Supplementary material

Figure S1. Boxplot to show the distribution of the adolescent rated (WAI-S) and Therapists' rated (WAI-S-T) overall alliance for each treatment arm across time
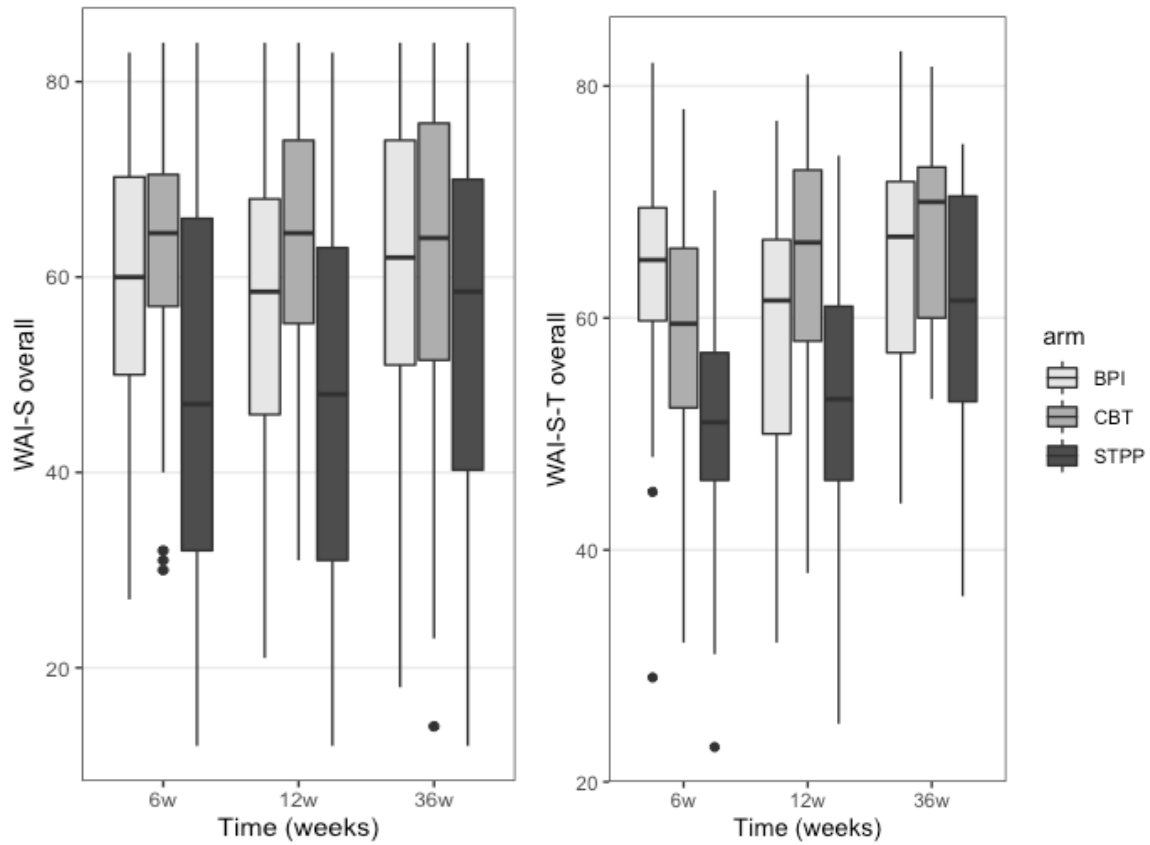
Figure S2. Spaghetti plot of the observed trajectory of youth-rated and therapist-rated alliance mean overall score
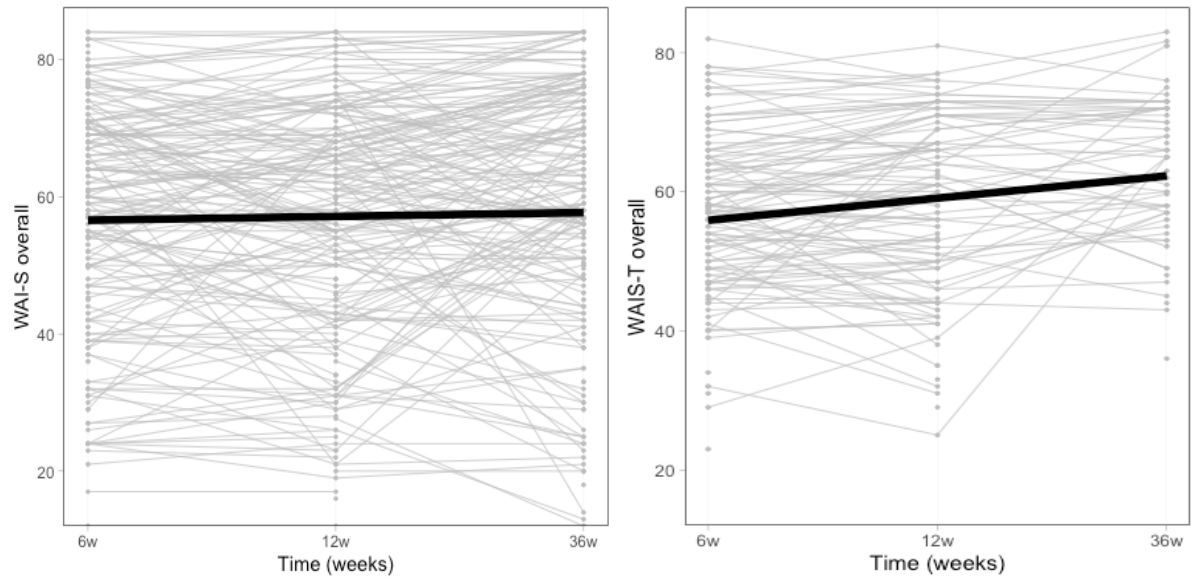

Figure S3. Spaghetti plot of the observed trajectory of youth-rated alliance mean overall Bond score
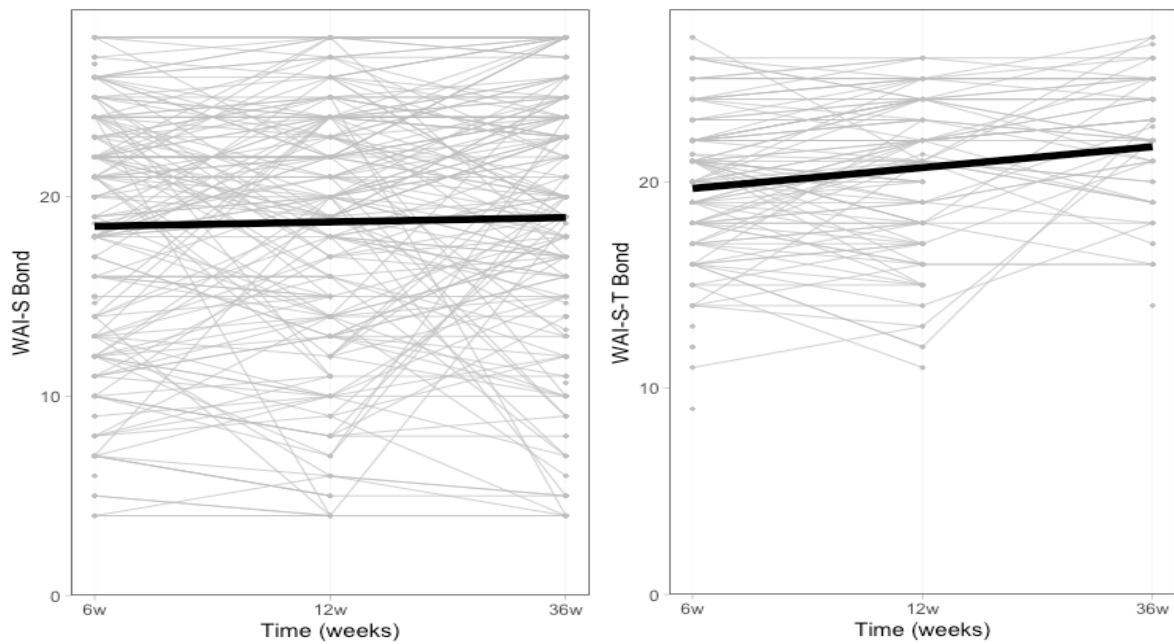

Figure S4. Spaghetti plot of the observed trajectory of youth-rated alliance mean overall Collaboration score
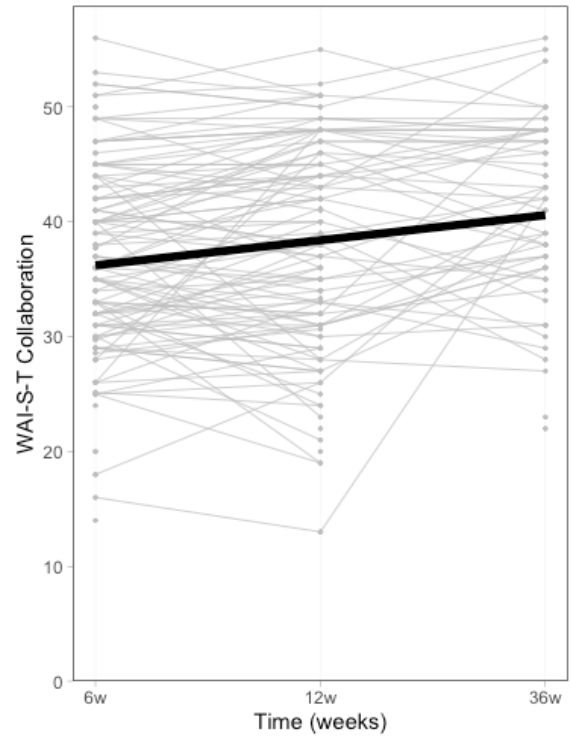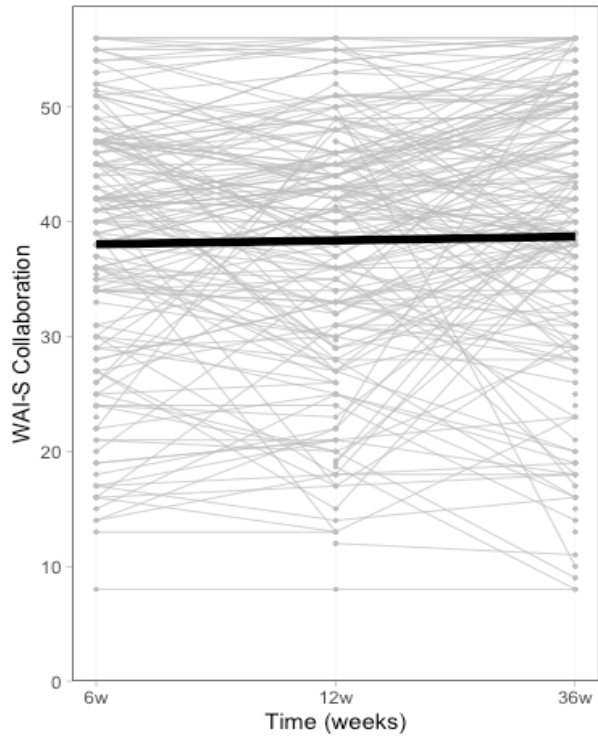
Table S1. Model comparison of the categorical and linear three-level models using time and treatment arm as predictors of the WAI-S and WAI-S-T scores with random intercept and slope

Sample	D.V.	Model	df	AIC	BIC	logLik	L.Ratio	p
WAI-S	WAI-S overall	Linear	11	5591.31	5641.24	-2784.65		
		Discrete	18	5602.01	5683.72	-2783.00	3.30	0.856
	WAI-S collabor.	Linear	11	5050.66	5100.60	-2514.33		
		Discrete	18	5061.01	5142.72	-2512.50	3.66	0.819
	WAI-S bond	Linear	11	4245.21	4295.14	-2111.60		
		Discrete	18	4255.21	4336.92	-2109.61	4.00	0.780
WAI-S-T	WAI-S-T overall	Linear	11	2352.82	2394.31	-1165.41		
		Discrete	18	2354.50	2422.39	-2422.39	12.32	0.091
	WAI-S-T collabor.	Linear	11	2159.95	2201.44	-1068.98		
		Discrete	18	2162.13	2230.02	-1063.07	11.82	0.107
	WAI-S-T bond	Linear	11	1591.68	1633.17	-784.84		
		Discrete	18	1599.96	1667.84	-1667.84	5.72	0.573

Table S2. Comparison between the linear three-level model including the interaction term between alliance and time and the simple model without interaction

Sample	D.V.	Model	df	AIC	BIC	logLik	L.Ratio	p
WAI-S	*WAI-S overall*	Model 1	11	5591.306	5641.241	-2784.65		
		Model 2	13	5588.341	5647.356	-2781.17	6.96	0.030
	WAI-S collabor.	Model 1	11	5050.663	5100.598	-2514.33		
		Model 2	13	5046.34	5100.355	-2510.17	8.32	0.015
	WAI-S bond	Model 1	11	4245.208	4295.144	-2111.60		
		Model 2	13	4245.672	4304.687	-2109.84	3.54	0.170
WAI-S-T	*WAI-S-T overall*	Model 1	11	2352.822	2394.308	-1165.41		
		Model 2	13	2355.856	2404.885	-1164.93	0.97	0.966

WAI-S-T collabor.	Model 1	11	2159.954	2201.439	-1068.98		
	Model 2	13	2162.883	2211.912	-1068.44	1.07	0.586
WAI-S-T bond	Model 1	11	1591.68	1633.165	-784.84		
	Model 2	13	1594.202	1643.23	-784.10	1.48	0.477

Table S3. Model comparison of the discrete and linear three-level models using time and treatment arm as predictors of the WAI-S and WAI-S-T scores with random intercept and slope for cases with alliance ratings at all 3 time points

Sample	D.V.	Model	df	AIC	BIC	logLik	L.Ratio	p
WAI-S (n=109)	*WAI-S overall*	Linear	11	2588.539	2630.229	-1283.27		
		Discrete	18	2598.166	2666.385	-1281.08	4.37	0.736
	WAI-S collabor.	Linear	11	2331.442	2373.131	-1154.72		
		Discrete	18	2342.26	2410.48	-1153.13	3.18	0.868
	WAI-S bond	Linear	11	1969.68	2011.37	-973.84		
		Discrete	18	1976.222	2044.441	-970.11	7.45	0.383
WAI-S-T (n=51)	*WAI-S-T overall*	Linear	11	1093.922	1127.257	-535.96		
		Discrete	18	1101.302	1155.85	-532.65	6.62	0.469
	WAI-S-T collabor.	Linear	11	1003.176	1036.51	-490.59		
		Discrete	18	1010.551	1065.099	-487.28	6.62	0.469
	WAI-S-T bond	Linear	11	731.2933	764.6281	-354.65		
		Discrete	Failed to converge					

Table S4 Comparison between the linear three-level model including the interaction term between alliance and time and the simple model without interaction for cases with alliance ratings at all 3 time points

Sample	D.V.	I.V	df	AIC	BIC	logLik	L.Ratio	p

WAI-S (n=109)	*WAI-S overall*	Model 1	11	2590.406	2639.676	-1283.27		
		Model 2	13	2588.539	2630.229	-1282.20	2.13	0.344
	WAI-S collabor.	Model 1	11	2331.544	2380.813	-1154.72		
		Model 2	13	2331.442	2373.131	-1153.27	2.90	0.235
	WAI-S bond	Model 1	11	1969.680	2011.37	-973.84		
		Model 2	13	1972.152	2016.422	-973.58	0.528	0.768
WAI-S-T (n=51)	*WAI-S-T overall*	Model 1	11	1093.922	1127.257	-535.96		
		Model 2	13	1096.658	1136.054	-535.33	1.26	0.532
	WAI-S-T collabor.	Model 1	11	1003.176	1036.51	-490.59		
		Model 2	13	1004.920	1044.316	-489.46	2.26	0.324
	WAI-S-T bond	Model 1	11	731.293	764.6281	-354.65		
		Model 2	13	734.878	774.2739	-354.44	0.42	0.813

Table S5. Sensitivity analyses: estimates from multilevel models predicting adolescent ratings of the WAI-S: Total score, Collaboration Subscale, and Bond Subscale (n=109).

Variables	WAI-S overall			WAI-S Collaboration			WAI-S Bond		
	Estimate	SE	p	Estimate	SE	p	Estimate	SE	p
Fixed effect									
Intercept	47.64	2.72	0.000	31.63	1.72	0.000	15.93	1.00	0.000
Time	0.14	0.07	0.050	0.11	0.05	0.048	0.03	0.02	0.145
Arm (ref: STPP)									
Arm: BPI	12.44	3.74	0.001	8.98	2.37	0.000	3.57	1.40	0.017
Arm: CBT	16.83	3.69	0.000	12.11	2.34	0.000	4.78	0.04	0.001
Time*BPI	-0.10	0.10	0.333	-0.08	0.07	0.269	-0.03	0.04	0.499
Time*CBT	-0.17	0.10	0.051	-0.13	0.07	0.049	-0.04	0.04	0.285
Random effect (level 3)		SD			SD			SD	

intercept	3.61	2.29	0.91
time	0.02	0.00	0.01
Random effect (level 2)	SD	SD	SD
Intercept	11.66	7.51	4.81
Time	0.28	0.20	0.09
Residual (level 1)	7.63	5.21	3.18

Table S6. Sensitivity analyses: estimates from multilevel models predicting adolescent ratings of the WAI-S-T: Total score, Collaboration Subscale, and Bond Subscale (n=51).

Variables	Linear Model			WAI-S-T Collaboration			WAI-S-T Bond		
	b	SE b	p	Estimate	SE	p	Estimate	SE	p
Fixed effect									
Intercept	55.69	2.13	0.000	35.84	1.59	0.000	19.78	0.65	0.000
Time	0.13	0.05	0.013	0.09	0.04	0.025	0.05	0.02	0.004
Arm (ref: STPP)									
Arm: BPI	6.80	3.42	0.057	5.98	2.57	0.028	0.68	1.03	0.509
Arm: CBT	8.16	3.09	0.014	5.35	2.33	0.030	2.85	0.93	0.005
Random effect (level 3)	SD			SD			SD		
intercept	3.50			2.48			1.53		
time	0.15			0.10			0.04		
Random effect (level 2)	SD			SD			SD		
Intercept	8.84			6.67			2.23		
Time	0.18			0.14			0.06		
Residual (Level 1)	5.09			3.78			1.62		