

## SUPPLEMENTAL TABLES

**Table 1. Fixed and Random Effects Estimates for Models of the Predictors of Depression**

Parameter	RE ANOVA	Fixed	Random	Model 1	Model 2	Model 3	Model 4	Model 5
<b>Fixed Effects</b>								
Intercept	17.79 (0.48)	20.81 (0.56)***	20.81 (0.50)***	20.56 (0.51)***	20.64 (0.51)***	18.15 (1.24)***	17.78 (1.30)***	18.15 (1.24)***
<b>Level 1</b>								
Time		-2.13 (.20)***	-2.12 (0.22)***	-1.94(0.22)***	-1.96 (0.22)***	-1.96 (0.22)***	-1.52 (0.47)**	-1.96 (0.22)***
<b>Sleep Problems</b>				0.97 (0.18)***	0.61 (0.32)	0.60 *0.32)	0.42 (0.47)	0.60(0.32)
Time * Sleep Problems					0.25 (0.18)	0.25 (0.18)	0.24 (0.18)***	0.25 (0.18)
<b>Level 2</b>								
Treatment Group - CBT-AD						-2.74 (1.21)*	-2.59 (1.31)*	-2.73 (1.21)*
Treatment Group - ISP-AD						-0.99 (1.21)	0.24 (1.31)	-0.99 (1.21)
<b>Between Person Sleep Problems</b>						1.51 (0.32)***	1.51 (0.32)***	1.51 (0.32)***
<b>Cross Level Interactions</b>								
Sleep Problems * CBT-AD							0.001 (0.48)	
Sleep Problems * ISP-AD							0.43 (0.47)	
Time * CBT-AD							-0.15 (0.58)	
Time *ISP-AD							-0.92 (0.58)	
<b>Random Effects</b>								
Intercept	40.84 (6.39)	41.90 (6.47)	30.31 (5.51)	33.16 (5.76)	32.55 (5.71)	26.98 (5.19)	26.51 (5.14)	26.98 (5.20)
Time			2.31 (1.52)	2.35 (1.53)	2.28 (1.51)	2.28 (1.51)	2.16 (1.47)	2.27 (1.51)
Residual	52.60 (7.25)	45.16 (6.72)	41.33 (6.43)	39.09 (6.25)	39.26 (6.27)	39.26 (6.27)	39.34 (6.27)	39.26 (6.27)
ICC for Random Effects Model	0.437							
2*log likelihood	6287.3	6185.5	6166.1	6138.1	6137.8	6107.5	6100.5	6107.5

**Notes:** Parameter estimates and standard errors are reported for each variable. Bolded lines are predictors of interest.

Sleep problems are within-person sleep problems (sleep problems centered within each person) and between person sleep problems are labeled in table.

Model 5 represents the final model as presented in the main table within text and results section within the manuscript.

Key: \*\*\* p<.001, \*\*p<.01, \*p<.05

**Table 2. Fixed and Random Effects Estimates for Models of the Predictors of General Health**

Parameter	RE ANOVA	Fixed	Random	Model 1	Model 2	Model 3	Model 4	Model 5
<b>Fixed Effects</b>								
Intercept	48.09 (1.28)	44.24 (1.42)***	44.22 (1.37)***	44.40 (1.37)***	44.51 (1.38)***	50.87 (3.47)***	51.32 (3.62)***	50.74 (3.46)***
<b>Level 1</b>								
Time		2.75 (0.45)***	2.76 (0.49)***	2.65 (0.50)***	2.62 (0.50)***	2.61 (0.50)***	2.25 (1.08)*	2.63 (0.50)***
<b>Sleep Problems</b>								
Time * Sleep Problems				-0.69 (0.40)	-1.22 (0.75)	-1.27 (0.74)	-2.03 (1.07)	-2.90 (0.88)**
<b>Level 2</b>								
Treatment Group - CBT-AD						0.04 (3.37)	-1.08 (3.66)	0.06 (3.37)
Treatment Group - ISP-AD						3.14 (3.37)	3.24 (3.66)	3.09 (3.37)
<b>Between Person Sleep Problems</b>								
						-2.91 (0.88)**	-2.92 (0.88)**	-2.90 (0.86)**
<b>Cross Level Interactions</b>								
Sleep Problems * CBT-AD							1.17 (1.08)	
Sleep Problems * ISP-AD							0.64 (1.07)	
Time * CBT-AD							1.02 (1.35)	
Time *ISP-AD							-0.14 (1.35)	
<b>Random Effects</b>								
Intercept	320.6 (17.91)	320.1 (17.89)	303.35 (17.42)	302.77 (17.40)	305.12 (17.47)	288.22 (16.98)	287.51 (16.96)	285.97 (16.91)
Time			13.99 (3.74)	13.52 (3.68)	14.32 (3.78)	14.37 (3.79)	14.42 (3.80)	13.51 (3.68)
Residual	231.5 (15.22)	219.7 (14.82)	196.57 (14.02)	195.94 (14.00)	194.87 (13.96)	194.75 (13.96)	195.31 (13.98)	195.91 (14.00)
ICC for Random Effects Model	0.5806							
2*log likelihood	7660.2	7623.3	7613.2	7591.8	7591.0	7570.1	7560.2	7571.0

**Notes:** Parameter estimates and standard errors are reported for each variable. Bolded lines are predictors of interest.

Sleep problems are within-person sleep problems (sleep problems centered within each person) and between person sleep problems are labeled in table.

Model 5 represents the final model as presented in the main table within text and results section within the manuscript.

Key: \*\*\* p<.001, \*\*p<.01, \*p<.05

**Table 3. Fixed and Random Effects Estimates for Models of the Predictors of Cognitive Health**

<b>Parameter</b>	<b>RE ANOVA</b>	<b>Fixed</b>	<b>Random</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>	<b>Model 5</b>
<b><u>Fixed Effects</u></b>								
Intercept	58.20 (1.31)	54.96 (1.46)***	54.95 (1.51)***	55.28 (1.51)***	55.41 (1.52)***	62.92 (3.61)***	63.13 (3.94)***	62.75 (3.61)***
<b><u>Level 1</u></b>								
Time		2.32 (0.46)***	2.32 (0.48)***	2.11 (0.49)***	2.08 (0.49)***	2.06 (0.488)***	1.95 (1.06)	2.09 (0.49)***
<b><u>Sleep Problems</u></b>								
Time * Sleep Problems				-1.46 (0.41)***	-2.04 (0.78)**	-2.06 (0.78)**	-1.29 (1.13)	-1.46 (0.41)***
					0.38 (0.44)	0.40 (0.43)	0.40 (0.44)	
<b><u>Level 2</u></b>								
Treatment Group - CBT-AD						1.80 (3.47)	1.47 (4.09)	1.82 (3.47)
Treatment Group - ISP-AD						-0.85 (3.47)	-1.03 (4.09)	-0.89 (3.46)
<b><u>Between Person Sleep Problems</u></b>								
						-2.99 (0.92)**	-3.00 (0.92)**	-2.98 (0.92)**
<b><u>Cross Level Interactions</u></b>								
Sleep Problems * CBT-AD							-0.92 (1.12)	
Sleep Problems * ISP-AD							-1.04 (1.12)	
Time * CBT-AD							0.18 (1.32)	
Time *ISP-AD							0.07 (1.32)	
<b><u>Random Effects</u></b>								
Intercept	336.1 (18.33)	337.2 (18.36)	382.61 (19.56)	387.81 (19.69)	389.03 (19.72)	375.71 (19.38)	376.73 (19.41)	374.55 (19.35)
Time			6.76 (2.60)	6.77 (2.60)	7.18 (2.68)	7.43 (2.73)	7.70 (2.78)	7.00 (2.64)
Residual	242.7 (15.58)	234.1 (14.30)	222.68 (14.92)	218.74 (14.79)	217.99 (14.76)	217.61 (14.75)	218.26 (14.77)	218.38 (14.78)
<b>ICC for Random Effects Model</b>								
	0.5806							
<b>2*log likelihood</b>								
	7701.2	7676.3	7673.8	7643.8	7642.8	7621.2	7612.5	7622.2

**Notes:** Parameter estimates and standard errors are reported for each variable. Bolded lines are predictors of interest.

Sleep problems are within-person sleep problems (sleep problems centered within each person) and between person sleep problems are labeled in table.

Model 5 represents the final model as presented in the main table within text and results section within the manuscript.

Key: \*\*\* p<.001, \*\*p<.01, \*p<.05

**Table 4. Fixed and Random Effects Estimates for Models of the Predictors of Pain**

<b>Parameter</b>	<b>RE ANOVA</b>	<b>Fixed</b>	<b>Random</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>	<b>Model 5</b>
<b><u>Fixed Effects</u></b>								
Intercept	58.33 (1.37)	56.20 (1.55)***	56.21 (1.55)***	56.36 (1.56)***	56.30 (1.57)***	65.34 (3.75)***	62.77 (4.02)***	65.40 (3.74)***
<b><u>Level 1</u></b>								
Time		1.52 (0.51)**	1.52 (0.54)**	1.43 (0.55)**	1.45 (0.55)**	1.42 (0.55)*	3.27 (1.19)**	1.41 (0.55)*
<b>Sleep Problems</b>				-0.65 (0.46)	-0.36 (0.87)	-0.43 (0.86)	-1.55 (1.24)	-0.65 (0.46)
Time * Sleep Problems					-0.20 (.47)	-0.15 (0.75)	-0.07 (0.49)	
<b><u>Level 2</u></b>								
Treatment Group - CBT-AD						0.15 (3.61)	3.86 (4.13)	0.15 (3.61)
Treatment Group - ISP-AD						3.61 (3.61)	6.43 (4.13)	3.63 (3.61)
<b>Between Person Sleep Problems</b>						-4.02 (0.95)***	-4.00 (0.95)***	-4.03 (0.95)***
<b><u>Cross Level Interactions</u></b>								
Sleep Problems * CBT-AD							2.29 (1.25)	
Sleep Problems * ISP-AD							0.28 (1.24)	
Time * CBT-AD							-2.77 (1.47)	
Time *ISP-AD							2.06 (1.48)	
<b><u>Random Effects</u></b>								
Intercept	364.7 (19.10)	365.8 (19.13)	380.21 (19.50)	382.2 (19.55)	380.88 (19.52)	347.53 (18.64)	348.31 (18.66)	348.44 (18.67)
Time			9.54 (3.09)	10.0 (3.16)	9.63 (3.10)	9.76 (3.12)	9.79 (3.13)	10.05 (3.17)
Residual	294.2 (17.15)	290.6 (17.05)	274.60 (16.57)	274.00 (16.55)	274.99 (16.58)	274.77 (16.58)	272.39 (16.50)	273.89 (16.55)
<b>ICC for Random Effects Model</b>	0.5535							
2*log likelihood	7891.4	7882.3	7880.3	7860.6	7860.0	7832.0	7814.0	7832.5

**Notes:** Parameter estimates and standard errors are reported for each variable. Bolded lines are predictors of interest.

Sleep problems are within-person sleep problems (sleep problems centered within each person) and between person sleep problems are labeled in table.

Model 5 represents the final model as presented in the main table within text and results section within the manuscript.

Key: \*\*\* p<.001, \*\*p<.01, \*p<.05

**Table 5. Fixed and Random Effects Estimates for Models of the Predictors of Energy/Vitality**

Parameter	RE ANOVA	Fixed	Random	Model 1	Model 2	Model 3	Model 4	Model 5
<b>Fixed Effects</b>								
Intercept	44.73 (1.14)	39.63 (1.33)***	39.62 (1.27)***	40.02***	40.13 (1.29)***	43.76 (3.13)***	44.05 (3.35)***	43.62 (3.12)***
<b>Level 1</b>								
Time		3.61 (0.50)***	3.62 (0.54)***	3.36 (0.55)***	3.33 (0.55)***	3.32 (0.55)***	3.00 (1.20)*	3.34 (0.55)***
<b>Sleep Problems</b>				-1.45 (0.44)***	-1.96 (0.80)*	-1.98 (.80)*	-0.67 (1.17)	-1.45 (0.44)***
Time * Sleep Problems					0.34 (0.46)	0.36 (0.45)	0.37 (0.46)	
<b>Level 2</b>								
Treatment Group - CBT-AD						3.47 (3.02)	3.31 (3.44)	3.48 (3.01)
Treatment Group - ISP-AD						1.84 (3.02)	1.31 (3.44)	1.80 (3.01)
<b>Between Person Sleep Problems</b>						-2.18 (0.80)**	-2.18 (0.80)**	-2.17 (0.80)**
<b>Cross Level Interactions</b>								
Sleep Problems * CBT-AD							-1.41 (1.19)	
Sleep Problems * ISP-AD							-1.90 (1.19)	
Time * CBT-AD							0.19 (1.48)	
Time *ISP-AD							0.57 (1.49)	
<b>Random Effects</b>								
Intercept	226.0 (15.03)	229.6 (15.15)	207.54 (14.41)	216.67 (14.72)	217.78 (14.76)	211.54 (14.55)	206.55 (14.37)	210.48 (14.51)
Time			16.07 (4.00)	18.42 (4.29)	18.64 (4.32)	18.81 (4.34)	17.94 (4.24)	18.58 (4.31)
Residual	293.3 (17.13)	271.9 (16.49)	245.7 (15.66)	235.09 (15.33)	234.66 (15.32)	235.02 (15.33)	236.81 (15.39)	235.47 (15.35)
<b>ICC for Random Effects Model</b>	0.4352							
2*log likelihood	7758.1	7706.7	7695.1	7660.8	7660.0	7642.6	7631.2	7643.5

**Notes:** Parameter estimates and standard errors are reported for each variable. Bolded lines are predictors of interest.

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Model 5 represents the final model as presented in the main table within text and results section within the manuscript.

Key: \*\*\* p<.001, \*\*p<.01, \*p<.05

**Table 6. Fixed and Random Effects Estimates for Models of the Predictors of Life Satisfaction**

<b>Parameter</b>	<b>RE ANOVA</b>	<b>Fixed</b>	<b>Random</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>
<b>Fixed Effects</b>							
Intercept	12.00 (1.81)	7.16 (2.00)***	7.19 (1.90)***	7.51 (1.91)***	7.96 (1.93)***	13.65 (4.99)**	18.74 (5.12)***
<b>Level 1</b>							
Time		3.49 (0.62)***	3.46 (0.67)***	3.31 (0.68)***	3.21 (0.68)***	3.19 (0.68)***	-1.80 (1.41)
<b>Sleep Problems</b>							
Time * Sleep Problems				-1.25 (0.53)*	-3.47 (0.99)***	-3.52 (0.98)***	-5.08 (1.40)***
					1.50 (0.57)**	1.53 (0.56)**	1.56 (0.56)**
<b>Level 2</b>							
Treatment Group - CBT-AD						-3.41 (4.90)	-9.81 (5.17)
Treatment Group - ISP-AD						3.72 (4.91)	-2.62 (5.20)
<b>Between Person Sleep Problems</b>							
						-2.24 (1.29)	-2.25 (1.29)
<b>Cross Level Interactions</b>							
Sleep Problems * CBT-AD							2.93 (1.41)*
Sleep Problems * ISP-AD							1.04 (1.42)
Time * CBT-AD							6.36 (1.76)***
Time *ISP-AD							6.37 (1.76)***
<b>Random Effects</b>							
Intercept							
Time	653.1 (25.56)	655.9 (25.61)	589.77 (24.29)	613.74 (24.77)	630.1 (25.10)	614.3 (24.79)	603.02 (24.56)
Residual			23.11 (4.81)	26.74 (5.17)	27.50 (5.24)	27.6 (5.25)	22.13 (4.70)
	405.2 (20.13)	385.8 (19.64)	347.57 (18.64)	330.54 (18.18)	323.6 (17.99)	323.2 (17.98)	321.55 (17.93)
ICC for Random Effects Model	0.6171						
2*log likelihood	7812.5	7780.4	7769.1	7730.6	7723.0	7705.5	7675.7

**Notes:** Parameter estimates and standard errors are reported for each variable. Bolded lines are predictors of interest.

Sleep problems are within-person sleep problems (sleep problems centered within each person) and between person sleep problems are labeled in table.

No Model 5 was needed as it was appropriate to keep in interactions for this model.

As such, Model 4 represents the final model as presented in the main table within text and results section within the manuscript.

Key: \*\*\* p<.001, \*\*p<.01, \*p<.05