The Pacific Identity and Wellbeing Scale – Revised: Comparisons across Pacific groups

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We test the factorial equivalence of the Pacific Identity and Wellbeing Scale – Revised (PIWBS-R) across the four largest Pacific Nations groups in New Zealand (Samoa, Cook Islands, Tonga, Niue). Using Multigroup Confirmatory Factor Analysis (N = 684) we show that the PIWBS-R exhibits similar properties within each Pacific group. Results indicate that across the four groups, the PIWBS-R shows the same basic factor structure, item factor loadings and intercepts. We also compare the group means for the individual factors of the PIWBS-R, whilst statistically adjusting for demographic covariates. Results showed a small but significant difference in Religious Centrality and Embeddedness, where Tongan participants scored higher relative to both Cook Island and Niuean participants. These results mirror population proportions of religious affiliation within Pacific groups in NZ. There were no other significant differences between groups in the other factors of the PIWBS-R. Together, these results provide strong evidence of the PIWBS-R as a valid tool for research with Pacific peoples at a general level, and within specific Pacific ethnic groups.

Keywords: Pacific Nations, Identity, Wellbeing, Measurement Equivalence

Introduction

Quantitative research on Pacific identities and wellbeing is a growing area of interest for Pacific researchers (Savila, Sundborn, Hirao & Paterson, 2011). One advancement in this area is the development and revision of the Pacific Identity and Wellbeing Scale (*PIWBS-R*: Manuela & Sibley, 2015). The *PIWBS-R* is the first psychometric measure developed specifically for Pacific peoples in New Zealand (NZ) and provides researchers with alternative avenues to explore Pacific identities and wellbeing. Here we test the measurement equivalence of the *PIWBS-R* and provide evidence to show it holds similar psychometric properties across the largest Pacific Nations groups represented in NZ (people from Cook Islands, Niue, Samoa and Tonga). We also compare the *PIWBS-R* across the Pacific Nations groups while controlling for key demographic variables that may influence identity and wellbeing.

The *PIWBS-R* is a culturally appropriate measure that assesses six factors of Pacific identity and wellbeing. It was developed through an integration and synthesis of both Pacific and psychological research concerning ethnic identity and subjective wellbeing (See Manuela & Sibley, 2013, 2014a, 2014b). It is a unique tool as it provides a quantitative approach to understanding the holistic conceptualisation of the Pacific self (see for example the Fonofale model of health: Crawley, Pulotu-Endemann & Stanley-Findlay, 1995). The *PIWBS-R* has six factors assessing *Perceived Familial Wellbeing, Perceived Societal Wellbeing, Group Membership Evaluation, Pacific Connectedness and Belonging, Religious Centrality* and *Embeddedness* and *Cultural Efficacy.* A formal list of construct definitions for the six PIWBS subscales is presented in Table 1 (see next page) and a list of items is presented in the appendix

The *PIWBS-R* is both a specific and general measure of identity and wellbeing (Manuela & Sibley, 2015). On the one hand, the *PIWBS-R* is specifically tailored to Pacific peoples. In this instance, it has more nuanced representations of ethnic identity and wellbeing pertinent to Pacific peoples. This separates it from more general measures such as the Multigroup Ethnic Identity Measure (Phinney, 1992) that assesses ethnic identity as a general phenomenon across all groups, and does not take on a holistic approach that includes measures of wellbeing or religion. On the other hand, the *PIWBS-R* was not developed for any one specific Pacific ethnic group. Instead, it is based on the common elements of identity and wellbeing across Pacific groups. In this way, the *PIWBS-R* is a general measure of ethnic identity and wellbeing specific to Pacific peoples.

In the initial development of the tool, Manuela & Sibley (2013) reflected on how it is "*a pan-Pacific scale in construct, aimed at being relevant equally for all Pacific peoples*" (p. 99). This paper seeks to test this earlier aim and with causes that extend beyond the psychometric. The *PIWBS-R* is a tool that is responsive to the needs of Pacific communities and Pacific researchers. One such need is a call for more ethnic specific interventions for Pacific communities, for example Pacific community perspectives on suicide prevention that include ethnic specific approaches and the importance of a secure cultural identity (Le Va, 2014). By providing evidence that a pan-Pacific measure can be used with single Pacific groups, we attempt to answer this call.

Testing Factor Equivalence

Because the *PIWBS-R* is developed for research with Pacific peoples at a general level, we need to show that it is suitable for use across Pacific groups. In other words, do the psychometric properties of the *PIWBS-R* hold across individual Pacific groups represented in NZ? Pacific peoples, as a group are a diverse population, so we need to show that the *PIWBS-R* is actually assessing the same constructs for different groups. That is, do Samoan people, for example, respond to the items in a similar way, or interpret them as referring to the same Pacific concepts, as Tongan

Table 1. Construct definitions for the Pacific Identity and Wellbeing Scale – Revised (PIWBS-R; from Table 1. Manuela & Sibley, 2015).

Factor	Construct Definition
Perceived Familial Wellbeing (PFW)	Perceived satisfaction with one's family. Indicated by satisfaction with familial relationships, respect, happiness and security.
Perceived Societal Wellbeing (PSW)	Perceived satisfaction with NZ society. Indicated by satisfaction with support from government, local communities and one's position in NZ society.
Group Membership Evaluation (GME)	Subjective evaluations of one's perceived membership in the Pacific group. Indicated by positive affect derived from group membership.
Pacific Connectedness and Belonging (PCB)	A sense of belonging and connections with Pacific others and the Pacific group at a general level.
Religious Centrality and Embeddedness (RCE)	The extent to which an individual feels that religion is intertwined with one's Pacific culture and identity.
Cultural Efficacy (CE)	The extent to which an individual feels they have the personal and cultural resources to act within a Pacific cultural or social context.

peoples, Cook Island peoples, or Niuean peoples? This is the same conceptual problem that cross-cultural research faces when aiming to compare scores on the same scale, for example self-esteem, across different cultural contexts, nations and languages (Farruggia, Chen, Greenberger, Dmitrieva & Macek, 2004; Schmitt & Allik, 2005).

MCFA is an extension of Confirmatory Factor Analysis (CFA – see Kline, 2005, for an introduction to CFA and Walkey & Walch, 2010, for an introduction to EFA). MCFA provides a way to test factorial equivalence by estimating a CFA model for separate groups (in our case, Pacific Nations groups) at the same time (Jöreskog, 1971). Factorial equivalence (otherwise known as measurement invariance) in a specific sense is defined by Kline (2005) as "*whether a set of indicators assesses the same constructs in different groups*" (p. 295) and can be assessed at three levels: configural, metric and scalar. These three levels increase in how stringent a test they provide for equivalence.

Configural equivalence assesses the extent to which the same basic factor structure, or loading pattern, holds across different groups. In our case, configural equivalence reflects the extent to which all the items assessing each factor hang together; or the extent to which the measurement model is similar across groups. Metric equivalence (or measurement unit equivalence/construct equivalence) is a step up from configural equivalence because it tests the extent to which the factor loadings themselves are similar. In the case of the *PIWBS-R*, metric equivalence would thus indicate that the actual values for the factor loadings are comparable. This would imply that different groups are interpreting the questions in the same way, or that the same construct is being assessed across groups. Scalar equivalence is more restrictive again. Extending the assumptions for configural and metric equivalence, tests of scalar equivalence assess whether the intercepts for the indicators are comparable across groups. In the case of the *PIWBS-R*, scalar equivalence would indicate that in addition to the pattern and values for factor loadings being similar, the intercept (mean) scores on the actual *PIWBS-R* items are comparable too. This is important because in addition to the same intervals, if the model shows scalar invariance, then the scales share the same origins across groups thus indicating that comparisons of mean differences in the latent scale scores are valid.

Pacific Peoples, Identity and Wellbeing

We compare mean scores on the PIWBS-R constructs across four Pacific Nations in NZ (Cook Islands, Niue, Samoa and Tonga). Although we only focus on the four largest Pacific groups, there are numerous groups represented in NZ. As a whole, Pacific peoples make up approximately 7.4% of the NZ population, and consist of communities from Samoa (49%), Cook Islands (21%), Tonga (20%), Niue (8%), Fiji (4%), Tokelau (2%), Tuvalu (1%), in addition to smaller communities from other Pacific Nations (3%).

While the specific Pacific Nations communities deserve to have their unique cultures and histories recognised within research, quite often it can be difficult to collect large enough samples to reach statistical power. As such, Pacific peoples are often systematically categorised into a single group in research which can conceal inter-group differences, such as variability in Pacific peoples' mortality rates (Statistics New Zealand and Ministry of Pacific Island Affairs, 2011). This can lead to a misconception of a single group. However, there are shared histories and experiences of Pacific peoples that have allowed them to develop a unique identity that is different from the first Pacific migrants (see Macpherson, 1996 for an extensive review and history of Pacific peoples in NZ). We do not aim to define or test this theorized collective identity. We do note, however, that the *PIWBS-R* was explicitly designed to draw on and represent identity and wellbeing common across the Pacific groups (Manuela & Sibley, 2013).

The demographic characteristics of initially immigrant populations, such as Pacific peoples, are important to consider when conducting research. For example, in a study of discrimination and psychological distress for Asian adults in America, ethnic identity buffered the effect of discrimination for middle-aged individuals born in America, whilst exacerbating the effect for American-born individuals above and below middle age (Yip, Gee & Takeuchi, 2008). It is possible that demographic characteristics of Pacific peoples may also influence relationships between ethnic identity and wellbeing in a similar manner. As a general group, Pacific peoples are young and highly religious relative to the overall NZ population, with an increasing proportion born in NZ (Statistics New Zealand, 2014). To account for this, we will compare group means whilst statistically adjusting for gender, age, country of birth and religious status. We provide a brief outline of how these variables could influence Pacific identities and wellbeing

Age

As a group, Pacific peoples are very young. Pacific peoples have a median age of 21.1 years (compared to 41 years for Europeans), giving them the highest proportion of young people of any ethnic group in NZ (Statistics New Zealand, 2014). Research from a national study on NZ youth shows that Pacific secondary school students report high levels of ethnic pride and the importance of being recognised as a member of their ethnic group relative to other non-Pacific ethnic groups in NZ (Clark et al., 2013).

There have been suggestions of intergenerational differences within Pacific communities. Pacific cultures are generally gerontocratic where the voices of elders are given authority over the voices of youth. This can potentially lead to cultural conflicts with Pacific youth in NZ feeling marginalised within their own cultural contexts (Tiatia, 1998). However the influences of older Pacific generations are crucial for the identity development of many Pacific youths. It is very common for Pacific families to have multiple generations within a single household, with older generations usually instilling cultural values into younger generations (Pene, Peita & Howden-Chapman, 2009). Previous research with the *PIWBS-R* has also shown that age is associated with confidence in speaking a Pacific language (Manuela & Sibley, in press)

which may also assist in the transfer of cultural knowledge to younger generations.

Age is an interesting covariate for Pacific peoples as it shows how demographic variables are related to each other, the combination of which could influence scores on the *PIWBS-R*. For example, older Pacific individuals are more likely to have been born overseas and more likely to identify with a religion (Statistics New Zealand, 2007) both of which are outlined in more detail below. As such, we control for age in our analyses to adjust for potential differences in our scores.

Country of Birth

The country of birth of Pacific peoples highlights the biggest change among Pacific communities in NZ. Originally a migrant group in the 1950's, approximately 60% of the Pacific populations that reside in NZ are now NZ-born and this is likely to increase. There are also more Cook Islands and Niue peoples born and/or living in NZ than there are born and/or living in the Cook Islands and Niue. The increasing proportion of Pacific peoples being born and raised in NZ has led to changes in the ways that Pacific identities are expressed and conceptualised.

Early Pacific settlers tended to identify their selves along their village and familial lines as they did in their respective mother-nations (Macpherson, 1996) despite being viewed as a homogenous group by non-Pacific others in NZ. The subsequent generations of the early Pacific migrants found themselves in a social context markedly different to the one the previous generation grew up in, where they interacted with others from a variety of Pacific and non-Pacific backgrounds in a largely multicultural setting. The subsequent NZ-born generations found they had common experiences with each other that differed from those of the Island-born generation before them. Although there are first-generation Pacific migrants and NZ-born Pacific peoples of all ages, the majority of Pacific youth are born in NZ.

The influence of the NZ context on the identities of Pacific peoples born highlights the complexity of Pacific identities in NZ. For example, Anae (1998) explored the identity journey of NZ-born Samoans within the church setting, and how individuals came to what she defined as a 'secure identity' in which one readily defined their self as Samoan. Similarly, Tiatia (1998) explored the experiences of NZ-born Pacific peoples, highlighting experiences of being caught between cultures; trying to navigate what it means to be engaged in both Pacific culture and NZ society when the cultural values of both may contradict each other. Furthermore, Mila-Schaaf (2010) explored the experiences of NZ-born Pacific peoples and how exposure to both Pacific and NZ social spaces was advantageous to individuals.

There are noted differences in mental health between Pacific peoples born in NZ and in the Pacific. Findings from Te Rau Hinengaro, a NZ mental health survey, show that 31.4% of NZ-born Pacific people had a mental disorder within the past 12 months of the time of the survey relative to 15.1% of those born in the Pacific (Foliaki, Kokaua, Schaaf, & Tukuitonga, 2006). It is important to note that age at the time of migration to NZ was influential in the experience of mental disorder rather than the time since migration. For example, of those born in NZ, 93.6% were aged under 45 compared to 47.1% of those who had migrated at 18 years or over.

These findings could represent the immigrant paradox, a counter-intuitive finding that second-generation individuals experience more negative outcomes than their immigrant counterparts (Sam, Vedder, Ward, & Horenczyk, 2006). The results of Te Rau Hinengaro show some evidence of the immigrant paradox with NZ-born Pacific peoples experiencing higher prevalence of mental disorders (Foliaki, Kokaua, Schaaf, & Tukuitonga, 2006). Additional research with Pacific youth has found evidence of first and second generation immigrants reporting higher levels of wellbeing than their NZ-born peers (Spijkers, 2011). This highlights a need to understand how both Pacific identities and wellbeing may be influenced within an acculturative process, and how taking into account one's country of birth may provide a more nuanced approach to understanding wellbeing outcomes. It is also possible that the experience and development of ethnic identity and wellbeing differs between NZ-born and Pacific-born individuals. As such, we control for birthplace in our analyses to adjust for potential differences in scores.

Religion

Religion plays a crucial role in many Pacific cultures in New Zealand.

Table 2

Proportion of religious affiliation and non-religious affiliation by Pacific ethnic groups in New Zealand from each census year (Data from Statistics New Zealand).

	At least one religion				No Religion			
Year	1996	2001	2006	2013	1996	2001	2006	2013
Cook Is.	.82	.77	.70	.65	.18	.21	.24	.31
Fijian	.85	.79	.82	.83	.15	.15	.15	.15
Niuean	.82	.76	.70	.66	.18	.22	.24	.30
Samoan	.92	.90	.86	.83	.08	.09	.11	.14
Tokelauan	.95	.91	.86	.83	.05	.09	.10	.14
Tongan	.94	.92	.90	.88	.06	.07	.08	.10
Tuvaluan	-	.97	.96	.93	-	.02	.02	.05

The Pacific group at a general level is highly religious with approximately 82% of Pacific peoples affiliating themselves with at least one religion in the 2006 NZ census (compared to 61% of the total NZ population). Religion, religious practices and spirituality have been widely researched in Pacific communities, largely in regards to the role of religion in culture. For example, Macpherson (1996) notes that many early Pacific migrants to NZ viewed their church as a village away from the islands. In their explorations of ethnic identity for NZ born Pacific peoples, identity narratives were explored within Church settings (Anae, 1998; Tiatia, 1998). Religious practices such as church attendance have also been seen as an avenue to promote and improve health outcomes for Pacific peoples (Dewes, Scragg& Elley, 2013) and recognised as a critical aspect of counselling for Pacific clients (McRobie & Makasiale, 2013).

The NZ population as a whole has seen a steady decline in religious affiliation. It appears that the Pacific population has followed suit, although to a lesser extent. Over the 10 year period from 1996 to 2006, the proportion of Pacific peoples that affiliated with at least one religious group decreased from 89% to 83%. A more nuanced look into religious affiliation across Pacific communities shows that the proportion of people that affiliate with at least one religious group has decreased across most Pacific groups, but this decrease is more pronounced amongst Cook Island and Niuean communities (see Table 2). Furthermore, the proportion of Pacific peoples that identified with no religion has increased across all Pacific groups (except Fiji which has remained relatively consistent) with the highest proportions in the Niue and Cook Islands groups. It is interesting to note that those that do not affiliate with any religion tend to be younger and New Zealand born, which suggests that there may be a change in the role of the church in the lives of Pacific youth in NZ (Anae, 2011). Despite the decreasing proportion of religious affiliation and increasing proportion of religious non-affiliation, the Pacific groups are still the most religious in New Zealand, even amongst Niue and Cook Islands groups

As the proportion of Pacific peoples affiliating with a religion is changing and the suggestion of a change in the role of churches (and potentially religion) in the lives of Pacific peoples, we opt to include religious status as a covariate in our analyses. It is possible that identification with a religion may influence scores of the *PIWBS-R*, particularly the Religious Centrality and Embeddedness factor.

Overview and Guiding Hypotheses

To show that the *PIWBS-R* is a suitable pan-Pacific tool for identity and wellbeing research, it is imperative that the scale is suitable for the groups it was developed for. Here, we will test the measurement properties of the *PIWBS-R* with the four largest Pacific groups in NZ: Cook Islands peoples, Niuean peoples, Samoan peoples and Tongan peoples. We will first conduct a MCFA to see if the relationship between the scale items and their latent constructs hold across the four Pacific groups. As the *PIWBS-R* was developed upon general aspects of identity and wellbeing pertinent to Pacific peoples, we expect that we will find evidence of measurement invariance for the *PIWBS-R* across the four Pacific groups.

In addition to testing the measurement invariance of the *PIWBS-R*, we compare the mean scores across the Pacific groups for the *PIWBS-R* subscales. Further to this, it is important to note potential influences of demographic factors such as age, place of birth and religious status on the *PIWBS-R* scores. As the *PIWBS-R* is assessing general aspects of identity and wellbeing that are specific to Pacific peoples, we expect to see no difference in mean scores on the *PIWBS-R* constructs, in as much as one can predict the null hypothesis. We do however expect there to be a difference in scores on the Religious Centrality and Embeddedness factor that will reflect the current proportions of religious affiliation within the specific Pacific groups. We conduct a Multivariate Analysis of Covariance (MANCOVA) to simultaneously test for differences between the means of the *PIWBS-R* constructs for Cook Islands, Niuean, Tongan and Samoan peoples, whilst controlling for demographic covariates of gender, age, birthplace and religious status.

Method

Participants and Procedure

Participants were 684 (530 female, 154 male) members of the NZ public who took part in the Pacific Identity Study, and identified as being of Pacific Nations ancestry (106 Cook Islands, 89 Niuean, 294 Samoan, 195 Tongan). Participants had a mean age of 29.49 years (SD = 10.43). Other analyses of the Pacific Identity Study are reported in Manuela and Sibley (2013; 2014a; 2014b). Pacific peoples are a notoriously difficult to reach population, and as far as we are aware, our survey represents the largest social psychological survey of Pacific identity and well-being ever conducted in New Zealand

Participants responded to an email advertisement inviting them to be part of an online study on Pacific identity and wellbeing. The email was sent to a variety of Pacific groups, organizations and community networks. A snowballing sampling method was also employed, where participants were asked to invite others in their networks to participate in the study. These data thus cannot be considered representative of the Pacific population in New Zealand. Participants were entered into a draw to win $300 grocery vouchers.

Materials

Participants completed the 35-item *PIWBS-R* (Manuela & Sibley, in press). The *PIWBS-R* contained seven items assessing Perceived Familial Wellbeing (PFW, α = .86), seven assessing Perceived Societal Wellbeing (PSW, α = .87), six items assessing Pacific Connectedness and Belonging (PCB, α = .78), five items assessing Group Membership Evaluation (GME, α = .87), six items assessing Religious Centrality and Embeddedness (RCE, α = .84) and four items assessing Cultural Efficacy (CE, α = .75). Items were rated on a Likert scale for both the identity related constructs (PCB, GME, RCE and CE; 1 = strongly disagree to 7 = strongly agree) and the wellbeing related constructs (PFW, PSW; 1 = completely dissatisfied to 7 = completely satisfied).

Participants were also asked to indicate demographic information about whether they identified with a religion (Yes, No) and their place of birth. Birthplace was then coded into two groups (NZ-Born, Overseas).

Results

Multigroup CFA

We conducted a MCFA assessing the configural, metric and scalar invariance of the *PIWBS-R* across four Pacific Nations groups in New Zealand (Cook Islands, Niue, Samoa, Tonga). We estimated our model using Maximum Likelihood with robust error estimation (MLR) using *MPlus 7.2*. The analysis involved several steps; a) investigating the independent CFA for each Pacific group; b) testing the measurement model specifying configural equivalence across the four groups; c) testing the measurement model imposing metric equivalence across the groups by constraining the factor loadings to equality between groups; and d) testing the measurement model imposing scalar equivalence across the groups by further constraining item-level intercepts to equality between groups. Table 3 presents fit indices for configural, metric and scalar tests of the model, as well as the fit indices when each group were examined independently. In the interpretation of model fit we rely on the recommendations of Hu and Bentler (1999) and present the Standardised Root Mean Square Residual (SRMR) and the Root Mean Square Error of Approximation (RMSEA), assuming the RMSEA of around .06 and the SRMR around .08 as indicators of acceptable model fit. We further present the model $\chi 2$ and the associated degrees of freedom, as well as the Akaike Information Criterion (AIC).

As shown in Table 3, independent CFAs for each specific group indicated that the *PIWBS-R* fit reasonably well when used within each group independent of the others. The *PIWBS-R* also provided reasonable fit when assessed across our sample of Pacific people as an overall group.

Critically, tests of the multi-group CFA indicated the *PIWBS-R* exhibited similar properties within each Pacific group. The model tests configural equivalence performed reasonably well, with an RMSEA of .064 and sRMR of .072. This suggests that the overall measurement model, or pattern of loadings, for the *PIWBS-R* is fairly similar across different Pacific groups.

Even more important, chi-square difference tests indicated that more constrained models imposing metric and scalar equivalence did not differ in their fit from the less restricted configural model (Metric against Configural model, $\chi 2$ (87) = 99.05, p = .18. Scalar against Configural model, $\chi 2$ (174) = 199.58, p = .09). The scale and metric model also did not differ significantly in fit ($\chi 2$ (87) = 100.93, p = .15). As reported in Table 3, the fit indices for the metric and scalar models were consistent with these non-significant Chi-square tests, and indicate that the *PIWBS-R* performed reasonably well under these additional restrictive assumptions.

Mean differences in the PIWBS-R

A one-way MANCOVA compared mean levels of *Perceived Familial Wellbeing, Perceived Societal Wellbeing, Pacific Connectedness and Belonging, Group Membership Evaluation, Religious Centrality and Embeddedness*, and *Cultural Efficacy* across four Pacific Nations groups in New Zealand (Cook Islands, Niue, Samoa, Tonga). Gender, age, religious status and birthplace were entered as covariates. Raw and covariate-adjusted means and standard errors are presented in Table 4.

The only significant difference across the four ethnic groups occurred for the *Religious Centrality and Embeddedness* (RCE) factor (F(3, 681) = 4.903, p = .002, partial η^2 = .021). Bonferroni-corrected post hoc tests indicated that there was a significant difference in the mean levels of RCE between

Table 3

Fit indices for Multigroup CFA assessing the equivalence of the PIWBS-R across different Pacific groups.

	x^2	*df*	AIC	RMSEA	90% CI $\varepsilon_a\Delta$	SRMR
Standard CFAs						
Cook Island	922.35	545	12706.58	.077	[.068, 0.085]	.087
Samoan	1241.70	545	37793.05	.061	[.056, .065]	.060
Niuean	963.50	545	11300.97	.088	[.079, .097]	.086
Tongan	1100.57	545	23439.25	.068	[.063, .074]	.073
Overall model	4482.00	2354	85145.74	.068	[.065, .071]	.088
Multigroup CFA						
Configural model	3923.07	2180	85239.85	.064	[.061, .067]	.072
Metric model	3998.63	2267	85218.69	.062	[.059, .066]	.086
Scalar model	4103.93	2354	85145.74	.062	[.058, .065]	.088

Metric against Configural model, χ^2 (87) = 99.05, p = .18. Scalar against Configural model, χ^2 (174) = 199.58, p = .09. Scalar against Metric model, χ^2 (87) = 100.93, p = .15. Multigroup model estimated using Maximum Likelihood with robust error estimation (MLR). Standard CFAs estimated using Maximum Likelihood (ML), as all fit indices for standard CFA models are not available under MLR.

Tongans (M = 5.638, SE = .093) and Cook Islanders (M = 5.106, SE = .123, p = .004), and between Tongans and Niueans (M = 5.174, SE = .136, p = .035).

There were no significant differences across ethnic groups for *Perceived Familial Wellbeing* (F(3, 676) = .242, p = .867, partial η^2 = .001), *Perceived Societal Wellbeing* (F(3, 681) = .1.227, p = .299, partial η^2 = .005), *Pacific Connectedness and Belonging* (F(3, 681) = .159, p =.924, partial η^2 = .001), *Group Membership Evaluation* (F(3, 681) = 1.795, p = .147, partial η^2 = .008) and Cultural Efficacy (F(3, 681) = .712, p = .545, partial η^2 = .003).

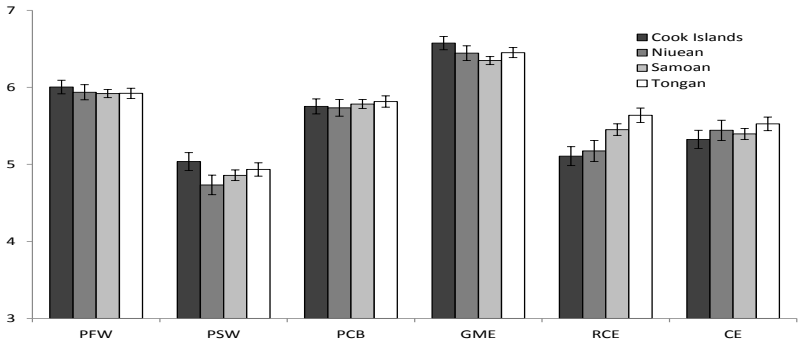

Fig. 1

Mean levels of the PIWBS-R constructs across ethnic groups. Means have been adjusted for gender, age, religious status and birthplace covariates (error bars represent the standard error of the mean, y axis ranged from 1 to 7; PFW = Perceived Familial Wellbeing; PSW = Perceived Societal Wellbeing; PCB = Pacific Connectedness and Belonging; GME = Group Membership Evaluation; RCE = Religious Centrality and Embeddedness; CE = Cultural Efficacy).

Table 4

Raw means, covariate-adjusted means and standard errors of the PIWBS-R factors.

Raw Means	PFW	PSW	PCB	GME	RCE	CE	*N*
Cook Islands	5.97 (.08)	5.01 (.11)	5.72 (.10)	6.55 (.07)	4.96 (.16)	5.30 (.12)	106
Niuean	5.90 (.11)	4.70 (.14)	5.69 (.12)	6.40 (.11)	4.93 (.15)	5.41 (.15)	89
Samoan	5.92 (.05)	4.86 (.07)	5.80 (.06)	6.35 (.06)	5.48 (.08)	5.41 (.07)	294
Tongan	5.95 (.07)	4.96 (.09)	5.83 (.07)	6.47 (.06)	5.78 (.09)	5.54 (.08)	195
Total	5.94 (.04)	4.89 (.05)	5.78 (.04)	6.42 (.03)	5.41 (.05)	5.43 (.05)	684
Covariate Adjusted Means							
Cook Islands	6.00 (.09)	5.04 (.12)	5.75 (.10)	6.57 (.09)	5.11 (.12)	5.32 (.12)	106
Niuean	5.94 (.10)	4.73 (.13)	5.73 (.11)	6.44 (.10)	5.17 (.14)	5.44 (.13)	89
Samoan	5.92 (.05)	4.86 (.07)	5.78 (.06)	6.35 (.05)	5.45 (.07)	5.40 (.07)	294
Tongan	5.92 (.07)	4.93 (.09)	5.82 (.07)	6.45 (.07)	5.64 (.09)	5.53 (.09)	195
Total	5.95 (.04)	4.89 (.05)	5.77 (.04)	6.45 (.04)	5.34 (.05)	5.42 (.05)	684

PFW = Perceived Familial Wellbeing; PSW = Perceived Societal Wellbeing; PCB = Pacific Connectedness and Belonging; GME = Group Membership Evaluation; RCE = Religious Centrality and Embeddedness; CE = Cultural Efficacy. Values in brackets represent the standard error of the means.

Discussion

We tested the measurement equivalence of the *PIWBS-R* to see if the psychometric properties of the *PIWBS-R* hold for Cook Islands, Niuean, Samoan and Tongan peoples in NZ. Our results indicate that the *PIWBS-R* provides a reliable measure of pan-Pacific identity which holds across the four largest Pacific Nations groups in NZ. The *PIWBS-R* can thus be used with confidence to make comparisons across these four groups.

We also compared covariate-adjusted mean scores of the *PIWBS-R* constructs across the Pacific groups. Our results indicate that after adjusting for differences in gender, age, country of birth and religious status, there were no significant differences between Cook Islands, Niuean, Samoan and Tongan peoples on their mean scores for five out of six of the *PIWBS-R* constructs. That is, there were no significant differences in covariate-adjusted mean scores for *Perceived Familial Wellbeing, Perceived Societal Wellbeing, Pacific Connectedness and Belonging, Group Membership Evaluation*, and *Cultural Efficacy.*

We did however find a significant difference in the mean scores for the *Religious Centrality and Embeddedness* (*RCE*) factor. Our results show that as a group, Tongans scored higher on the *RCE* factor relative to their Cook Island and Niuean counterparts, even after statistically adjusting for gender, age, birthplace and religious status. There were no other differences in adjusted mean scores between the Pacific groups on the *RCE* factor. The *RCE* factor reflects the extent to which individuals feel their Pacific culture is intertwined with religion. As mentioned earlier, there has been a decline in religious affiliation across all Pacific groups, and this is more pronounced among Cook Islands and Niuean groups. It is likely that our findings are reflecting this trend. Pacific groups with a higher proportion of individuals not affiliating with a religion are more likely to, on average, score lower on the *RCE* factor relative to Pacific groups with a lower proportion of religious non-affiliation. In other words, Cook Islands and Niuean peoples view religion as an integral aspect of their Pacific identity to a marginally lesser extent than Tongan peoples.

Despite the significant difference in *RCE* scores, the effect size is small. All Pacific groups that were included in this study have moderate/high mean scores on this factor. At a general level, this would suggest that all Pacific groups surveyed here view religion as an integral component of their Pacific culture. A more specific intra-Pacific view shows that although scores on *RCE* are relatively high overall, some groups score higher relative to others. Exploring the other factors of the *PIWBS-R*, we see that there are no significant differences in the covariate-adjusted means. This shows that participants were responding to the scale items in a similar way, regardless of what Pacific group they identified with, their gender, age, place of birth and religious status. We can also see an important difference in the two wellbeing measures of the *PIWBS-R*. Firstly, we can see that participants score high on *Perceived Familial Wellbeing*, indicating that participants are generally highly satisfied with their family relationships. In comparison, we see that participants scored moderately, but relatively lower than *Perceived Familial Wellbeing*, for *Perceived Societal Wellbeing*. This indicates that Pacific participants are moderately satisfied with NZ society. Moreover, this comparison is showing that Pacific peoples in general are reporting more satisfaction from micro-level wellbeing domains relative to macro-level wellbeing domains.

Exploring the other identity domains of the *PIWBS-R*, there were no significant differences between the ethnic groups on their mean scores. Focussing on *Pacific Connectedness and Belonging*, we see that participants are scoring moderate/high. This indicates that participants generally feel a sense of belonging and a sense of connections to other Pacific peoples at a general level. Looking at *Group Membership Evaluation*, participants scored very high regardless of their ethnicity. This indicates that Pacific peoples have a lot of positive affirmations about their self-perceived membership within the Pacific groups. This finding is similar to that of the Youth '12 research that shows that large proportions of Pacific youth reported high levels of ethnic pride relative to other ethnic groups (Clark et al., 2013).

It appears that regardless of what Pacific ethnic group one belongs to, self-perceived membership within that group or identification with the Pacific group at a general level is rated as a highly positive aspect. Finally, focussing on *Cultural Efficacy*, our results show that participants scored moderate/highly on this factor. This indicates that participants feel they have the personal and cultural resources to express their selves in a Pacific cultural or social context to a moderate-high extent. It is interesting to note that scores on *Cultural Efficacy* were lower relative to *Group Membership Evaluation*. This indicates that despite Pacific individuals' self-perceived capacity of participating in a cultural context, or their cultural efficacy, self-perceived membership in one's Pacific group is still regarded as a positive aspect of identity. Similar findings have been found by Manuela and Sibley (2013), who found that *Cultural Efficacy* was positively associated with confidence in speaking one's Pacific language, whilst *Group Membership Evaluation* was negatively associated.

The results presented here provide evidence that the *PIWBS-R* is performing equally well across groups. This is important for two reasons. Firstly, the *PIWBS-R* was explicitly designed as a pan-Pacific research tool. As the scale was developed based on common elements of identity and wellbeing across the Pacific Nations, we argue that it can be used to pursue identity and wellbeing research for the Pacific group at a general level. This is the first psychometric tool developed specifically for Pacific peoples that incorporates a holistic view of the self from a Pacific perspective. Although the individual factors of the *PIWBS-R* can be used independently for researchers' purposes, the overall model provides the best psychometric and quantitative equivalent to the holistic conceptualisation of the Pacific self to date.

Secondly, the evidence presented here shows that the *PIWBS-R* performs well for the groups assessed this may lead to even more specific measures of identity and wellbeing for the Pacific groups. The *PIWBS-R* as it stands provides an avenue for intra-ethnic Pacific research to understand identity

and wellbeing within the Pacific group at a general level and potential differences and similarities between the groups. It is also possible, as shown by our tests of configural, metric and scalar equivalence, that the *PIWBS-R* can be used for research with specific Pacific ethnic groups in NZ. For example, should one wish to conduct research specifically with Cook Islands communities in NZ, our findings lend support to the *PIWBS-R* provides a valid assessment of ethnic identity and wellbeing for them

Limitations

Our findings provide evidence that the *PIWBS-R* works well for research with Pacific groups in NZ. However, we had to limit the groups included in our analyses to the four largest Pacific groups represented here. As such, we are unable to provide evidence of measurement equivalence for the numerous other peoples from Pacific Nations represented in NZ such as Fiji, Tokelau and Tuvalu. This was due to inadequate sample sizes for the other Pacific Nations groups represented in NZ to conduct our analyses. One option would have been to combine the smaller numbers of the other Pacific Nations groups into another "Other Pacific" category. However, as part of the aim of this study was to test measurement equivalence across groups, combining groups into a single category would be inappropriate. Further research with large enough samples could test this again to see how the *PIWBS-R* performs within the smaller Pacific groups represented in NZ. We would expect to observe similar findings for the other Pacific groups not represented in this study.

Concluding comments

The Pacific Identity and Wellbeing Scale—Revised (*PIWBS-R*) is a measure of ethnic group identification and wellbeing designed specifically for Pacific peoples living in New Zealand. A copy of the original PIWBS is presented in Manuela and Sibley (2013), and a copy of the *PIWBS-R* in Manuela and Sibley (2015). Here, we document the measurement properties of the *PIWBS-R*, and show that the scale performs well with different Pacific groups. Our analyses indicate that participants that identify with the four largest Pacific Nations groups in NZ (Samoa, Cook Islands, Tonga and Niue) are responding to, and interpreting, items of the *PIWBS-R* in a similar way to each other. This allows researchers using the *PIWBS-R* to make meaningful comparisons of group means between the Pacific groups assessed here. Furthermore, we found a small but significant difference in the Religious Centrality and Embeddedness factor where Tongan participants scored higher relative to their Cook Island and Niuean counterparts, even after controlling for gender, age, place of birth and religious status. This finding was consistent with patterns of religious affiliation within Pacific groups in NZ. There were no other differences between groups in other constructs of the *PIWBS-R*. These findings show that the *PIWBS-R* provides an important and psychometrically sound tool to advance psychological knowledge concerning the ethnic identity and wellbeing of Pacific peoples in NZ.

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Appendix. Item content for the PIWBS-R

Perceived Familial Wellbeing (PFW)

Your relationship with your parents.

Your position in your family.

Communication with your family.

The respect you give for your parents.

The respect you receive from your family.

Your family's happiness.

Your family's security.

Perceived Societal Wellbeing (PSW)

Support provided to you by the New Zealand government to you as a Pacific Islander.

Your position in New Zealand as a Pacific person.

The support you receive as a Pacific Islander in New Zealand.

Your personal needs being met by New Zealand.

Your relationship with New Zealand society.

The support you receive as a Pacific Islander in the community you live in.

The support you receive in the community you live in.

Pacific Connectedness & Belonging (PCB)

I feel at home around other Islanders, even if they are not from my island.

I feel connected to other Pacific peoples in general.

I feel connected to people from a different Pacific Island to myself.

I feel comfortable in places with lots of other Pacific peoples.

I feel most comfortable in Pacific communities.

I don't get along with other Island groups (r).

Group Membership Evaluation (GME)

The fact that I am an Islander is an important part of my identity.

Being an Islander is an important part of how I see myself.

Being a Pacific Islander gives me a good feeling.

I am glad to be a Pacific Islander.

I am proud to be a Pacific Islander.

Religious Centrality & Embeddedness (RCE)

Going to church is part of my culture and religion.

God has a strong connection to my culture.

Religion is not important for my culture (r).

Our religion is the centre of our culture as Pacific Islanders.

Religion is the root of our Pasifika culture.

Part of being a Pacific Islander is having a connection with God.

Cultural Efficacy (CE)

I find it easy to participate in Pacific cultural events.

I feel I am easily able to express who I am as a Pacific person.

I enjoy participating in Pacific cultural events.

I find it difficult to express my Pacific culture (r).

(r) Indicates a reverse coded item.