

**Longitudinal Study of Indigenous Children:  
A measure of global social and emotional well being at Wave 1**

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This document summarises the internal reliability of a measure of social and emotional well being (SEWB) constructed from the 16 item measure recommended from the Western Australian Aboriginal Child Health Survey (Zubrick et al, 2006).

### **Sample characteristics**

Carers of Aboriginal children were in scope for the SEWB items where the study child was in the K-cohort of the Longitudinal Study of Australian Children and at least four years of age. There were 720 children in the K-cohort sample and the carers of 632 (87.8%) of these children completed the items for the SEWB measure. Of the 88 children for whom the SEWB items were not administered, 30 of these children were under the age of four years for which the SEWB was not suitable, while another 58 of these children were four years and older and were in scope but missing data on these items. Of the 632 children for whom SEWB data were available, 444 (70.3%) were aged four years and over.

This report is based upon the sample of 444 children for whom data were available on the SEWB items and who were in the intended developmental age range. Fifty-one percent of these children were male. The average age of the children in the sample was 53.2 months (sd 4.2) and they ranged from 48 to 67 months at the time of the interview. Using a measure of the Level of Relative Isolation (LORI) (see Zubrick et al, 2004), participating families were classified across a range of remoteness: Approximately 25% (n=111) were in metropolitan settings. For the remainder, another 54% (n= 241) were in areas characterised by Low levels of relative isolation, 11% were in areas of Moderate isolation (N =47) and the remaining 10% (N=45) were in areas of High/Extreme relative isolation.

### **Scale items**

The SEBW candidate items were specifically selected on the basis of their suitability in constructing a global composite measure of social and emotional well being (see Zubrick et al, 2005). The items administered were taken from the Western Australian Aboriginal Child Health Survey and appear in Appendix 1.

### **Confirmatory factor analysis**

Prior to undertaking confirmatory factor analysis all items were screened for outliers and missing data. Univariate analyses revealed the items to be coarsely ordinal with many being manifestly skewed. Items were recoded to conform to a three point ordinal scale (0 = No, 1 = Sometimes, 2 = Yes) and reverse coded where appropriate (2 items – “no friend” and “not liked”). Following this we undertook to fit a confirmatory factor model using LISREL 8.8 to test the fit of the items to an underlying five factor structure. The proposed factors were: Emotional Problems (3 items), Conduct problems (3 items), Hyperactivity (3

items), Peer problems (3 items) and Prosocial behaviour (4 items). Input comprised polychoric correlations and an asymptotic covariance matrix and estimation was undertaken via Weighted Least Squares. This resulted in a reasonable fit of the items to the underlying model (RMSEA = .06). Appendix B displays the path diagram for the final fitted model.

### **Item loadings and total scale reliability**

Item loadings are presented in Table 1. These factor loadings ranged from a high of .92 (“no friend”) to a low of .26 (“stolen”). Factor correlations are presented in Table 2. These correlations were moderate and ranged from .589 (Hyperactivity and Conduct Problems) to .414 (Emotion and Conduct). Thus the maximum shared variance in the underlying factors ranged from 17% to 35% suggesting that the factors were relatively independent of one another.

In general the factor loadings and factor correlations were comparable to those reported in the WA Aboriginal Child Health Survey. It should be noted that the low variance in the item “stolen” restricts its factor loading. This is most likely to reflect the restricted developmental appropriateness of the item in a sample of (predominately) four year old children.

### **Second order factor characteristics**

The total SEBW score is predicated on the assumption that the scale represents a single overall composite factor.<sup>1</sup> We undertook to examine this assumption by fitting a second order factor model (Appendix C). Using the same input of polychoric correlations and asymptotic covariance matrix this estimation was undertaken via Weighted Least Squares. This resulted once again in a reasonable fit of the items and associated first order factors to the underlying model (RMSEA = .06).

On the basis of this, the 16 items were summed to generate a proportionally weighted composite using the method described by Rowe (2006) to create a measure of Social and Emotional Wellbeing (SEBW score). The total score SEBW demonstrated excellent scale reliability (0.96) (Hancock and Mueller, 2001). The SEBW total score had a mean of 7.9 (sd 4.5; Range 0-22) with a moderate positive skew. Higher scores denote more disturbed social and emotional well being.

### **Association with level of relative isolation, gender and family money situation**

The distribution of the total SEBW was examined with reference to household level of relative isolation, the study child’s gender, and the family’s money situation.

There was no significant difference in the mean SEBW total score for children living in areas differentiated by Level of Relative Isolation ( $F_{3,440} = 38$ ;  $P > .05$ ). Male study children had a significantly higher mean SEBW score compared with Female study children ( $X_{\text{males}} = 8.4$ ;  $X_{\text{females}} = 7.3$ ;  $t_{442} = 2.56$ ;  $p < .01$ ). There was no significant difference in mean SEBW total scores for those children differentiated by family money situation ( $F_{5,420} = 1.3$ ;

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<sup>1</sup> The use of individual factor scores derived from this measure is not recommended.

p>.05). Available sample size generally restricted the extent to which many variables could be assessed.

## **Summary**

In general the 16 item SEBW composite scale has adequate internal reliability and construct validity for use in the LSIC sample. These properties pertain to those children aged four years and above.<sup>2</sup> The small sample available in this Wave restricted the available statistical power to assess many of the underlying properties of this measure. Further work to assess the concurrent validity of the composite SEBW total score with respect to other items and scales collected on the Wave 1 K study children is recommended.

Finally, it is important to note that the composite score is not calibrated against an independent clinical benchmark or “gold standard” measure of emotional and behavioural distress or disturbance. This was not its purpose. This precludes setting a “cut off” with which to distinguish those children meeting a criteria for “clinical caseness” from those who do not. The composite score distinguishes those children along a continuum of emotional and behavioural distress and analyses sensitive to this distributional property are encouraged.

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<sup>2</sup> There were 188 children aged 4 years and less on whom SEBW data were gathered. Calculation of the SEBW composite score and its use for children under the age of 4 should be considered exploratory and undertaken with caution.

**Table 1. Social and Emotional Wellbeing Items and item loadings – Confirmatory Factor Analysis (Weighted Least Squares)**

Item	Factor				
	EMOTION	CONDUCT	HYPER	PEER	PROSOC
worries	0.747	--	--	--	--
sad	0.784	--	--	--	--
nervous	0.478	--	--	--	--
fight	--	0.602	--	--	--
lied	--	0.542	--	--	--
stolen	--	0.261	--	--	--
fidgits	--	--	0.888	--	--
restless	--	--	0.756	--	--
distract	--	--	0.718	--	--
notliked	--	--	--	0.901	--
nofriend	--	--	--	0.927	--
pickedon	--	--	--	0.322	--
consider	--	--	--	--	0.576
shared	--	--	--	--	0.707
helpful	--	--	--	--	0.772
kind	--	--	--	--	0.823

**Table 2. Social and Emotional Wellbeing Factor Correlations – Confirmatory Factor Analysis (Weight Least Squares)**

	Factor				
	EMOTION	CONDUCT	HYPER	PEER	PROSOC
<b>EMOTION</b>	1.000				
<b>CONDUCT</b>	0.414	1.000			
<b>HYPER</b>	0.541	0.589	1.000		
<b>PEER</b>	0.525	0.578	0.514	1.000	
<b>PROSOC</b>	0.445	0.433	0.464	0.454	1.000

## Appendix A

### Items used in the composite Social and Emotional Wellbeing measure: Univariate frequencies

#### Frequency Table

##### consider Has (not) been considerate of other peoples feelings

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 No	316	71.2	71.2	71.2
	1.00 Sometimes	99	22.3	22.3	93.5
	2.00 Yes	29	6.5	6.5	100.0
	Total	444	100.0	100.0	

##### restless Has been restless, overactive, cannot sit still for long

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 No	158	35.6	35.6	35.6
	1.00 Sometimes	110	24.8	24.8	60.4
	2.00 Yes	176	39.6	39.6	100.0
	Total	444	100.0	100.0	

##### shared has (not) readily shared with other children

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 No	333	75.0	75.0	75.0
	1.00 Sometimes	90	20.3	20.3	95.3
	2.00 Yes	21	4.7	4.7	100.0
	Total	444	100.0	100.0	

##### worries has often seemed worried

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 No	295	66.4	66.4	66.4
	1.00 Sometimes	121	27.3	27.3	93.7
	2.00 Yes	28	6.3	6.3	100.0
	Total	444	100.0	100.0	

##### helpful has (not) been helpful if someone is hurt, upset or feeling ill

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 No	381	85.8	85.8	85.8
	1.00 Sometimes	45	10.1	10.1	95.9
	2.00 Yes	18	4.1	4.1	100.0
	Total	444	100.0	100.0	

**fidgets is constantly fidgeting and squirming**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 No	232	52.3	52.3	52.3
	1.00 Sometimes	99	22.3	22.3	74.5
	2.00 Yes	113	25.5	25.5	100.0
	Total	444	100.0	100.0	

**nofriend has (not) had at least one good friend**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 No	410	92.3	92.3	92.3
	1.00 Sometimes	19	4.3	4.3	96.6
	2.00 Yes	15	3.4	3.4	100.0
	Total	444	100.0	100.0	

**pickedon has been picked on or bullied by other children**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 No	217	48.9	48.9	48.9
	1.00 Sometimes	108	24.3	24.3	73.2
	2.00 Yes	119	26.8	26.8	100.0
	Total	444	100.0	100.0	

**fighths has been in fights with other children or has bullied them**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 No	221	49.8	49.8	49.8
	1.00 Sometimes	129	29.1	29.1	78.8
	2.00 Yes	94	21.2	21.2	100.0
	Total	444	100.0	100.0	

**sad has often been unhappy, sad or tearful**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 No	225	50.7	50.7	50.7
	1.00 Sometimes	161	36.3	36.3	86.9
	2.00 Yes	58	13.1	13.1	100.0
	Total	444	100.0	100.0	

**notliked has (not) generally been liked by other children**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 No	405	91.2	91.2	91.2
	1.00 Sometimes	30	6.8	6.8	98.0
	2.00 Yes	9	2.0	2.0	100.0
	Total	444	100.0	100.0	

**distract has been easily distracted or had poor concentration**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 No	188	42.3	42.3	42.3
	1.00 Sometimes	133	30.0	30.0	72.3
	2.00 Yes	123	27.7	27.7	100.0
	Total	444	100.0	100.0	

**nervous has been nervous or clingy in new situations, easily lost confidence**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 No	194	43.7	43.7	43.7
	1.00 Sometimes	111	25.0	25.0	68.7
	2.00 Yes	139	31.3	31.3	100.0
	Total	444	100.0	100.0	

**kind has (not) been kind to younger children**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 No	373	84.0	84.0	84.0
	1.00 Sometimes	62	14.0	14.0	98.0
	2.00 Yes	9	2.0	2.0	100.0
	Total	444	100.0	100.0	

**lied has often lied or cheated**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 No	260	58.6	58.6	58.6
	1.00 Sometimes	130	29.3	29.3	87.8
	2.00 Yes	54	12.2	12.2	100.0
	Total	444	100.0	100.0	

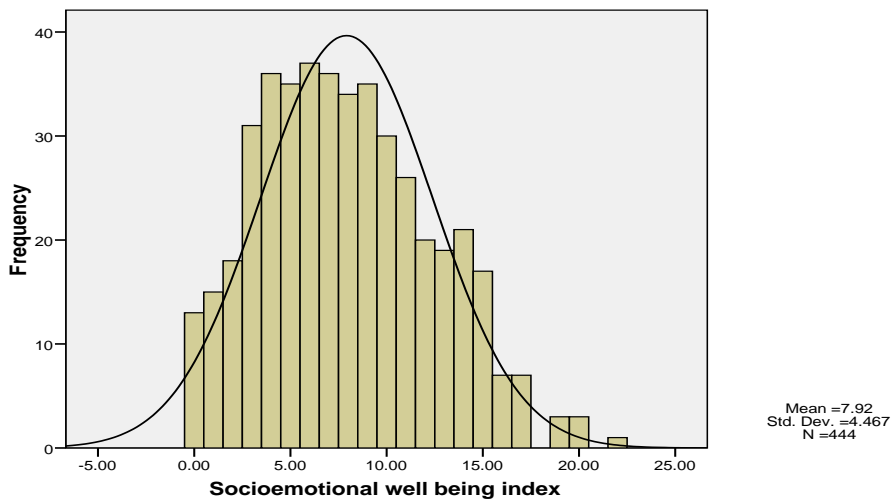
**stolen has stolen from home, school or elsewhere**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 No	400	90.1	90.1	90.1
	1.00 Sometimes	29	6.5	6.5	96.6
	2.00 Yes	15	3.4	3.4	100.0
	Total	444	100.0	100.0	

**sewbtot Socioemotional well being index**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	13	2.9	2.9	2.9
	1.00	15	3.4	3.4	6.3
	2.00	18	4.1	4.1	10.4
	3.00	31	7.0	7.0	17.3
	4.00	36	8.1	8.1	25.5
	5.00	35	7.9	7.9	33.3
	6.00	37	8.3	8.3	41.7
	7.00	36	8.1	8.1	49.8
	8.00	34	7.7	7.7	57.4
	9.00	35	7.9	7.9	65.3
	10.00	30	6.8	6.8	72.1
	11.00	26	5.9	5.9	77.9
	12.00	20	4.5	4.5	82.4
	13.00	19	4.3	4.3	86.7
	14.00	21	4.7	4.7	91.4
	15.00	17	3.8	3.8	95.3
	16.00	7	1.6	1.6	96.8
	17.00	7	1.6	1.6	98.4
	19.00	3	.7	.7	99.1
	20.00	3	.7	.7	99.8
	22.00	1	.2	.2	100.0
Total		444	100.0	100.0	

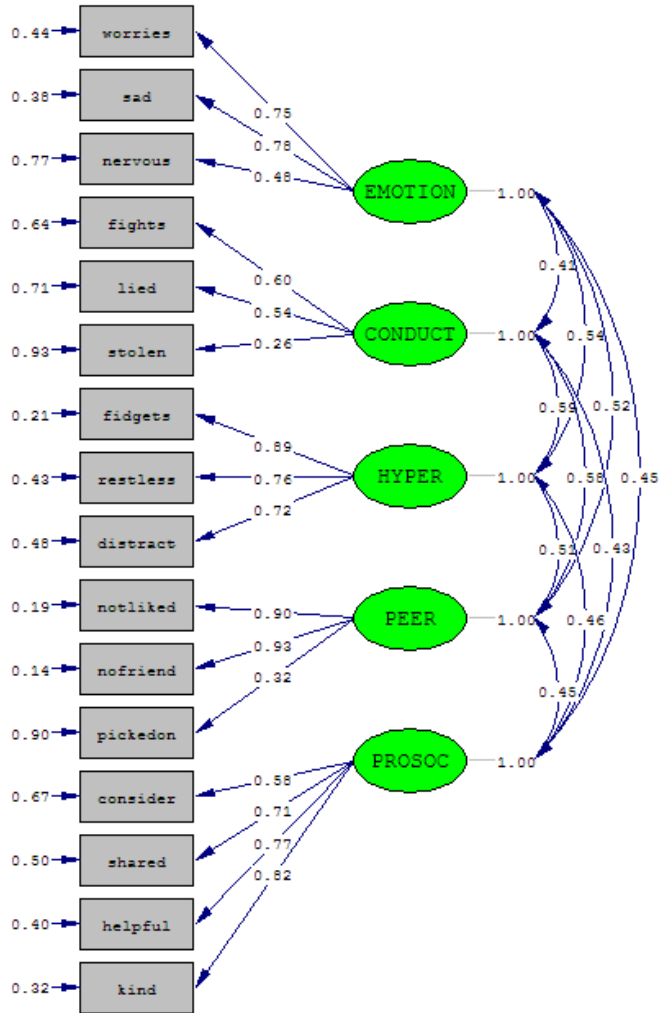
**Histogram**





## Appendix B

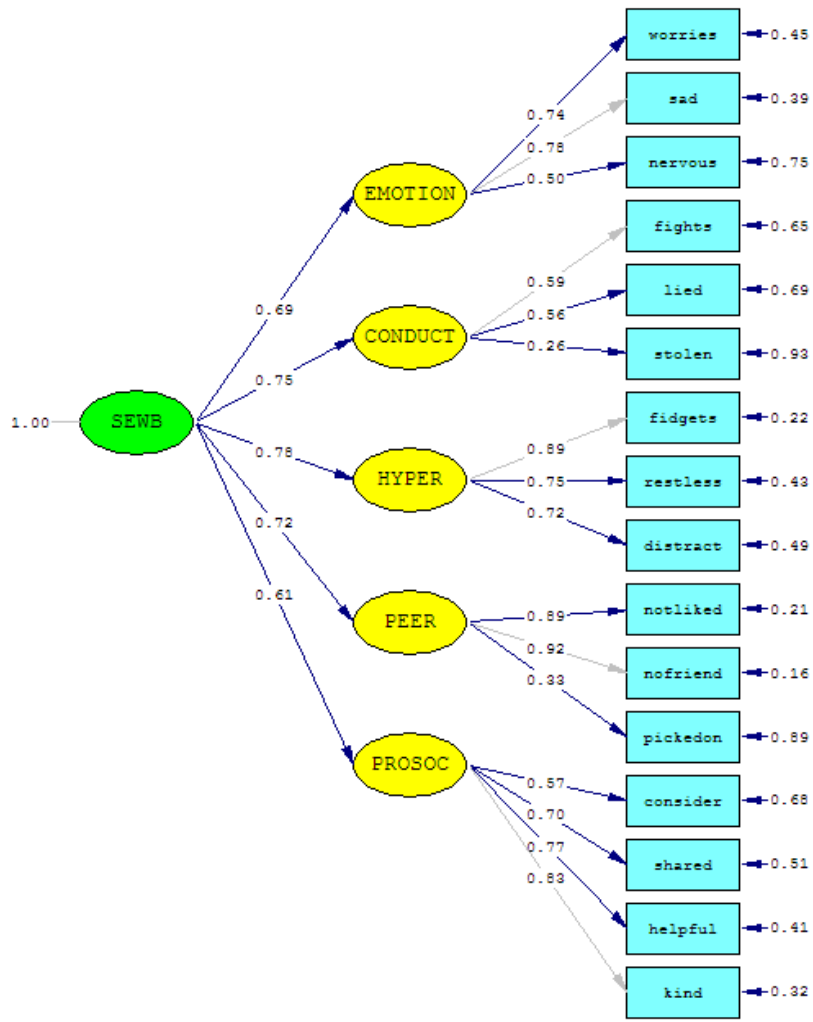
### Path Diagram for SEBW items – Weighted Least Squares Estimation



Chi-Square=239.59, df=94, P-value=0.00000, RMSEA=0.059

## Appendix C

### Second Order Factor Analysis for SEBW items – Weighted Least Squares Estimation



Chi-Square=244.44, df=99, P-value=0.00000, RMSEA=0.058

## References

Hancock, H.R. and Mueller, R.O. (2001) Rethinking construct reliability with latent variable systems. In Robert Cudeck, Stephen Du Toit and Dag Sorbom (Eds.) Structural Equation Modelling: Present and Future. SSI, Inc: Lincoln, IL.

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