

Excluded and Low Loading Items of First Order Factors

During the course of testing first order factor models in this study, a number of items were removed due to model re-specification. Table 12 provides a summary of these items.

Table 1 Summary of Excluded and Low Loading Items

<i>Item</i>	<i>Domain/Sub-Domain</i>	<i>Description</i>
Q37	Skills & Abilities/ Contact	Engaging with Aboriginal colleagues/community members to improve skills with Aboriginal people <i>Factor Loading<.5</i>
Q29a	Skills & Abilities/ Engagement	Ensuring client is able to vouch for practitioner's credentials <i>Factor Loading<.5</i>
Q33	Skills & Abilities/ Engagement	Practitioner's comfort level when discussing cultural explanations for mental illnesses with clients <i>Factor Loading<.5</i>
Q39	Skills & Abilities/ Engagement	Difficulty in engaging Aboriginal people in discussion versus non-Aboriginal people <i>Excluded</i>
Q40	Skills & Abilities/ Engagement	Difference in time engaging Aboriginal people in discussion versus non-Aboriginal people <i>Excluded</i>
Q41	Skills & Abilities/ Assessment	In case planning/intervention, how is Aboriginal culture considered <i>Factor Loading<.5</i>
Q42	Skills & Abilities/ Intervention	In assessment, how is Aboriginal culture taken into account <i>Factor Loading<.5</i>
Q44	Attitudes & Beliefs/ Cultural Competence Continuum	Desiring a stronger sense of connectedness with Aboriginal culture <i>Factor Loading<.5</i>
Q49	Attitudes & Beliefs/ Cultural Competence Continuum	Extent of feeling different working with Aboriginal people versus non-Aboriginal people <i>Factor Loading<.5</i>
Q50	Attitudes & Beliefs/ Cultural Competence Continuum	Thinking mainstream interventions should be adapted with Aboriginal people <i>Excluded</i>
Q54	Organisational Influences/ Access	Engaging in cultural supervision <i>Excluded</i>
Q52	Resources & Linkages/ Resources	Regularly attending cultural awareness workshops/training <i>Factor Loading<.5</i>
Q55	Resources & Linkages/ Resources	If offered, actively engaging in cultural supervision to improve skills with Aboriginal people <i>Factor Loading<.5</i>

Cultural Knowledge Domain

It was hypothesized that four first order factors (General cultural knowledge, Mental health specific knowledge, Application of knowledge and Local awareness) loaded on the Cultural Knowledge second order factor. Goodness-of-fit for this model is presented in Table 13 and indicates an overall poor fit to the data. In addition, the factor loadings for General cultural knowledge (.09), Mental health specific knowledge (.18) and Local awareness (.87) were not significant ($p > .05$). The squared multiple correlations for General cultural knowledge and Mental health specific knowledge in particular (.008 and .031 respectively) did not explain an acceptable portion of the variance in the Cultural Knowledge factor. The critical ratio values for both General cultural knowledge and Mental health specific knowledge did not exceed the threshold of 2, indicating that the Cultural Knowledge factor does not seem to influence responses on either of these indicators. Construct reliability was poor with a value of .46 and convergent validity was also poor with an average variance extracted value of .25. Only the Application of knowledge weighting was significant ($p < .05$) with a critical ratio value exceeding 2. These findings challenge the hypothesized model and do not support the Cultural Knowledge factor. Given these observations no further testing of the Cultural Knowledge factor was undertaken in regards to testing the full model.

Table 2 Cultural Knowledge Goodness-of-Fit Indices

	$\chi^2(df)$	<i>p-value</i>	χ^2/df	<i>SRMR</i>	<i>GFI</i>	<i>TLI</i>	<i>CFI</i>	<i>RMSEA</i>	<i>90% CI</i>	<i>p-value</i>	<i>AIC</i>
One Factor Model	7.45 (2)	.02	3.72	.04	.99	.80	.93	.08	.03, .15	.15	23.45

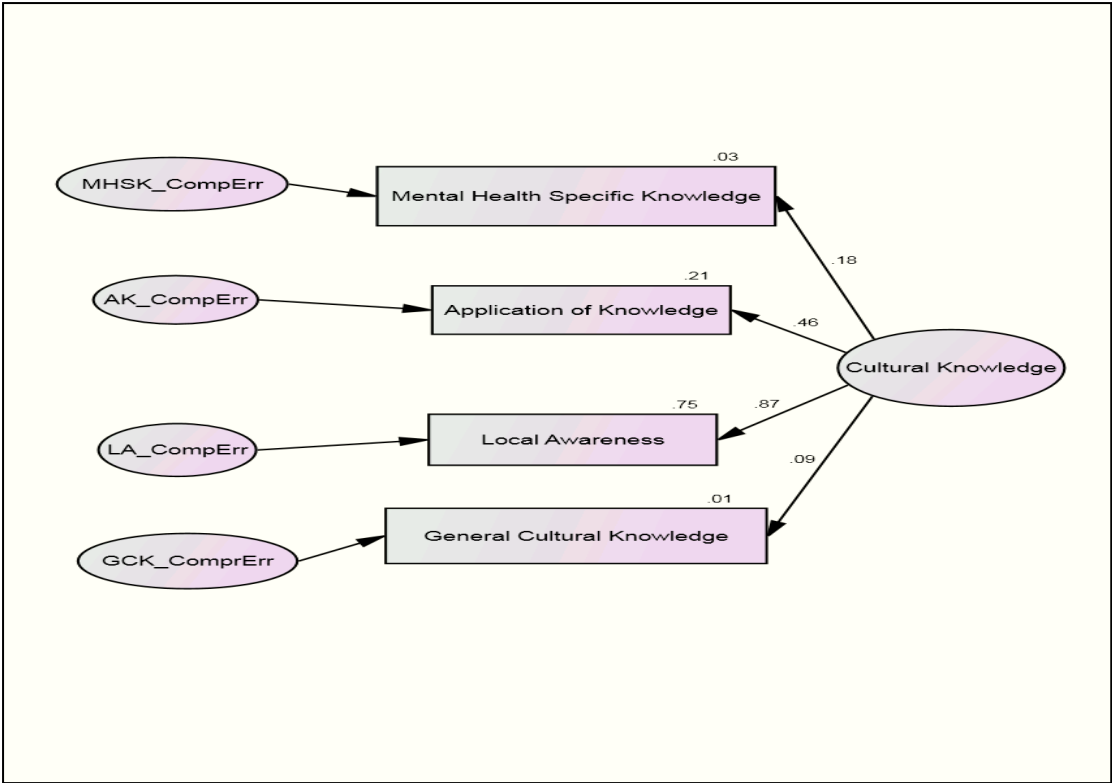


Figure 1. One Factor Model for Cultural Knowledge domain.

Estimation of Model Fit – Higher Order Factor

Considering the Cultural Knowledge domain was not supported, it was not possible to test the initial hypothesized model in Figure 2. An alternative higher order model was hypothesized without Cultural Knowledge. This model, Model 1, was tested for goodness-of-fit and factor loadings are presented in Figure 15. Notably the model includes negative error estimates and factor loadings exceeding 1. Consequently the model fit indices cannot be interpreted and are not presented.

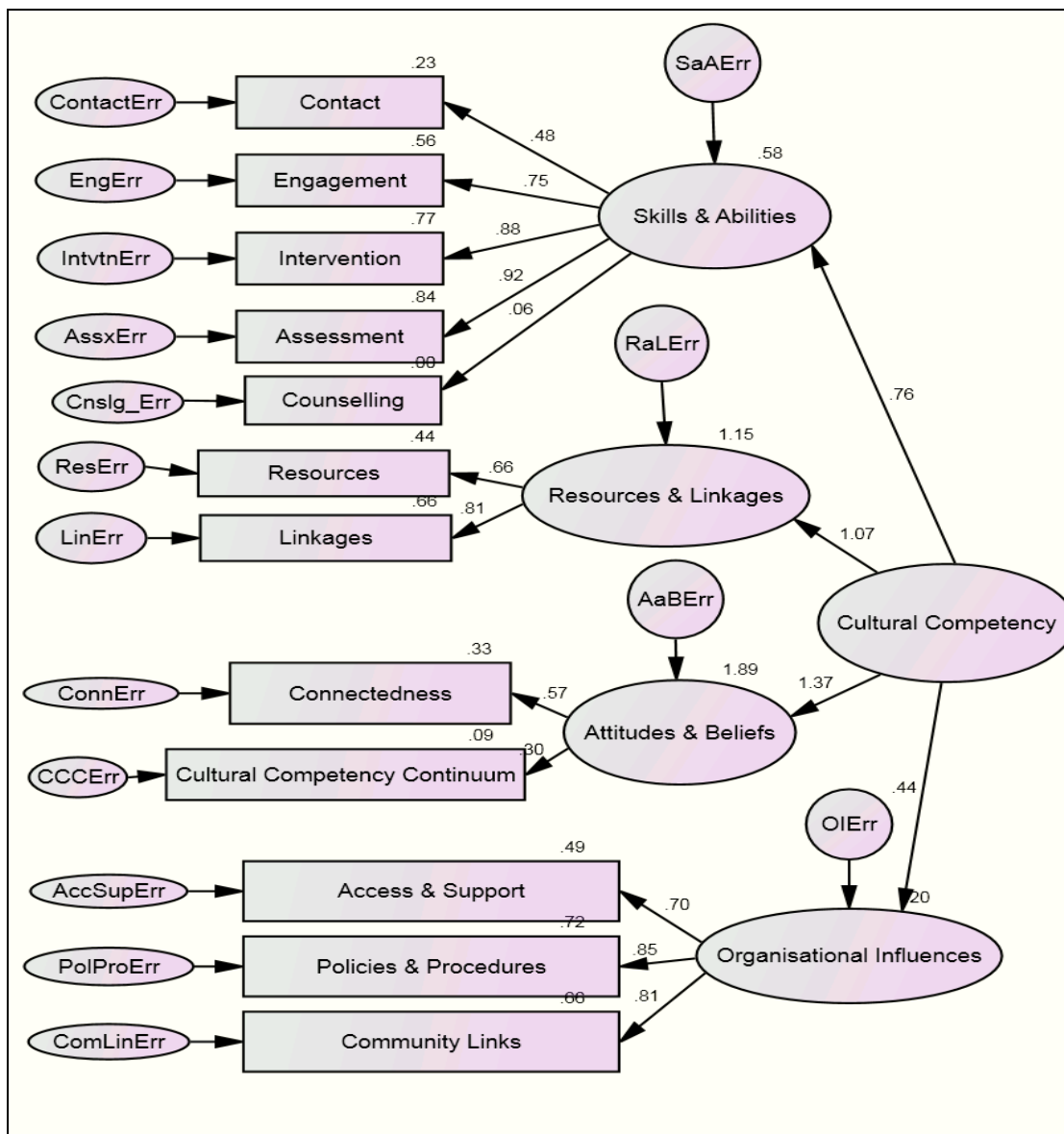


Figure 2. Higher Order Factor Model for Cultural Competency (Model 1).

The presence of such “out of bound” estimates as loadings of greater than one suggest that improper solutions can be derived (Newsom, 2010) and are consistent with what are called Heywood cases (Garson, 2011; Hair et al., 2010; Kenny, 2011). Heywood cases represent a structured equation modelling solution that produces an error variance estimate of less than zero (i.e. a negative error variance) (Hair et al., 2010). Heywood cases are considered a common occurrence in factor analysis and structural equation modelling (Kolenikov & Bollen, 2007), however Garson (2011) warns that in such circumstances, goodness-of-fit measures should be ignored. Heywood cases are problematic because they imply not only a less than 0 percent error in an item, but also that more than 100 percent of the variance in an item/construct is explained (Hair et al., 2010).

Kolenikov and Bollen (2007) have drawn together the literature that describes the causes of Heywood cases. Among the reasons mentioned include outliers, non-convergence and under-identification, empirical under-identification, structurally mis-specified models and sampling fluctuations. Heywood cases are usually associated with small sample sizes or when the three-indicator rule is not met (Hair et al., 2010). The three indicator rule is a heuristic that states that a standard CFA model with a single factor is identified if it has at least three indicators (Kline, 2011). In the current circumstance, low sample size does not apply, but the three indicator rule has been breached for both the Resources & Linkages and Attitudes & Beliefs factors.

In the current instance, a simple course of action was undertaken to address both the Heywood cases and the three indicator rule. As represented by Model 2 in Table 14, a model with Cultural Competency Continuum linked to Organisational Influences and Connectedness linked to Resources & Linkages was hypothesized. This was considered theoretically consistent because Connectedness could be argued to overlap with the themes covered under Resources and Linkages. In particular, this may include the educational,

informational and human resources that facilitate social and emotional support to service providers as described in Resources, and the ties with local community that facilitate the degree and quality of local knowledge available to service providers as described in Linkages.

Indices for Model 2 were poor in terms of goodness of fit to the data. However there were no Heywood cases present. Factor loadings were examined and for Cultural Competency Continuum and Counselling they were $-.07$ and $.07$ respectively which are very low. The squared multiple correlation for Cultural Competency Continuum only explained 1% of the variance in the Organisational Influences construct. Similarly, the squared multiple correlation for Counselling only explained 0.5% of the variance in the Skills & Abilities construct. Critical Ratios for both Cultural Competency Continuum and Counselling were below the threshold of 2.0 and were non-significant indicating that these parameters should not have been estimated. A number of MIs (Regression Weights) and related expected parameter change (EPC) values were above the threshold criteria. Many of the higher MIs were in regard to Cultural Competency Continuum. Notable MIs for Counselling were not observed and given its relatively low loading on Skills & Abilities, this item was removed from subsequent testing in Model 3 onwards.

Considering the above, model respecification was conducted as per MIs, and nested models were tested with Cultural Competency Continuum being first linked to Skills & Abilities as indicated in Model 3 in Table 14, and then linked to Resources & Linkages as indicated by Model 4 in Table 14. Similar to the observations regarding Model 2, the fit indices for both Models 3 and 4 were mixed. In both instances, Cultural Competency Continuum only explained 14% and 12% of the variance in Skills & Abilities and then in Resources & Linkages respectively. Despite the MIs, the thematic link to either of these

factors is unclear, and as a consequence a final model, model 5, was hypothesized which did not include Cultural Competence Continuum.

The final nested model, Model 5, is presented in Figure 16. Fit indices presented in Table 14 for Model 5 indicated an overall good fit to the data including adequate results for SRMR and RMSEA.

Table 3 Higher Order Model Cultural Competency Goodness-of-Fit Indices

	$\chi^2(df)$	<i>p-value</i>	χ^2/df	<i>SRMR</i>	<i>GFI</i>	<i>TLI</i>	<i>CFI</i>	<i>RMSEA</i>	<i>90% CI</i>	<i>p-value</i>	<i>AIC</i>
Model 2	302.42 (51)	.00	5.93	.11	.89	.86	.89	.11	.09, .12	.00	356.42
Model 3	206.27 (41)	.00	5.03	.07	.92	.90	.92	.10	.08, .11	.00	256.27
Model 4	214.84 (41)	.00	5.24	.07	.91	.89	.92	.10	.09, .12	.00	264.84
Model 5	110.55 (32)	.00	3.46	.06	.95	.95	.96	.08	.06, .09	.00	156.55

Factor loadings for all variables in Model 5 were significant ($p < .05$) and were moderate to high as observed in Figure 16. Indicator variables were found to explain an acceptable portion of the variance in their respective constructs. For instance, the squared multiple correlations for Connectedness, Resources and Linkages (.67, .42 and .74 respectively) explained a respectable portion of the variance in the Resources & Linkages construct. In addition, construct reliability and convergent validity were demonstrated for all variables.

Interconstruct (IC) and squared interconstruct correlations (SIC) were calculated for Skills & Abilities, Resources & Linkages, and Organisational Influences in order to determine whether nomological and discriminant validity were present in Model 5. Nomological validity was supported by interconstruct correlations that were all positive and significant ($p < .01$). Discriminant validity was demonstrated by the Average Variance

Extracted for all three constructs being greater than the Squared Interconstruct Correlations (see Appendix I).

The model presented in Figure 16, Model 5, supports a model of Cultural Competency in which three second order factors load onto a higher order factor called Cultural Competency. These three factors possess construct reliability and convergent, nomological and discriminant validity which further supports this model.

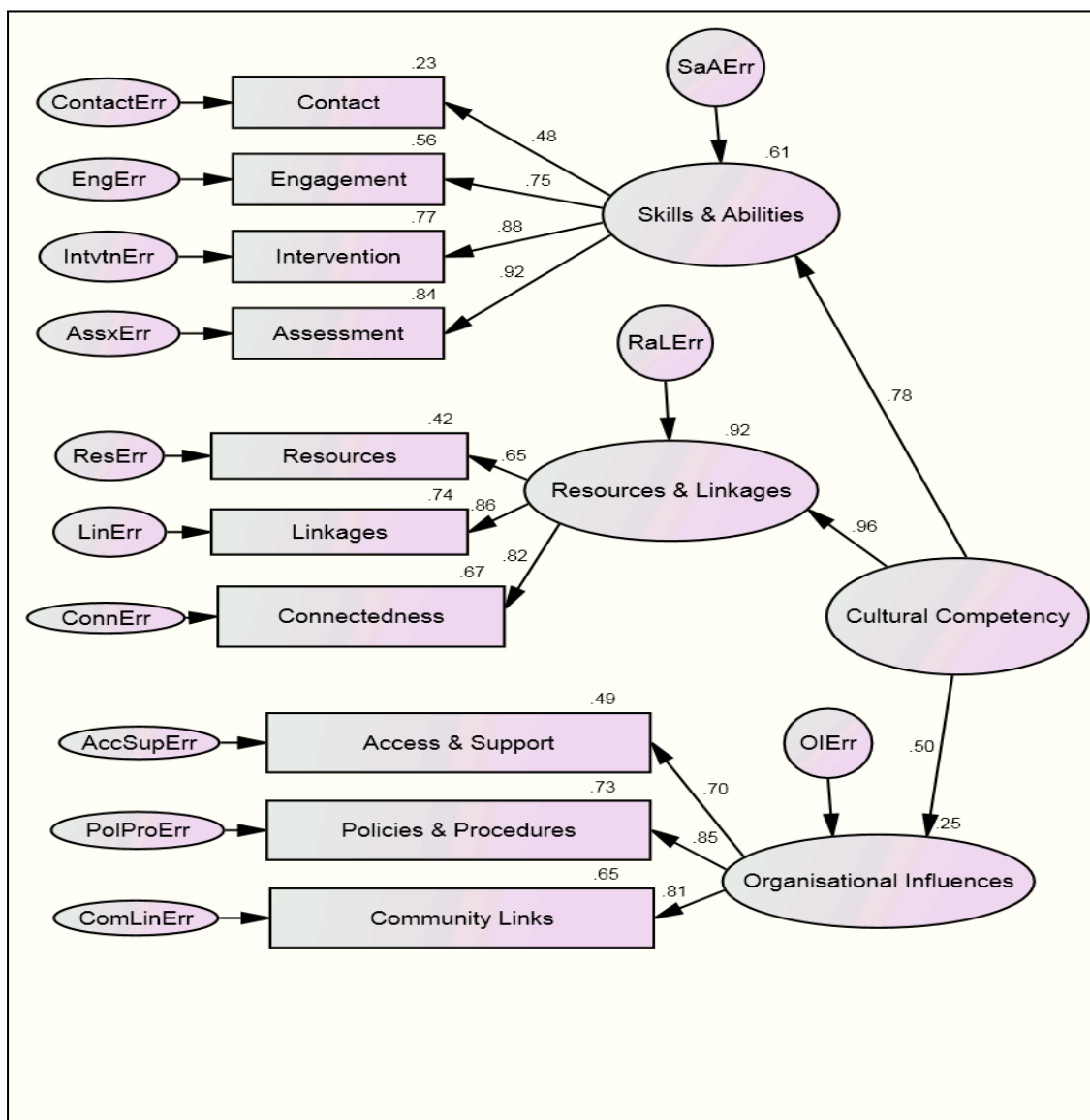


Figure 3. Higher Order Factor Model for Cultural Competency (Model 5).

General Discussion

This study tested a hierarchical model of cultural competence in the Aboriginal mental health sector as measured by the Cultural Competence Test (CCT) (Westerman, 2003). The analysis indicated that a hierarchical model in which the second order factors: Skills & Abilities, Resources & Linkages, and Organisational Influences, load on a single third order factor of Cultural Competence, provides an acceptable fit to the data. This model demonstrated good construct reliability and convergent, nomological, and discriminant validity. This final model is different to the hypothesized model that proposed that five second order factors load on Cultural Competence. Cultural Knowledge and Attitudes & Beliefs did not load on the final model. The supported model therefore provides only limited support to the theories of Cultural Competence and/or the CCT.

The lack of fit of the second order factors of Cultural Knowledge and Attitudes & Beliefs is worthy of discussion. Whether these factors are not captured adequately by the CCT or do not load on Cultural Competence is important to address considering there is general acceptance of the Tripartite model (D.W. Sue et al. 1982; 1992; 1996) which argues that cultural competence is comprised of Awareness & Beliefs, Knowledge and Skills. The current study examined the goodness-of-fit of each second order factor prior to examining overall model goodness-of-fit. The results indicated that the Cultural Knowledge factor assessed by the CCT was not a good fit to the data. Therefore it is not possible to examine if Cultural Knowledge is part of Cultural Competence in the current study. The questionnaire format of the Cultural Knowledge items are multiple choice. Although these items were recoded into continuous variables, the loadings were not significant. Apart from Application of Knowledge which explained little variance in Cultural Knowledge, the other Cultural Knowledge items do not lend themselves to the maximum likelihood methodology commonly employed for estimating confirmatory factor analysis models (Byrne, 2010; Hair et al., 2010).

While Byrne (2010) advises that in such circumstances, non-significant items can be considered unimportant to a model and should be deleted, it is more likely that the CCT does not adequately assess the Cultural Knowledge construct and SEM is unable to test its components.

From a practical standpoint, the use of a relatively small number of multiple choice questions (18 in total) to test for Cultural Knowledge may be problematic, particularly given the diversity of Aboriginal cultures in Australia (Downing et al. 2011; Walker & Sonn, 2010). Indeed Downing et al. (2011) caution against the tendency for training to essentialise Aboriginal culture as it risks perpetuating the perception that there is a single “Indigenous culture” in Australia. Therefore the assessment of Cultural Knowledge itself requires further development.

Attitudes & Beliefs was the other second order factor that was not included in the final model. The Attitudes & Beliefs factor was hypothesized to contain Connectedness and Cultural Competence Continuum, yet these factors had poor fit in the final model. Examination of modification indices suggest Connectedness loaded better on Resources & Linkages whereas Cultural Competence Continuum did not load significantly on Attitudes & Beliefs or any of the other second order factors. Further refinement is recommended in order to improve discrimination between items and the second order factors they are theorised to fall under. Similar to the conclusions for Cultural Knowledge, it is likely that Cultural Competence Continuum is not adequately measured by the CCT, despite support in the literature for such an aspect of cultural competence (see Cross et al. 1989; Westerman 2010).

Limitations

The inclusion of just-identified models and the implications of this on composite items are worth noting with regards to reviewing the CCT measure. The goodness-of-fit of

just-identified models is based on theoretical versus statistical justification. It is subject to the judgement of the researcher and can be considered implicitly biased. Further, it is assumed that item loadings of an appropriate size equate to good fit. If this assumption is met, then composite scores based on item loadings (as proportional weightings) can be established. In the current study, this approach was utilised to derive composite scores for some but not all first order factors. It has been argued that the use of simple unit weighting versus proportional weighting to establish composite scores will yield an incorrect estimate of the composite score representing that construct. Rather, the correct weights are the factor score regression weights (i.e. item loadings) (Holmes-Smith, 2008). Therefore in the current study, this may have resulted in a source of error and replication is required to confirm the current findings. Despite this, the findings of the current study have important theoretical and practical implications.

Theoretical Implications

The final model has no clear implications for D.W. Sue et al.'s (1982; 1992) tripartite model, in particular those elements related to Cultural Knowledge or Attitudes & Beliefs, which have to date been considered significant drivers for cultural competence. It does however underscore the importance of organisational factors. A number of authors have proposed that the individual practitioner's level of cultural competence is an outcome of the interdependence between the activities and responsibilities of the organisations and systems in which practitioners are positioned (Arrendondo et al., 1996; Chrobot-Mason & Ferdman, 2001; Darnell & Kuperminc, 2006; Hernandez, Nesman, Mowery, Acevedo-Polakovich, & Callejas, 2009), and the service practices of these organisations and systems (Brach & Fraserirector, 2000). The results confirm that models of cultural competence should include organisational factors such as Resources & Linkages and Organisational Influences. These

factors are consistent with the characteristics of organisational cultural competence (see Betancourt et al. 2002; DeSousa 2008; Gallegos 2006).

Practical Implications

The current study has practical implications and provides support for the importance of organisational factors in facilitating culturally appropriate service delivery. Consistent with the above, the items that comprise Resources & Linkages and Organisational Influences are consistent with the characteristics of culturally competent organisations (see Betancourt et al. 2002; DeSousa 2008; Gallegos 2006). On the basis of these findings, organisations should include policies and practices to recruit, retain, develop and advance a diverse workforce. Complimentary to these, organisations should implement training and supervision to support working with Aboriginal people and make use of culturally appropriate practices in case management. Where possible, organisations should assist staff to develop links with the Aboriginal community particularly to improve staff members' relationships and connection with Aboriginal people and culture. Staff attendance at key cultural events (as appropriate) is one example of an opportunity for staff to improve their level of community engagement. These findings are consistent with a recent review of training in Australia which emphasises the importance of training to address systemic power imbalances (Downing et al. 2011).

In addition the findings provide support for the inclusion of certain skills and abilities in the repertoire of practitioners. Through cultural supervision and continuous feedback, organisations should seek to improve practitioners' knowledge of Aboriginal communication styles. Proficiency in this skill will facilitate the development of other important skills such as being able to differentiate between mental health illnesses as identified by Western diagnostic systems and culturally related illnesses, and being able to identify culture as a contributing factor to mental ill health. As an adjunct to these skills, organisations should also seek to develop practitioners' abilities to develop appropriate intervention strategies

Concluding Remarks

This study is one of the first to examine a model of cultural competence for mental health practitioners who work with Aboriginal people. By using exploratory CFA this study applies statistical rigour to a neglected field. The results indicate an acceptable fit to the data, in particular the three factors of Skills & Abilities, Resources & Linkages, and Organisational Influences. However future research is needed to improve the assessment of factors including Cultural Knowledge and Attitudes & Beliefs, and items which assess Counselling Skills, Cultural Competence Continuum and Training that did not adequately load on the hypothesized model of cultural competence. In the absence of additional research, the findings suggest that the CCT provides a useful tool to assess some aspects of cultural competence for practitioners in Aboriginal mental health settings. Importantly these aspects include both individual and organisational factors.