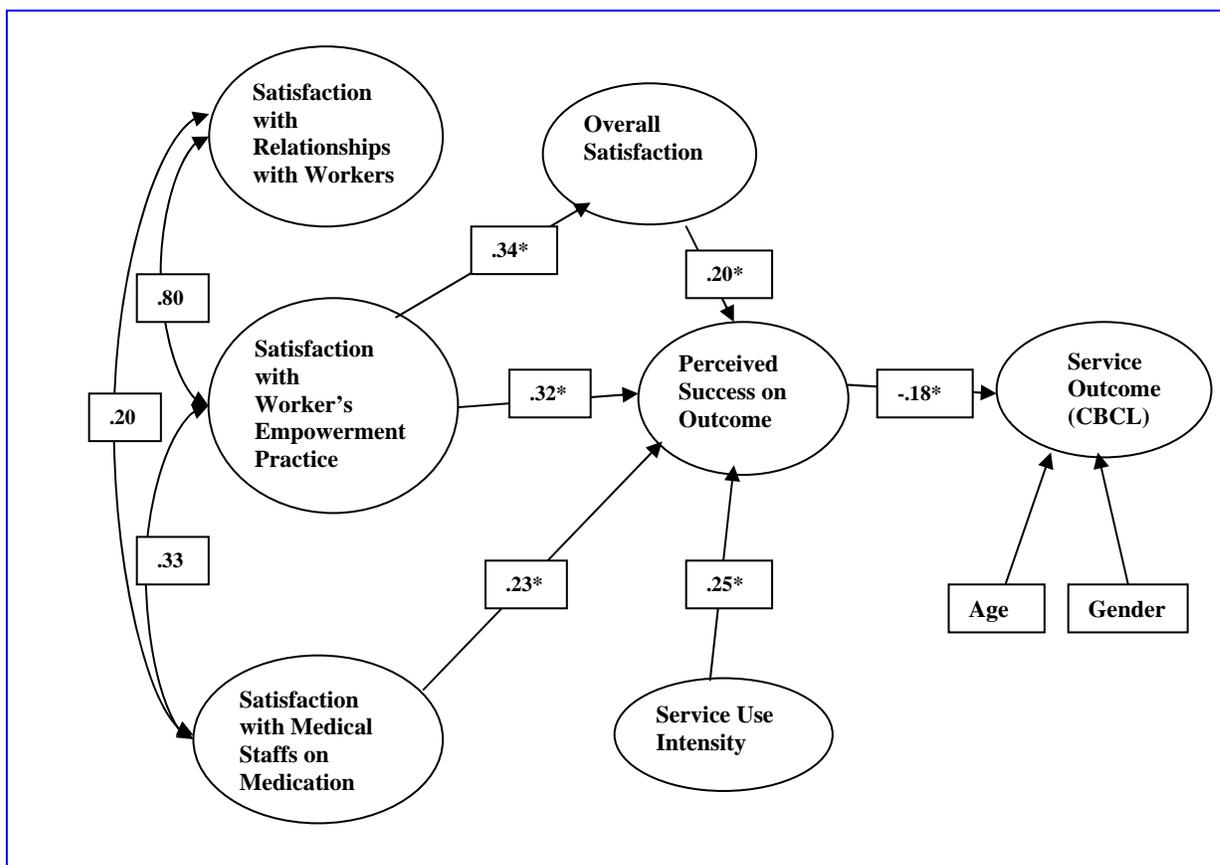
Second, young consumers' satisfaction with worker's empowerment practices positively affected their perceived success on outcomes ($\beta = .32$). When youth thought that their workers knew how to help them, such as helping them or their parents to see good things about themselves, helping them to plan the future, keeping problems from getting big, and letting them decide the issues to focus on, these young consumers were more likely to predict their success on service outcome. Third, young consumer's satisfaction with medical staffs' services on medication directly affected their perceived success on outcome ($\beta = .23$). When youth answered that their doctor or nurse explained why they should take medication, explained about side effects, and asked how medication worked for them, they were more likely to perceive success on their functioning in their lives. Lastly, the service use intensity affected the level of youth consumers' perceived success on outcome. Among services they received, case management and psychosocial treatment services proved to causally affect this satisfaction factor ($\beta = .25$). The longer they received these services, the higher level in their perception of success on outcome, meaning that they were more likely to think

that they were doing better and coping better in their school, family and social interaction.

There was only one factor that directly affected young consumers' overall satisfaction with services, which was the level of their satisfaction with worker's empowerment practices ($\beta = .34$). When youth were more satisfied with worker's empowerment practices, they were more likely to show overall satisfaction with services they received. However, satisfaction with relationships with workers, satisfaction with medical staffs' services on medication, and service use intensity did not significantly predict consumer's overall satisfaction with services.

The results of this study shows that young consumer's satisfaction with their workers empowerment practice skills proved to stand out as the most critical factors in predicting success on service outcomes, whether these workers were either social workers or medical staffs. Also, the satisfaction factors with workers were highly correlated each other even though they comprised separate factors with their indicators.

Figure 7-3 Respecified Causal Model (Standardized Solution)



8. Conclusion and Implication

8.1 Summary

The SEM analysis in this study showed that the specific causal relationships were identified among service outcomes, consumer satisfaction, and service utilizations of children and youth who received services from community mental health centers in Kansas, indicating the result of this study supported the conceptual model proposed in Figure 1.

This study took several steps to apply Structural Regression analysis on the dataset. SR analysis is one of the SEM analyses to test causal relationships among latent factors with multiple observed indicators.

From preliminary multiple regression analysis, practically and statistically significant variables were identified for subsequent SEM analysis. Specifically, case management and psychosocial treatment were identified as most significant service utilization predictors for service outcomes. Also, CBCL internalizing and externalizing scores were proved to be the most significant outcome variables in this sample.

Exploratory Factor Analysis were conducted to extract factors among consumer satisfaction indicators, since there were quite a lot of indicators that are supposed to measure construct (consumer satisfaction) in our conceptual model. From this EFA, four factors were extracted, and labeled as satisfaction with relationships with workers, satisfaction with worker's empowerment practices, satisfaction with medical staff's services on medication, and perceived success on outcome. Since Overall satisfaction was measured with only one indicator, it was not included in this EFA.

As a preliminary SEM analysis to Structural Regression Modeling, Confirmatory Factor Analysis (CFA) was conducted to confirm that each indicator of factors measured the construct that they are supposed to measure. In this proposed measurement model, Service Utilization Factor, Service Outcome Factor were included along with four factors from EFA with Consumer Satisfaction Scales. Age and Gender were included in CFA model as single-indicator factors as control variables.

The result of CFA indicated that the proposed measurement model fitted data in acceptable level, and all indicators significantly loaded onto their factors.

Based on the results of these preliminary studies, Structural Regression (SR) modeling was applied to test the proposed causal model among factors. Initial estimation of proposed causal model supported acceptable model fit. However, there were several paths regression coefficients that were not statistically significant. Accordingly, those paths that were not significant were eliminated from the initial model to establish respecify the model.

The test of respecified model using LISREL 8.80 still supported acceptable model fit. Also all the regression coefficients proved to be statistically and practically significant. In conclusion, when controlling for youth consumers' age and gender, consumer satisfaction and service use intensity directly and indirectly improved their behavior outcome that are measured with CBCL internalizing and externalizing score mediated by their perception on success on service outcome.

8. 2 Limitation

As with other studies, this study also has limitations. First, this study relied on cross-sectional data, even though the each dataset which comprised whole merged data were deliberately chosen to make sure that they were collected at subsequent time periods. Second, this study utilized data sources collected for reasons not related to the conceptual model proposed in this study. Third, even though the sample power was strong enough to conduct SEM analyses, the sample size can be said to be small ($n=293$), compared to sample size from original data set (over 6,000 cases) This sample size reduction was caused by the process of data management, mainly by data merging process.

8. 3 Implication

This study applied advanced SEM analysis technique to examine causal relationships among factors proposed in the model. This analysis made it possible to investigate the relationships among the constructs using multiple indicators that intended to expand the analysis beyond exploring the relationships among each single indicator. Accordingly, with the result of this advanced SEM analysis, this research paved the path to contribute to theory building related with consumer satisfaction and service outcome studies in children's mental health field. In addition, CFA analysis with consumer satisfaction showed the possibility that indicators in consumer satisfaction survey in Kansas can be established as instruments that has content validity and construct validity (Brown, 2006).

Also, there were several practice implications from this study.

First, satisfaction with workers played major role in predicting perceived success on outcome and service outcome. More specifically, satisfaction with relationships with workers and workers' empowerment practice skill turned out to be very important factors in improving service outcome. Therefore, ongoing supervision and training for workers would be needed to improve worker's empowerment practice skills and relationship building skills with young clients. Second, these satisfactions with workers' job performances included medical staff's services on medication as well as case manager and therapeutic service providers. When young consumers were satisfied with doctors or nurse' services, especially services related with medication, they showed increased level of perceived success on outcome, and it directly affected their behavior outcome. Therefore, regular training for these medical staffs would be needed, especially in order to cultivate the consumer-centered practice skills among these staffs. This training should include encouraging staffs to explain the reason for medication, and their side effects, and to check in with consumers how medication is working for them. In addition, effective collaboration between social workers, therapeutic service providers, case manger and medical staffs should be warranted in community mental health centers.

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Appendices

A. Consumer Satisfaction Data: Sample Characteristics

Table A-1 Overall Satisfaction

Variable	Mean	%
How satisfied are you with the services you have received? 1=Very Dissatisfied 2= Dissatisfied 3= Satisfied 4=Very Satisfied	3.38	96.9

Table A-2 Perceived Success on Outcome

Variable	Mean	%
As a result of the services I received, I am better at handling daily life (1=No-never, 2=Sometimes, 3=Most of times, 4=Yes-always)	3.43	81.6
As a result of the services I received, I get along better with family members.	3.29	76.5
As a result of the services I received, I get along better with friends and other people.	3.49	83.6
As a result of the services I received, I am doing better at school and/or work.	3.37	79.5
As a result of the services I received, I am doing better at school and/or work.	3.41	79.2
As a result of the services I received, I am better able to cope when things go wrong.	3.59	88.1
As a result of the services I received, I am satisfied with my family life right now.		

Table A-3 Worker Satisfaction

Variable	Mean	%
Trust the worker (1=No-never, 2=Sometimes, 3=Most of times, 4=Yes-always)	3.81	92.8
Not blamed for things that happened by worker	3.87	95.9
Worker helps you see the good things about yourself	3.67	87.7
Worker does not tell things to your parents that were going to be private	3.55	86.3
Worker knows how to help you with issues	3.57	85.0
Help parents see good things about you	3.60	86.3
Helps to keep problems from getting too big	3.59	85.3

Table A-4 Satisfaction with Medication

Variable	Mean	%
Did this doctor/nurse explain why you should take the medications? (1=No-never, 2=Sometimes, 3=Most of times, 4=Yes-always)	3.58	90.1
Did s/he explain what the side effects might be?	3.40	82.9
Did s/he ask you about how the medications are working for you?	3.87	97.3
How satisfied are you with how the medications are working for you?	3.15	89.4

B. Multiple Regression Analysis

Table B-1 Association between Satisfaction and Demographics

	Age		Gender		Race/Ethnicity		R ²	F
	B	Beta B (SE)	B	Beta B (SE)	B	Beta B (SE)		
Overall Satisfaction	.020	.056 (.021)	-.001	-.001 (.071)	.312	.109 (.168)	.015	1.478
<i>Success</i>								
Daily	.008	.014 (.033)	-.043	-.023 (.112)	.368	.081 (.265)	.007	.704
Family	-.010	-.017 (.034)	-.294*	-.149 (.116)	-.209	-.044 (.275)	.025	2.508
Friends	-.003	-.006 (.032)	-.151	-.082 (.109)	-.006	-.001 (.259)	.007	.669
School	.018	.029 (.037)	-.143	-.068 (.124)	-.134	-.027 (.296)	.006	.547
Cope	.027	.041 (.035)	-.149	-.075 (.118)	-.005	-.001 (.279)	.006	.623
Life	-.053	-.104 (.030)	-.221*	-.127 (.102)	-.239	-.057 (.241)	.035	3.457*
<i>Medication</i>								
Explained Why Meds	.001	.001 (.030)	.178	.103 (.102)	-.093	-.022 (.242)	.011	1.086
Explained Side Effect	-.095*	-.155 (.036)	.264*	.126 (.122)	-.269	-.054 (.290)	.037	3.706*
Asked How It's Working	-.035*	-.126 (.017)	.016	.017 (.056)	-.040	-.017 (.134)	.016	1.567
Satisfied With Meds	-.040	-.107 (.022)	-.050	-.039 (.075)	-.007	-.002 (.179)	.014	1.398
<i>Worker</i>								
Trust Worker	-.003	-.007 (.023)	.034	.026 (.079)	-.196	-.061 (.189)	.004	.423
Does Not Blame	.028	.077 (.022)	-.080	-.064 (.074)	-.152	-.051 (.176)	.011	1.069
Help You See Good	.013	.024 (.031)	-.120	-.066 (.107)	-.342	-.079 (.254)	.011	1.041
Keep Private	.022	.036 (.037)	-.208	-.098 (.126)	-.035	-.007 (.299)	.010	.954
Know How to Help	-.024	-.042 (.033)	-.070	-.036 (.114)	-.267	-.058 (.270)	.007	.681
Help Parents See Good	.030	.052 (.034)	-.206	-.105 (.116)	.194	.041 (.275)	.014	1.351
Keep Problems	-.005	-.008 (.034)	-.187	-.094 (.117)	.101	.021 (.279)	.010	.937

* p < .05, **p < .001

Table B-2 Association between Satisfaction and Service Utilization

	Case Management		Psychosocial Treatment		R ²	F
	B	Beta B (SE)	B	Beta (SE)		
Overall Satisfaction	.012	.021 (.035)	.026	.045 (.035)	.003	.440
<i>Success</i>						
Daily	.077	.086 (.055)	.063	.070 (.055)	.016	2.315
Family	.099	.105 (.057)	-.014	-.015 (.057)	.010	1.522
Friends	.095	.108 (.053)	.086	.098 (.053)	.027	4.063*
School	-.034	-.034 (.059)	.253**	.253 (.059)	.060	9.296**
Cope	.134*	.142 (.057)	.001	.001 (.057)	.020	2.990
Life	-.002	-.003 (.51)	-.026	-.031 (.051)	.001	.148
<i>Medication</i>						
Explained Why Meds	.063	.077 (.049)	.126*	.154 (.049)	.036	5.422*
Explained Side Effect	.052	.053 (.060)	.103	.103 (.060)	.016	2.413
Asked How It's Working	.036	.080 (.027)	.056*	.124 (.027)	.027	4.029*
Satisfied With Meds	.003	.005 (.037)	-.012	-.021 (.037)	.000	.057
<i>Worker</i>						
Trust Worker	-.024	-.038 (.039)	-.001	-.002 (.039)	.002	.219
Does Not Blame	.016	.027 (.036)	.082*	.137 (.036)	.022	3.193*
Help You See Good	.023	.027 (.053)	-.063	-.073 (.053)	.005	.729
Keep Private	.013	.013 (.062)	-.055	-.054 (.062)	.003	.392
Know How to Help	-.122*	-.134 (.055)	.011	.012 (.055)	.017	2.528
Help Parents See Good	.048	.051 (.057)	-.043	-.046 (.057)	.003	.497
Keep Problems	-.016	-.017 (.058)	.023	.025 (.058)	.001	.097

* p <.05, **p<.001

Table B-3 Prediction of Educational Outcomes by Satisfaction

	School Attendance			School Performance		
	B	Beta (SE)	R ² (F)	B	Beta (SE)	R ² (F)
Overall Satisfaction	.709	.074 (.560)	.005 (1.606)	-.163*	-.118	.014 (4.117*)
<i>Success</i>			.015 (.749)			.023 (1.139)
Daily	-.276	-.045 (.444)		.061	.069 (.064)	
Family	.297	.051 (.390)		-.034	-.076 (.056)	
Friends	-.429	-.069 (.431)		-.058	-.064 (.062)	
School	-.237	-.043 (.369)		.073	.092 (.053)	
Cope	.580	.100 (.394)		-.075	-.090 (.057)	
Life	-.263	-.040 (.453)		.067	.070 (.065)	
<i>Medication</i>			.017 (1.213)			.005 (.385)
Explained Why Meds	-.175	-.026 (.457)		.027	.029 (.066)	
Explained Side Effect	.726	.132 (.373)		-.048	-.061 (.054)	
Asked How It's Working	-.143	-.012 (.802)		-.027	-.015 (.116)	
Satisfied With Meds	.270	.030 (.554)		.072	.056 (.080)	
<i>Worker</i>			.017 (.710)			.030 (1.256)
Trust Worker	-.831	-.097 (.636)		-.127	-.103 (.091)	
Does Not Blame	.211	.023 (.552)		-.074	-.056 (.079)	
Help You See Good	.842	.132 (.483)		.079	.086 (.069)	
Keep Private	-.156	-.029 (.330)		-.016	-.021 (.047)	
Know How to Help	.249	.042 (.466)		.009	.011 (.067)	
Help Parents See Good	.089	.015 (.045)		-.038	-.045 (.058)	
Keep Problems	-.273	-.047 (.448)		-.079	-.095 (.064)	

* p <.05, **p<.001

Table B-4 Prediction of Residential and Juvenile Justice Outcomes by Satisfaction

	Permanent Home Placement			Law Enforcement Contacts		
	B	Beta (SE)	R ² (F)	B	Beta (SE)	R ² (F)
Overall Satisfaction	.043	.095 (.026)	.009 (2.562)	-.052	-.054 (.057)	.003 (.845)
<i>Success</i>			.030 (1.475)			.030 (.183)
Daily	.010	.036 (.021)		.098*	.159 (.045)	
Family	.045*	.163 (.018)		-.032	-.054 (.039)	
Friends	-.001	-.002 (.020)		-.030	-.048 (.043)	
School	-.013	-.050 (.017)		.005	.009 (.037)	
Cope	-.016	-.060 (.018)		.030	.051 (.040)	
Life	.011	.035 (.021)		-.063	-.095 (.045)	
<i>Medication</i>						.023 (1.730)
Explained Why Meds	-.004	-.012 (.022)		.060	.090 (.046)	
Explained Side Effect	-.007	-.028 (.018)		.043	.078 (.038)	
Asked How It's Working	-.014	-.024 (.038)		.023	.019 (.081)	
Satisfied With Meds	.037	.086 (.026)		-.086	-.094 (.056)	
<i>Worker</i>			.023 (.965)			.023 (.977)
Trust Worker	-.038	-.093 (.030)		-.051	-.059 (.064)	
Does Not Blame	-.020	-.047 (.026)		-.024	-.026 (.056)	
Help You See Good	.006	.020 (.023)		.109*	.170 (.049)	
Keep Private	-.009	-.036 (.016)		.006	.012 (.033)	
Know How to Help	.027	.095 (.022)		-.008	-.013 (.047)	
Help Parents See Good	.032	.116 (.019)		-.009	-.016 (.041)	
Keep Problems	-.022	-.081 (.021)		-.067	-.115 (.045)	

* p <.05, **p<.001

Table B-5 Prediction of Child Behavior Outcomes by Satisfaction

	Internalizing Scores			Externalizing Scores		
	B	Beta (SE)	R ² (F)	B	Beta (SE)	R ² (F)
Overall Satisfaction	-1.813	-.111 (.952)	.012 (3.624)	-1.550	-.107 (.844)	.011 (3.377)
<i>Success</i>			.092 (4.853**)			.066 (3.363*)
Daily	.852	.082 (.727)		1.170	.127 (.653)	
Family	-.607	-.061 (.639)		-.1591*	-.181 (.574)	
Friends	-1.543*	-.145 (.707)		-1.218	-.129 (.635)	
School	-1.012	-.108 (.605)		-.178	-.022 (.543)	
Cope	-.424	-.043 (.646)		-.382	-.044 (.580)	
Life	-1.477*	-.131 (.742)		-.417	-.042 (.667)	
<i>Medication</i>			.032 (2.357)			.054 (4.092*)
Explained Why Meds	-1.117	-.098 (.774)		-2.354*	-.234 (.678)	
Explained Side Effect	.826	.088 (.632)		.732	.088 (.553)	
Asked How It's Working	2.706*	.132 (1.358)		1.086	.060 (1.189)	
Satisfied With Meds	-1.765	-.115 (.939)		-1.322	-.097 (.821)	
<i>Worker</i>			.010 (.398)			.027 (1.137)
Trust Worker	.046	.003 (1.091)		-1.369	-.105 (.957)	
Does Not Blame	.428	.027 (.947)		-.347	-.025 (.831)	
Help You See Good	-.163	-.015 (.828)		.790	.082 (.726)	
Keep Private	-.046	-.005 (.566)		.159	.020 (.496)	
Know How to Help	-.807	-.079 (.799)		-.152	-.017 (.701)	
Help Parents See Good	-.414	-.041 (.694)		-1.182	-.133 (.069)	
Keep Problems	.183	.768 (.019)		.588	.067 (.674)	

* p <.05, **p<.001

C. Confirmatory Factor Analysis

Table C-1 Covariance Matrix

	q04	q18	q19	q21	q06	q09
q04	0.406					
q18	0.341	0.982				
q19	0.301	0.470	0.709			
q21	0.244	0.271	0.269	0.326		
q06	0.253	0.372	0.388	0.249	0.742	
q09	0.310	0.378	0.410	0.221	0.373	0.834
q11	0.223	0.338	0.300	0.212	0.360	0.324
q12	0.239	0.375	0.376	0.189	0.419	0.479
q13	0.269	0.357	0.345	0.217	0.432	0.473
q14	0.148	0.246	0.258	0.104	0.304	0.310
q26	0.010	0.076	0.045	-0.021	0.047	0.074
q27	0.075	0.102	0.146	0.077	0.049	0.075
q28	0.048	0.096	0.081	0.034	0.071	0.045
ZCaseMan	-0.025	-0.050	0.010	-0.015	0.006	-0.119
ZPsychos	-0.008	-0.204	-0.062	-0.001	-0.057	-0.023
q62	0.079	0.124	0.097	0.088	0.072	0.141
q63	0.048	0.154	0.087	0.072	0.120	0.149
q64	0.055	0.146	0.087	0.041	0.066	0.191
q65	0.110	0.121	0.084	0.055	0.134	0.186
q66	0.108	0.141	0.106	0.104	0.102	0.228
q67	0.115	0.146	0.175	0.089	0.102	0.194
age	-0.004	0.000	0.029	0.015	0.018	-0.072
gender	0.007	-0.021	-0.014	0.011	-0.026	-0.019
ZChildIn	-0.032	-0.035	-0.041	0.013	-0.049	-0.079
ZChildEx	-0.061	-0.051	-0.026	-0.017	0.002	-0.046

Covariance Matrix (continued)

	q11	q12	q13	q14	q26	q27
q11	0.870					
q12	0.526	1.086				
q13	0.376	0.524	0.893			
q14	0.264	0.323	0.390	0.777		
q26	0.159	0.195	0.113	0.145	0.676	
q27	0.183	0.195	0.087	0.159	0.367	0.994
q28	0.080	0.070	0.079	0.055	0.152	0.174
ZCaseMan	0.036	0.023	-0.009	-0.054	0.098	0.081
ZPsychos	-0.030	0.081	0.019	0.043	0.144	0.117
q62	0.136	0.153	0.154	0.044	0.067	0.051
q63	0.143	0.228	0.188	0.115	0.174	0.154
q64	0.219	0.217	0.144	0.105	0.182	0.108
q65	0.110	0.151	0.207	0.163	0.108	0.159
q66	0.247	0.208	0.200	0.145	0.057	0.169
q67	0.181	0.243	0.175	0.164	0.112	0.136
age	0.056	0.065	-0.034	-0.152	0.022	-0.221
gender	-0.043	-0.034	-0.043	-0.035	0.040	0.049
ZChildIn	-0.062	-0.132	-0.044	-0.044	-0.027	0.066
ZChildEx	-0.106	-0.008	-0.003	-0.068	-0.160	-0.018

Covariance Matrix (continued)

	q28	ZCaseMan	ZPsychos	q62	q63	q64
q28	0.207					
ZCaseMan	0.052	1.000				
ZPsychos	0.066	0.278	1.000			
q62	0.032	0.019	0.029	0.327		
q63	0.069	0.095	0.085	0.115	0.808	
q64	0.034	0.095	0.014	0.078	0.320	0.886
q65	0.062	0.119	0.113	0.118	0.329	0.229
q66	0.040	0.036	0.243	0.099	0.361	0.295
q67	0.090	0.134	0.038	0.131	0.374	0.245
age	-0.092	0.166	0.030	0.054	0.018	-0.062
gender	0.000	-0.006	0.031	0.002	-0.009	-0.068
ZChildIn	0.044	-0.067	-0.009	-0.063	-0.093	-0.155
ZChildEx	-0.012	-0.022	0.221	-0.061	-0.032	-0.191

Covariance Matrix (continued)

	q65	q66	q67	age	gender	ZChildIn
q65	0.771					
q66	0.245	1.002				
q67	0.317	0.274	0.894			
age	-0.027	0.030	0.045	2.637		
gender	-0.035	-0.031	-0.031	0.116	0.228	
ZChildIn	-0.197	-0.195	-0.138	0.123	0.038	1.000
ZChildEx	-0.145	-0.091	-0.099	-0.201	-0.023	0.480

Covariance Matrix (continued)

	ZChildEx
ZChildEx	1.000

Figure C-1 Model Fit Indices

Degrees of Freedom = 244
Minimum Fit Function Chi-Square = 516.617 (P = 0.0)
Normal Theory Weighted Least Squares Chi-Square = 464.380 (P = 0.00)
Estimated Non-centrality Parameter (NCP) = 220.380
90 Percent Confidence Interval for NCP = (163.377 ; 285.193)

Minimum Fit Function Value = 1.769
Population Discrepancy Function Value (F0) = 0.755
90 Percent Confidence Interval for F0 = (0.560 ; 0.977)
Root Mean Square Error of Approximation (RMSEA) = 0.0556
90 Percent Confidence Interval for RMSEA = (0.0479 ; 0.0633)
P-Value for Test of Close Fit (RMSEA < 0.05) = 0.113

Expected Cross-Validation Index (ECVI) = 2.145
90 Percent Confidence Interval for ECVI = (1.950 ; 2.367)
ECVI for Saturated Model = 2.226
ECVI for Independence Model = 15.736

Chi-Square for Independence Model with 300 Degrees of Freedom = 4545.015
Independence AIC = 4595.015
Model AIC = 626.380
Saturated AIC = 650.000
Independence CAIC = 4712.020
Model CAIC = 1005.474
Saturated CAIC = 2171.056

Normed Fit Index (NFI) = 0.886
Non-Normed Fit Index (NNFI) = 0.921
Parsimony Normed Fit Index (PNFI) = 0.721
Comparative Fit Index (CFI) = 0.936
Incremental Fit Index (IFI) = 0.937
Relative Fit Index (RFI) = 0.860

Critical N (CN) = 169.611

Root Mean Square Residual (RMR) = 0.0665
Standardized RMR = 0.0599
Goodness of Fit Index (GFI) = 0.884
Adjusted Goodness of Fit Index (AGFI) = 0.846
Parsimony Goodness of Fit Index (PGFI) = 0.664

Table C-2 Factor Loadings (Lamda Y, Unstandardized)

	WorkRel	WorkEmpo	SatMed	SerUSE	OverSat	PerSuc
q04	0.507	--	--	--	--	--
	(0.033)					
	15.386					
q18	0.686	--	--	--	--	--
	(0.054)					
	12.719					
q19	0.640	--	--	--	--	--
	(0.044)					
	14.441					
q21	0.435	--	--	--	--	--
	(0.030)					
	14.478					
q06	--	0.607	--	--	--	--
		(0.046)				
		13.079				
q09	--	0.657	--	--	--	--
		(0.049)				
		13.447				
q11	--	0.590	--	--	--	--
		(0.052)				
		11.375				
q12	--	0.729	--	--	--	--
		(0.056)				
		12.956				
q13	--	0.706	--	--	--	--
		(0.050)				
		14.149				
q14	--	0.476	--	--	--	--
		(0.051)				
		9.380				
q26	--	--	0.560	--	--	--
			(0.054)			
			10.439			
q27	--	--	0.649	--	--	--
			(0.065)			
			9.995			
q28	--	--	0.273	--	--	--
			(0.030)			
			9.235			
ZCaseMan	--	--	--	0.410	--	--
				(0.085)		
				4.816		
ZPsychos	--	--	--	0.686	--	--
				(0.119)		
				5.772		
q62	--	--	--	--	0.575	--
					(0.024)	
					24.174	
q63	--	--	--	--	--	0.628
						(0.053)
						11.830
q64	--	--	--	--	--	0.503
						(0.058)
						8.651
q65	--	--	--	--	--	0.541

						(0.053)
						10.214
q66	--	--	--	--	--	0.561
						(0.061)
						9.137
q67	--	--	--	--	--	0.579
						(0.057)
						10.133
age	--	--	--	--	--	--
gender	--	--	--	--	--	--
ZChildIn	--	--	--	--	--	--
ZChildEx	--	--	--	--	--	--

LAMBDA-Y (continued)

	Age	Gender	CBCL
q04	--	--	--
q18	--	--	--
q19	--	--	--
q21	--	--	--
q06	--	--	--
q09	--	--	--
q11	--	--	--
q12	--	--	--
q13	--	--	--
q14	--	--	--
q26	--	--	--
q27	--	--	--
q28	--	--	--
ZCaseMan	--	--	--
ZPsychos	--	--	--
q62	--	--	--
q63	--	--	--
q64	--	--	--
q65	--	--	--
q66	--	--	--
q67	--	--	--
age	1.625	--	--
	(0.067)		
	24.166		
gender	--	0.477	--
		(0.020)	
		24.166	
ZChildIn	--	--	1.000
ZChildEx	--	--	1.000

Table C-3 Factor Loadings (Lamda Y, Completely Standardized)

	WorkRel	WorkEmpo	SatMed	SerUSE	OverSat	PerSuc
q04	0.794	--	--	--	--	--
q18	0.691	--	--	--	--	--
q19	0.759	--	--	--	--	--
q21	0.761	--	--	--	--	--
q06	--	0.704	--	--	--	--
q09	--	0.719	--	--	--	--
q11	--	0.632	--	--	--	--
q12	--	0.699	--	--	--	--
q13	--	0.746	--	--	--	--
q14	--	0.540	--	--	--	--
q26	--	--	0.681	--	--	--
q27	--	--	0.650	--	--	--
q28	--	--	0.600	--	--	--
ZCaseMan	--	--	--	0.410	--	--
ZPsychos	--	--	--	0.684	--	--
q62	--	--	--	--	1.000	--
q63	--	--	--	--	--	0.691
q64	--	--	--	--	--	0.531
q65	--	--	--	--	--	0.612
q66	--	--	--	--	--	0.557
q67	--	--	--	--	--	0.608
age	--	--	--	--	--	--
gender	--	--	--	--	--	--
ZChildIn	--	--	--	--	--	--
ZChildEx	--	--	--	--	--	--

LAMBDA-Y (continued)

	Age	Gender	CBCL
q04	--	--	--
q18	--	--	--
q19	--	--	--
q21	--	--	--
q06	--	--	--
q09	--	--	--
q11	--	--	--
q12	--	--	--
q13	--	--	--
q14	--	--	--
q26	--	--	--
q27	--	--	--
q28	--	--	--
ZCaseMan	--	--	--
ZPsychos	--	--	--
q62	--	--	--
q63	--	--	--
q64	--	--	--
q65	--	--	--
q66	--	--	--
q67	--	--	--
age	1.000	--	--
gender	--	1.000	--
ZChildIn	--	--	0.808
ZChildEx	--	--	0.836

D. Structural Regression Modeling – Proposed Model

Figure D-1 Model Fit Indices

Degrees of Freedom = 264
Minimum Fit Function Chi-Square = 572.116 (P = 0.0)
Normal Theory Weighted Least Squares Chi-Square = 498.641 (P = 0.00)
Estimated Non-centrality Parameter (NCP) = 234.641
90 Percent Confidence Interval for NCP = (175.520 ; 301.575)

Minimum Fit Function Value = 1.959
Population Discrepancy Function Value (F0) = 0.804
90 Percent Confidence Interval for F0 = (0.601 ; 1.033)
Root Mean Square Error of Approximation (RMSEA) = 0.0552
90 Percent Confidence Interval for RMSEA = (0.0477 ; 0.0625)
P-Value for Test of Close Fit (RMSEA < 0.05) = 0.124

Expected Cross-Validation Index (ECVI) = 2.125
90 Percent Confidence Interval for ECVI = (1.923 ; 2.355)
ECVI for Saturated Model = 2.226
ECVI for Independence Model = 15.736

Chi-Square for Independence Model with 300 Degrees of Freedom = 4545.015
Independence AIC = 4595.015
Model AIC = 620.641
Saturated AIC = 650.000
Independence CAIC = 4712.020
Model CAIC = 906.131
Saturated CAIC = 2171.056

Normed Fit Index (NFI) = 0.874
Non-Normed Fit Index (NNFI) = 0.918
Parsimony Normed Fit Index (PNFI) = 0.769
Comparative Fit Index (CFI) = 0.927
Incremental Fit Index (IFI) = 0.928
Relative Fit Index (RFI) = 0.857

Critical N (CN) = 164.516

Root Mean Square Residual (RMR) = 0.0707
Standardized RMR = 0.0653
Goodness of Fit Index (GFI) = 0.877
Adjusted Goodness of Fit Index (AGFI) = 0.848
Parsimony Goodness of Fit Index (PGFI) = 0.712

E. Structural Regression Modeling – Respecified Model

Figure E-1 Model Fit Indices

Degrees of Freedom = 269
 Minimum Fit Function Chi-Square = 576.936 (P = 0.0)
 Normal Theory Weighted Least Squares Chi-Square = 504.698 (P = 0.00)
 Estimated Non-centrality Parameter (NCP) = 235.698
 90 Percent Confidence Interval for NCP = (176.274 ; 302.938)

Minimum Fit Function Value = 1.976
 Population Discrepancy Function Value (F0) = 0.807
 90 Percent Confidence Interval for F0 = (0.604 ; 1.037)
 Root Mean Square Error of Approximation (RMSEA) = 0.0548
 90 Percent Confidence Interval for RMSEA = (0.0474 ; 0.0621)
 P-Value for Test of Close Fit (RMSEA < 0.05) = 0.141

Expected Cross-Validation Index (ECVI) = 2.112
 90 Percent Confidence Interval for ECVI = (1.908 ; 2.342)
 ECVI for Saturated Model = 2.226
 ECVI for Independence Model = 15.736

Chi-Square for Independence Model with 300 Degrees of Freedom = 4545.015
 Independence AIC = 4595.015
 Model AIC = 616.698
 Saturated AIC = 650.000
 Independence CAIC = 4712.020
 Model CAIC = 878.788
 Saturated CAIC = 2171.056

Normed Fit Index (NFI) = 0.873
 Non-Normed Fit Index (NNFI) = 0.919
 Parsimony Normed Fit Index (PNFI) = 0.783
 Comparative Fit Index (CFI) = 0.927
 Incremental Fit Index (IFI) = 0.928
 Relative Fit Index (RFI) = 0.858

Critical N (CN) = 165.936

Root Mean Square Residual (RMR) = 0.0709
 Standardized RMR = 0.0660
 Goodness of Fit Index (GFI) = 0.875
 Adjusted Goodness of Fit Index (AGFI) = 0.850
 Parsimony Goodness of Fit Index (PGFI) = 0.725