Comparative Reliability of 108 Scales and their Short-Form Counterparts

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Short-form scales are often necessary for large omnibus surveys. This study compared the reliability of 108 short-form scales and single-item indicators included in the New Zealand Attitudes and Values Study (NZAVS) with their full-form parent counterparts. Scale psychometrics were evaluated using an omnibus dataset pooling multiple samples with a foundation sample that employed a planned missing design presenting a random selection of 66% of the 1,012-item pool to n=2,947 undergraduates. Comparative reliability estimates for all short and full-form scales are reported. The majority of short-form scales displayed adequate reliability, indexed by coefficient omega. Fit statistics for all 108 full-form scales are also reported, and factor loadings are provided in an online supplement. These results calibrate conclusions for studies that necessarily employ short-form scales, and indicate that the majority of short-form scales employed by the NZAVS display adequate internal reliability relative to their original full-form (parent) versions.

Keywords: *Psychometrics, Reliability, Scales, Survey Methods*

INTRODUCTION

Where questionnaire space is at a premium, short-form scales or single-item indicators are often employed. The New Zealand Attitudes and Values Study (NZAVS) is one such large-scale study in which questionnaire space is contested. The NZAVS is a national probability annual longitudinal panel study that began in 2009 and includes more than 70,000 participants in total (see Sibley, 2023). Like many such studies, our research team adopt a design philosophy of breadth rather than depth, and have opted to include many brief scales or single-item indicators covering a diverse range of constructs. The inevitable trade-off is that by including fewer indicators canvassing many constructs, one risks measuring a myriad of constructs badly (with poor reliability) rather than fewer constructs well.

Here, we present data comparing the psychometric properties of the full-form (parent) versions of 108 scales commonly used in personality and social psychology with the short-form (often three-item) or single-item index versions included in the NZAVS. The majority of the short-form index scales included in the NZAVS were selected specifically for the study, rather than from officially validated short-forms (as very few validated short-forms were available). Item selection has thus been based on a range of criterion; such as factor loadings from our own unpublished pilot data, personal opinion and focus groups evaluating how we think items will be interpreted in the New Zealand context; and when available, the psychometric properties (factor loadings and such) provided in previously published papers. To put it charitably, evaluation of the many short-form scales included in the NZAVS has, until now, been somewhat unsystematic and employed diverse ad-hoc criteria depending on the construct of interest. Incidentally, the present study also documents the psychometric properties (reliability, fit statistics, and factor loadings) for the full versions of more than 100 scales using a standard set of criteria, which may be of some interest in its own right.

Scale reliability

We evaluate the psychometric performance of the short-form scale and single-item indicators included in the NZAVS relative to their full-scale counterparts by comparing their performance according to McDonald's (1970, 1999) omega (see McNeish, 2017, for an excellent and accessible discussion of omega and other indices of reliability). Our goal is to document and compare the parameter estimates of more than 100 scales, regardless of whether a given scale is theorized to assess a sub-factor nested in a larger multidimensional model (such as Extraversion in the Big-Five model of personality) or is operationalized as a unidimensional construct, such as Social Dominance Orientation (as originally conceptualized by Pratto et al., 1994). We thus evaluate each scale as its own univariate latent variable; to illustrate, a single-factor Confirmatory Factor Analysis (CFA) of the items assessing Extraversion, then another independent single-factor CFA assessing Agreeableness, and so forth. This approach maintains parity in parameter estimates across scales.

Omega is an estimate of composite reliability that represents the ratio of the sum of the factor loadings

squared divided by the sum of the factor loadings squared plus the sum of the item residuals. Omega can therefore be thought of as representing the degree to which the composite variation in a set of scale items is explained by a latent variable representing the construct those items are presumed to measure. As an aside, Cronbach's alpha is a special case of omega under the condition that all factor loadings are identical and each item contributes identically to the scale score (see Geldhof et al., 2014).

We estimate omega for the short and full versions of each scale using the parameters (factor loadings and item residuals) from a single-factor CFA of the full set of items for each scale. Our rationale is that when deriving omega for the reduced set of items contained in the short-form scale, one should use the maximum available information about the latent variable reflecting the construct of interest. Because we measured the full versions of every scale, information regarding presumed population parameters relating to the latent variable are maximized in a model including the full set of scale items. Applying this same logic also allows one to derive omega for single-item indicators. In such cases, omega is simply the factor loading squared for the item of interest divided by the sum of the factor loading squared plus the item residual; which is equivalent to the proportion of variance in the item explained by the latent variable (the item R2).

The present study

We assess omega in an omnibus dataset pooling our internal archive of mostly unpublished or pilot samples containing partially overlapping item sets that have been previously employed when assessing items for inclusion in the NZAVS (described below). The approach of pooling overlapping datasets for simultaneous analysis is known as Integrative Data Analysis (IDA), and was popularized by Curran and Hussong (2009). These pooled samples, each containing responses to a small set of the scales, are anchored or linked together by a foundation sample. This foundation sample employed a planned missing design where participants (undergraduate students) were each presented with an independent random selection of 66% of the total pool of 1,012 items from the 108 scales. This approach maximizes the data available to evaluate each scale while reducing participant burden to a manageable level as no one participant completed all items.

We employed Bayesian estimation with full information to evaluate scale psychometrics. Similar to Full Information Maximum Likelihood (FIML; see Enders & Bandalos, 2001), Bayes can leverage all available data to reliably estimate population parameters in structural equation models when data are missing at random, as is the case here (see Asparouhov & Muthén, 2010). Moreover, Bayesian credible intervals do not assume symmetry in upper and lower bounds. This is important when comparing the reliability of short- versus full-scales as such intervals may be asymmetric when omega approaches the upper bound.

An ancillary goal of the current study was to document and compare the fit of unidimensional Confirmatory Factor Models of the full version of each of the 108 scales. We present model fit indices for identical single-factor CFAs of all full scales using both Bayesian estimation and Maximum Likelihood with Robust estimation (MLR), both employing full information. On the one hand, Bayesian estimation has the advantage of providing credible intervals for indices of both the Comparative Fit Index (CFA) and Tucker-Lewis Index (TLI), in addition to the confidence interval for the RMSEA also available under Maximum Likelihood (see Asparouhov and Muthén, 2021, for technical details of fit indices in Bayesian models). On the other hand, MLR also allows for the estimation of the Standardized Root Mean Square Residual (SRMR). We anticipate readers interested in the performance of full-scale univariate CFAs will wish to evaluate the SRMR along with other fit indices. We opted to provide model fit indices for both methods of estimation so readers can make their own informed decisions about the performance of the full scales.

METHOD

Participants

The sample contained 8977 participants, pooled across multiple independent undergraduate and community samples (6191 women, 2591 men, 76 gender diverse, missing n = 119). Participants' mean age was 27.28 years (SD = 14.99, missing n = 260). The sample contained 5964 people who identified as New Zealand European, 723 who identified as Māori, 433 who identified as Pacific and 1696 who identified as Asian (note that these counts are not independent as people could identify with multiple ethnic groups; missing n = 641). The sample contained 1534 people who identified as religious (3133 non-religious, missing n = 4310); 3010 people were employed (1796 unemployed or full-time students, missing n = 4171); 2555 had a romantic partner (2610 single, missing n = 3821); and a median household income of $NZ 75,000 (missing n = 5615). The large amount of missing demographic information occurred because not all samples included all demographic questions.

Pooled Samples

Our goal was to construct a sample pooling as much information as possible about full versions of scales from multiple datasets (IDA). This involved combining the archive of mostly unpublished or pilot samples analysed when assessing items for inclusion in the NZAVS. In total, we combined 12 such samples, with sample sizes ranging from n = 114 to n = 1335 participants. All samples were of New Zealand residents or undergraduates collected by our research team, with the exception of Goldberg's (1999) International Personality Item Pool sample of 600 Oregon residents. These 12 samples typically included full versions of two or three different scales, with the exception of one collected via a Facebook advertisement that contained short-form versions of the majority of NZAVS scales. Complete details listing the items included in each sample are provided in the NZAVS data dictionary on the Open Science Framework (OSF): https://osf.io/75snb/wiki/home/

We also collected a foundation sample that included the full versions of all 108 scales (1,012 items). The foundation sample employed a planned missing design and presented a random draw of 66% of the total item pool to each participant. Participants were 2,947 undergraduates who completed the online survey for partial course credit at one of three New Zealand Universities. This foundation sample was collected over six years (2018-2023), and formed the basis of the scale

validation study by ensuring a reasonable minimum sample size for all 108 scales (pooled *n*s for each scale are reported in Table 1). Note that scales assessing Trust in Science, Science Credibility and Left-Wing Authoritarianism, were added to the item pool for the foundation sample in 2022 (and completed by only 1,579 participants in that sample). The foundation sample also included items that presume religious belief and were presented only to people who identified as religious (e.g., Quest Religious Orientation and Religious Group Narcissism). This research was approved by the University of Auckland Human Ethics Committee (Ref. 021498).

We are unaware of sample size recommendations for estimates of reliability, but note that Hu and Bentler (1999) caution against their combinatorial rules for evaluating model fit in CFAs with $n \leq 250$, and in some cases $n \leq 500$. We were also guided by Yang and Green (2015), who caution against the estimation of omega using WLSMV of ordinal indicators with $n \leq 500$. We therefore defined n=500 as a reasonable minimum, as our models were broadly similar in most respects to the parameters in Hu and Bentler's (1999) simulations. We far exceeded this minimum sample size. This is important because our use of a planned missing design attenuates statistical power relative to sample size.

Scales

Table 1 lists the 108 scales we examined, the number of items included in each full scale, the number of items included in the NZAVS short-form version, and the source reference for the full version of the original scale. The list of items included in each scale is available on the scale validation page of the NZAVS OSF wiki: https://osf.io/75snb/wiki/Scale%20Validation%20Study/.

The wiki also identifies the items in each scale that were included in NZAVS short-form versions. Items were rated on a Likert scale ranging from 1-7 in most cases. In instances where other ranges were used (such as a 1-5 or 1-10 rating), these were rescaled to range from 1-7 for consistency. All contrait items were reverse-scored. Only the first 7 of the total 28 items from the Multicultural Attitudes Scale were included in the item pool; and only Part One of the Disgust Scale-Revised. Evaluation of these two scales is therefore based on a reduced item pool, not the full scale.

The NZAVS includes previously validated short-form scales of a suitable length where possible. This includes the Mini-IPIP four-item scales assessing Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness (Donnellan et al., 2006); the three-item versions of Historical Negation and Symbolic Exclusion (Sibley & Osborne, 2016); and the three-item versions of Active Harm, Passive Harm, Active Facilitation and Passive Facilitation (Sibley, 2011). In all other cases, the short-form versions evaluated here were developed specifically for the NZAVS.

RESULTS

Model overview

Analyses were conducted in M*plus* 8.10. We first estimated a separate CFA for each scale in which the full set of items included in the scale loaded on a univariate latent factor using Bayesian estimation with diffuse (non-informative) priors. As discussed above, we used the parameters estimated from the full model (i.e., the model containing all items in a given scale) when estimating omega coefficients for the subset of items included in the corresponding short-form scale and single-item indicator for that construct. This is because we aimed to estimate population parameters relating to the latent variable (factor loadings, item residuals) for each short-form scale. Information about these specific item parameters was maximized by including the full set of scale items when estimating each univariate latent variable. We also estimated fit statistics for these same CFAs using MLR.

Psychometrics

There are no exact values defining the threshold for acceptable reliability, or model fit for that matter. There are only rules of thumb. We view omega coefficients of greater than .70 as indicating acceptable scale reliability. Given the inevitable trade-off with using short-scales in national probability samples with very large sample sizes, we suggest that values in the .60-.70 range indicate that results provide credible information but should be interpreted with caution.

Omega coefficients for the short- and full-forms of all 108 scales are reported in Table 2. As also shown in supplementary Figure 1, most of the short-form scales assessed here displayed adequate reliability (i.e., omega coefficients were mostly above .60 or .70). There were, however, some notable exceptions, which we return to in the discussion.

Although not our focus, we also document model fit indices and factor loadings for single-factor CFAs assessing each of the 108 full-form scales (see Table 3), and one can get a visual sense of the relative fit of different scales in supplementary Figures 2 and 3. Standardized factor loadings for all scales are also provided in an online supplement, available as a wiki on the NZAVS OSF: https://osf.io/75snb/wiki/Scale%20Validation%20Study/.

As a rule-of-thumb, the following values are typically interpreted as indicating reasonable model fit: CFI and TLI greater than .95, RMSEA below .06 and SRMR below .08 (see Hu & Bentler, 1999). Hu and Bentler based these approximate cut-off values on simulations of a three-factor CFA, each with five indicators with factor loadings close to .70. The parameters in their simulations are fairly similar to our CFAs and so these recommendations should generalize fairly well, but note that our models were all single-factor.

Finally, we report fit indices for all full scales with four or more items, but caution readers not to place too much emphasis on fit indices for models with few degrees of freedom. Fit indices (and the RMSEA in particular) tend to be biased in models with few degrees of freedom, such as a single-factor CFA of a scale with only four, five or even six items (Kenny et al., 2015). Regardless, we report all available fit indices in M*plus* using both Bayes and MLR; we hope these may be of some use to other researchers when evaluating scale performance for use in other research.

Table 1. Short-form scales included in the New Zealand Attitudes and Values Study

	No. of Items		*N*	Source Reference
	Full	Short		
50-item IPIP - Agreeableness	10	4	5,344	Goldberg (1999)
50-item IPIP - Conscientiousness	10	4	5,344	Goldberg (1999)
50-item IPIP - Extraversion	10	4	5,344	Goldberg (1999)
50-item IPIP - Neuroticism/Emotionality	10	4	5,344	Goldberg (1999)
50-item IPIP - Openness to Experience	10	4	5,344	Goldberg (1999)
Active Facilitation (BIAS-TS)	8	3	2,912	Sibley (2011)
Active Harm (BIAS-TS)	8	3	2,910	Sibley (2011)
Agreeableness (Politeness facet)	10	3	4,010	DeYoung et al. (2007)
Approach Social Motivation	4	3	2,864	Elliot et al. (2006)
Attributions about Income Inequality	11	1	4,211	Kluegel and Smith (1986)
Avoidance Social Motivation	4	3	2,880	Elliot et al. (2006)
Benevolent Sexism	11	5	5,467	Glick and Fiske (1996)
Body Satisfaction	7	1	4,206	Cash et al. (2002)
Brief Self-Control Scale	14	2	4,260	Tangney et al. (2004)
Colour-Blind Ideology	4	3	2,859	Knowles et al. (2009)
Competitive World View	20	2	2,944	Duckitt et al. (2002)
Compliance with Police	3	2	4,054	Tyler (2005)
Dangerous World View	10	2	3,275	Duckitt et al. (2002)
Disgust Sensitivity	14	1	3,720	Olatunji et al. (2007)
Dissipation-Rumination	15	–	4,203	Caprara (1986)
Economic System Justification	17	1	4,180	Jost and Thompson (2000)
Em. Reg. Difficulties Goal-Directed Behavior	5	–	2,903	Gratz and Roemer (2004)
Em. Reg. Impulse Control Difficulties	7	1	4,199	Gratz and Roemer (2004)
Em. Reg. Lack of Emotional Awareness	6	–	2,933	Gratz and Roemer (2004)
Em. Reg. Lack of Emotional Clarity	5	–	2,912	Gratz and Roemer (2004)
Em. Reg. Limited Regulation Strategies	8	–	2,944	Gratz and Roemer (2004)
Em. Reg. Nonacceptance of Responses	6	–	2,933	Gratz and Roemer (2004)
Em. Reg. Reappraisal	7	1	4,902	Gross and John (2003)
Em. Reg. Suppression	5	1	4,881	Gross and John (2003)
Environmental Efficacy	6	2	3,763	Sharma (2008)
Equality Positioning	8	3	4,641	Sibley and Wilson (2007)
Ethnic Group Active Harm	8	3	2,915	Sibley (2011)
Ethnic Group Narcissism	9	3	2,942	de Zavala et al. (2009)
Ethnic Group Passive Facilitation	8	3	2,915	Sibley (2011)
Ethnic Group Passive Harm	8	3	2,911	Sibley (2011)
Ethnic Subgroup Respect	3	1	3,382	Huo et al. (2010)
Extrinsic-Personal Religious Orientation	11	3	890	Batson and Schoenrade (1991)
Extrinsic-Social Religious Orientation	3	–	828	Gorsuch and McPherson (1989)
Forgivingness versus Vengeful Rumination	12	3	4,261	Berry et al. (2005)
Gender Identity Centrality	3	1	3,513	Leach et al. (2008)
Gender Income and Employment Opportunity	6	3	3,387	Sibley and Perry (2010)
Gender-Specific System Justification	8	2	4,238	Jost and Kay (2005)
God Locus of Health Control	6	3	886	Wallston et al. (1999)

Table 1 (Cont'd). Short-form scales included in the New Zealand Attitudes and Values Study

	No. of Items		*N*	Source Reference
	Full	Short		
Gratitude (GQ-6)	6	3	4,263	McCullough et al. (2002)
Health Locus of Control	12	3	3,789	Wallston et al. (1978)
HEXACO-100 Honesty-Humility	16	4	4,279	Ashton et al. (2004)
Historical Negation	8	3	5,166	Sibley et al. (2008)
Hostile Sexism	11	5	5,468	Glick and Fiske (1996)
Identification with All Humanity - Community	9	–	2,915	McFarland et al. (2012)
Identification with All Humanity - Humanity	9	–	2,915	McFarland et al. (2012)
Identification with All Humanity - Nation	9	–	2,915	McFarland et al. (2012)
Individual Permeability	2	1	3,711	Tausch et al. (2015)
Institutional Trust in Police	8	3	4,265	Tyler (2005)
Intergroup Anxiety	12	1	4,172	Stephan and Stephan (1985)
Intrinsic Religious Orientation	9	3	890	Batson and Schoenrade (1991)
Left-Wing Authoritarianism	39	5	2,438	Costello et al. (2020)
Modern Racism	6	1	4,171	McConahay (1986)
Moral Foundations - Authority	6	–	2,936	Graham et al. (2009)
Moral Foundations - Fairness	6	–	2,937	Graham et al. (2009)
Moral Foundations - Harm	6	–	2,939	Graham et al. (2009)
Moral Foundations - Ingroup	6	–	2,940	Graham et al. (2009)
Moral Foundations - Purity	6	–	2,933	Graham et al. (2009)
Multicultural Attitudes	7	3	5,444	Breugelmans and van de Vijver (2004)
Nat. Char. Cultural/Bicultural Awareness	7	1	4,301	Sibley et al. (2011)
Nat. Char. Citizenship and Ancestry	7	3	4,305	Sibley et al. (2011)
Nat. Char. Liberal Democratic Values	14	2	4,306	Sibley et al. (2011)
Nat. Char. Patriotic Values	5	1	4,299	Sibley et al. (2011)
Nat. Char. Rugby/Sporting Culture	6	1	4,301	Sibley et al. (2011)
National Wellbeing Index	6	5	4,248	Tiliouine et al. (2006)
Nationalism	7	2	4,421	Kosterman and Feshbach (1989)
Openness (Openness facet)	10	3	3,542	DeYoung et al. (2007)
Passive Facilitation (BIAS-TS)	8	3	2,912	Sibley (2011)
Passive Harm (BIAS-TS)	8	3	2,910	Sibley (2011)
Patriotism	12	2	4,434	Kosterman and Feshbach (1989)
Perceived Social Support	25	3	4,269	Cutrona and Russell (1987)
Perfectionism Discrepancy	12	3	4,263	Rice et al. (2014)
Personal Locus of Control	10	3	2,944	Paulhus and Van Selst (1990)
Personal Respect	5	1	3,384	Tyler et al. (1996)
Personal Wellbeing Index	8	4	4,250	Cummins et al. (2003)
Political Locus of Control/ Political Efficacy	10	3	4,271	Paulhus and Van Selst (1990)
Presence of Meaning in Life	5	2	4,236	Steger et al. (2006)
Primary Psychopathy	16	4	2,944	Levenson et al. (1995)
Psychological Entitlement Scale	9	3	4,252	Campbell et al. (2004)
Quest Religious Orientation	12	3	889	Batson and Schoenrade (1991)
Race Essentialism	8	1	2,937	No et al. (2008)

Table 1 (Cont'd). Short-form scales included in the New Zealand Attitudes and Values Study

	No. of Items		*N*	Source Reference
	Full	Short		
Realistic Threat - Asian Peoples	4	1	2,841	Bobo (1998)
Realistic Threat - Māori	4	1	2,864	Bobo (1998)
Realistic Threat - NZ Europeans	4	1	2,834	Bobo (1998)
Realistic Threat - Pacific Peoples	4	1	2,855	Bobo (1998)
Religious Fundamentalism	20	3	3,059	Altemeyer and Hunsberger (1992)
Religious Group Narcissism	9	3	887	de Zavala et al. (2009)
Right-Wing Authoritarianism	30	6	4,558	Altemeyer (1996)
Satisfaction with Life	5	2	4,224	Diener et al. (1985)
Science Credibility	6	1	2,834	Hartman et al. (2017)
Self-Esteem	10	3	5,346	Rosenberg (1965)
Sense of Belonging (SOBI-P)	20	3	4,273	Hagerty and Patusky (1995)
Social Dominance Orientation (SDO6)	16	6	4,909	Sidanius and Pratto (1999)
Socially Desirability - Impression Management	20	1	2,944	Paulhus (1991)
Socially Desirability - Self-Deceptive Enhancement	20	1	2,944	Paulhus (1991)
Subjective Health	5	3	4,266	Ware and Sherbourne (1992)
Symbolic Exclusion	8	3	4,924	Sibley (2010)
Symbolic Threat - Asian Peoples	8	1	2,940	Stephan et al. (2002)
Symbolic Threat - Māori	5	1	2,907	Stephan et al. (2002)
Symbolic Threat - NZ Europeans	5	1	2,900	Stephan et al. (2002)
Symbolic Threat - Pacific Peoples	8	1	2,941	Stephan et al. (2002)
System Justification	8	4	5,076	Kay and Jost (2003)
Tall Poppy Attitudes	20	3	4,206	Feather (1989)
Trust in Science	5	1	2,843	Nisbet et al. (2015)

Table 2. Comparative Reliability of Short-Form Scales and Single-Item Indicators Included in the New Zealand Attitudes and Values Study Relative to their Full-Form (Parent) Counterparts.

	Scale Reliability	
	Full Scale Omega (ω) [99% CI]	Short-Form Scale Omega (ω) [99% CI]
50-item IPIP – Agreeableness	.809 [.797, .821]	.723 [.704, .740]
50-item IPIP - Conscientiousness	.812 [.800, .823]	.673 [.651, .693]
50-item IPIP - Extraversion	.874 [.866, .881]	.762 [.747, .777]
50-item IPIP - Neuroticism/Emotionality	.882 [.875, .889]	.763 [.748, .778]
50-item IPIP - Openness to Experience	.801 [.788, .813]	.647 [.622, .670]
Active Facilitation (BIAS-TS)	.892 [.883, .900]	.781 [.762, .799]
Active Harm (BIAS-TS)	.934 [.929, .939]	.876 [.865, .886]
Agreeableness (Politeness facet)	.721 [.699, .741]	.487 [.442, .530]
Approach Social Motivation	.768 [.743, .791]	.705 [.666, .738]
Attributions about Income Inequality	.895 [.886, .903]	.560 [.509, .607]
Avoidance Social Motivation	.601 [.553, .643]	.570 [.514, .619]
Benevolent Sexism	.791 [.778, .804]	.686 [.665, .705]

Table 2 (Cont'd). Comparative Reliability of Short-Form Scales and Single-Item Indicators Included in the New Zealand Attitudes and Values Study Relative to their Full-Form (Parent) Counterparts.

	Scale Reliability	
	Full Scale Omega (ω) [99% CI]	Short-Form Scale Omega (ω) [99% CI]
Body Satisfaction	.898 [.891, .905]	.652 [.611, .690]
Brief Self-Control Scale	.851 [.839, .862]	.604 [.568, .636]
Colour-Blind Ideology	.683 [.648, .715]	.646 [.600, .686]
Competitive World View	.858 [.847, .869]	.400 [.348, .450]
Compliance with Police	.809 [.788, .827]	.687 [.648, .725]
Dangerous World View	.725 [.701, .746]	.365 [.312, .418]
Disgust Sensitivity	.771 [.750, .790]	.356 [.289, .425]
Dissipation-Rumination	.850 [.838, .862]	–
Economic System Justification	.837 [.823, .850]	.284 [.227, .343]
Em. Reg. Difficulties Goal-Directed Behavior	.851 [.837, .865]	–
Em. Reg. Impulse Control Difficulties	.916 [.909, .923]	.606 [.558, .651]
Em. Reg. Lack of Emotional Awareness	.839 [.824, .852]	–
Em. Reg. Lack of Emotional Clarity	.853 [.839, .866]	–
Em. Reg. Limited Regulation Strategies	.891 [.882, .900]	–
Em. Reg. Nonacceptance of Responses	.903 [.895, .911]	–
Em. Reg. Reappraisal	.872 [.862, .881]	.524 [.472, .573]
Em. Reg. Suppression	.858 [.847, .869]	.674 [.619, .724]
Environmental Efficacy	.857 [.844, .869]	.753 [.725, .777]
Equality Positioning	.895 [.888, .902]	.688 [.666, .710]
Ethnic Group Active Harm	.948 [.944, .952]	.904 [.896, .912]
Ethnic Group Narcissism	.872 [.860, .882]	.756 [.729, .779]
Ethnic Group Passive Facilitation	.939 [.934, .943]	.780 [.760, .798]
Ethnic Group Passive Harm	.943 [.939, .947]	.872 [.860, .882]
Ethnic Subgroup Respect	.896 [.888, .904]	.774 [.745, .802]
Extrinsic-Personal Religious Orientation	.624 [.556, .683]	.291 [.176, .411]
Extrinsic-Social Religious Orientation	.853 [.820, .880]	–
Forgivingness versus Vengeful Rumination	.849 [.837, .860]	.588 [.550, .623]
Gender Identity Centrality	.755 [.727, .779]	.745 [.624, .891]
Gender Income and Employment Opportunity	.892 [.884, .900]	.859 [.846, .870]
Gender-Specific System Justification	.746 [.724, .767]	.679 [.646, .710]
God Locus of Health Control	.944 [.935, .952]	.850 [.821, .874]
Gratitude (GQ-6)	.734 [.710, .756]	.602 [.569, .633]
Health Locus of Control	.856 [.844, .867]	.646 [.616, .674]
HEXACO-100 Honesty-Humility	.805 [.789, .819]	.685 [.657, .710]
Historical Negation	.901 [.895, .906]	.687 [.668, .705]
Hostile Sexism	.892 [.886, .898]	.854 [.845, .863]
Identification with All Humanity - Community	.877 [.868, .886]	–
Identification with All Humanity - Humanity	.824 [.811, .837]	–
Identification with All Humanity - Nation	.843 [.832, .854]	–
Individual Permeability	–	–
Institutional Trust in Police	.920 [.914, .925]	.783 [.766, .799]

Table 2 (Cont'd). Comparative Reliability of Short-Form Scales and Single-Item Indicators Included in the New Zealand Attitudes and Values Study Relative to their Full-Form (Parent) Counterparts.

	Scale Reliability	
	Full Scale Omega (ω) [99% CI]	Short-Form Scale Omega (ω) [99% CI]
Intergroup Anxiety	.857 [.846, .868]	.166 [.124, .212]
Intrinsic Religious Orientation	.876 [.856, .893]	.778 [.732, .816]
Left-Wing Authoritarianism	.928 [.922, .935]	.733 [.710, .755]
Modern Racism	.868 [.855, .879]	.525 [.467, .582]
Moral Foundations - Authority	.654 [.622, .684]	–
Moral Foundations - Fairness	.549 [.508, .588]	–
Moral Foundations - Harm	.484 [.439, .526]	–
Moral Foundations - Ingroup	.563 [.520, .602]	–
Moral Foundations - Purity	.671 [.641, .700]	–
Multicultural Attitudes	.817 [.804, .830]	.787 [.773, .801]
Nat. Char. Cultural/Bicultural Awareness	.867 [.858, .875]	.712 [.683, .739]
Nat. Char. Citizenship and Ancestry	.858 [.848, .867]	.602 [.575, .628]
Nat. Char. Liberal Democratic Values	.902 [.896, .908]	.636 [.612, .659]
Nat. Char. Patriotic Values	.777 [.761, .792]	.196 [.161, .234]
Nat. Char. Rugby/Sporting Culture	.869 [.860, .877]	.761 [.734, .785]
National Wellbeing Index	.801 [.786, .814]	.808 [.795, .821]
Nationalism	.643 [.606, .675]	.455 [.400, .506]
Openness (Openness facet)	.731 [.710, .752]	.463 [.420, .505]
Passive Facilitation (BIAS-TS)	.916 [.909, .922]	.732 [.710, .753]
Passive Harm (BIAS-TS)	.905 [.898, .912]	.793 [.775, .809]
Patriotism	.857 [.846, .867]	.731 [.707, .753]
Perceived Social Support	.921 [.916, .927]	.750 [.730, .770]
Perfectionism Discrepancy	.918 [.912, .924]	.809 [.794, .823]
Personal Locus of Control	.684 [.655, .712]	.665 [.619, .704]
Personal Respect	.710 [.677, .738]	.224 [.161, .292]
Personal Wellbeing Index	.837 [.825, .847]	.737 [.720, .754]
Political Locus of Control/ Political Efficacy	.673 [.643, .701]	.573 [.536, .608]
Presence of Meaning in Life	.897 [.888, .905]	.800 [.780, .819]
Primary Psychopathy	.836 [.823, .849]	.707 [.678, .735]
Psychological Entitlement Scale	.816 [.800, .831]	.673 [.642, .703]
Quest Religious Orientation	.781 [.745, .812]	.632 [.553, .698]
Race Essentialism	.634 [.597, .667]	.016 [.002, .044]
Realistic Threat - Asian Peoples	.816 [.796, .833]	.642 [.570, .713]
Realistic Threat - Māori	.820 [.801, .837]	.665 [.596, .733]
Realistic Threat - NZ Europeans	.648 [.606, .684]	.454 [.345, .577]
Realistic Threat - Pacific Peoples	.804 [.783, .822]	.639 [.563, .711]
Religious Fundamentalism	.932 [.927, .937]	.723 [.698, .746]
Religious Group Narcissism	.830 [.801, .855]	.709 [.650, .759]
Right-Wing Authoritarianism	.923 [.918, .928]	.676 [.653, .696]
Satisfaction with Life	.795 [.777, .813]	.784 [.761, .805]
Science Credibility	.871 [.858, .883]	.623 [.574, .668]
Self-Esteem	.906 [.900, .912]	.834 [.823, .845]

Table 2 (Cont'd). Comparative Reliability of Short-Form Scales and Single-Item Indicators Included in the New Zealand Attitudes and Values Study Relative to their Full-Form (Parent) Counterparts.

	Scale Reliability	
	Full Scale Omega (ω) [99% CI]	Short-Form Scale Omega (ω) [99% CI]
Sense of Belonging (SOBI-P)	.921 [.915, .927]	.600 [.571, .627]
Social Dominance Orientation (SDO6)	.882 [.874, .889]	.764 [.748, .778]
Socially Desirability - Impression Management	.761 [.741, .780]	.162 [.111, .219]
Socially Desirability - Self-Deceptive Enhancement	.708 [.682, .732]	.098 [.057, .148]
Subjective Health	.792 [.775, .807]	.571 [.540, .600]
Symbolic Exclusion	.897 [.891, .902]	.846 [.837, .856]
Symbolic Threat - Asian Peoples	.775 [.754, .795]	.437 [.365, .508]
Symbolic Threat - Māori	.742 [.715, .766]	.406 [.327, .487]
Symbolic Threat - NZ Europeans	.716 [.686, .743]	.399 [.319, .485]
Symbolic Threat - Pacific Peoples	.738 [.714, .761]	.364 [.297, .433]
System Justification	.751 [.734, .768]	.673 [.654, .692]
Tall Poppy Attitudes	.804 [.788, .819]	.393 [.345, .439]
Trust in Science	.874 [.861, .886]	.685 [.638, .727]

Table 3. Model Fit Statistics for Full-Form Scales.

		Bayesian Estimation			Maximum Likelihood with Robust Standard Errors (MLR)				
	BIC (free parameters)	CFI [90% CI]	TLI [90% CI]	RMSEA [90% CI]	χ^2(df)	CFI	TLI	RMSEA [90% CI]	SRMR
50-item IPIP - Agreeableness	108367.08 (30)	.908 [.905, .910]	.882 [.878, .885]	.056 [.055, .057]	476.13 (35)	.895	.866	.049 [.045, .052]	.047
50-item IPIP - Conscientiousness	118740.96 (30)	.902 [.899, .904]	.874 [.870, .877]	.056 [.055, .057]	533.07 (35)	.895	.865	.052 [.048, .056]	.053
50-item IPIP - Extraversion	119751.89 (30)	.922 [.921, .924]	.900 [.897, .902]	.065 [.064, .065]	671.12 (35)	.917	.893	.058 [.055, .062]	.049
50-item IPIP - Neuroticism/Emotionality	121026.52 (30)	.917 [.915, .918]	.893 [.892, .895]	.070 [.070, .071]	836.43 (35)	.910	.885	.065 [.062, .069]	.048
50-item IPIP - Openness to Experience	115182.22 (30)	.730 [.728, .732]	.652 [.649, .655]	.098 [.098, .099]	1487.81 (35)	.710	.627	.088 [.084, .092]	.079
Active Facilitation (BIAS-TS)	57861.91 (24)	.933 [.932, .934]	.907 [.904, .908]	.100 [.099, .101]	373.95 (20)	.921	.890	.078 [.071, .085]	.041
Active Harm (BIAS-TS)	55626.62 (24)	.996 [.995, .997]	.995 [.993, .996]	.029 [.026, .033]	39.29 (20)	.997	.995	.018 [.009, .027]	.011
Agreeableness (Politeness facet)	84929.63 (30)	.891 [.884, .897]	.860 [.851, .868]	.044 [.042 .045]	290.36 (35)	.875	.839	.043 [.038, .047]	.045
Approach Social Motivation	20561.38 (12)	1.000 [.998, 1.000]	1.000 [.994, 1.000]	.000 [.000, .019]	.58 (2)	1.000	1.000	.000 [.000, .026]	.006
Attributions about Income Inequality	75057.83 (33)	.950 [.947, .953]	.938 [.934, .942]	.040 [.039, .042]	309.96 (44)	.940	.925	.038 [.034, .042]	.049
Avoidance Social Motivation	22824.71 (12)	1.000 [.981, 1.000]	1.000 [.942, 1.000]	.000 [.000, .039]	5.01 (2)	.989	.967	.023 [.000, .049]	.017
Benevolent Sexism	144394.61 (33)	.779 [.776, .781]	.722 [.718, .724]	.079 [.079, .079]	1365.43 (44)	.764	.705	.074 [.071, .078]	.073
Body Satisfaction	76499.40 (21)	.928 [.927, .929]	.891 [.891, .893]	.110 [.109, .111]	547.56 (14)	.919	.878	.095 [.088, .102]	.042
Brief Self-Control Scale	98265.10 (42)	.906 [.901, .910]	.888 [.883, .894]	.037 [.036, .038]	511.84 (77)	.889	.869	.036 [.033, .039]	.054
Colour-Blind Ideology	26495.11 (12)	.945 [.931, .956]	.830 [.788, .864]	.086 [.077, .097]	42.21 (2)	.925	.776	.084 [.063, .107]	.045
Competitive World View	116487.66 (60)	.898 [.894, .903]	.886 [.881, .891]	.035 [.034, .036]	745.89 (170)	.880	.866	.034 [.031, .036]	.052
Compliance with Police	–	–	–	–	–	–	–	–	–
Dangerous World View	76601.96 (30)	.810 [.804, .816]	.758 [.750, .765]	.064 [.063, .065]	446.32 (35)	.796	.738	.060 [.055, .065]	.068
Disgust Sensitivity	104621.11 (42)	.883 [.875, .892]	.862 [.852, .872]	.032 [.031, .034]	408.60 (77)	.856	.830	.034 [.031, .037]	.052
Dissipation-Rumination	101889.98 (45)	.830 [.826, .833]	.801 [.797, .806]	.051 [.050, .051]	986.90 (90)	.814	.782	.049 [.046, .051]	.070
Economic System Justification	111683.66 (51)	.863 [.858, .869]	.844 [.838, .850]	.037 [.037, .038]	763.45 (119)	.843	.821	.036 [.034, .038]	.061
Em. Reg. Difficulties Goal-Directed Behavior	29738.20 (15)	.973 [.969, .977]	.945 [.937, .953]	.071 [.066, .076]	64.71 (5)	.965	.931	.064 [.051, .079]	.037
Em. Reg. Impulse Control Difficulties	47719.92 (21)	.980 [.977, .982]	.970 [.966, .973]	.044 [.042, .047]	109.20 (14)	.974	.961	.040 [.033, .047]	.029
Em. Reg. Lack of Emotional Awareness	34526.20 (18)	.988 [.983, .991]	.979 [.972, .986]	.037 [.030, .043]	37.86 (9)	.983	.971	.033 [.023, .044]	.028
Em. Reg. Lack of Emotional Clarity	31523.43 (15)	.982 [.978, .986]	.964 [.955, .972]	.056 [.050, .063]	42.44 (5)	.977	.954	.051 [.037, .065]	.030
Em. Reg. Limited Regulation Strategies	48835.81 (24)	.957 [.954, .959]	.939 [.935, .943]	.061 [.059, .063]	215.58 (20)	.951	.931	.058 [.051, .065]	.044
Em. Reg. Nonacceptance of Responses	37385.24 (18)	.986 [.983, .988]	.977 [.973, .981]	.049 [.045, .053]	61.94 (9)	.982	.969	.045 [.035, .056]	.024

Table 3 (Cont'd). Model Fit Statistics for Full-Form Scales.

		Bayesian Estimation			Maximum Likelihood with Robust Standard Errors (MLR)				
	BIC (free parameters)	CFI [90% CI]	TLI [90% CI]	RMSEA [90% CI]	χ^2(df)	CFI	TLI	RMSEA [90% CI]	SRMR
Em. Reg. Reappraisal	58075.23 (21)	.951 [.949, .953]	.926 [.922, .929]	.065 [.063, .066]	191.39 (14)	.945	.917	.051 [.045, .057]	.046
Em. Reg. Suppression	46311.76 (15)	1.000 [.997, 1.000]	1.000 [.995, 1.000]	.000 [.000, .019]	10.85 (5)	.997	.995	.015 [.000, .028]	.011
Environmental Efficacy	41084.70 (18)	.989 [.985, .993]	.982 [.975, .988]	.033 [.027, .038]	42.26 (9)	.984	.973	.031 [.022, .041]	.026
Equality Positioning	83396.94 (24)	.908 [.906, .909]	.871 [.869, .873]	.098 [.097, .099]	649.73 (20)	.900	.860	.082 [.077, .088]	.065
Ethnic Group Active Harm	52995.08 (24)	.995 [.994, .995]	.992 [.991, .993]	.038 [.036, .041]	43.75 (20)	.995	.994	.020 [.012, .028]	.011
Ethnic Group Narcissism	56247.25 (27)	.962 [.959, .966]	.950 [.945, .954]	.046 [.044, .049]	188.50 (27)	.955	.940	.045 [.039, .051]	.038
Ethnic Group Passive Facilitation	62994.36 (24)	.923 [.922, .923]	.891 [.890, .892]	.144 [.143, .145]	624.72 (20)	.916	.882	.102 [.095, .109]	.065
Ethnic Group Passive Harm	62866.40 (24)	.951 [.951, .952]	.932 [.931, .933]	.109 [.109, .111]	330.68 (20)	.949	.929	.073 [.066, .080]	.033
Ethnic Subgroup Respect	–	–	–	–	–	–	–	–	–
Extrinsic-Personal Religious Orientation	23236.45 (33)	.481 [.461, .498]	.352 [.327, .373]	.107 [.105, .109]	482.99 (44)	.411	.264	.106 [.097, .114]	.149
Extrinsic-Social Religious Orientation	–	–	–	–	–	–	–	–	–
Forgivingness versus Vengeful Rumination	93746.49 (36)	.736 [.733, .740]	.679 [.675, .683]	.081 [.080, .081]	1437.65 (54)	.711	.647	.078 [.074, .081]	.096
Gender Identity Centrality	–	–	–	–	–	–	–	–	–
Gender Income and Employment Opportunity	49304.16 (18)	.985 [.983, .986]	.975 [.972, .977]	.058 [.055, .061]	69.44 (9)	.983	.971	.045 [.035, .055]	.021
Gender-Specific System Justification	59451.11 (24)	.974 [.966, .981]	.963 [.952, .973]	.025 [.021, .029]	87.89 (20)	.960	.943	.028 [.022, .034]	.037
God Locus of Health Control	10863.23 (18)	.994 [.988, .999]	.990 [.981, .999]	.040 [.012, .057]	20.18 (9)	.990	.983	.037 [.015, .060]	.021
Gratitude (GQ-6)	45983.95 (18)	.996 [.989, 1.000]	.993 [.981, 1.000]	.014 [.000, .023]	24.11 (9)	.988	.979	.020 [.010, .030]	.029
Health Locus of Control	78511.85 (36)	.880 [.876, .884]	.855 [.850, .859]	.055 [.054, .056]	570.52 (54)	.868	.839	.050 [.047, .054]	.067
HEXACO-100 Honesty-Humility	135345.84 (48)	.720 [.716, .723]	.676 [.672, .681]	.062 [.061, .062]	1650.85 (104)	.701	.654	.059 [.056, .061]	.086
Historical Negation	143548.37 (24)	.871 [.871, .872]	.822 [.821, .823]	.170 [.170, .170]	2224.30 (20)	.857	.799	.146 [.141, .151]	.066
Hostile Sexism	134879.32 (33)	.933 [.932, .934]	.917 [.915, .918]	.064 [.063, .064]	804.40 (44)	.928	.910	.056 [.053, .060]	.054
Identification with All Humanity - Community	64427.01 (27)	.899 [.898, .900]	.866 [.865, .868]	.116 [.115, .116]	780.37 (27)	.898	.863	.098 [.092, .104]	.053
Identification with All Humanity - Humanity	69221.01 (27)	.836 [.834, .837]	.783 [.780, .785]	.124 [.123, .125]	1076.67 (27)	.832	.776	.115 [.110, .121]	.064
Identification with All Humanity - Nation	64518.49 (27)	.874 [.872, .875]	.832 [.830, .834]	.115 [.114, .116]	867.24 (27)	.872	.829	.103 [.097, .109]	.055
Individual Permeability	–	–	–	–	–	–	–	–	–
Institutional Trust in Police	59267.74 (24)	.989 [.987, .991]	.985 [.982, .988]	.031 [.028, .034]	94.26 (20)	.985	.979	.030 [.024, .036]	.028
Intergroup Anxiety	99105.36 (36)	.663 [.661, .664]	.587 [.585, .589]	.131 [.131, .132]	3036.74 (54)	.634	.553	.115 [.112, .119]	.126
Intrinsic Religious Orientation	18056.48 (27)	1.000 [.999, 1.000]	1.000 [.999, 1.000]	.000 [.000, .007]	35.52 (27)	.992	.990	.019 [.000, .034]	.030

Table 3 (Cont'd). Model Fit Statistics for Full-Form Scales.

		Bayesian Estimation			Maximum Likelihood with Robust Standard Errors (MLR)				
	BIC (free parameters)	CFI [90% CI]	TLI [90% CI]	RMSEA [90% CI]	χ^2(df)	CFI	TLI	RMSEA [90% CI]	SRMR
Left-Wing Authoritarianism	221521.53 (117)	.704 [.703, .706]	.688 [.686, .690]	.057 [.057, .057]	5588.29 (702)	.693	.675	.053 [.052, .055]	.075
Modern Racism	40532.55 (18)	.995 [.991, 1.000]	.992 [.985, .999]	.019 [.005, .027]	24.58 (9)	.990	.984	.020 [.011, .030]	.021
Moral Foundations - Authority	46197.16 (18)	.918 [.909, .926]	.864 [.848, .876]	.063 [.060, .067]	111.41 (9)	.905	.841	.062 [.052, .073]	.051
Moral Foundations - Fairness	39664.41 (18)	.985 [.976, .993]	.976 [.961, .988]	.027 [.019, .035]	32.83 (9)	.974	.957	.030 [.019, .041]	.036
Moral Foundations - Harm	42278.42 (18)	.993 [.983, 1.000]	.989 [.971, 1.000]	.017 [.000, .027]	23.30 (9)	.982	.971	.023 [.012, .035]	.027
Moral Foundations - Ingroup	47501.78 (18)	.829 [.818, .837]	.718 [.701, .731]	.088 [.086, .091]	207.44 (9)	.808	.680	.087 [.077, .097]	.075
Moral Foundations - Purity	48319.62 (18)	.770 [.761, .777]	.615 [.601, .627]	.111 [.109, .113]	367.76 (9)	.705	.509	.117 [.107, .127]	.073
Multicultural Attitudes	77600.46 (21)	.973 [.971, .974]	.959 [.956, .961]	.051 [.049, .052]	185.60 (14)	.966	.949	.047 [.042, .054]	.034
Nat. Char. Cultural/Bicultural Awareness	91707.43 (21)	.904 [.903, .905]	.857 [.855, .858]	.135 [.134, .135]	746.22 (14)	.902	.854	.110 [.104, .117]	.059
Nat. Char. Citizenship and Ancestry	91590.39 (21)	.957 [.955, .958]	.935 [.933, .937]	.081 [.080, .083]	310.61 (14)	.953	.929	.070 [.063, .077]	.036
Nat. Char. Liberal Democratic Values	162038.25 (42)	.746 [.745, .746]	.700 [.699, .701]	.145 [.145, .146]	4443.05 (77)	.734	.685	.115 [.112, .118]	.094
Nat. Char. Patriotic Values	64460.82 (15)	.973 [.970, .975]	.948 [.942, .952]	.066 [.063, .070]	85.10 (5)	.970	.940	.061 [.050, .073]	.026
Nat. Char. Rugby/Sporting Culture	81374.05 (18)	.979 [.977, .979]	.965 [.963, .966]	.073 [.072, .075]	170.72 (9)	.975	.959	.065 [.056, .073]	.025
National Wellbeing Index	89029.32 (18)	.940 [.938, .942]	.901 [.897, .903]	.090 [.089, .092]	220.09 (9)	.939	.898	.074 [.066, .083]	.047
Nationalism	56751.30 (21)	.867 [.852, .880]	.799 [.777, .820]	.046 [.043, .048]	137.94 (14)	.840	.759	.045 [.038, .052]	.056
Openness (Openness facet)	83879.34 (30)	.783 [.777, .787]	.721 [.715, .727]	.075 [.074, .075]	622.54 (35)	.772	.706	.069 [.064, .074]	.076
Passive Facilitation (BIAS-TS)	64746.98 (24)	.928 [.927, .929]	.899 [.897, .900]	.122 [.121, .123]	571.36 (20)	.921	.889	.097 [.091, .104]	.063
Passive Harm (BIAS-TS)	67089.55 (24)	.941 [.939, .942]	.917 [.915, .918]	.099 [.098, .101]	383.79 (20)	.937	.912	.079 [.072, .086]	.041
Patriotism	86490.25 (36)	.958 [.955, .961]	.949 [.945, .953]	.033 [.032, .035]	290.49 (54)	.950	.939	.031 [.028, .035]	.043
Perceived Social Support	150989.91 (75)	.853 [.851, .855]	.840 [.837, .842]	.046 [.045, .046]	2167.53 (275)	.837	.822	.040 [.039, .042]	.073
Perfectionism Discrepancy	87488.70 (36)	.953 [.950, .955]	.942 [.940, .945]	.044 [.043, .045]	421.77 (54)	.946	.933	.040 [.036, .044]	.043
Personal Locus of Control	61681.67 (30)	.889 [.878, .899]	.858 [.844, .870]	.041 [.039, .043]	209.70 (35)	.867	.829	.041 [.036, .047]	.052
Personal Respect	29942.86 (15)	.986 [.975, .996]	.972 [.950, .991]	.030 [.017, .040]	23.32 (5)	.974	.949	.033 [.020, .047]	.029
Personal Wellbeing Index	107581.77 (24)	.968 [.966, .970]	.956 [.953, .958]	.048 [.047, .050]	165.81 (20)	.966	.952	.041 [.036, .047]	.029
Political Locus of Control/ Political Efficacy	77757.69 (30)	.900 [.888, .912]	.872 [.856, .886]	.032 [.030, .034]	191.31 (35)	.873	.837	.032 [.028, .037]	.056
Presence of Meaning in Life	39004.15 (15)	.994 [.991, .997]	.988 [.983, .993]	.034 [.026, .041]	29.71 (5)	.990	.980	.034 [.023, .046]	.018
Primary Psychopathy	97427.65 (48)	.900 [.895, .904]	.884 [.879, .890]	.039 [.038, .040]	544.13 (104)	.882	.864	.038 [.035, .041]	.052
Psychological Entitlement Scale	64518.22 (27)	.963 [.958, .969]	.951 [.944, .958]	.032 [.030, .034]	142.70 (27)	.953	.937	.032 [.027, .037]	.039

Table 3 (Cont'd). Model Fit Statistics for Full-Form Scales.

		Bayesian Estimation			Maximum Likelihood with Robust Standard Errors (MLR)				
	BIC (free parameters)	CFI [90% CI]	TLI [90% CI]	RMSEA [90% CI]	χ^2(df)	CFI	TLI	RMSEA [90% CI]	SRMR
Quest Religious Orientation	24616.87 (36)	.768 [.749, .785]	.716 [.693, .737]	.070 [.067, .073]	276.40 (54)	.727	.667	.068 [.060, .076]	.089
Race Essentialism	51254.57 (24)	.741 [.730, .750]	.634 [.618, .647]	.076 [.075, .078]	307.92 (20)	.719	.607	.070 [.063, .077]	.088
Realistic Threat - Asian Peoples	24157.75 (12)	1.000 [.994, 1.000]	1.000 [.982, 1.000]	.000 [.000, .041]	5.61 (2)	.996	.987	.025 [.000, .051]	.013
Realistic Threat - Māori	23938.85 (12)	1.000 [.998, 1.000]	1.000 [.994, 1.000]	.000 [.000, .024]	1.25 (2)	1.000	1.000	.000 [.000, .032]	.006
Realistic Threat - NZ Europeans	25253.39 (12)	.979 [.961, .995]	.935 [.876, .984]	.045 [.022, .063]	14.99 (2)	.964	.891	.048 [.027, .072]	.029
Realistic Threat - Pacific Peoples	23442.04 (12)	1.000 [.998, 1.000]	1.000 [.995, 1.000]	.000 [.000, .021]	.66 (2)	1.000	1.000	.000 [.000, .027]	.005
Religious Fundamentalism	127038.52 (60)	.939 [.937, .940]	.931 [.929, .934]	.043 [.042, .043]	959.74 (170)	.929	.921	.039 [.037, .041]	.047
Religious Group Narcissism	17547.81 (27)	.823 [.810, .835]	.766 [.748, .781]	.094 [.091, .098]	235.34 (27)	.792	.723	.093 [.082, .104]	.086
Right-Wing Authoritarianism	220655.74 (90)	.772 [.770, .774]	.755 [.753, .758]	.046 [.045, .046]	3716.22 (405)	.754	.736	.042 [.041, .044]	.086
Satisfaction with Life	39796.44 (15)	.997 [.993, 1.000]	.995 [.986, 1.000]	.017 [.000, .029]	17.98 (5)	.993	.986	.025 [.013, .038]	.020
Science Credibility	33835.67 (18)	.986 [.982, .989]	.976 [.970, .981]	.045 [.040, .050]	56.62 (9)	.978	.964	.043 [.033, .054]	.025
Self-Esteem	108783.74 (30)	.886 [.885, .887]	.855 [.854, .856]	.093 [.092, .093]	1246.79 (35)	.882	.848	.080 [.077, .084]	.067
Sense of Belonging (SOBI-P)	139979.45 (60)	.936 [.933, .938]	.928 [.925, .931]	.032 [.031, .033]	895.12 (170)	.923	.914	.032 [.030, .034]	.047
Social Dominance Orientation (SDO6)	147920.58 (48)	.814 [.812, .815]	.786 [.783, .788]	.066 [.066, .067]	1842.81 (104)	.800	.769	.058 [.056, .061]	.087
Socially Desirability - Impression Management	136457.01 (60)	.837 [.828, .846]	.818 [.808, .828]	.030 [.029, .031]	690.37 (170)	.800	.776	.032 [.030, .035]	.050
Socially Desirability - Self-Deceptive Enhancement	130853.95 (60)	.779 [.769, .789]	.753 [.742, .765]	.033 [.032, .033]	723.91 (170)	.740	.710	.033 [.031, .036]	.055
Subjective Health	48682.29 (15)	1.000 [.999, 1.000]	1.000 [.997, 1.000]	.000 [.000, .015]	7.88 (5)	.999	.998	.012 [.000, .026]	.010
Symbolic Exclusion	124505.21 (24)	.961 [.960, .961]	.945 [.944, .946]	.091 [.090, .092]	548.11 (20)	.952	.933	.073 [.068, .079]	.029
Symbolic Threat - Asian Peoples	48574.69 (24)	.783 [.777, .788]	.696 [.688, .704]	.094 [.093, .096]	455.30 (20)	.763	.668	.086 [.079, .093]	.091
Symbolic Threat - Māori	29920.56 (15)	.918 [.909, .926]	.837 [.818, .853]	.083 [.079, .088]	87.88 (5)	.895	.790	.076 [.062, .090]	.053
Symbolic Threat - NZ Europeans	29166.65 (15)	.906 [.894, .915]	.812 [.789, .830]	.080 [.076, .085]	72.69 (5)	.889	.779	.068 [.055, .083]	.055
Symbolic Threat - Pacific Peoples	47450.33 (24)	.786 [.780, .792]	.700 [.691, .708]	.091 [.090, .093]	405.07 (20)	.766	.672	.081 [.074, .088]	.090
System Justification	89765.36 (24)	.832 [.829, .835]	.763 [.759, .767]	.087 [.086, .088]	658.26 (20)	.813	.738	.079 [.074, .085]	.074
Tall Poppy Attitudes	131927.06 (60)	.696 [.691, .702]	.660 [.654, .667]	.045 [.044, .045]	1463.16 (170)	.669	.630	.043 [.041, .045]	.085
Trust in Science	27637.75 (15)	.971 [.968, .974]	.943 [.937, .948]	.082 [.078, .086]	74.72 (5)	.962	.923	.070 [.057, .084]	.030

Notes. Scale order matched with Table 1, number of items and source reference are provided in Table 1. Model fit statistics were not available for full scales with three or less items (a CFA with three items is just-identified). CI for Bayesian model = Credible Intervals. CI for MLR = Confidence Intervals. BIC = Bayesian Information Criterion. CFI = Confirmatory Fit Index. TLI = Tucker-Lewis Index. RMSEA = Root Mean Square Error of Approximation. SRMR = Standardized Root Mean Square Residual.

DISCUSSION

Most researchers appreciate the trade-off involved in collecting large and expensive national probability samples like the NZAVS; where questionnaire space is limited and only short or single-item measures are viable. This approach begs the inevitable (and very reasonable) question: How reliable are the brief measures?

Our results indicate that the majority of NZAVS short-form scales are generally reliable, with omega coefficients for most short-form scales > .60 and some > .70. For such extremely short-scales, we view values of omega in the .60-.70 range as indicating that the results provide credible information but should be interpreted cautiously; and values > .70 as indicating acceptable scale reliability. This is important as it indicates that the items included in our short-form scales and single-item indicators, in most cases, form reasonable reliable indicators of the same construct assessed in their full-form or parent scale. Researchers can be reasonably confident in most cases that the constructs assessed in the NZAVS using brief scales have adequate internal reliability.

Our analyses also identify where extreme caution is warranted when analysing scales included in the NZAVS, and where results using NZAVS short-form scales are unlikely to generalize. Of note, the short-form measures of competitive worldview (2 items), dangerous worldview (2 items), disgust sensitivity (1 item), economic system justification (1 item), extrinsic-personal religious orientation (3 items), national character patriotic values (1 item), personal respect (1 item), race essentialism (1 item), social desirable responding (2 items), tall poppy attitudes (3 items), the set of four one-item measures of ethnic group symbolic threat, and realistic threat posed by Europeans (1 item) all evidenced unacceptably low reliability. Fortunately, many of these poorly performing measures were culled from the NZAVS in early waves.

The full-form scales are, by definition, the reference standard against which we evaluate our short-form versions. With regard to intergroup anxiety, this may be somewhat misleading. The original measure of intergroup anxiety by Stephan and Stephan (1985) included ratings of 11 emotional reactions: 'certain, awkward, self-conscious, happy, accepted, confident, irritated, impatient, defensive, suspicious, and careful'. Many of these items seem at face value to reflect more global positive versus negative emotion rather than anxiety. The single-item indicator included in the NZAVS, in contrast, refers explicitly to anxiety: 'I feel anxious about interacting with people from other races.' This item performed poorly relative to the full-form scale (short-form omega = .166). With the benefit of hindsight, we do not think the original intergroup anxiety scale is an appropriate reference standard. Regardless, we opted to report this result in the interest of completeness.

A brief discussion of the Left-Wing Authoritarianism (LWA) scale developed by Costello et al. (2020) is also warranted. We modelled the 39-item LWA scale as a single factor because we explicitly wanted to contrast the unidimensional five-item LWA short-form used in the NZAVS relative to a latent variable representing overall LWA based on the full-form scale. However, as Costello et al. (2020) demonstrate, although their LWA scale can be operationalized as a composite or overall variable, the scale was designed to index three correlated facets of LWA: Anti-Hierarchical Aggression, Anti-Conventionalism, and Top-Down Censorship. A three-factor CFA of LWA indicated that all three subscales were reliable, with omega coefficients of .865, .865 and .804, respectively; and with the following model fit under MLR: CFI=.815, TLI=.804, RMSEA=.039, SRMR=.062. In our view, LWA may be modelled as a general or global construct (as we suggest when using the NZAVS short-form) or as three correlated but distinct lower-level facets. The choice depends on one's research question.

A brief discussion of why we opted specifically to estimate scale reliability using omega may also be of interest to some readers. We also considered *Coefficient H*; a measure of maximal reliability designed for use with optimally weighted scales (Hancock & Mueller, 2001). We opted for omega because we wanted an estimate of scale reliability that would generalize to conditions where scale scores were estimated using unit weighting (such as the sum or mean of scale items). This is important because estimates of omega are penalized if they include weakly loading items; *Coefficient H* is not. Unit weighting is often employed in analyses of NZAVS data, for example, in cases with computationally intensive and complex longitudinal models containing many random effects, which would be difficult to estimate with latent scale scores.

Conclusion

We compared the reliability of 108 short-form scales and single-item indicators included in the New Zealand Attitudes and Values Study (NZAVS) with their full-form counterparts. These psychometric properties were assessed in a large pooled dataset containing a total of 1,012 items. We identify a small number of scales, most included only in initial waves of the NZAVS, which are unreliable and unlikely to represent the same latent construct as their full-form parent scales. We recommend these scales not be used; if NZAVS data using these measures is to be analysed, then the researcher should make a compelling case for its use and ideally demonstrate that the scale or item in question reliably indexes some construct other than that initially intended.

On a more positive note, the majority of short-form scales (and single-item indicators) displayed adequate composite reliability (omega). These findings calibrate credence in conclusions based on the NZAVS and indicate that the brief scales included in the NZAVS are fit-for-purpose in most cases. We hope our findings will help researchers to make informed decisions about including short-form measures in their own research projects when space or participant time is limited; and welcome the use of the NZAVS short-form measures by other researchers.

We end with some brief recommendations for future reporting and analysis of NZAVS data. We recommend that the reliability estimates reported in this paper be included when describing NZAVS short-form measures. This should provide useful contextual information, particularly in analyses of single-item indicators. When analyzing NZAVS scales with three or more items, the short-form omega coefficients we report here can also be compared to those observed in the specific NZAVS sample of interest. Doing so should ideally increase credence in results from large-scale national probability samples like the NZAVS, which necessarily walk the tight-rope between trying to reliably canvas a large range

of constructs using as few indicators as possible. When it comes to short-form scales, sometimes there are no solutions, model-based or otherwise; there are only compromises.

References

Altemeyer, B. (1996). *The authoritarian spectre*. London: Harvard University Press.

Altemeyer, B., & Hunsberger, B. (1992). Authoritarianism, religious fundamentalism, quest, and prejudice. *International Journal for the Psychology of Religion, 2*, 113-133. https://doi.org/10.1207/s15327582ijpr0202_5

Ashton, M. C., Lee, K., Perugini, M., Szarota, P., De Vries, R. E., Di Blas, L., ... & De Raad, B. (2004). A six-factor structure of personality-descriptive adjectives: solutions from psycholexical studies in seven languages. *Journal of Personality and Social Psychology, 86*(2), 356. https://doi.org/10.1037/0022-3514.86.2.356

Asparouhov, T., & Muthén, B. (2021). Advances in Bayesian model fit evaluation for structural equation models. *Structural Equation Modeling: A Multidisciplinary Journal*, *28*(1), 1-14. https://doi.org/10.1080/10705511.2020.1764360

Asparouhov, T., & Muthén, B. (2010). *Bayesian analysis of latent variable models using Mplus*. http://www.statmodel.com/download/BayesAdvantages18.pdf

Batson, C. D., & Schoenrade, P. A. (1991). Measuring religion as quest: 2) reliability concerns. *Journal for the Scientific Study of Religion, 30*, 430-447. https://doi.org/10.2307/1387278

Berry, J. W., Worthington, E. L., O'Connor, L. E., Parrott, L., & Wade, N. G. (2005). Forgivingness, vengeful rumination, and affective traits. *Journal of Personality, 73*(1), 183-226. https://doi.org/10.1111/j.1467-6494.2004.00308.x

Bobo, L. (1998). Race, interests, and beliefs about affirmative action. *American Behavioral Scientist, 41*, 985-1003. https://doi.org/10.1177/0002764298041007009

Breugelmans, S. M., & van de Vijver, F. J. R. (2004). Antecedents and components of majority attitudes toward multiculturalism in the Netherlands. *Applied Psychology: An International Review, 53*, 400-422. https://doi.org/10.1111/j.1464-0597.2004.00177.x

Campbell, W. K., Bonacci, A. M., Shelton, J., Exline, J. J., & Bushman, B. J. (2004). Psychological entitlement: Interpersonal consequences and validation of a self-report measure. *Journal of Personality Assessment, 83*(1), 29-45. https://doi.org/10.1207/s15327752jpa8301_04

Caprara, G. V. (1986). Indicators of aggression: The dissipation-rumination scale. *Personality and Individual Differences, 7*(6), 763-769. https://doi.org/10.1016/0191-8869(86)90074-7

Cash, T. F., Fleming, E. C., Alindogan, J., Steadman, L., & Whitehead, A. (2002). Beyond body image as a trait: The development and validation of the Body Image States Scale. *Eating Disorders, 10*(2), 103-113. https://doi.org/10.1080/10640260290081678

Costello, T. H., Bowes, S., Stevens, S. T., Waldman, I., Tasimi, A., & Lilienfeld, S. O. (2020). Clarifying the structure and nature of left-wing authoritarianism. *Journal of Personality and Social Psychology, 122*(1), 135-170. https://doi.org/10.1037/pspp0000341

Cummins, R.A., Eckersley, R., Pallant, J., van Vugt, J. & Misajon, R. (2003). Development of a national index of subjective wellbeing: The Australian Unity Wellbeing Index. *Social Indicators Research, 64*, 159-190. https://doi.org/10.1023/A:1024704320683

Curran, P. J., & Hussong, A. M. (2009). Integrative data analysis: the simultaneous analysis of multiple data sets. *Psychological methods*, *14*(2), 81-100. https://doi.org/10.1037/a0015914

Cutrona, C.E., & Russell, D.W. (1987). The provisions of social relationships and adaptation to stress. *Advances in Personal Relationships, 1*, 37-67.

de Zavala, A. G., Cichocka, A., Eidelson, R., & Jayawickreme, N. (2009). Collective narcissism and its social consequences. *Journal of Personality and Social Psychology, 97*, 1074-1096. https://doi.org/10.1037/a0016904

DeYoung, C.G., Quilty, L.C., & Peterson, J.B. (2007). Between facets and domains: 10 aspects of the Big-Five. *Journal of Personality and Social Psychology, 93*, 880-896. https://doi.org/10.1037/0022-3514.93.5.880

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Psychological Assessment, 49*, 71-75. https://doi.org/10.1207/s15327752jpa4901_13

Donnellan, M. B., Oswald, F. L., Baird, B. M., & Lucas, R. E. (2006). The mini-IPIP scales: tiny-yet-effective measures of the Big Five factors of personality. *Psychological assessment*, *18*(2), 192-203. https://doi.org/10.1037/1040-3590.18.2.192

Duckitt, J., Wagner, C., du Plessis, I., & Birum, I. (2002). The psychological bases of ideology and prejudice: Testing a dual process model. *Journal of Personality and Social Psychology, 83*, 75-93. https://doi.org/10.1037/0022-3514.83.1.75

Elliot, A.J., Gable, S.L., & Mapes, R.R. (2006). Approach and Avoidance Motivation in the Social Domain. *Personality and Social Psychology Bulletin, 32*, 378-391. https://doi.org/10.1177/0146167205282153

Enders, C. K., & Bandalos, D. L. (2001). The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Structural Equation Modeling: A Multidisciplinary Journal*, *8*(3), 430-457. https://doi.org/10.1207/S15328007SEM0803_5

Feather, N. T. (1989). Attitudes towards the high achiever: The fall of the tall poppy. *Australian Journal of Psychology, 41(3)*, 239-267. https://doi.org/10.1080/00049538908260088

Geldhof, G. J., Preacher, K. J., & Zyphur, M. J. (2014). Reliability estimation in a multilevel confirmatory factor analysis framework. *Psychological Methods, 19*, 72–91. http://dx.doi.org/10.1037/a0032138

Glick, P., & Fiske, S. T. (1996). The Ambivalent Sexism Inventory: Differentiating hostile and benevolent sexism. *Journal of Personality and Social Psychology, 70*, 491-512. https://doi.org/10.1037/0022-3514.70.3.491

Goldberg, L. R. (1999). A broad-bandwidth, public domain, personality inventory measuring the lower-level facets of several five-factor models. *Personality Psychology in Europe, 7*(1), 7-28.

Gorsuch, R. L., & McPherson, S. E. (1989). Intrinsic/extrinsic measurement: I/E revised and single item scales. *Journal for the Scientific Study of Religion, 28*, 348-354. https://doi.org/10.2307/1386745

Graham, J., Haidt, J., & Nosek, B. A. (2009). Liberals and conservatives rely on different sets of moral foundations. *Journal of Personality and Social Psychology, 96*, 1029-1046. https://doi.org/10.1037/a0015141

Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation:

Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of Psychopathology and Behavioral Assessment, 26*(1), 41-54. https://doi.org/10.1023/B:JOBA.0000007455.08539.94

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*(2), 348-362. https://doi.org/10.1037/0022-3514.85.2.348

Hagerty, B. M., & Patusky, K. (1995). Developing a measure of sense of belonging. *Nursing Research, 44*, 9-13.

Hancock, G. R., & Mueller, R. O. (2011). The reliability paradox in assessing structural relations within covariance structure models. *Educational and Psychological Measurement, 71*, 306–324. https://doi.org/10.1177/0013164410384856

Hartman, R. O., Dieckmann, N. F., Sprenger, A. M., Stastny, B. J., & DeMarree, K. G. (2017). Modeling attitudes toward science: development and validation of the credibility of science scale. *Basic and Applied Social Psychology, 39*(6), 358-371. https://doi.org/10.1080/01973533.2017.1372284

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1–55. https://doi.org/10.1080/10705519909540118

Huo, Y. J., Molina, L. E., Binning, K. R., & Funge, S. P. (2010). Subgroup respect, social engagement, and well-being: A field study of an ethnically diverse high school. *Cultural Diversity and Ethnic Minority Psychology, 16*, 427-436. https://doi.org/10.1037/a0019886

Jost, J. T., & Thompson, E. P. (2000). Group-based dominance and opposition to equality as independent predictors of self-esteem, ethnocentrism, and social policy attitudes among African Americans and European Americans. *Journal of Experimental Social Psychology, 36*(3), 209-232. https://doi.org/10.1006/jesp.1999.1403

Jost, J.T., & Kay, A.C. (2005). Exposure to benevolent sexism and complementary gender stereotypes: Consequences for specific and diffuse forms of system justification. *Journal of Personality and Social Psychology, 88*, 498-509. https://doi.org/10.1037/0022-3514.88.3.498

Kay, A. C., & Jost, J. T. (2003). Complementary justice: effects of "poor but happy" and "poor but honest" stereotype exemplars on system justification and implicit activation of the justice motive. *Journal of Personality and Social Psychology, 85*, 823-837. https://doi.org/10.1037/0022-3514.85.5.823

Kenny, D. A., Kaniskan, B., & McCoach, D. B. (2015). The performance of RMSEA in models with small degrees of freedom. *Sociological Methods & Research, 44*, 486 – 507. https://doi.org/10.1177/0049124114543236

Kluegel, J. E, Smith. (1986). *Beliefs about Inequality: Americans' Views of What is and What Ought to Be*. New York: Aldine de Gruyter.

Knowles, E.D., Lowery, B.S., Hogan, C.M., & Chow, R.M. (2009). On the malleability of ideology: motivated construals of color blindness. *Journal of Personality and Social Psychology, 96*, 857-869. https://doi.org/10.1037/a0013595

Kosterman, R., & Feshbach, S. (1989). Toward a measure of patriotic and nationalistic attitudes. *Political Psychology, 10*, 257-274. https://doi.org/10.2307/3791647

Leach, C.W., van Zomeren, M., Zebel, S., Vliek, M. L. W., Pennekamp, S. F., Doosje, B.,... Spears, R. (2008). Group-level self-definition and self-investment: A hierarchical (multicomponent) model of ingroup identification. *Journal of Personality and Social Psychology, 95*, 144-165. https://doi.org/10.1037/0022-3514.95.1.144

Levenson M. R., Kiehl, K. A., & Fitzpatrick, C. M. (1995). Assessing Psychopathic Attributes in a Non-institutionalised Population. *Journal of Personality and Social Psychology, 68*(1), 151-158. https://doi.org/10.1037/0022-3514.68.1.151

McConahay, J. B. (1986). Modern racism, ambivalence, and the Modern Racism Scale. In J. Dovidio & S. Gaertner (Eds.), *Prejudice, discrimination, and racism* (pp. 91–125). Orlando, FL: Academic Press.

McCullough, M. E., Emmons, R. A., & Tsang, J. A. (2002). The grateful disposition: a conceptual and empirical topography. *Journal of Personality and Social Psychology, 82*(1), 112. https://doi.org/10.1037/0022-3514.82.1.112

McDonald, R. P. (1970). The theoretical foundations of principal factor analysis, canonical factor analysis, and alpha factor analysis. *British Journal of Mathematical and Statistical Psychology, 23*, 1–21. https://doi.org/10.1111/j.2044-8317.1970.tb00432.x

McDonald, R. P. (1999). *Test theory: A unified approach*. Mahwah, NJ: Erlbaum.

McFarland, S., Webb, M., & Brown, D. (2012). All humanity is my ingroup: A measure and studies of identification with all humanity. *Journal of Personality and Social Psychology, 103*, 830-853. https://doi.org/10.1037/a0028724

McNeish, D. (2018). Thanks coefficient alpha, we'll take it from here. *Psychological methods, 23*(3), 412. https://doi.org/10.1037/met0000144

Nisbet, E. C., Cooper, K. E., & Garrett, R. K. (2015). The partisan brain: How dissonant science messages lead conservatives and liberals to (dis) trust science. *The ANNALS of the American Academy of Political and Social Science, 658*(1), 36-66. https://doi.org/10.1177/0002716214555474

No, S., Hong, Y-Y., Liao, H-Y., Lee, K., Wood, D., & Chao, M. M. (2008). Lay theory of race affects and moderated Asian Americans' responses toward American culture. *Journal of Personality and Social Psychology, 95*, 991-1004. https://doi.org/10.1037/a0012978

Olatunji, B. O., Williams, N. L., Tolin, D. F., Sawchuck, C. N., Abramowitz, J. S., Lohr, J. M., et al. (2007). The disgust scale: Item analysis, factor structure, and suggestions for refinement. *Psychological Assessment, 19*, 281-297. https://doi.org/10.1037/1040-3590.19.3.281

Paulhus, D. L. (1991). Measurement and control of response bias. In J. P. Robinson, P. Shaver, & L. S. Wrightsman (Eds.), *Measures of Personality and Social Psychological Attitudes*. San Diego: Academic Press.

Paulhus, D. L., & Van Selst, M. (1990). The Spheres of Control Scale: 10 Years of Research. *Personality and Individual Differences, 11*, 1029-1036. https://doi.org/10.1016/0191-8869(90)90130-J

Rice, K. G., Richardson, C. M., & Tueller, S. (2014). The short form of the revised almost perfect scale. *Journal of Personality Assessment, 96*(3), 368-379. https://doi.org/10.1080/00223891.2013.838172

Rosenberg, M. (1965). *Society and the Adolescent Self-image*. Princeton, NJ: Princeton University Press.

Sharma, S. (2008). *Where do we stand? One Auckland secondary school's journey toward sustainability*.

Unpublished MA thesis, The University of Auckland, Auckland, NZ.
Sibley, C. G. (2023) Sampling procedure and sample details for the New Zealand Attitudes and Values Study. https://doi.org/10.31234/osf.io/wgqvy
Sibley, C. G. (2010). The dark duo of post-colonial ideology: A model of symbolic exclusion and historical negation. *International Journal of Conflict and Violence, 4*, 106-123. https://doi.org/10.4119/ijcv-2818
Sibley, C. G. (2011). The BIAS Treatment Scale (BIAS-TS): A measure of the subjective experience of active and passive harm and facilitation. *Journal of Personality Assessment, 93*, 300-315. https://doi.org/10.1080/00223891.2011.559389
Sibley, C. G., & Osborne, D. (2016). Ideology and post-colonial society. *Political Psychology, 37*, 115-161. https://doi.org/10.1111/pops.12323
Sibley, C. G., & Perry, R. (2010). An opposing process model of benevolent sexism. *Sex Roles, 62*, 438-452. https://doi.org/10.1007/s11199-009-9705-6
Sibley, C. G., & Wilson, M. S. (2007). Political attitudes and the ideology of equality: Differentiating support for liberal and conservative political parties in New Zealand. *New Zealand Journal of Psychology, 36*, 72-84.
Sibley, C. G., Hoverd, W. J., & Liu, J. H. (2011). Pluralistic and monocultural facets of New Zealand national character and identity. *New Zealand Journal of Psychology, 40*, 19-29.
Sibley, C. G., Liu, J. H., Duckitt, J., & Khan, S. S. (2008). Social representations of history and the legitimation of social inequality: The form and function of historical negation. *European Journal of Social Psychology, 38*, 542-565. https://doi.org/10.1002/ejsp.449
Sidanius, J., & Pratto, F. (1999). *Social dominance: An intergroup theory of social hierarchy and oppression.* Cambridge: Cambridge University Press.
Smith, T. W., Marsden, P. V., Hout, M., & Kim, J. (2011). *General Social Surveys, 1972-2010: Cumulative Codebook.* University of Chicago: National Opinion Research Center.
Steger, M. F., Frazier, P., Oishi, S., & Kaler, M. (2006). The Meaning in Life Questionnaire: Assessing the presence of and search for meaning in life. *Journal of Counseling Psychology, 53*, 80-93. https://doi.org/10.1037/0022-0167.53.1.80
Stephan, W. G., & Stephan, C. W. (1985). Intergroup anxiety. *Journal of Social Issues, 41*(3), 157-175. https://doi.org/10.1111/j.1540-4560.1985.tb01134.x
Stephan, W. G., Boniecki, K. A., Ybarra, O., Bettencourt, A., Ervin, K. S., Jackson, L. A., McNatt, P. S., & Renfro, C. L. (2002). The role of threats in the racial attitudes of Blacks and Whites. *Personality and Social Psychology Bulletin, 28*, 1242-1254. https://doi.org/10.1177/01461672022812009
Tangney, J. P., Baumeister, R. F., & Boone, A. L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality, 72*, 271–322. https://doi.org/10.1111/j.0022-3506.2004.00263.x
Tausch, N., Saguy, T., & Bryson, J. (2015). How does intergroup contact affect social change? Its impact on collective action and individual mobility intentions among members of a disadvantaged group. *Journal of Social Issues, 71*(3), 536-553. https://doi.org/10.1111/josi.12127
Tiliouine, H., Cummins, R.A., & Davern, M. (2006). Measuring wellbeing in developing countries: The case of Algeria. *Social Indicators Research, 75*, 1-30. https://doi.org/10.1007/s11205-004-2012-2
Tyler, T. R. (2005). Policing in black and white: Ethnic group differences in trust and confidence in the police. *Police Quarterly, 8*(3), 322-342. https://doi.org/10.1177/1098611104271105
Tyler, T. R., Degoey, P., & Smith, H. J. (1996). Understanding why the justice of group procedures matters: A test of the psychological dynamics of the group-value model. *Journal of Personality and Social Psychology, 70*(5), 913-930. https://doi.org/10.1037/0022-3514.70.5.913
Wallston, K. A., Malcarne, V. L., Flores, L., Hansdottir, I., Smith, C. A., Stein, M. H., … & Clements, P. J. (1999). Does God determine your health? The God locus of health control scale. *Cognitive Therapy and Research, 23*, 131-142. https://doi.org/10.1023/A:1018723010685
Wallston, K. A., Wallston, B. S., DeVellis, R. (1978). Development of the multidimensional health locus of control (MHLC) scales. *Health Education Monographs, 6*, 160-170. https://doi.org/10.1177/109019817800600107
Ware Jr, J. E., & Sherbourne, C. D. (1992). The MOS 36-item short-form health survey (SF-36): I. Conceptual framework and item selection. *Medical Care, 30*, 473-483. https://www.jstor.org/stable/3765916
Yang, Y., & Xia, Y. (2015). On the number of factors to retain in exploratory factor analysis for ordered categorical data. *Behavior research methods, 47*, 756-772. https://doi.org/10.3758/s13428-014-0499-2

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Data Availability:
The data analysed in this manuscript is available upon request from the corresponding author, or any member of the NZAVS advisory board. This is due to ethics restrictions, as the original consent form stated that data would be provided upon request on a case-by-case for the purposes of checking or validating analyses. This study was not pre-registered. M*plus* syntax and output for all models reported in this manuscript are available on the NZAVS OSF. Supplementary materials (the list of scale items, along with standardized factor loadings for all 108 scales) are also available on the NZAVS OSF: https://osf.io/75snb/wiki/Scale%20Validation%20Study/

Author Contributions:
CGS wrote the paper with formative feedback from SS, KJL, KY, DRVT, TLM, EZ, JAB, MSW, NCO, and DO. CGS and SS designed the study. CGS and KJL conducted data analyses. KJL prepared the tables and supplementary materials. JAB prepared the figures. CGS, SS, KY, DRVT, TLM, MSW and NCO collected data.

Figure 1. Comparative Reliability of Short-Form Scales and Single-Item Indicators Included in the New Zealand Attitudes and Values Study Relative to their Full-Form (Parent) Counterparts.

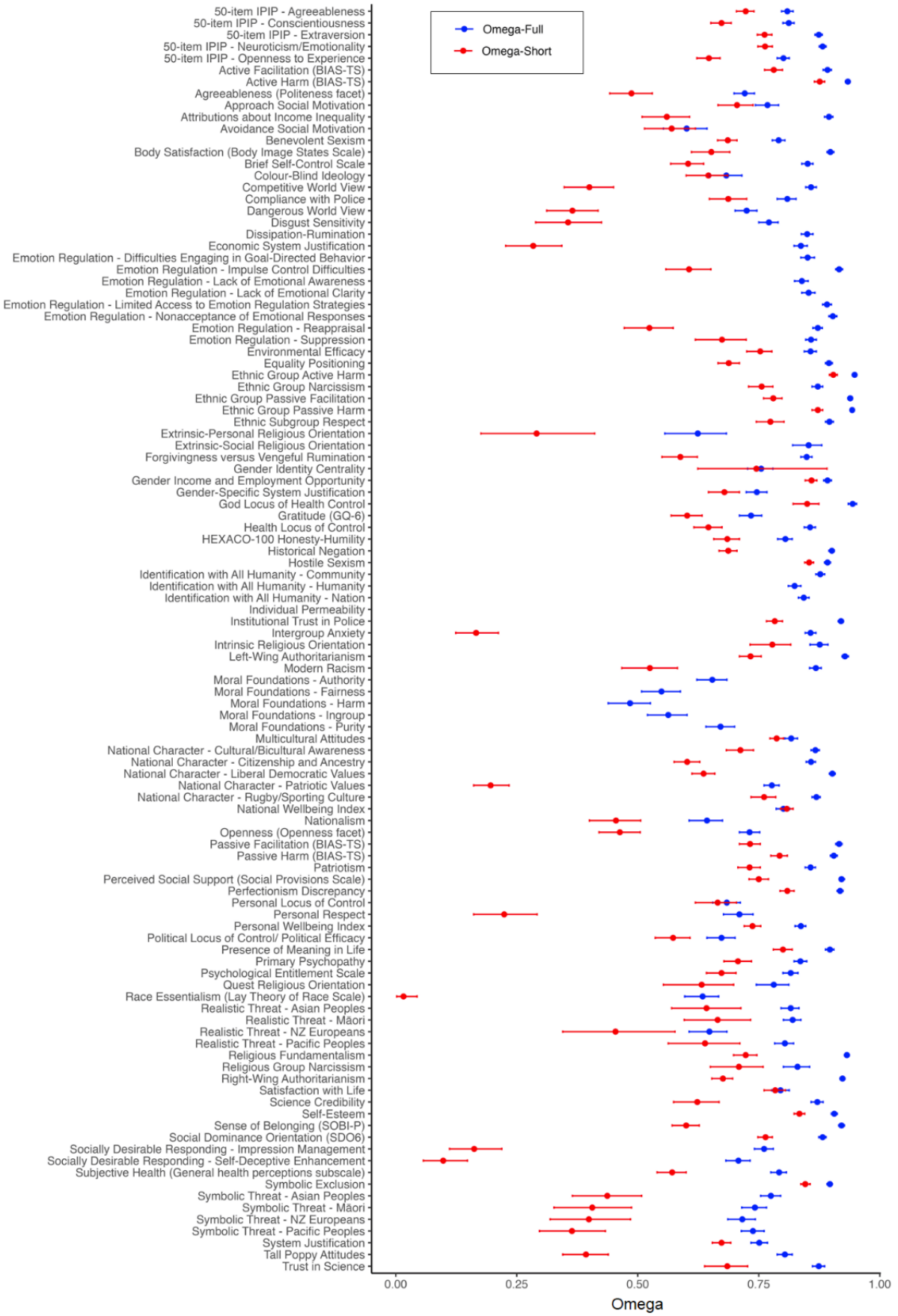

Figure 2. Model Fit Statistics (CFI and TLI) for Full-Form Scales.

Figure 3. Model Fit Statistics (RMSEA and SRMR) for Full-Form Scales.