

*Online supplement DS1: Fidelity rating*

**Development of the ACT for Psychosis Adherence and Competence Scale - APACS**

*Scale Development.* In the absence of any published ACT for psychosis fidelity scale, we developed a 6-item scale, the ACT for Psychosis Adherence and Competence Scale – APACS.<sup>19</sup> The Competence subscale is not reported due to low inter-rater reliability. Only the Adherence scale was used. Adherence is measured on a 5-point (0-4) scale where ratings reflect a composite of the presence and frequency across a 50-minute session of the six ACT processes (Acceptance (Control as the problem); Defusion; Mindfulness; Self as context; Values; Willingness), as defined in our unpublished therapy manual.<sup>44</sup>

**The APACS Adherence Rating Scale:**

**0**= the concept was not addressed

**1**=a little: the concept was addressed 1-2 times and briefly (up to 2 minutes spent each time) **OR** the concept was addressed once for less than 5 minutes

**2**=somewhat: the concept was addressed 3-5 times briefly **OR** it was addressed by the therapist once for approximately 5-14 minutes

**3**=considerably: the concept was addressed briefly six or more times throughout the session **OR**, a substantial amount of time was spent addressing the concept (15-25 minutes)

**4**= frequently: the majority of the session was spent addressing the concept

The primary score was the total of the 6 items, with the maximum realistically possible score of approximately 10. (The possible permutations of duration and frequency when summed across each of the 6 components enable a theoretical maximum score of about 14, however this is clinically implausible).

*Inter-rater reliability.* Twenty ACT sessions were rated by the primary rater and an independent rater agreeing on the presence of a therapy component in a session 89% of the time (107/ 120 ratings; kappa = .78, good agreement). Kappas for adherence to each

component of therapy were *Strong* or *Moderate* for each component except Defusion, where agreement was *Fair* (Table DS1).

**Table DS1** Inter-rater kappa values by domain on APACS

Item	Total N	Rater 1 (M)	Rater 2 (M)	Kappa
Acceptance	20	1.20	0.95	.54** M
Defusion	20	1.05	0.70	.39** F
Mindfulness	20	2.20	1.95	.53** M
Self as context	20	0.30	0.25	.73** S
Values	20	1.30	1.15	.69** S
Willingness	20	0.55	0.25	.61** S

Note. \*\*= $p \leq .005$ ; \*= $p \leq .05$ ; ICC (C)= Intraclass correlation - consistency; S= substantial agreement; M=moderate agreement; F= fair agreement; Sl=slight agreement

*Validity assessment.* The first 23 participants who were enrolled in the *Lifengage* trial and who gave consent for their therapy sessions to be audio recorded were selected for inclusion in the first round of fidelity assessment (representing all available data to that date). Twelve participants were in the ACT condition and 11 in the Befriending condition. Measures used were the APACS, The Befriending Treatment Integrity Measure (BTIM – Bendall, Killackey, Jackson, & Gleeson, 2003),<sup>15</sup> a CBT for psychosis fidelity measure the Cognitive Therapy for Psychosis Adherence Scale (R-CTPAS)<sup>40</sup> and the ACT Session Record, a checklist of therapy components included in a session, completed after each session by trial therapists.

Table DS2 shows descriptive data from the ACT sessions from the primary rater. The mean total APACS Adherence score of 6.54 indicates that on average, most of the session time was ratable as ACT therapy, or that therapy components were frequently identified by raters.

Conversely, low mean ratings of the ACT sessions on the R-CTPAS,  $M(SD)=4.17(3.29)$  and its low correlation with the APACS ( $r=.25$ ), and low correlation ( $r=.12$ ) with the BTIM suggested discriminant validity of the scale. Convergent validity of the APACS items was

suggested by moderate or better correlations of the presence of the 6 ACT components (Kappas from .56 – 1.0) as rated on the APACS with therapists' self-reported delivery of each ACT process recorded following each session on a checklist (the ACT Session Record).

**Table DS2** Mean (SD) adherence ratings and percent of sessions with a scale item endorsed, for the APACS and validation measures using 24 randomly selected ACT sessions

Scale/Item	<i>M</i>	<i>SD</i>	Presence (% of sessions)
APACS			
Adherence Total	6.54	1.98	N/A
Acceptance	1.25	1.51	46
Defusion	0.88	1.30	33
Mindfulness	2.13	1.30	83
Self as context	0.42	1.14	12
Values	1.42	1.64	50
Willingness	0.46	1.02	21
ACT Session Record	2.45	1.01	100
R-CTPAS	4.17	3.29	79
BTIM	2.29	1.55	N/A

*Note.* Two sessions selected randomly from the first 12 consenting ACT participants

### **Fidelity analysis for the full sample**

*Sample.* Following completion of the study a second round of fidelity rating was performed. ACT and Befriending sessions (24 sessions each) were randomly sampled from the participants who were not included in Round 1 (38 participants contributing 1-4 sessions each). The original rater was re-trained to criterion and rated all newly selected audio files. Descriptive results for ratings of ACT sessions were compared for Rounds 1 & 2 to check for any differences. Comparison of mean total adherence ratings and the 6 component means across the two rounds showed no significant differences apart from a statistically significant increase in the mean Willingness score (possibly indicating an increase in skill of therapists with practice). All sessions from each round (Round 1 ACT=24; BF=22; Round 2 ACT=24 BF=24) were pooled for the final analysis of Adherence ratings.

*Adherence Results* The masked rater correctly assigned to condition all ACT sessions and all befriending sessions. The mean total APACS score across all 48 ACT sessions sampled was  $M(SD) = 7.06 (1.79)$  indicating on average the presence of ratable ACT processes for a majority of the session. The most frequently identified ACT components were Mindfulness and Values, being present in 43 (89.6%) and 26 (54.2%) of sampled ACT sessions respectively. Self-as-context was the least frequently rated component (3(6.3%) sessions). One sampled befriending session had a rated ACT component for values, and no ACT sessions had a befriending component rated.

**Additional reference**

44. Shawyer, 2008, *ACT for Psychosis Eight Session Program. Guidelines for Therapists*. School of Psychological Science, La Trobe University, Melbourne Australia, 2008.

**Table DS3** Untransformed means and standard deviations for primary and secondary measures

Measure	ACT						Befriending					
	Baseline		Post-therapy		Follow-up		Baseline		Post-therapy		Follow-up	
	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>
PANSS Total	49	79.2 (14.1)	43	74.6 (16.6)	41	72.5 (16.0)	47	78.6 (14.9)	42	72.6 (14.7)	36	73.9 (15.5)
PANSS Positive	49	22.8 (5.5)	43	20.6 (5.6)	41	19.3 (6.3)	47	20.8 (5.2)	42	19.1 (5.5)	36	19.6 (5.3)
PANSS Negative	49	16.9 (4.4)	43	16.8 (5.1)	41	17.2 (4.7)	47	19.2 (5.2)	42	17.8 (5.0)	36	17.8 (4.7)
PANSS General	49	39.5 (8.1)	43	37.2 (9.4)	41	35.8 (8.3)	47	38.6 (8.0)	42	35.7 (8.7)	36	36.1 (8.4)
<b>PSYRATS AH</b>												
Preoccupation	37	2.41 (1.32)	32	2.25 (1.05)	31	2.19 (1.49)	30	2.27 (1.41)	29	2.03 (1.59)	23	2.35 (1.50)
Origin Beliefs	36	2.50 (1.18)	31	2.16 (1.32)	30	2.53 (1.43)	31	2.65 (1.31)	29	2.34 (1.47)	22	2.32 (1.52)
Amt Distress	37	2.73 (1.02)	32	2.16 (1.27)	31	2.03 (1.40)	31	2.29 (1.37)	29	2.21 (1.52)	23	2.57 (1.62)
Int Distress	37	2.65 (0.95)	32	2.25 (1.22)	31	2.00 (1.44)	31	2.58 (1.36)	29	2.10 (1.45)	23	2.26 (1.54)
Disruption	36	1.86 (0.59)	30	1.60 (0.81)	31	1.26 (0.97)	31	1.65 (0.91)	29	1.17 (1.00)	23	1.43 (1.04)
<b>PSYRATS DEL</b>												
Preoccupation	47	2.53 (1.10)	41	2.07 (1.35)	38	1.92 (1.19)	42	2.79 (1.22)	40	2.13 (1.26)	32	2.19 (1.23)
Conviction	45	2.80 (1.34)	41	2.41 (1.47)	38	2.37 (1.60)	42	3.33 (1.03)	40	2.70 (1.36)	32	2.78 (1.39)
Amt Distress	47	2.77 (1.20)	41	2.20 (1.55)	39	2.05 (1.45)	42	2.69 (1.28)	40	2.13 (1.54)	32	2.34 (1.54)
Int Distress	47	2.83 (1.07)	41	1.95 (1.43)	38	1.89 (1.39)	42	2.71 (1.15)	40	2.05 (1.40)	32	2.06 (1.37)
Disruption	46	1.78 (0.63)	40	1.15 (0.80)	38	1.34 (0.94)	42	1.81 (0.86)	40	1.20 (0.97)	31	1.45 (0.89)
SFS	49	100.5(10.7)	43	99.7 (10.2)	41	100.3(10.4)	47	99.5 (8.5)	42	100.3(8.4)	35	99.7 (7.9)
No. Consults	47	29.7 (20.3)	-	-	38	32.5 (31.1)	47	30.2 (21.2)	-	-	32	22.3 (14.6)
Consult minutes	47	892 (672)	-	-	38	1240(1347)	47	911 (713)	-	-	32	909 (853)
AAQ-16	48	71.4 (13.0)	42	69.3 (11.4)	37	68.3 (12.4)	47	72.8 (10.8)	42	72.5 (10.7)	36	69.5 (9.1)
VAAS-9	35	27.7 (5.0)	33	28.4 (4.9)	26	29.3 (4.5)	29	29.3 (4.3)	29	28.9 (6.1)	20	30.3 (5.7)
RSQ	49	2.63 (1.15)	43	2.47 (1.18)	39	2.46 (1.07)	47	2.68 (1.20)	42	2.38 (1.10)	36	2.75 (1.16)

Notes: AAQ-16 = Acceptance and Action Questionnaire. PANSS = Positive and Negative Syndrome Scale. PSYRATS AH: Psychotic Symptom Rating Scales Auditory Hallucinations. PSYRATS DEL = PSYRATS Delusions. RSQ = Recovery Style Questionnaire. SFS = Social Functioning Scale. VAAS-9 = Voices Acceptance and Action Scale

**Table DS4** Proportion of participants with clinically significant change ( $\geq 25\%$ ) in PANSS total and subscale scores by condition from baseline to endpoint and baseline to follow-up

Time point	Total N	PANSS Positive <i>n</i> (%)	PANSS Negative <i>n</i> (%)	PANSS General <i>n</i> (%)	PANSS Total <i>n</i> (%)
Baseline to Post-therapy					
ACT	43	15 (34.9%)	14 (32.6%)	14 (32.6%)	11 (25.6%)
Befriending	42	11 (26.2%)	15 (35.7%)	17 (40.5%)	10 (23.8%)
Baseline to Follow-up					
ACT	41	21 (51.2%)	13 (31.7%)	14 (34.2%)	14 (34.2%)
Befriending	36	8 (22.2%)	15 (41.7%)	13 (36.1%)	14 (38.9%)

*Notes:* PANSS = Positive and Negative Syndrome Scale. Criterion for clinically significant change recommended by Leucht for treatment resistant populations. (Leucht S, Kane JM, Kissling W, Hamann J, Etschel E, Engel RR. What does the PANSS mean? *Schizophr Res.* 2005; 79: 231–238)

**Table DS5** Means (95% CI) values and Group x Time Fixed Effects in Mixed-Effects Model Repeated Measures ANOVA for Process Measures

Measure	<u>ACT</u>			<u>Befriending</u>			<u>Group x Time</u>			
	Mean (95% CI)						<i>F</i>	<i>df</i>	<i>p</i>	<i>d</i>
	Baseline	Post-therapy	Follow-up	Baseline	Post-therapy	Follow-up				
AAQ-16	71.4 (68.1, 74.7)	70.3 (66.9, 73.8)	70.0 (66.4, 73.6)	72.5 (69.1, 75.9)	72.3 (68.1, 75.9)	69.8 (66.1, 73.5)	0.36	156.3	0.70	0.12 (-0.18, 0.43)
VAAS-9	27.8 (26.1, 29.5)	28.2 (26.4, 29.9)	28.7 (26.9, 30.5)	29.6 (27.7, 31.4)	28.7 (26.8, 30.6)	30.1 (28.1, 32.2)	0.66	103.6	0.52	0.17 (-0.22, 0.56)
RSQ	2.7 (2.3, 3.0)	2.5 (2.1, 2.8)	2.5 (2.1, 2.8)	2.6 (2.3, 3.0)	2.4 (2.0, 2.7)	2.7 (2.4, 3.1)	1.16	170.0	0.32	0.22 (-0.09, 0.53)

Note. AAQ-16 = Acceptance and Action Questionnaire-16; VAAS-9 = Voices Acceptance and Action Scale-9; RSQ = Recovery Style Questionnaire