



**REPORT / TRANSITION AGE YOUTH**  
**AUGUST 31, 2017**

# **Initial Evaluation of First Episode Psychosis Early Intervention Programs in Texas**

Submitted to the Texas Health and Human Services Commission

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## ACKNOWLEDGEMENT

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This work is funded through a contract with the Texas Health and Human Services Commission (HHSC). The contents are solely the responsibility of the authors and do not necessarily represent the official views of Texas HHSC.

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**Recommended Citation:** Kramer, M. D. and Lopez, M. A. (August 2017). Initial Evaluation of First Episode Psychosis Early Intervention Programs in Texas. Texas Institute for Excellence in Mental Health, School of Social Work, University of Texas at Austin.

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# Initial Evaluation – First Episode Psychosis Program

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## Background

Schizophrenia is one of the most burdensome of mental health and substance use disorders in terms of years lived with disability (Whiteford et al., 2013). The onset of schizophrenia typically occurs between the ages of 18 and 35, with development occurring over the course of months or years predated by symptoms of depression, anxiety, and difficulty in social relationships, school, or work (Hafner & an der Heiden, 2008). Psychotic disorders can be difficult to diagnose during this prodromal period, with the first episode of psychosis often going undetected for months to years (median 74 weeks; Addington et al., 2015). There is evidence indicating that delayed treatment of psychosis is modestly associated with poorer prognosis (Boonstra et al., 2012; Marshall et al., 2005; Perkins, Gu, Boteva, & Lieberman, 2005). Additionally, the deterioration seen in schizophrenia and related psychotic disorders may not owe to a 'biological process' but to those that are related to the psychosocial stressors facing individuals when these disorders emerge over the course of the first few years (National Early Psychosis Clinical Guidelines Working Party, 2010). These and other findings support the need to implement early interventions for first episode psychosis (FEP).

A number of coordinated specialty care (CSC) services and conventional therapeutic forms of care have been utilized in the treatment of FEP, often introduced as a comprehensive treatment program. Countries other than the United States have led the way in rolling out these programs, such as Australia, Britain, and Canada. There is some consensus regarding common elements of these programs, outlined in Addington et al. (2013): a) multidisciplinary team treatment, b) individualized treatment planning, c) low dose antipsychotic medication, d) family psychoeducation, e) cognitive-behavioral therapy, f) education about illness management, g) social and role functioning rehabilitation, h) case management, and i) outreach. Compared to treatment as usual, specialized FEP programs appear to yield better prevention of relapse (Alvarez-Jimenez, Parker, Hetrick, McGorry, & Gleeson, 2011), reduce readmission and treatment dropout rates (Craig et al., 2004), reduce positive and negative symptoms and increase functional improvement (Harvey, Lepage, & Malla, 2007; Norman et al., 2011), and a reduction in the use of supportive housing and hospitalization (Bertelsen et al., 2008). Importantly, extant evidence suggests not only may FEP programs be more effective than standard care, but also less expensive (Mihalopoulos, McGorry, & Carter, 1999).

In the United States, the National Institute of Mental Health (NIMH) began development and evaluation of comprehensive treatment programs for FEP in 2008. Two independent research teams were funded to develop standardized programs: Recovery After an Initial Schizophrenia Episode (RAISE) Connection Program and NAVIGATE. A specific implementation of the program in New York state is titled OnTrackNY, representing an extension of the RAISE Connection Program. RAISE Connection Program teams are comprised of a Team Lead, Psychiatrist or medication provider, Individualized Placement and Support Specialist, and Recovery Coach. NAVIGATE teams include a Psychiatrist or medication provider, two clinicians, Supported Employment and Education Specialist, and a director or Team Lead. The programs share similar approaches (e.g., recovery orientation, multidisciplinary), team membership, and components (e.g., illness management, family collaboration, supported employment/education, social rehabilitation), despite being developed independently (Heinssen, Goldstein, & Azrin, 2014). Preliminary evidence of NAVIGATE's success indicated that those in the program experienced greater reduction in symptomatology, greater improvement in quality of life, greater involvement in employment and education, and remained in treatment longer than those in community care

(Kane et al., 2016). Effectiveness in the United States was important to demonstrate, in part, because prior research in other countries utilized alternative health insurance structures.

There are currently over 100 clinics in the United States offering CSC services for FEP, with over half of them in Oregon, New York, Ohio, Virginia, California, and Illinois. NIMH collaborates with the Substance Abuse and Mental Health Services Administration (SAMHSA) in implementing the programs. In 2014, SAMSHA directed the Texas Health and Human Services Commission (HHSC) to allocate 5% of its Mental Health Block Grant funding to pilot FEP programs in the state. In Harris county and Dallas, the implementation of programs at The Harris Center for Mental Health and IDD and Metrocare Services, respectively, was evaluated independently at the end of 2016. The Harris report indicated that cognitive behavioral therapy (CBT) for psychosis increased treatment continuation, and CSC clients were more likely to stay in treatment, were less likely to be hospitalized, and were more successful in obtaining employment or attending school than those in standard care (Hamilton et al., 2017). The Metrocare report revealed several positive clinical outcomes for CSC clients, including increases in full employment, reduced hospitalizations, decreases in negative symptoms of schizophrenia, and decreases in social withdrawal (North, 2016). Both reports in Texas recommended further evaluation of the effectiveness of CSC services for FEP.

In fiscal year 2017, Texas has expanded services to additional communities beyond Houston and Dallas. Texas has aimed to extend services from 45 individuals in the program in 2016 to 90 in fiscal year 2017. The current evaluation of the FEP/Early Intervention pilot program will use a formative evaluation model to characterize how the programs are being implemented, successes and barriers across sites, and initial outcomes that individuals in the program are experiencing. There are three core components to the current evaluation. First, a baseline outcomes evaluation will be conducted that will utilize administrative data to establish initial information on those individuals enrolled in the program since its initiation. Second, the formative evaluation will entail interviews with program administrators and providers to understand the core components of each program, including program staffing, training experiences, referral processes, and data tracking. Unifying themes across sites will be identified. Third, NIMH efforts to standardize empirical assessment of the effectiveness of FEP programs across the country will be described and discussed in terms of how these aims may inform evaluation of Texas' programs in this context.

## **Purpose and Methodology**

The current report uses a formative evaluation model to understand the characteristics of the programs that are being implemented, the accomplishments and barriers experienced in each site, and the initial outcomes participants are experiencing. In the initial outcome evaluation, the team will utilize administrative data, primarily focusing on the Child and Adolescent Needs and Strengths (CANS) and the Adult Needs and Strengths Assessment (ANSA), to establish preliminary outcome information on those served by the FEP program since its initiation. Outcomes will be compared to young people with similar characteristics, identified through propensity matching, to examine the benefit of the FEP program compared to treatment as usual. Since this evaluation will be limited to administrative data, the findings should be considered exploratory in nature. The evaluation staff will begin to work with providers of FEP interventions to better understand how participant outcomes are currently being tracked in order to inform a future empirical evaluation of the effectiveness of the FEP programs in Texas. In the formative evaluation, investigators conduct stakeholder interviews with program administrators and providers to understand the core components of each FEP program, program staffing, training experiences, referral processes, and data tracking. Stakeholders are asked about challenges they have experienced, lessons learned, and barriers that may be impeding success.

**Initial Outcome Evaluation.** The evaluation team has access to service encounter data as well as CANS and ANSA data for the fiscal years 2013 through 2017. Approximately 300 adults between the ages of 18 and 30, and 25 young adults between the ages of 15 and 18 participated in FEP programs across the state during this time period. The empirical portion of the current report focuses primarily on characteristics of the participants at baseline, or their first CANS or ANSA evaluation. However, we also utilize the first four waves of CANS and ANSA data as just over half the participants were assessed at four timepoints. In particular, in these analyses we are interested in clarifying trajectories of clinical symptomatology over time. These clusters of symptoms and their trajectories will be evaluated using factor analysis and growth mixture modeling techniques, respectively. The older adults with ANSA data will be analyzed more thoroughly than the young adults with CANS data given the difference in sample size, with young adult data considered more descriptive in focus. The modeling techniques are described in more detail below.

**Formative Evaluation.** The formative evaluation began in early 2017 with informal phone conversations with each site's Team Lead or Program Manager. In these discussions, the stakeholders provided information regarding their team composition, enrollment and outreach processes, and any initial barriers or challenges faced during the roll-out of the programs. More recently, a structured qualitative interview was developed comprising general questions for all administrators and providers to answer, as well as more specific questions depending on the particular team member's role. Each of the site's Team Lead or Program Manager was interviewed via phone, as well as randomly selected team members of various roles from each site. In total, approximately forty interviews were conducted, providing information regarding common and unique perspectives on the workings of the program, its implementation, and successes and challenges experienced to this point. Consistent themes as well as varied responses to the interview questions are reported herein with representativeness of respondents' ideas conveyed by identifying consensual and more distinctive answers.

## Initial Outcome Evaluation

**Baseline Characteristics.** Propensity matching of participants allows for comparison of two groups that were not randomly selected in an attempt to estimate the effect of an intervention by accounting for covariates predicting receipt of treatment. The covariates that we included were gender, age, and Time 1 scores on each of the psychopathology factors outlined below. Descriptive statistics for the samples and comparisons between FEP participants and controls are presented in Table 1. While a number of significant differences were observed between FEP participants and propensity-matched controls in the adult sample, there were no significant differences on the six factor scores described below. Propensity matching was less successful in the adolescent sample, with FEP participants scoring significantly higher on all four factors possibly owing to the very small sample size and the unique characteristics of adolescents identified with psychosis.

**Demographics.** Adult participants in the FEP program ranged in age from 18 to 31, with an average of 22.57 ( $SD = 3.28$ ); 67.9% were male ( $n = 207$ ) and 32.1% were female ( $n = 98$ ). Matched adults in the control group ranged in age from 18 to 31, with an average age of 28.41 ( $SD = 2.07$ ); 53.8% were male ( $n = 164$ ) and 46.2% were female ( $n = 141$ ). The ethnicity of adult participants in the FEP program included 28.5% Caucasians, 29.5% Hispanic Americans, 37% African Americans, 3.6% Mixed race, and 1.3% Asian Americans. The ethnicity of matched adult controls included 43.9% Caucasians, 19.9% Hispanic Americans, 28.1% African Americans, 1.4% Mixed race, and 6.8% Asian Americans. Adolescents in the FEP program ranged in age from 15 to 18, with an average age of 16.97 ( $SD = 0.99$ ); 60.7% were male ( $n = 17$ ) and 39.3% were female ( $n = 11$ ). The ethnicity of adolescent participants in the FEP program included 50% Caucasians, 14.3% Hispanic Americans, 25% African Americans, 3.6% Native Americans, and 7.1% Mixed race. Matched adolescents in the control group ranged in age from 15 to 18, with an average age of 17.44 ( $SD = 0.54$ ); 57.1% were male ( $n = 16$ ) and 42.9% were female ( $n = 12$ ). The ethnicity of

Table 1. *Baseline Descriptive Statistics for FEP Participants and Controls*

	<i>FEP Participants</i>		<i>Controls</i>		<i>t-test</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>p</i>
<i>Young Adults (N = 305 per)</i>					
Suicide Risk	0.67	0.83	0.72	0.83	.499
Self-Injury	0.22	0.51	0.31	0.56	.051
Self-Harm	0.22	0.53	0.26	0.57	.504
Exploitation	0.15	0.40	0.21	0.45	.122
Danger to Others	0.37	0.70	0.34	0.62	.600
Gambling	0.03	0.19	0.03	0.21	.874
Sexual Aggression	0.01	0.09	0.02	0.15	.169
Criminal Behavior	0.37	0.61	0.41	0.60	.502
Antisocial Behavior	0.22	0.52	0.32	0.62	.040
Depression	1.36	0.86	1.51	0.82	.044
Anxiety	1.29	0.86	1.35	0.90	.426
Adjustment to Trauma	0.54	0.76	0.64	0.81	.112
Eating Disturbances	0.20	0.49	0.23	0.50	.442
Mania	0.55	0.76	0.64	0.78	.165
Impulse Control	0.78	0.82	0.86	0.81	.250
Interpersonal	0.71	0.83	0.75	0.80	.551
Anger Control	0.74	0.78	0.95	0.79	.003
Substance Use	0.78	0.83	0.60	0.79	.007
Psychosis	1.43	0.85	0.83	0.87	.000
Cognitive Disturbance	0.39	0.69	0.60	0.77	.001
Life Domain Functioning	10.58	6.22	10.62	6.90	.938
Strengths	19.78	8.85	18.71	8.64	.150
Psychiatric Crisis	0.51	0.69	0.22	0.57	.000
<i>Adolescents (N = 28 per)</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>p</i>
Suicide Risk	0.96	1.07	0.54	1.07	.140
Self-Injury	0.46	0.69	0.19	0.49	.105
Depression	1.56	0.96	0.54	0.83	.000
Anxiety	1.48	0.92	0.42	0.58	.000
Adjustment to Trauma	0.32	0.63	0.21	0.51	.498
Eating Disturbance	0.24	0.52	0.04	0.20	.089
Self-Harm	0.29	0.46	0.08	0.27	.050
Danger to Others	0.54	0.69	0.04	0.20	.001
Psychosis	1.71	0.81	0.15	0.46	.000
Social Behavior	0.68	0.90	0.21	0.42	.024
Bullying	0.12	0.44	0.17	0.48	.725
Impulsivity	1.00	0.71	0.46	0.78	.014
Oppositional Behavior	0.72	0.74	0.75	0.90	.899
Conduct Problems	0.20	0.50	0.08	0.41	.377
Anger Control	0.92	0.76	0.50	0.72	.053
Runaway	0.24	0.52	0.13	0.45	.414
Delinquency	0.40	0.65	0.08	0.28	.032
Substance Use	0.60	0.76	0.08	0.28	.003
Life Domain Functioning	10.79	6.59	4.3791	6.04	.001
Strengths	16.17	9.02	7.2917	9.88	.002

matched adolescent controls included 44% Caucasians, 24.0% Hispanic Americans, 28% African Americans, and 4% Asian Americans.

**Factor Structures of Clinical Symptomatology.** The CANS and ANSA each assess a range of clinical phenomena, risk factors, and behavioral health issues. Each of these items is scored in the same way, on a zero to three scale assessing the necessity of attention to each of these emotional and behavior problems. Reporting on change in CANS and ANSA scores can entail selecting specific items of pertinence to the treatment (e.g., psychosis, cognitive disturbance in this case), reporting change in domain categories that the instruments espouse, or reliable change on each individual item. Given increasing evidence that clinical problems cohere in systematic ways (e.g., Kotov et al. 2017; Krueger & Markon, 2006), we utilize here an alternative but sophisticated approach to reporting on change in clinical symptomatology domains. The approach entails first exploratory factor analysis (EFA) to identify factor structure followed by confirmatory factor analysis (CFA) to assess model fit. The fit of CFA models is evaluated using a number of criteria, including the Bayesian information criterion (BIC), root mean square error of approximation (RMSEA), and comparative fit index (CFI). Following identification of well-fitting structural models, the factor scores are estimated from the model using regression-based approaches and these factor scores, reflecting symptomatology in distinctive but related domains, are then utilized in subsequent analyses.

**Trajectories of Clinical Symptom Factors.** Growth mixture modeling (GMM; Muthén & Muthén, 2000) is a statistical technique that identifies latent subpopulations of individuals within the overall trajectory of a variable over time. The technique characterizes the number and nature of latent trajectories that comprise the overall trajectory of the full sample. In other words, the overall trajectory may show recovery from symptoms over time, however, within that trajectory are others who may worsen over time, stay the same, or show marked improvement. The method does not assume a specific number or shape of trajectories, but the estimated models are judged in terms of fit to the observed data in much the same way as CFA models. Lower values of BIC and sample-size adjusted BIC, higher values of entropy, which represents the accuracy of classification of individuals to particular trajectories, and class sizes are taken into account in selecting the best-fitting model. Additionally, significant Vuong-Lo-Mendell-Rubin (VLMR) likelihood ratio test and parametric bootstrapped likelihood ratio test (BLRT) statistics indicate that the number of classes in the model being evaluated results in improvement of fit beyond the prior model with lesser classes. In the current evaluation, we are able to model latent trajectories of CFA factors of symptomatology in the older adults because of adequate sample size; however, we model individual trajectories in the adolescents. We compare trajectories between individuals in the FEP program with propensity-matched controls in the treatment-as-usual group.

**Factor Analyses.** Structural modeling analyses were conducted in *Mplus* (Muthén & Muthén, 1998-2012). Our initial step in the factor analysis was to conduct an EFA on all age 18- to 30-year-olds' baseline clinical and behavioral health problems ( $k = 22$ ) from fiscal years' 2013-2017 ANSA data ( $N = 60,779$ ). The results of the EFA suggested testing one- to eight-factor models in CFA. The 22 items utilized in the CFA were best accounted for by the six-factor CFA model, demonstrating the lowest BIC, sample-size adjusted BIC, and RMSEA, and the highest CFI. Fit statistics for these models are presented in Table 2. This model specified suicide risk, self-injurious behavior, self-harm, and exploitation as loading on an Instability factor; danger to others, gambling, sexual aggression, criminal behavior, and antisocial behavior as loading on an Externalizing: Antagonism factor; depression, anxiety, adjustment to trauma, and eating disturbances as loading on an Internalizing factor; mania, impulse control problems, interpersonal problems, and anger control as loading on an Externalizing: Disinhibition factor; substance use, severity of use, and duration of use as loading on a Substance Abuse factor; and psychosis and cognitive disturbance as loading on a Psychotic Disturbance factor (Figure 1). The primary outcome of interest in the current evaluation is the Psychotic Disturbance factor; however, we present evidence as to how the FEP program may have affected the other clinical symptomatology dimensions as well.



Table 2. *Fit Statistics for ANSA (N = 60,779) Confirmatory Factor Analysis Models at Time 1*

<i>ANSA</i>	<i>2LL</i>	<i>k</i>	<i>BIC</i>	<i>aBIC</i>	<i>RMSEA</i>	<i>CFI</i>
1-factor	-975531	66	1951789	1951579	0.065	0.716
2-factor	-965325	67	1931388	1931175	0.057	0.786
3-factor	-955809	69	1912377	1912158	0.047	0.856
4-factor	-952639	72	1906071	1905842	0.043	0.879
5-factor	-951064	76	1902966	1902724	0.042	0.891
<b>6-factor</b>	<b>-948406</b>	<b>81</b>	<b>1897704</b>	<b>1897447</b>	<b>0.038</b>	<b>0.910</b>
7-factor	-950293	87	1901545	1901268	0.042	0.896

*Note.* ANSA = Adult Needs and Strengths Assessment; CANS = Child and Adolescent Needs and Strengths; LL = loglikelihood; k = number of free parameters; BIC = Bayesian information criterion; aBIC = sample-size adjusted BIC; RMSEA = root mean square error of approximation; CFI = comparative fit index.

While the six-factor model fit best at the large baseline assessment, cross-sectional analyses are limited in evaluating the fit of the model over time. In addition, it is unknown which parameters of the model can be constrained over time without conducting formal confirmatory factorial invariance modeling (Meredith, 1993). There are several types of measurement invariance, but for the current purpose we evaluated the fit of the strong invariance model, which specifies that factor loadings and intercepts are equal over time. This model is interpreted to mean that change in endorsement of specific items over time is accounted for by changes at the level of the latent factors. The strong invariance model was fit to ANSA data provided by all 18- to 30-year-olds between fiscal years 2013 to 2017, and the first four ANSA assessments were used as a majority had completed at least four waves of assessment. The sample size at time points one to four were  $N = 60,779$ ,  $n = 61,119$ ,  $n = 40,835$ , and  $n = 28,528$ , respectively. This model fit reasonably well ( $-2LL [246] = -3070134$ ,  $BIC = 6143260$ ,  $aBIC = 6142478$ ,  $RMSEA = .039$ , and  $CFI = .886$ ). The model indicated that there was change in the factors over time in the overall sample. In standard deviation units, Factor 1 Instability decreased by .20 ( $p < .001$ ), Factor 2 Externalizing: Antagonism decreased by .07 ( $p < .001$ ), Factor 3 Internalizing decreased by .06 ( $p < .001$ ), Factor 4 Externalizing: Disinhibition decreased by .03 ( $p = .004$ ), Factor 5 Substance Abuse decreased by .18 ( $p < .001$ ), and Factor 6 Psychotic Disturbance increased by .21 ( $p < .001$ ) from Time 1 to Time 4. Noteworthy is the limited decrease in factors 2, 3, and 4, while the Psychotic Disturbance factor showed an increase over time in the full ANSA sample.

Next, we conducted analyses on the CANS data. An EFA was performed on all age 15- to 18-year-olds' baseline clinical and behavioral health problems ( $k = 18$ ) from fiscal years' 2013-2017 CANS data ( $N = 40,702$ ). The results of the EFA suggested testing one- to five-factor models in CFA. The 18 items utilized in the CFA were best accounted for by the five-factor CFA model based on fit statistics; however, the scree plot favored the four-factor model, which was selected despite fitting slightly worse. The four-factor model had an adequate RMSEA and CFI. Fit statistics for these models are presented in Table 3. This model specified suicide risk, self-mutilation, depression, anxiety, adjustment to trauma, and eating disturbances as loading on an Internalizing factor; other self-harm, danger to others, and psychosis as loading on an Instability factor; social behavior, bullying, impulsivity, oppositional behavior, conduct problems, and anger control as loading on an Externalizing: Antagonism factor; and running away, delinquency, and substance abuse as loading on an Externalizing: Disinhibition factor (Figure 2).

Figure 1. Parameters of the 6-factor ANSA strong invariance model.

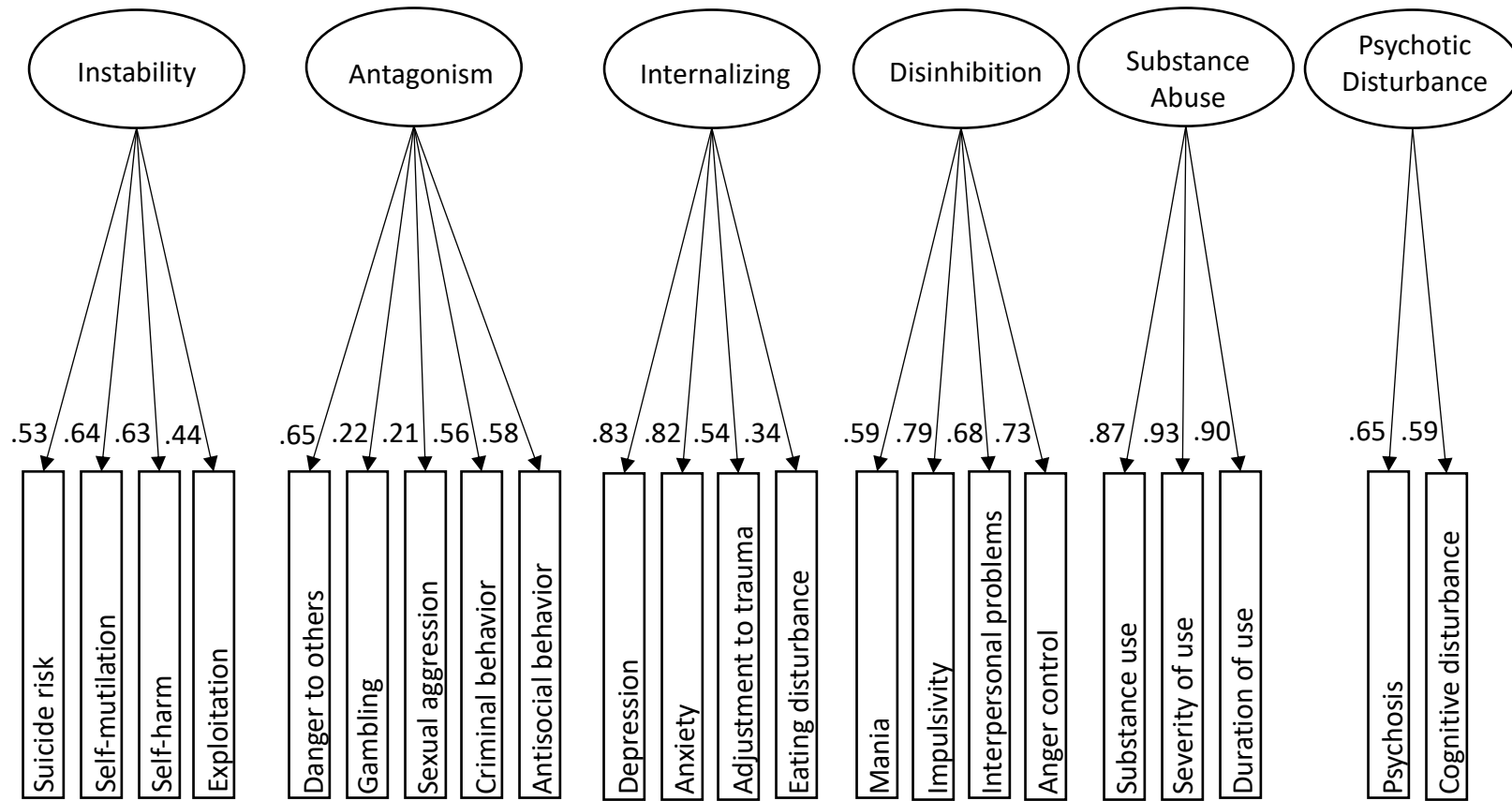


Figure 2. Parameters of the 4-factor CANS strong invariance model.

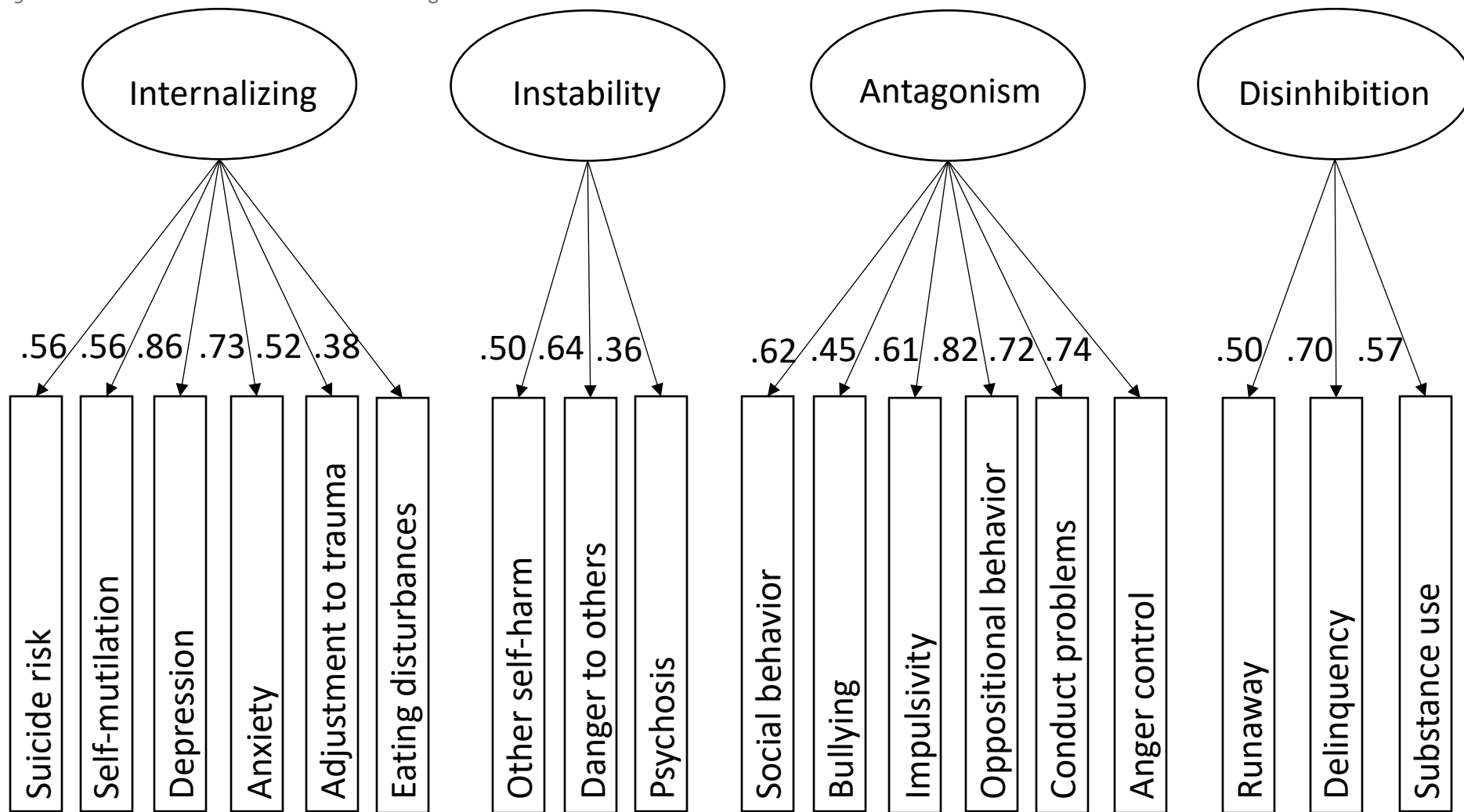


Table 3. *Fit Statistics for CANS (N = 40,702) Confirmatory Factor Analysis Models at Time 1*

CANS	2LL	k	BIC	aBIC	RMSEA	CFI
1-factor	-618895	54	1238363	1238192	0.078	0.649
2-factor	-604618	55	1209819	1209645	0.049	0.861
3-factor	-603687	57	1207979	1207798	0.047	0.874
<b>4-factor</b>	<b>-602659</b>	<b>60</b>	<b>1205955</b>	<b>1205764</b>	<b>0.045</b>	<b>0.888</b>
5-factor	-601528	64	1203736	1203533	0.042	0.905

Note. ANSA = Adult Needs and Strengths Assessment; CANS = Child and Adolescent Needs and Strengths; LL = loglikelihood; k = number of free parameters; BIC = Bayesian information criterion; aBIC = sample-size adjusted BIC; RMSEA = root mean square error of approximation; CFI = comparative fit index.

We identified the four-factor model as best accounting for shared variance between indicators at baseline, and again followed up with formal factorial invariance modeling to determine whether the factors accounted for change in item endorsement over time. The strong invariance model was fit to four waves of CANS data provided by all 15- through 17-year-olds between fiscal years 2013 to 2017. The sample size at time points one to four were  $N = 40,702$ ,  $n = 20,629$ ,  $n = 13,029$ , and  $n = 8,696$ , respectively. The strong invariance model measured over four timepoints fit reasonably well ( $-2LL [168] = -1268549$ ,  $BIC = 2539001$ ,  $aBIC = 2538467$ ,  $RMSEA = .049$ , and  $CFI = .858$ ). In standard deviation units, Factor 1 Internalizing decreased by  $.57$  ( $p < .001$ ), Factor 2 Instability decreased by  $.26$  ( $p < .001$ ), Factor 3 Externalizing: Antagonism increased by  $.16$  ( $p < .001$ ), and Factor 4 Externalizing: Disinhibition decreased by  $.16$  ( $p < .001$ ). Notable are the slightly larger changes in magnitude relative to the adult sample, and a decrease rather than an increase in the Instability factor, on which the psychosis item loads.

**Growth Mixture Modeling.** While the changes in factor scores from baseline to Time 4 may seem diminutive in the ANSA data, the advantage of GMM is that it clusters individuals into latent class trajectories that can differ across groups and that do not simply reflect the overall mean-level changes in the factors. We utilized factor scores from each of the four timepoints estimated in the full ANSA sample strong invariance model in the estimation of two- to five-trajectory models. The two- to five-trajectory models were tested for each of the six ANSA factors in the FEP participant sample ( $N = 305$ ) and separately in age, gender, and baseline psychopathology propensity-matched controls ( $N = 305$ ). We selected each best-fitting model based on the lowest BIC values, balancing high entropy and significant VLMR and BLRT values with adequate sample sizes in each trajectory. Fit statistics for the GMM in the FEP group and in the control group are presented in Table 4. As bolded in the table, we selected the four-class, two-class, four-class, two-class, four-class, and two-class models as best fitting for factors one through six in the FEP group, respectively. As also bolded in the table, we selected the four-class, three-class, three-class, three-class, four-class, and three-class models as best fitting for factors one through six in the control group, respectively. Trajectories for each of the six factors for the FEP participants and controls are presented in Figures 3 through 8.

Table 4. Fit statistics for ANSA Growth Mixture Models in First Episode Psychosis Participants (N = 305) and Controls (N = 305)

FEP	BIC	ssaBIC	entropy	vlmr	blrt	Controls	BIC	ssaBIC	entropy	vlmr	blrt
<i>Factor 1 Instability</i>						<i>Factor 1 Instability</i>					
2-class	674	620	0.91	0.025	0.000	2-class	588	534	0.89	0.234	0.000
3-class	662	596	0.89	0.199	0.000	3-class	538	472	0.86	0.332	0.000
<b>4-class</b>	<b>652</b>	<b>572</b>	<b>0.85</b>	<b>0.307</b>	<b>0.000</b>	<b>4-class</b>	<b>516</b>	<b>437</b>	<b>0.85</b>	<b>0.086</b>	<b>0.000</b>
5-class	661	569	0.87	0.433	0.000	5-class	509	417	0.89	0.170	0.000
<i>Factor 2 Externalizing: Antagonism</i>						<i>Factor 2 Externalizing: Antagonism</i>					
<b>2-class</b>	<b>303</b>	<b>250</b>	<b>0.92</b>	<b>0.002</b>	<b>0.000</b>	2-class	107	53	0.86	0.190	0.000
3-class	302	235	0.94	0.011	0.000	<b>3-class</b>	<b>119</b>	<b>53</b>	<b>0.85</b>	<b>0.484</b>	<b>0.500</b>
4-class	297	218	0.89	0.161	0.000	4-class	298	218	0.89	0.171	0.000
5-class	320	228	0.91	0.240	0.000	5-class	80	-12	0.86	0.812	0.020
<i>Factor 3 Internalizing</i>						<i>Factor 3 Internalizing</i>					
2-class	1374	1320	0.36	0.649	1.000	2-class	1235	1181	0.88	0.297	0.000
3-class	1370	1304	0.74	0.048	0.000	<b>3-class</b>	<b>1215</b>	<b>1148</b>	<b>0.84</b>	<b>0.096</b>	<b>0.000</b>
<b>4-class</b>	<b>1369</b>	<b>1290</b>	<b>0.74</b>	<b>0.607</b>	<b>0.013</b>	4-class	1234	1155	0.81	0.719	0.308
5-class	1389	1297	0.74	0.297	0.092	5-class	1245	1153	0.73	0.376	0.111
<i>Factor 4 Externalizing: Disinhibition</i>						<i>Factor 4 Externalizing: Disinhibition</i>					
<b>2-class</b>	<b>521</b>	<b>467</b>	<b>0.84</b>	<b>0.039</b>	<b>0.000</b>	2-class	377	324	0.69	0.642	0.000
3-class	536	470	0.89	0.020	0.000	<b>3-class</b>	<b>379</b>	<b>313</b>	<b>0.85</b>	<b>0.293</b>	<b>0.040</b>
4-class	537	458	0.67	0.478	0.000	4-class	401	322	0.83	0.210	0.429
5-class	556	464	0.72	0.500	1.000	5-class	377	285	0.72	0.618	0.000
<i>Factor 5 Substance Abuse</i>						<i>Factor 5 Substance Abuse</i>					
2-class	1450	1396	0.74	0.048	0.000	2-class	1186	1132	0.82	0.025	0.000
3-class	1455	1388	0.74	0.735	0.000	3-class	1079	1013	0.83	0.618	0.000
<b>4-class</b>	<b>1450</b>	<b>1371</b>	<b>0.71</b>	<b>0.351</b>	<b>0.000</b>	<b>4-class</b>	<b>924</b>	<b>845</b>	<b>0.85</b>	<b>0.002</b>	<b>0.000</b>
5-class	1230	1138	0.96	0.045	0.000	5-class	871	779	0.82	0.000	0.000
<i>Factor 6 Psychotic Disturbance</i>						<i>Factor 6 Psychotic Disturbance</i>					
<b>2-class</b>	<b>398</b>	<b>344</b>	<b>0.87</b>	<b>0.048</b>	<b>0.013</b>	2-class	491	437	0.76	0.051	0.000
3-class	417	351	0.91	0.125	0.013	<b>3-class</b>	<b>479</b>	<b>412</b>	<b>0.85</b>	<b>0.259</b>	<b>0.000</b>
4-class	437	357	0.71	0.240	1.000	4-class	418	348	0.68	0.370	1.000
5-class	447	355	0.62	0.500	1.000	5-class	493	401	0.82	0.031	0.000

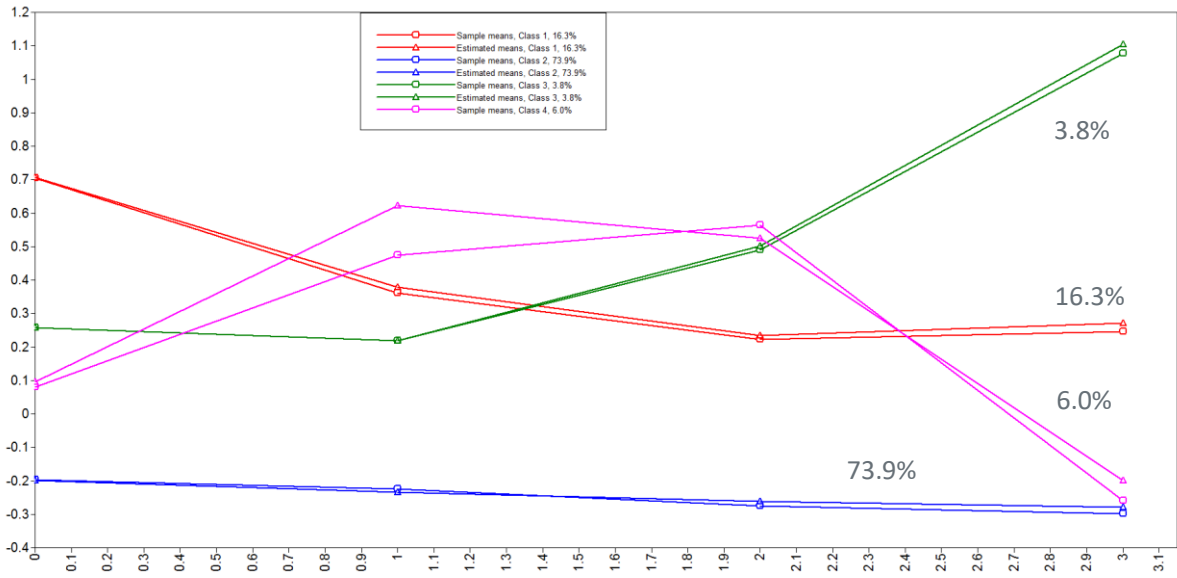
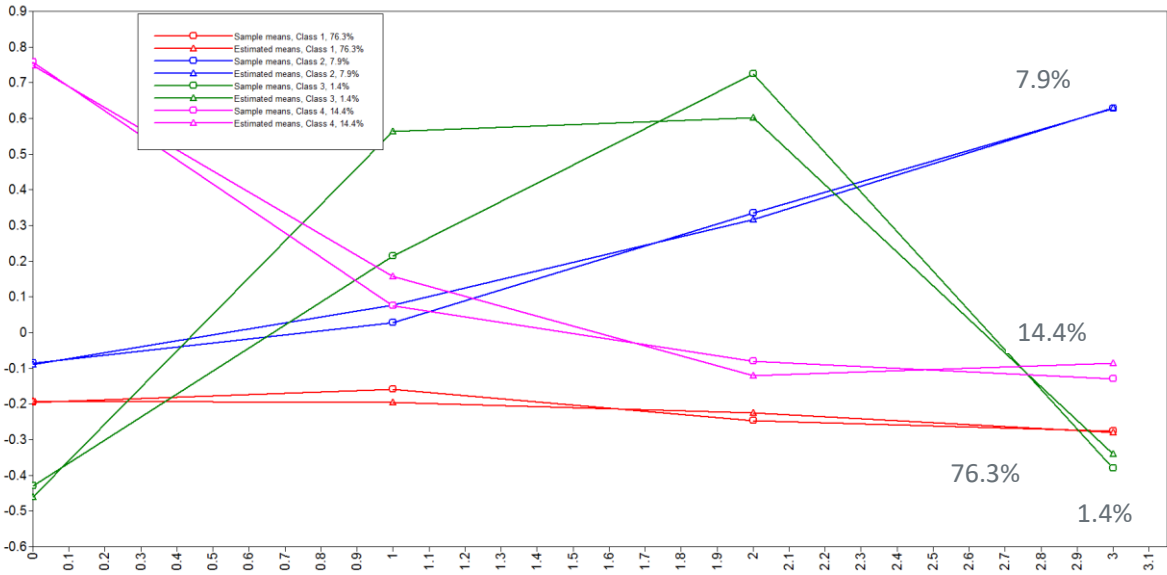


Figure 3. ANSA Factor 1 Instability trajectories for FEP participants (top) and controls (bottom).

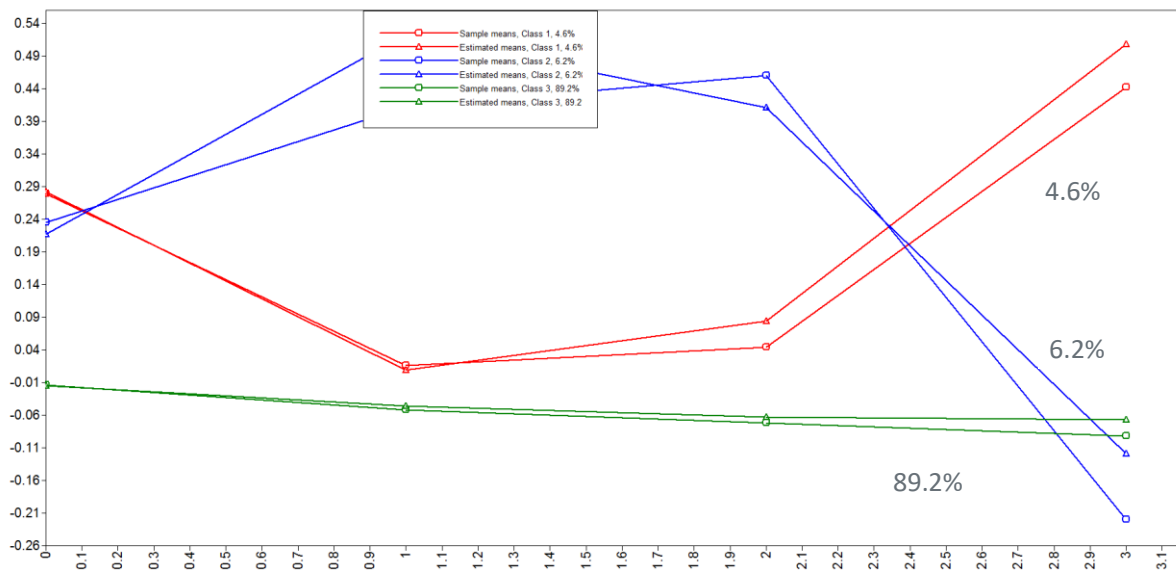
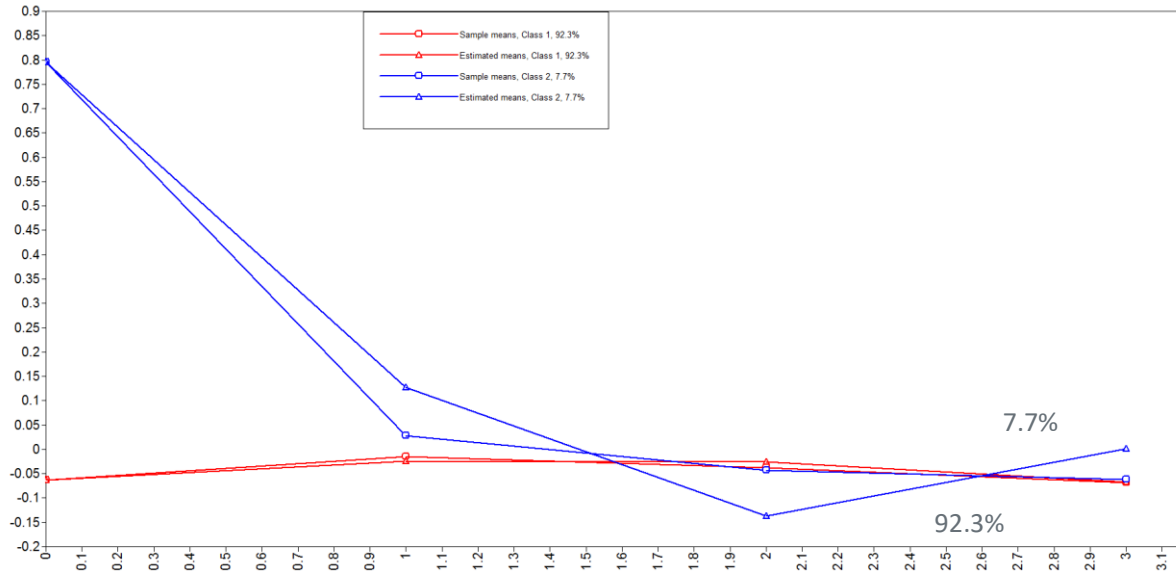


Figure 4. ANSA Factor 2 Externalizing: Antagonism trajectories for FEP participants (top) and controls (bottom).

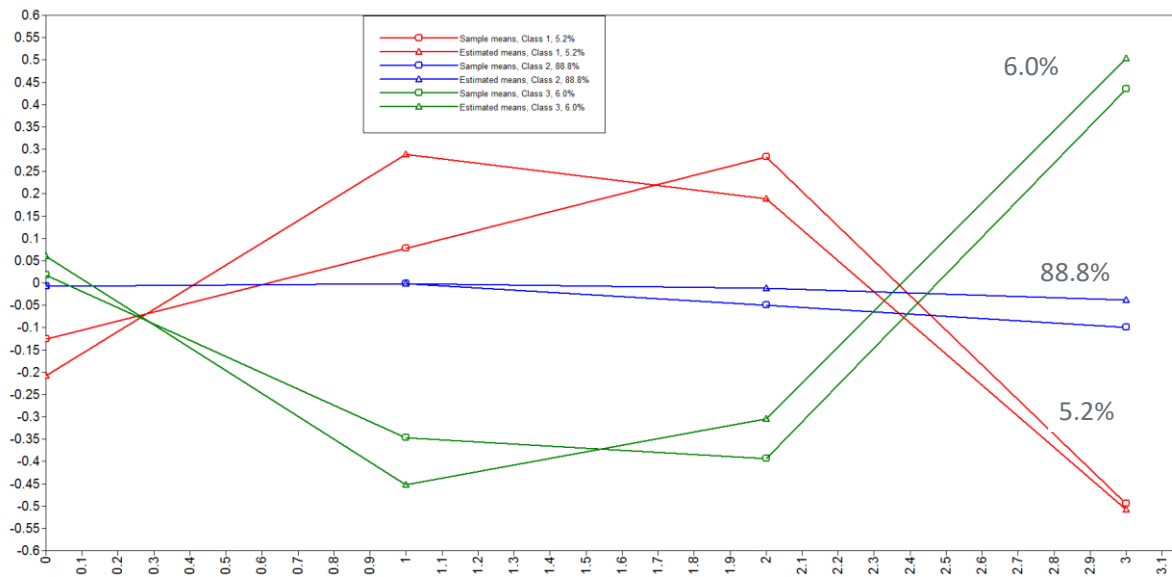
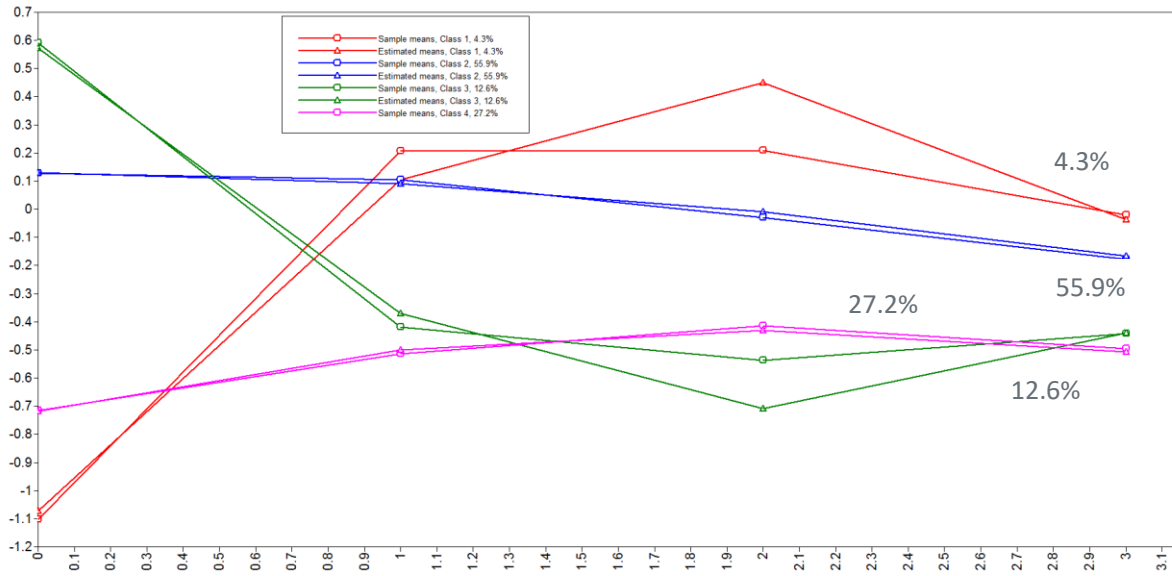


Figure 5. ANSA Factor 3 Internalizing trajectories for FEP participants (top) and controls (bottom).



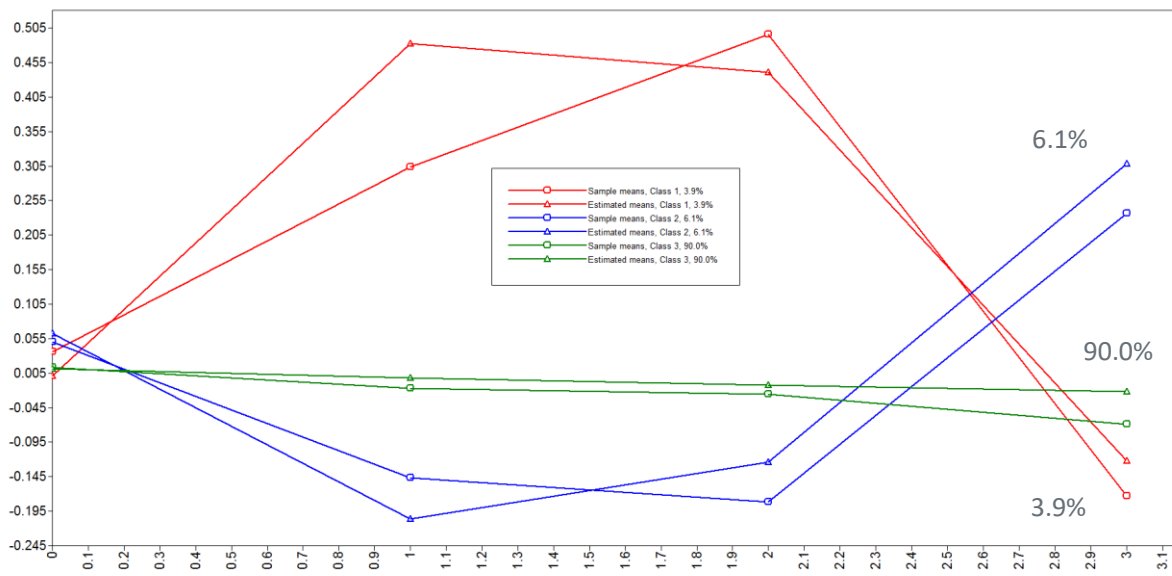
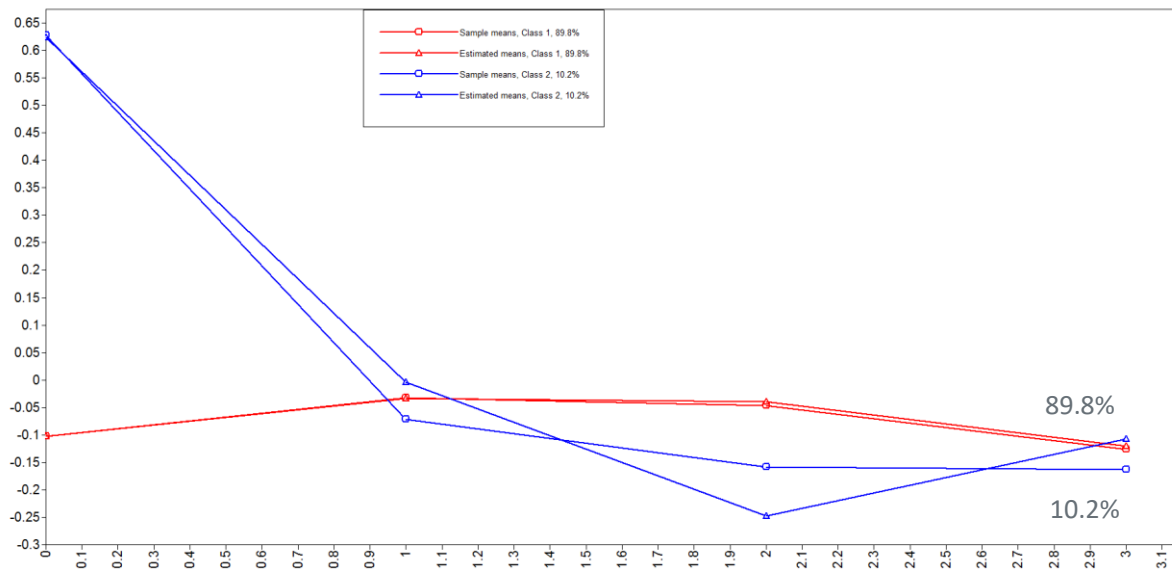


Figure 6. ANSA Factor 4 Externalizing: Disinhibition trajectories for FEP participants (top) and controls (bottom).

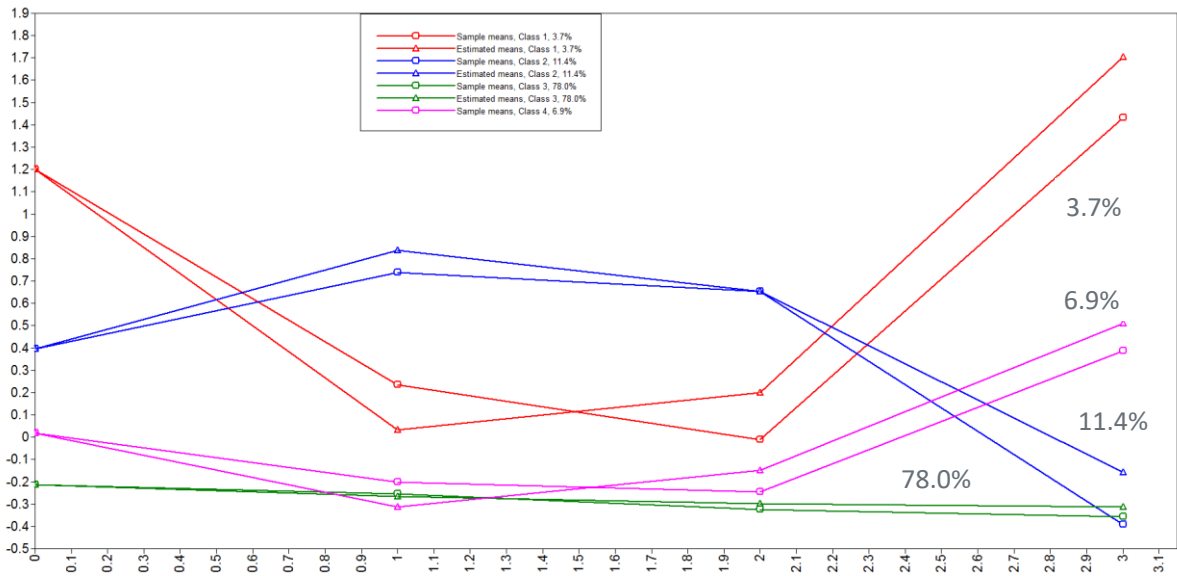
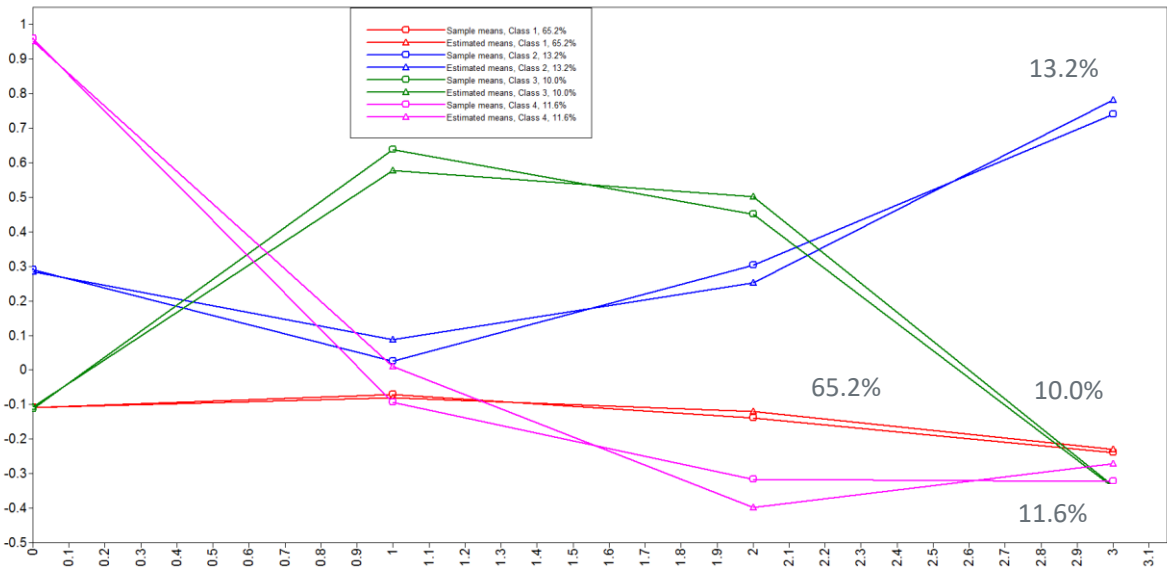


Figure 7. ANSA Factor 5 Substance Abuse trajectories for FEP participants (top) and controls (bottom).

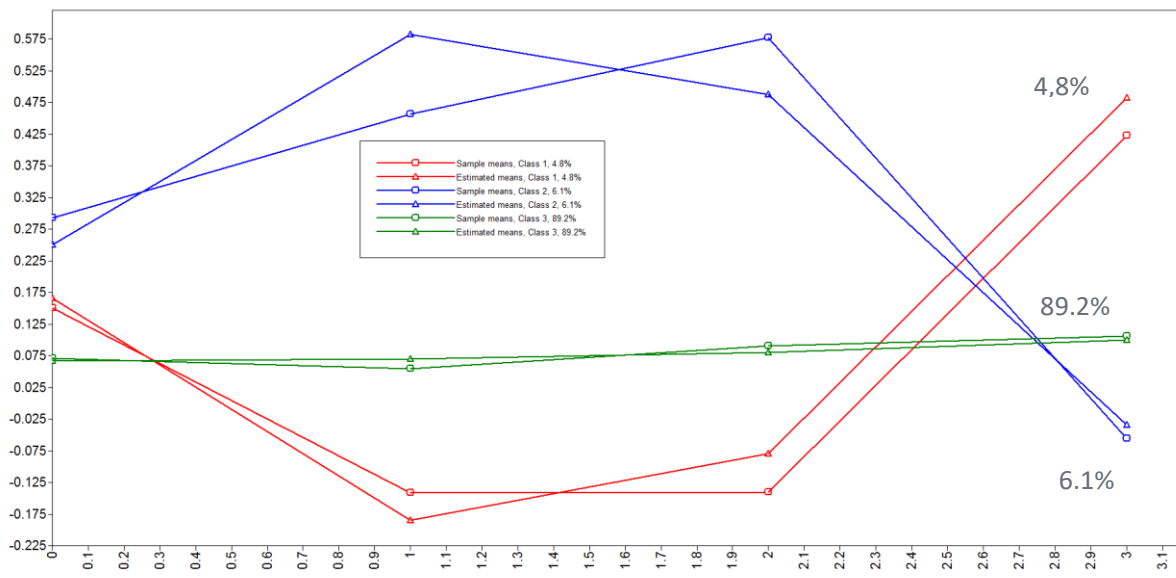
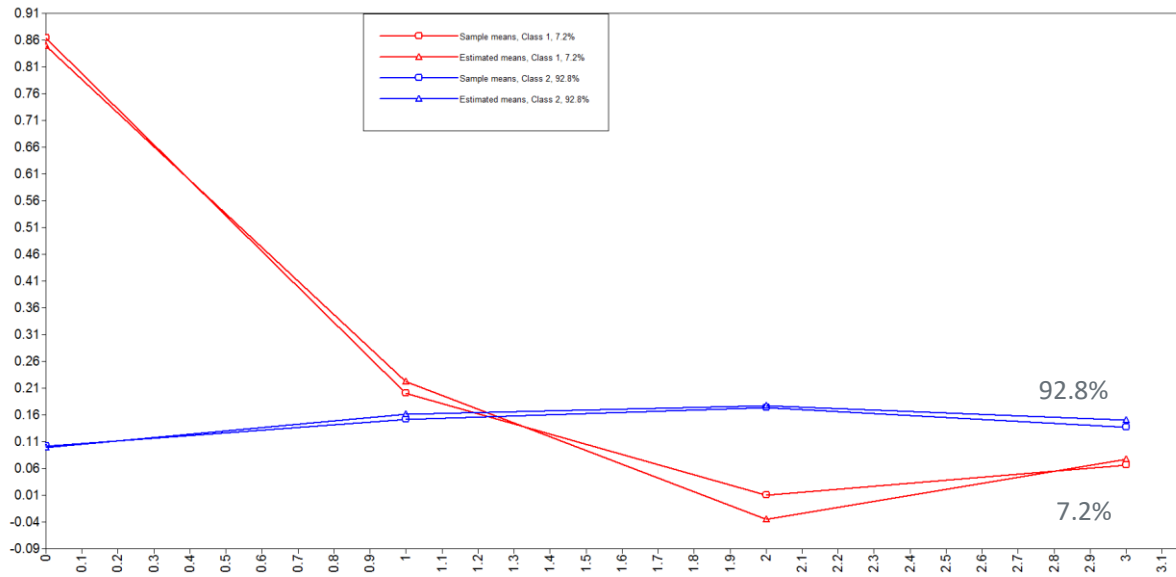


Figure 8. ANSA Factor 6 Psychotic Disturbance trajectories for FEP participants (top) and controls (bottom).

Several findings from these models are noteworthy. First, the majority of individuals for all factors except Factor 3 Internalizing were best characterized by the low-stable symptom trajectories. Second, there was a bit more heterogeneity in terms of the number of latent trajectories in the control group relative to the FEP group. Third, recovery-type trajectories are perhaps of greatest interest. In Factor 1 Instability, two trajectories showed recovery for the FEP (15.8%) and control (22.3%) groups. For Factor 2 Externalizing: Antagonism, one trajectory showed recovery for the FEP (7.7%) and control (6.2%) groups. For Factor 3 Internalizing, two trajectories showed recovery for the FEP (68.5%) group, and only one showed recovery for the control group (5.2%), a marked difference. For Factor 4 Externalizing: Disinhibition, one trajectory for each of the FEP (10.2%) and control (3.9%) groups showed recovery. For Factor 5 Substance Abuse, twice the proportion of the FEP (21.6%) group evinced a recovery trajectory relative to the control group (11.4%). Finally, for Factor 6 Psychotic Disturbance, a majority of individuals in the FEP (92.8%) and control (89.2%) groups showed low-stable symptoms. In the FEP group, the rest of the participants showed a recovery trajectory (7.2%) whereas the control group had an initial worsening followed by recovery group (6.1%) and a worsening group (4.8%). These preliminary findings suggest that the FEP program in adults may offer both more recovery benefits in a variety of psychopathology domains than the treatment-as-usual group, and may help to stabilize those with psychosis more quickly and effectively than the control group.

The small sample sizes in the younger sample of FEP participants ( $N = 28$ ) and propensity-matched controls ( $N = 28$ ) precluded estimation of more than one trajectory in GMM analyses. However, the small number of individuals in each group did allow for estimation of one-class models and plots of all participant and control trajectories. These plots for Factor 1 Internalizing, Factor 2 Instability (again, of primary interest), Factor 3 Externalizing: Antagonism, and Factor 4 Externalizing: Disinhibition are depicted in Figures 9 through 12, respectively. First, for Factors 2, 3, and 4, it appears that the control group evinces much more regression to the mean than does the FEP treatment group. It is important to recognize that the mean (0) represents the average level of psychopathology in the entire treatment-seeking sample because these factor scores were estimated using all available data, and does not represent the absence of psychopathology. Thus, it would appear that there is more evidence of recovery in FEP participants than controls (i.e., more trajectories dipping below the mean). Second, with regard to Factor 2 Instability, there appears to be more evidence of recovery in the FEP group than the control group, some chronically high symptom individuals as well, though the control group seems to show more evidence of individuals worsening over time. Given the small samples, these findings should be interpreted as suggestive but preliminary.

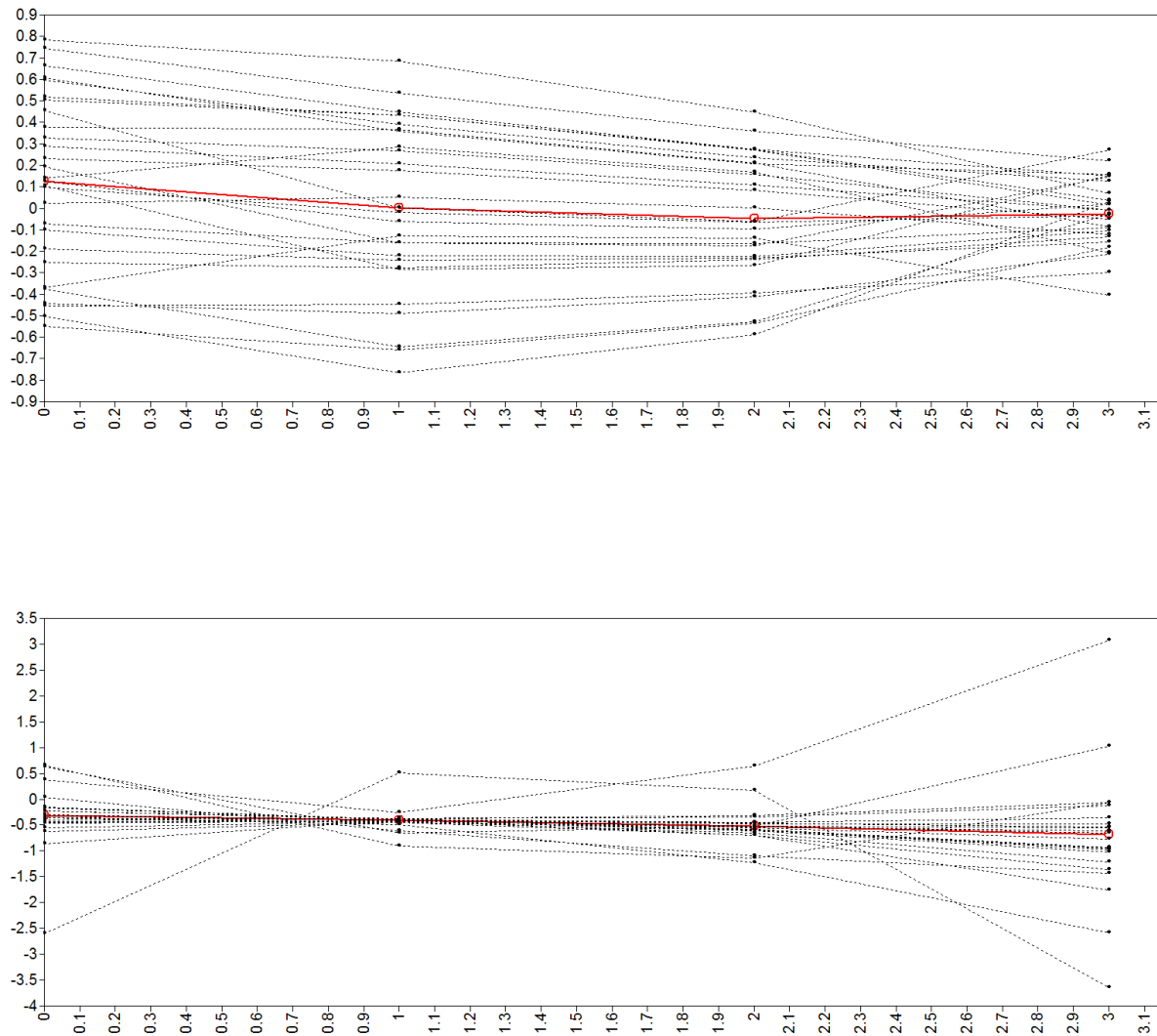


Figure 9. CANS Factor 1 Internalizing estimated means and individual trajectories for FEP participants (top) and controls (bottom).

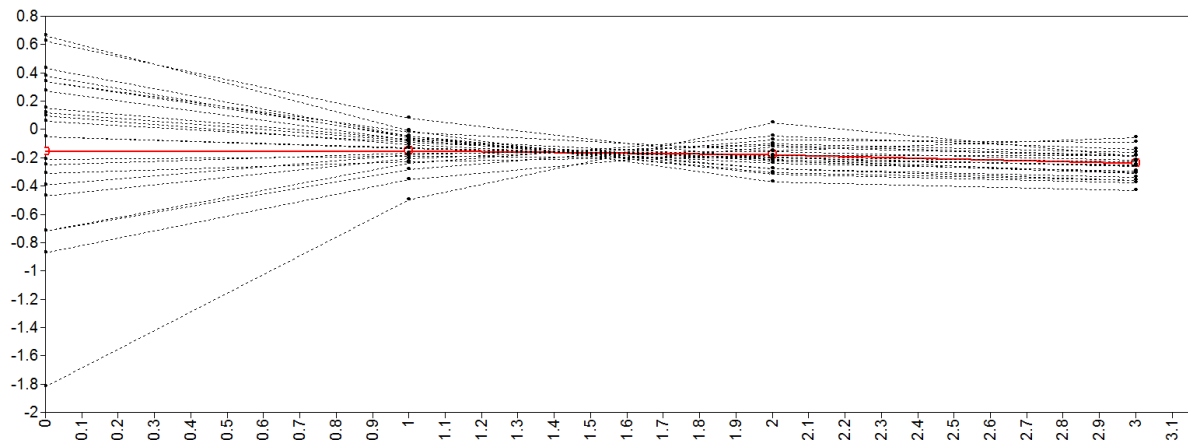
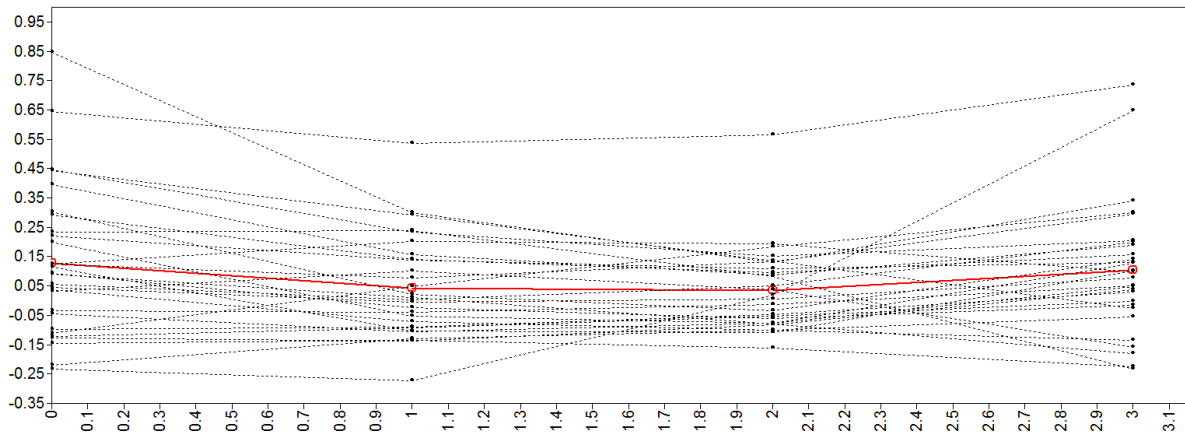


Figure 10. CANS Factor 2 Instability estimated means and individual trajectories for FEP participants (top) and controls (bottom).

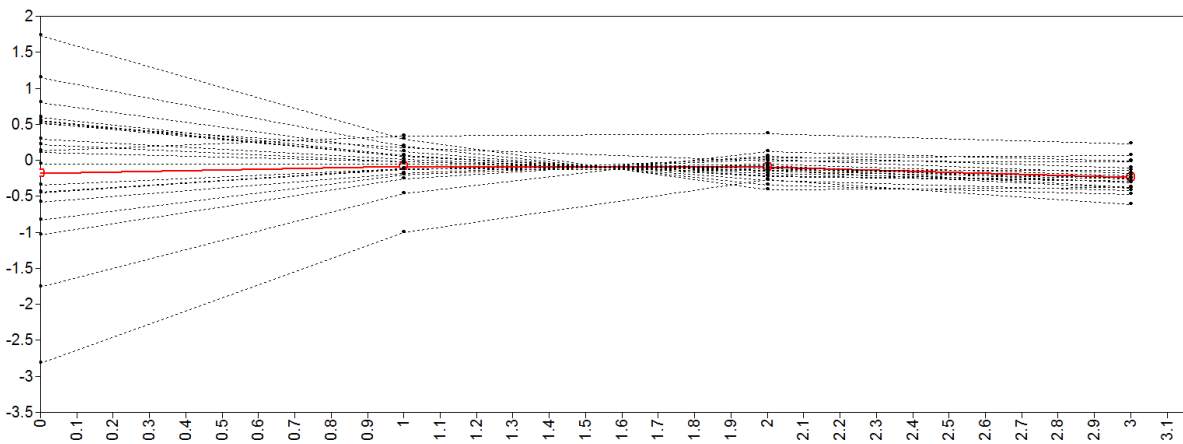
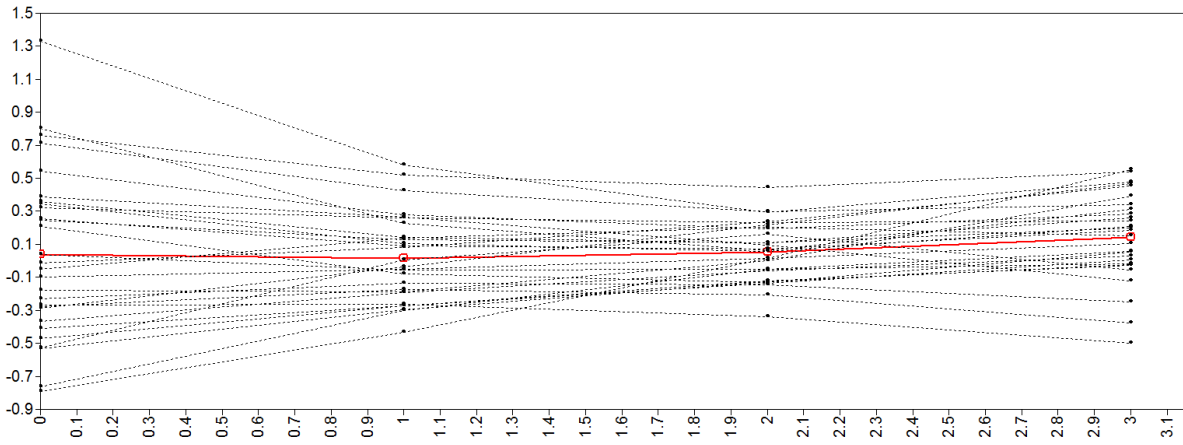


Figure 11. CANS Factor 3 Externalizing: Antagonism estimated means and individual trajectories for FEP participants (top) and controls (bottom).

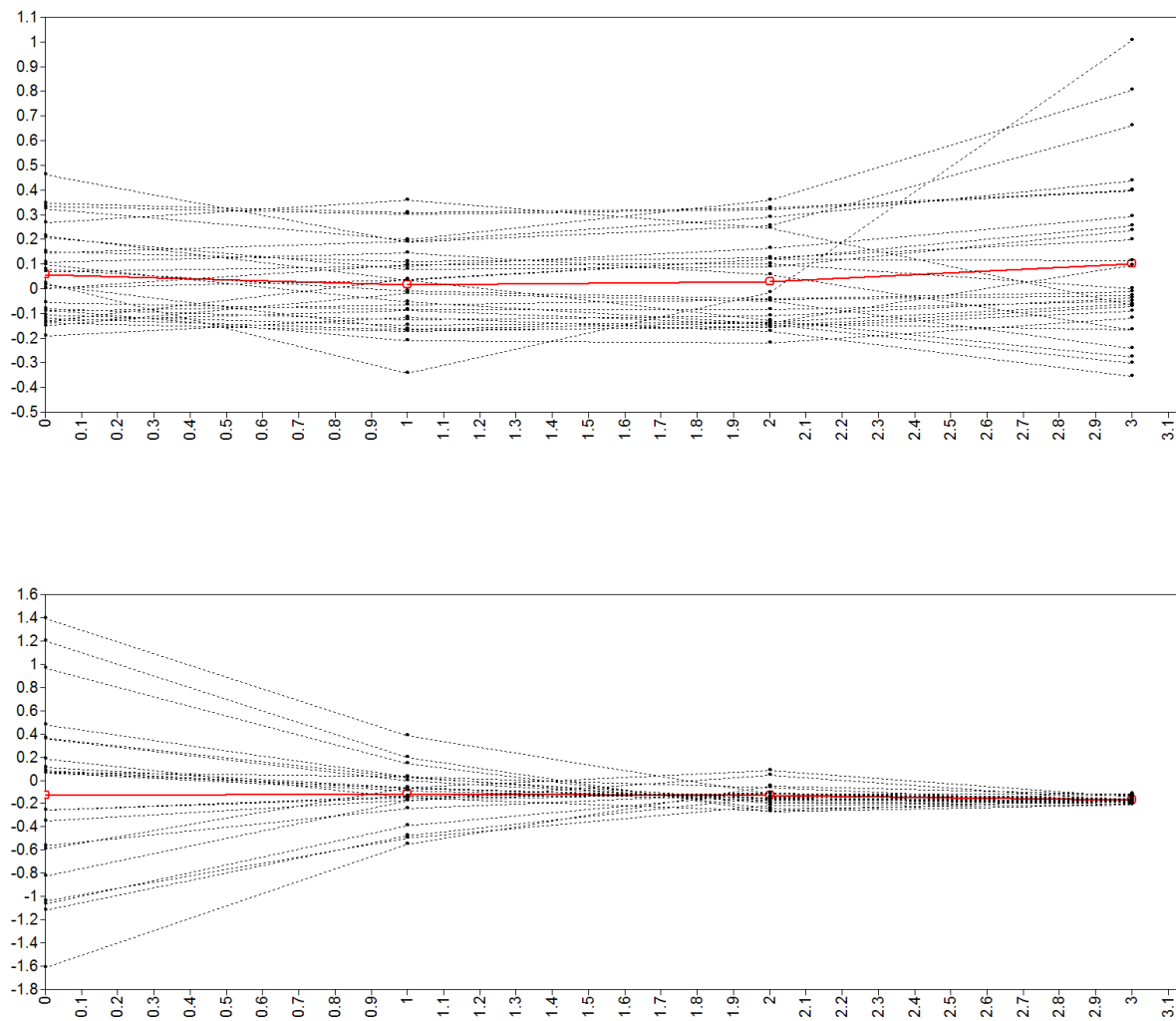


Figure 12. CANS Factor 4 Externalizing: Disinhibition estimated means and individual trajectories for FEP participants (top) and controls (bottom).



## Formative Evaluation

### Programs and Structure

*The Harris Center for Mental Health and IDD.* This center serves the Houston area. There are two teams, including a Clinical Team Leader, Therapist, Peer Support Specialist, Supported Employment and Education Specialist, Licensed Chemical Dependency Counselor, Psychiatrist, and nurse. As of 8/2/2017, 60 individuals were enrolled in the program.

*Metrocare Services.* This agency serves the Dallas area. There are two teams, each with a Team Lead, Case Manager, Supported Employment and Education Specialist, Peer Support, Licensed Professional Counselor, and one Psychiatrist serving both teams. As of 4/6/17, the agency was also trying to fill a Peer Support Specialist role, and 48 individuals were enrolled in the program.

*Bluebonnet Trails Community Services.* This agency serves counties east of Austin. The team comprises a Team Lead/Primary Clinician, Psychiatrist, Skills Trainer, Peer Support Specialist and Recovery Coach, Outreach Specialist, Supported Employment and Education Specialist, and Family Partner. As of 5/5/17, 20 individuals were enrolled in the program.

*Burke Center.* This agency serves Lufkin and surrounding areas. The team comprises a Team Lead/Primary Clinician, Skills Trainer, Supported Employment and Education Specialist, Peer Support Specialist, and Psychiatrist. As of 4/10/17, 28 individuals were enrolled in the program.

*Texas Panhandle Centers.* This agency serves Amarillo and surrounding areas. The team comprises a Team Lead, Psychiatrist, Nurse, Case Manager, Peer Support Specialist, Supported Employment and Education Specialist, and Outreach Coordinator. As of 3/21/17, 18 individuals were enrolled in the program.

*Integral Care.* This agency serves the Austin area. The team comprises a Program Lead, Primary Clinician, Skills Trainer and Administration Specialist, Peer Support Specialist, Supported Employment and Education Specialist, and Family Partner. As of 4/7/17, 37 individuals were enrolled in the program.

*Tropical Texas Behavioral Health.* This agency serves the southern-most regions of the state. The team comprises a Team Lead, Recovery Coach, Supported Employment and Education Specialist, Outreach Specialist, Peer Support Specialist, and prescriber. As of 8/1/17, 30 individuals were enrolled in the program.

*MHMR Tarrant County.* This agency serves the Fort Worth area. Representatives of this program were not available for contribution to this evaluation.

*Emergence Health Network.* This agency serves the El Paso area. The team comprises a Team Lead, Supported Employment and Education Specialist, Family Partner, Peer Support Specialist, Medication Prescriber, and Outreach Coordinator. As of 3/30/17, 14 individuals were enrolled in the program.

*The Center for Health Care Services.* This agency serves the San Antonio area. The team comprises a Team Lead, Medical Provider/Advanced Nurse Practitioner, Primary Clinician, Supported Employment and Education Specialist, Peer Support Specialist and Recovery Coach, Counselor, Family Partner, and Outreach and Recovery Specialist. As of 6/13/17, 29 individuals were enrolled in the program.

**Training.** Each of the programs utilizes the RA1SE model for training, as implemented in the OnTrackNY program. According to the RA1SE manual, *Coordinated Care for First Episode Psychosis Manual II: Implementation*, training should involve two domains: Team Training and Specialty Trainings. Team Training involves skills development for working with this population that is common to all team members, such as the program philosophy, procedures that structure the team, guide the manner in which members work together, and delegate tasks to specific roles. Specialty Trainings target responsibilities of each team member, focusing on the skills and interventions specific members use to deliver their assigned duties. The providers of team and specialty trainings for each of the sites to this point has included both OnTrackNY initial training and monthly consultations and within-agency specialty training.

The FEP teams in Texas each reported selecting OnTrackNY as their primary means of training, which includes a two-day webinar, monthly case consultation, and online training modules. The teams also report that their own agencies provide training in working with this population. These within-agency trainings covered a broad array of topics, including, but not limited to: The University of Texas cultural formulation interview, supervision and leadership training, mental health first aid, cognitive-behavioral therapy for psychosis, program management, motivational interviewing, cognitive processing therapy, trauma-focused cognitive-behavioral therapy, crisis management, treatment planning, and suicide prevention. Most providers reported that they had received ample training, but recommendations included additional training in supervision, working with individuals with psychosis in particular, and in peer support.

**Supervision.** The RA1SE implementation manual describes four types of supervision in CSC programs: administrative supervision, clinical supervision, clinical consultation, and component supervision. Administrative supervision involves oversight by the Team Lead or Program Manager to ensure that the FEP team is following procedures of the agency in which the program is embedded. Clinical supervision involves reviewing participants' status to ensure competent and adequate clinical care through discussion of techniques and activities the clinician is providing, review of tapes or progress notes, and identification of ways to enhance clinical interventions. Clinical consultation involves discussion of clients with someone from outside of the team, such as another clinician or psychiatrist in the agency. Component supervision involves bringing together team members from multiple sites to provide a forum for discussion, to share materials, resources, and successes, and to facilitate problem solving and creative thinking.

Supervision as reported by administrators and providers at the FEP program sites in Texas largely adhered to the RA1SE model of implementation. Consistent across sites were at least weekly team meetings or clinical staffings in which the whole team convenes to discuss each individual client on the caseload to track progress from the perspective of each team member. Team Leads and Program Managers described being supervised by outside administrators and providers with their respective agencies, such as medical directors, executive directors, clinical specialists, and the director of crisis services. Team Leads and Program Managers provide supervision to the team members individually as well, generally ranging from once a week to several times per month, with supervision tailored to each of the individual roles. Finally, teams reported engaging in monthly case-consultation phone meetings with providers from OnTrackNY.

### **Qualitative Results of Provider Interviews**

*Outreach.* The majority of referrals in the FEP program was attained through the agency in which the program is located. However, outreach efforts by the teams were varied, extensive, and referrals came from a variety of additional sources. Most teams did not have a dedicated Outreach Specialist at the program's initiation but have hired them more recently, so outreach efforts were often spread across team members. Outside agencies contacted included local hospitals, inpatient units, pediatricians, emergency rooms, psychiatric hospitals, high

schools, universities, jail/probation diversion programs, support groups, mobile crisis teams, outpatient clinics, health fairs, community events, town hall meetings, mental health conferences, mental health public attorneys, private attorneys, homelessness programs, and advocacy groups. Outreach activities also varied, including distribution of flyers, development of websites, presentation to various organizations, emailing clinics, setting up booths at conferences, and being on the local news program.

*Participant Enrollment.* The enrollment process for participants in the FEP program generally involves a referral, in person intake interview that often includes a symptom timeline and a CANS/ANSA, education about the program, diagnosis, seeing the prescriber, introduction to various team members, and development of a person-centered treatment plan. The Team Lead, Primary Clinician, or Psychiatrist generally conducts the intake assessment. The model calls for enrollment within seven days of referral, which some providers described as a difficult goal to meet. It also conflicts with some program's interest in gauging the potential participant's engagement prior to enrollment. The enrollment process across sites differed in the administration of standardized instruments in facilitation of screening potential clients. The CANS/ANSA and a timeline interview seemed to be the most common metrics, but more comprehensive assessments added clinician-administered and self-report clinical rating scales, such as the Positive and Negative Syndrome Scale and scales to measure suicidality, depression, bipolar disorder, and alcohol use. There were several commonly cited challenges to assessment of participants that included ensuring the potential participant had not evinced symptoms for greater than two years, ruling out substance-induced psychosis, under- or over-reporting of symptoms, and differential diagnosis more generally.

*Treatment Planning.* Treatment planning includes the client and sometimes family members and is person-centered in nature with a primary focus on the individual participant's goals. Sites varied as to which team members were present during the meeting, including the Team Lead, Primary and Rehabilitation Clinicians, Recovery Coach/Skills Trainer, Supported Employment and Education Specialist, or the entire team. Per contract, treatment plans are updated every three months or as necessary. The treatment plan evolves and changes frequently with flexibility around which services are provided and deemed necessary by the clients and providers. The treatment plan is also updated as client goals progress over the course of treatment, following the shared decision-making model of the program.

*Family Involvement.* In addition to being involved in the treatment planning process, family members are encouraged to participate in their loved one's recovery and illness management. The degree to which family members were involved varied across sites, but most providers reported that families were involved more often than not. Providers reported that there was a lot more family involvement in the FEP program than in others, and that part of their role is to become educated about the illness to help support the participant. Some sites include family therapy, family meetings, family support groups, family barbecues, and dedicated Family Partners to facilitate such activities. A social club brought together by one site helped participants and their families to meet other individuals in the program and their family members. One difference between standard care and the FEP program, as cited by a number of providers, is that the early intervention helps to glean family support because family members are not "burned out yet" from dealing with the client's illness and the mental health system. Additionally, numerous providers indicated that those FEP participants with involved family members and family support tended to have better outcomes than those without such support.

*Communication.* Perhaps differentiating CSC programs in general and the FEP program in particular from treatment-as-usual, in addition to the recovery-oriented, person-centered approach, is the extensive communication between team members. Most of the programs had the benefit of offices within close proximity to one another that greatly facilitates face-to-face communication between team members. Teams, whether located physically in proximity or not, utilize email or the phone in coordinating services and some used texts with non-sensitive information as well. Some providers reported having spreadsheets on each of their client's

schedules and progress that could be shared and viewed across team members. Coordination in terms of communication of services and client progress seems to be an integral part of the team approach to the FEP program.

*Technology in Services.* The utilization of technology in communication and provision of services varied somewhat across sites. First, some sites reported that the use of text messaging to communicate non-sensitive information with clients was highly prevalent as young adults often prefer this means of communication, whereas other agencies prohibited the use of texts. Some agencies have developed software applications that dedicate a separate phone number exclusively for communication with clients while others were in the pilot phase of application development or utilization. Another difference between sites is the use of website information for recruitment. A few programs had dedicated websites to disseminate information, educate the community, raise awareness of the FEP program, and facilitate recruitment. Most programs had information located on their agency's website. Team members in various roles reported using their laptops in client sessions to display OnTrackNY skill-building videos and webinars, help clients with resumes/applications, search for jobs, and even record music together.

*Successful Participants.* The success of participants in the program as expressed by providers included a number of themes. First, given the person-centered orientation of the program, providers deemed participants successful if they were meeting their stated goals. The next most common responses were that the participants evidenced reduced symptoms of psychosis, increased functioning, and participation in work or school. Providers also mentioned participant engagement in the program and in the community as markers of success. Participants' insight into their illnesses and management of their own care, stability in terms of housing and medical care, independent living, and evidence of "little successes" or "nuggets of success" (e.g., taking medications every day, attending support groups, making appointments) were also important to providers in monitoring achievements. As one provider noted, "our success is their success."

*Measuring Success.* At a minimum, providers reported that success was measured through improvements in the CANS and ANSA, in addition to updates to recovery plans. Providers also reported that changes in engagement in employment status and education was tracked, as well as the amount of hours of care participants are receiving, family involvement, medication adherence, hospitalizations, and state and OnTrackNY performance metrics. Several providers mentioned that the state of Texas is recommending the regular administration of the Patient Health Questionnaire depression scale (PHQ-9), the Alcohol Use Disorder Identification Test (AUDIT), and measures of suicidality, tobacco use, and body mass index. Beyond these measures of success, there were not consistent empirical metrics that were standardized methods of reflecting the recovery of participants in FEP programs across sites.

*Factors in Success.* Providers were asked to describe factors in making the program work successfully. Hiring dedicated, passionate, flexible team members capable of self-care and team collaboration was deemed highly important to the success of the program. The team members should espouse and abide by the recovery-oriented and shared decision-making modes of treatment, have positive, "roll up your sleeves" attitudes, and be able to "think outside of the box." The team approach and solid communication between team members were often cited as vital to the success of the program. Additionally, having clearly defined roles for each team member was mentioned, as was having a passionate Team Lead and administrative leadership involvement and buy-in. Commonly reported were various outreach and recruitment efforts, such as having a website, an effective Outreach Specialist, and strong community relationships in order to obtain referrals. Family involvement was deemed important as well, as it was reported that those clients with family support tended to do better in the program. Screening clients well to ensure that they met eligibility criteria, particularly not having been ill for too long, was said to be of paramount importance as both the research and the providers' experience showed that

those with greater delays in treatment tended to have poorer outcomes. Groups or social clubs were also utilized by some programs to further engage clients.

*Accomplishments.* Providers reported a number of accomplishments of which they were most proud to this point. The team members were cited as being passionate, engaged with clients and the community, and understanding of their distinctive roles within the program. Effective communication between team members and between team members and clients was also viewed as paramount to the overall strength of the program, which was facilitated in part by most agencies providing shared office space for team members. Successful outreach and recruitment efforts were also deemed major accomplishments. Seeing individuals in the program getting jobs, graduating from high school or going back to college, and staying out of the hospital and jail were important benchmarks of success for the program. In some cases, changing the mindset from seeking disability benefits to seeking education/employment was also cited as important. Successful discharges, returning to functioning at premorbid levels, engagement in group skills training, and reaching caseloads were included in descriptions of program accomplishments. One provider stated that he was amazed at the turnaround that can occur in some lives, the program increased client insight into their illnesses leading to less premature dropout from treatment, and that the program “restored his faith in some treatment modalities.” Another provider noted that many clients enter the program in dire situations, and that, while difficult to prove, prevention of suicide was his proudest accomplishment.

*Challenges to Success.* Providers were asked to describe challenges to the overall success of the FEP program. Initially, some providers stated that recruitment of participants meeting eligibility criteria was difficult. A number of providers noted lack of engagement of clients in the program as a challenge to its success. Most clients were described as being highly engaged, though some were either difficult to engage in the first place or decreased engagement once the individuals were feeling better or achieved some of their goals such as obtaining gainful employment. For these reasons, it was at times difficult to meet the aim of five hours of client contact per month for some participants. Some clients simply didn’t need that level of service after being stabilized. In rural areas as well, requiring a great deal of travel, the five-hour minimum was cited as difficult to meet. Also mentioned was the difficulty of some clients connecting with Peer Support Specialists, who were often of older age and clients may have found it challenging to relate to them. Another specific challenge mentioned was enrolling clients within seven days of referral.

*Recommendations: Design/Scope.* Providers were asked if they had any recommendations regarding the design or scope of the FEP program. Many of the providers’ comments had to do with eligibility criteria for enrollment in the program. In particular, the age range was suggested to be broadened, more often downward. The two-year limitation regarding onset of psychosis was also recommended to be relaxed. Additionally, the implementation of the program in Texas has included affective disorders with psychosis, instead of the more narrow schizophrenia and related disorders initially targeted and researched in the RA1SE initiative. At the beginning of the roll-out of the program, some providers appeared to recommend relaxation of eligibility requirements in part to facilitate recruitment but also to provide services to more people in need. However, as enrollments were filled and wait lists started, there have been recommendations to narrow the scope in terms of excluding affective psychosis in particular and possibly to add another team to their agency to meet demand. Other recommendations include reducing the five-hour service requirement when clients begin to recover, making the program more financially sustainable, including in the budget flexible funding toward basic necessities of the clients (e.g., an allowance to participate in group outings, money for transportation), and adding a housing component to the program.

*Recommendations: Implementation.* Providers were asked if they had any recommendations regarding the implementation of the FEP program. The most cited difficulty with the roll-out of the program through the state was that initially sites were selected but funding was not provided for a period, making hiring team members

challenging. Enrollment targets set up by contract were also difficult to meet at the beginning, which led to enrollment of some participants not quite suited to the program. For example, one provider noted that the RA1SE program enrolled one to two people per month, whereas the state initiative expected enrollment of 20 participants in six months. Other than this requirement, the recommendation to reduce the five-hour service requirement as participants recover, and the limitation of the scope of the program to schizophrenia and related disorders, there was not a single administrator or provider who did not think the program was running smoothly at this point.

In their own words, providers across team roles stated “I would like to see the program continue,” the program is “coming along really well,” the program is “working well,” “there is such a need for this program,” “we do a pretty good job,” that their team has “done well so far,” and “overall the program is going very well.” Team members also reported that the “team as a whole is really supportive,” that any time the team has an idea about improvements to the program, “we just do it,” and that the program is “running smoothly.” One provider noted that the “implementation is awesome” and that the program fills a niche between private practice and traditional state mental health services. Another stated that they had a good team and described members as “passionate,” while another reported that they were “really glad to be a pilot site” and that the FEP program is “consistent with the direction we want to go with all of our programs.”

## **Harmonizing Data Collection in Community-Based Treatment Programs**

The FEP programs in Texas to date have utilized a variety of methods for measuring the success of participants, using the CANS/ANSA at a minimum, tracking progress in records, keeping spreadsheets regarding client goals, and administering some clinical rating scales. In this evaluation, we used CANS/ANSA data from FEP participants and propensity-matched controls to gauge the success of the program in reducing clinical symptomatology relative to standard care. The more comprehensive quantitative analysis for next year’s report will likely use similar techniques, however, preferably with additional quantitative assessment tools to the CANS/ANSA that are standardized across FEP program sites. Our team initially planned to identify a battery of validated instruments that could be used for this purpose in Texas; however, we have become aware of a national effort to standardize assessment motivated by the NIMH that could place findings in Texas regarding the effectiveness of the FEP program in a national context.

Representatives from states with CSC programs for FEP have been invited to participate in a meeting at NIMH entitled “Harmonizing Data Collection in Community-Based Treatment Programs for First Episode Psychosis,” including members of the current evaluation team. The goal of the meeting is to learn how key aspects of CSC programs for FEP are currently being measured, and to define a core battery of measures that can be feasibly assessed uniformly across FEP sites. Additionally, NIMH is developing an Early Psychosis Intervention Network (EPINET) based on the principals of common measures, standardized data collection, and integration of data across sites. Pooled data can then be analyzed to evaluate strengths and weaknesses of the FEP program in general, and possibly to compare the success of the FEP programs in Texas to programs around the country. A major potential barrier to standardized measurement in FEP programs is the time and effort required by providers to conduct these additional activities. A goal of this team’s evaluation for next year is to promote buy-in from stakeholders, and the national effort to evaluate the success of FEP programs may be beneficial in this regard.

## Conclusions

Preliminary empirical findings regarding the overall effectiveness of the FEP program are largely positive. In order to evaluate the effectiveness of the program, we utilized cutting-edge structural modeling and GMM techniques that revealed a variety of means of assessing the program's effectiveness. First, the ANSA factor analyses showed that emotional and behavioral problem items can be organized in a coherent way, and that these symptomatology dimensions evinced differential change over time. Very little change in the full sample of 18- to 30-year-olds in standard care was shown, and significant worsening over time in the Psychotic Disturbance factor actually occurred. In contrast, comparing the FEP participants to propensity-matched controls revealed either recovery or stabilization of symptoms as opposed to the control group that showed one group worsening by Time 4, another group initially worsening and getting better by Time 4, and a third stable group. Prevention of escalation of symptoms in the FEP group is a major success relative to the typical escalation of symptoms in the sample as a whole. Indeed, the FEP participants evinced more recovery and less worsening of symptoms across a variety of psychopathological domains. Future work can evaluate trajectories over more time points given the length of the FEP program and more individuals being assessed at later time points.

The adolescent sample was considerably smaller and therefore findings regarding the effectiveness of the FEP program in this population should be considered exploratory. Again, CANS emotional and behavioral problems were found to be organized into clinically meaningful symptomatology dimensions. Propensity matching on these dimensions between FEP participants and controls was less successful than in adults, so again a measure of caution should be taken in interpreting results. However, in the full CANS sample, there was more evidence of decreases in symptom dimensions over time in treatment as usual conditions than in adults, particularly on the Internalizing dimension and the Instability dimension, on which the psychosis item loaded. The trajectory analyses revealed a great deal of regression toward the mean in the control group, and less evidence of recovery than the FEP group. There was much more evidence of movement in the FEP intervention group, with more trajectories falling below the average symptomatology line in this group than the control group. In contrast, the regression toward the mean in controls suggests that standard care may simply return most individuals to their baseline symptomatology levels. In next year's evaluation, a larger sample size will provide opportunities to explore this phenomenon in greater detail in the younger sample.

The formative evaluation gleaned a number of insights through conversations with approximately forty administrators and providers of FEP services in adolescents and young adults. First, the programs uniformly selected OnTrackNY as their training model and have adhered to the implementation of the model to the best of their ability, while balancing state contractual agreements. Second, programs evinced some difficulty in meeting rate of recruitment demands at initial roll-out in part owing to the state's delay in funding following initial identification of pilot sites. Third, outreach and recruitment efforts to enroll participants and educate the community about early psychosis have been extensive, varied, and each team reported meeting full enrollment and some required the addition of a wait list. Fourth, there were some challenges in assessing the appropriateness of individuals for the FEP program because of the nature of the criteria, and some disagreement as to whether the age requirements and inclusion of affective psychosis were ideal. Fourth, communication between team members about client progress and family involvement in the program lead to improvements in subjective participant outcomes, and, in addition to the person-centered, recovery-oriented, and team approaches, appeared to be factors influencing the differentiation from standard care and the overall success of the FEP program. Fifth, engagement of some clients was said to be a challenge to the success of the program, and in particular, meeting five-hour service requirements for all clients particularly after initial recovery may be a bit stringent. Sixth, the success of participants in the program and the program as a whole was primarily measured using the CANS/ANSA, but other instruments for assessment were not standardized across sites. Finally, and

perhaps most importantly, administrators and providers reported being passionate about the program and unanimously stated that the FEP program is working well for their clients.

## Recommendations

Based on the initial evaluation, TIEMH makes the following recommendations:

1. Given evidence of the international, national, and state success of CSC programs in the treatment of FEP, in addition to preliminary findings reported herein, it is highly recommended that this pilot program continues to receive funding in the state of Texas.
2. The CANS and ANSA clinical and behavior problems items evince higher order structures of psychopathological dimensions that should be considered to be utilized in future analyses of state intervention outcomes.
3. This is the first implementation study of its kind to utilize GMM analytic techniques in the evaluation of trajectories of clinical symptomatology, which may facilitate the way outcomes are assessed in future studies.
4. Recovery from symptomatology and stabilization of symptoms should be considered benchmarks of success as opposed to regression to the population mean which is not an absence of psychopathology in treatment-seeking samples.
5. Utilization of the CANS/ANSA in identifying eligible participants for the FEP program, tracking progress, and measuring success may be inadequate, and further standardized assessment techniques may benefit the program and evaluation of its effectiveness.
6. State funding should be considered to compensate for the time providers spend engaging in formal psychological testing using such standardized instruments.
7. The state should consider evaluating the effectiveness of the FEP program for persons with affective psychosis as well as schizophrenia and related disorders using empirical evidence. The RA1SE model has been supported serving the latter, and there may be opportunity to show that the model is also effective in individuals with affective psychosis.
8. The state should consider reducing the number of required service hours per month as participants progress through the program and have other responsibilities such as gainful employment and education.
9. The state should consider including in the budget a flexible funding pool for FEP participants in order to engage in group activities and meet person-centered goals.
10. Given subjective evidence that family support and involvement is associated with improved outcomes, more of the FEP sites should include a Family Partner on their teams.
11. If agency regulations allow, software applications to allow communication via text messages should be implemented across more sites. Best practice agency policies should be shared to foster agency changes around the use of technology.
12. If agency regulations allow, dedicated websites should be implemented to facilitate education to the community and recruitment efforts.
13. Monthly consultation calls with OnTrackNY providers should be continued.



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