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MEASURING WHANAUNGATANGA AND IDENTITY FOR WELL-BEING IN RANGATAHI MĀORI

Creating a scale using the Youth19 Rangatahi Smart Survey

*Lara M. Greaves**
Jade Le Grice†
Ariel Schwencke‡
Sue Crengle§
Sonia Lewycka||
Logan Hamley¶
*Terryann C. Clark***

Abstract

There have been many attempts at measuring Māori identity and cultural engagement, yet there have been no scales created to specifically explore whanaungatanga. Whanaungatanga can be operationalised as active participation in and a sense of belonging to social groups and collective, reciprocal caring relationships. In this article, we document the development of a whanaungatanga scale alongside a measure of Māori identity. The research reported here analysed the responses of the rangatahi Māori who completed the Youth19 Rangatahi Smart Survey (Youth19, $N_{Māori}$ = 1,627), which was administered in secondary schools from the Te Tai Tokerau (Northland), Tāmaki Makaurau (Auckland), and Waikato regions in 2019. We discuss the deliberative parts of the scale development then move on to describe the factor analytic techniques employed, which identified a reliable three-factor structure for whanaungatanga, independent of the cultural identity questions in Youth19. We then show that the three subscales for whanaungatanga—with whānau, friends, and other adults, respectively—predict well-being for rangatahi Māori and can be used as a basis for further work.

* Ngāpuhi. Lecturer, School of Social Sciences, University of Auckland, Auckland, New Zealand. lara.greaves@auckland.ac.nz
† Ngāpuhi, Te Rarawa. Senior Lecturer, School of Psychology, University of Auckland, Auckland, New Zealand.
‡ Ngāpuhi. Research Assistant, School of Nursing, University of Auckland, Auckland, New Zealand.
§ Kāi Tahu, Kāti Māmoe, Waitaha. Professor, Department of Preventive and Social Medicine, University of Otago, Dunedin, New Zealand, and General Practitioner, Invercargill Medical Centre, New Zealand.
|| Senior Epidemiologist, Nuffield Department of Medicine, University of Oxford, and Oxford University Clinical Research Unit, National Hospital for Tropical Diseases, Hanoi, Vietnam.
¶ Ngāti Rangi, Whanganui. PhD Candidate, School of Psychology, University of Auckland, Auckland, New Zealand.
** Ngāpuhi. Associate Professor, School of Nursing, University of Auckland, Auckland, New Zealand.

Keywords

whanaungatanga, Māori identity, measurement, surveys, scale development, rangatahi

Rangatahi Māori face ongoing impacts of colonisation, racism and inequality (Berryman et al., 2017; Kearns et al., 2009; Reid et al., 2014). Given that rangatahi Māori face significant health inequities (Clark et al., 2018), there is increasing demand for Māori-specific evidence to support programmes and policies to create services that are compliant with Te Tiriti o Waitangi/the Treaty of Waitangi, culturally safe, and relevant for whānau. There is growing evidence that whanaungatanga and a strong sense of cultural identity are protective for a range of important health issues, including mental health (Clark, 2007; Huriwai et al., 2001; NiaNia et al., 2017; O'Carroll, 2013; Williams et al., 2018). In particular, research in education has highlighted the benefits of a positive Māori cultural identity promoting rangatahi well-being (Rata, 2012, 2015; Webber, 2012; Webber et al., 2020). Importantly, research has also emphasised the fluidity of cultural identity for rangatahi, and the need to engage with diverse perspectives on Māori identity to support well-being. This reflects the developmental stage that rangatahi are in, and the unique challenges and opportunities that arise for rangatahi today (Ware & Walsh-Tapiata, 2010). However, there is less research exploring how rangatahi conceptualise whanaungatanga, and how it supports their well-being and cultural identity.

Whanaungatanga, as with many Māori concepts, is hard to define in a brief English sentence. Contemporary Māori research utilises diverse understandings of whanaungatanga: some refer to whanaungatanga as relationship building (Waitoa et al., 2015), as a synonym for *rapport* (Walsh-Mooney, 2009), as intricate relationships (Edwards, 2009) or as relationship/kinship and a sense of connection (Carlson et al., 2016). Others emphasise the importance of whanaungatanga within a network of beliefs and practices which underlie Māori society (McNatty & Roa, 2002).

As an important concept aligned with values from te ao Māori, whanaungatanga is asserted to be a core protective factor by Māori communities. Despite the importance of whanaungatanga to Māori well-being, there has been little genuine engagement by mainstream services to reorient service provision to meet these needs. As a starting point, the measurement of whanaungatanga by contemporary rangatahi as a distinct concept needs further exploration. The research described in this article sought to extend past literature on Māori identity by developing a scale of whanaungatanga to use with rangatahi alongside measures of Māori ethnic identity. This work is part of a mixed-methods project seeking to investigate links between whanaungatanga, identity and the health and well-being of rangatahi Māori. We describe the development of a scale to measure whanaungatanga and test its validity by relating the scale to psychological well-being.

What is whanaungatanga?

Whanaungatanga is one of several important cultural values for Māori, and it has even been called the "basic cement that holds things Māori together" (Ritchie, 1992, p. 66). Some have tried to discern the deeper ontological meaning of whanaungatanga through its etymology. For instance, Ritchie (1992, p. 67) deconstructed the word into three basic elements: *whānau*, the word for extended family; *ngā*, which extends whānau beyond kin; and *tanga*, which transforms the word into "a process concept concerned with everything about relationships between kin". Metge (1995), in contrast, argued that *whanaungatanga* is actually derived from the word *whānau*, meaning "leaning together". This murky etymology leads some to question whether it is in fact useful to define whanaungatanga, given that some would argue that it is simply implicit and underlies all of Māori culture (McNatty & Roa, 2002).

However, in academic work, definitions of whanaungatanga range from the theoretical and conceptual to the more concrete. On the conceptual side, whanaungatanga has been theorised as a web underlying the different connections someone, something or an idea has through society (McNatty & Roa, 2002; Mikaere, 2011; Ritchie, 1992). However, many definitions emphasise that whanaungatanga is connected to the nurturing of relationships through care, connection, common understandings and shared obligations (Berryman et al., 2017). In particular, this focus on relationships occurs within scholarship that centres on engaging rangatahi (Edwards, 2009; O'Carroll, 2013; Waitoa et al., 2015; Walsh-Mooney, 2009). Traditionally, whanaungatanga was said to relate to kin only, with whanaungatanga ensuring that whānau who lived and worked together maintained strong ties with one another (M. Durie, 1998). However, this traditional definition has expanded over time, as colonisation and urbanisation have shaped how Māori make meaning of their diverse

identities (M. Durie, 1998). Whanaungatanga can include non-kin relationships that have become whānau-like (Kukutai et al., 2016) as well as relationships mediated by online platforms (O'Carroll, 2013; Waitoa et al., 2015) and with professionals who engage with Māori (Carlson et al., 2016).

As such, whanaungatanga can exist between people at all levels of society. What these diverse understandings all highlight is the importance of relationships within te ao Māori and the need to build family or kin-like relationships. Importantly, Le Grice et al. (2017) state that the concept of whanaungatanga has shifted in order to meet the everyday needs of Māori in contemporary times and ensure the intergenerational transmission of Māori ways of knowing and being through everyday practices. Thus, whanaungatanga, along with other concepts such whakapapa, wairuatanga, manaakitanga, kotahitanga and rangatiratanga, continues to ensure the ongoing well-being of Māori (Carlson et al., 2016; Le Grice et al., 2017; McNatty & Roa, 2002; O'Carroll, 2013).

Given that whanaungatanga is so broad and encompassing, we needed to clarify the scope—that is, create a *working definition* of whanaungatanga for the purposes of creating survey questions (de Vaus, 2014). Here, we define whanaungatanga as active participation and sense of belonging in social groups such as whānau, friends, school, communities, iwi and hapū, kaupapa-based collectives, organisations or groups, and wider society. Whanaungatanga also encompasses the intergenerational knowledge exchange, collective empowerment, reciprocal responsibility, sharing, caring, guardianship, and planning together as a collective (M. Durie, 1997, 1998; Moeke-Pickering, 1996; Simmonds et al., 2014). As such, we focus on whanaungatanga with living people and conceptualise whanaungatanga as being created with (1) close family/whānau, (2) friends and (3) other adults.

Measuring Māori cultural concepts

There has been a rich, albeit recent, history of work measuring engagement with Māori cultural identity and concepts. However, there is little work measuring whanaungatanga-type constructs, and none on a specifically designed whanaungatanga scale. Many of these works have shown utility by predicting positive outcomes for Māori and protection against negative ones. Early quantitative work on aspects of Māori culture included measures of cultural connection and behaviours rather than specific scales using scale-development techniques. Thomas (1988) provided a test of cultural knowledge and te reo Māori fluency, and Ratima et al.'s (1993) identity questions included ones on cultural familiarity and knowledge in combination with a self-identification question. A. E. Durie (1993) took a similar approach, combining questions on iwi and marae affiliations, self-reported involvement with Māori organisations and schools, and attitudes towards, and proficiency in, te reo Māori. This culminated in M. Durie's (1995) identity scale through Te Hoe Nuku Roa, a longitudinal study of Māori households. The identity measure that M. Durie (1995) developed revolved around four axes. The most relevant axis to this work is "Paihere Tangata" (the human relationships axis), which included questions on household roles, relationships, in(ter)dependence, and cohesion; ethnic group affiliations; te reo Māori and tikanga use; views on land, environment, and resource issues; and involvement with iwi, hapū, and marae. The Paihere Tangata axis represented a first attempt at measuring concepts relating to whanaungatanga through a Māori lens.

Recent work has explored Māori identity and has more formally recognised this relationality. Houkamau and Sibley (2015) created the Multidimensional Model of Māori Identity and Cultural Engagement, conceptualising Māori identity into seven domains. Related to whanaungatanga, the Interdependent Self-concept scale measures the extent to which one views their identity as Māori in relationship to other Māori. However, the scale is focused on ethnic identity in adults and drew on a broad range of international concepts and work, rather than being built primarily on concepts *within* Māori culture. Two recent articles have focused on measuring cultural identity, including proxies of whanaungatanga pertaining to rangatahi. R. Fox et al. (2018, p. 14) created a scale of "Māori cultural embeddedness", or "the degree and intensity of cultural identification" and predicted well-being and adaptive coping over time in a stratified random sample of rangatahi Māori (N = 405). The scale included two domains relating to others: connectedness to whānau, including ancestors, through knowledge and doing things for the community; and connecting with culture through friends, and simply having Māori friends. Finally, Williams et al. (2018), constructed a measure of cultural identity from existing survey questions in Youth12, the third national health and well-being survey of secondary school students in New Zealand conducted in 2012, analysing responses from a national sample of rangatahi Māori (N = 1,699). In their literature review the authors identified the domain "Whanaungatanga (Collectivist

Identity and Relationships)", which was defined as "a sense of belonging to family and various social groups" (Williams et al., 2018, p. 3), as important to well-being in rangatahi. However, a limitation was that the researchers worked backwards from survey questions which had been created with other purposes in mind and were not able to create whanaungatanga-specific questions. Nevertheless, the overall results showed that a stronger cultural identity related to greater well-being and lower depression scores.

In summary, Māori researchers have sought to develop *emic* measures of Māori ethnic identity and culture—scales that can be used *within* or *specific to* Māori culture— rather than use existing *etic* measures—generic, universal measures to be used *across* cultures, which may lack applicability (Berry, 1989). The focus of past scales has been to create measures of cultural connection/identity rather than whanaungatanga. The study reported here sought to create an open-access scale of whanaungatanga as a tool for researchers, policy makers and communities.

Research overview

While a body of quantitative work exists measuring Māori identity, we sought to measure whanaungatanga by creating a scale for broader use. This scale, we hypothesised, should be useful to predict well-being for Māori in strengths-based, mana-enhancing ways. Māori cultural concepts can be hard to pin down in quantitative scales. There is often a tension between Māori research and quantitative methods, given Māori histories with research and researchers (Smith, 2012). The kaupapa or motivation behind the current project is strengths-based (Walter & Andersen, 2013). The project centres Māori cultural concepts, takes these "for granted" and positions Māori culture as the normal, default values or concepts to work from (Moewaka Barnes, 2000). By measuring whanaungatanga we want to conceptualise and explore (through quantitative methods) whanaungatanga as a protective factor for rangatahi. Therefore, the aims of this article are (1) to describe how we derived the whanaungatanga questions and Māori identity/culture items, and describe responses to these questions; (2) to apply both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to these whanaungatanga and identity questions to show a reliable underlying factor structure; and (3) to test both the construct validity of the whanaungatanga scale and its predictive validity.

Method

Participants and procedure

Data reported in this article were drawn from the Youth19 Rangatahi Smart Survey (Youth19), which is part of a series of four representative survey waves of New Zealand high school students (2001, 2007, 2012 and 2019) (Adolescent Health Research Group, n.d.). A two-stage clustered sampling design was used across the four survey waves. Earlier survey waves recruited participants nationally, however the 2019 wave included only the Te Tai Tokerau (Northland), Tāmaki Makaurau (Auckland) and Waikato regions. One-third of schools in those regions were randomly selected and then 50% of those schools' rolls were randomly selected to participate. All schools with >50 students in years 9–13 (aged 12–18 years) were included. Students with significant physical and cognitive disabilities that prohibited them from participating were excluded. In a separate sample, seven of nine kura kaupapa Māori from these regions were invited to participate, with all students invited to participate. The average response rate for all invited students was 60% (calculated from a response rate of 59% for "mainstream schools" and 71.4% for kura).

The anonymous survey consisted of 285 questions regarding the health and social issues that influence youth well-being. The survey was hosted on Qualtrics XM and administered via a multimedia computer-administered survey instrument (M-CASI) on internet-enabled tablets with te reo Māori or English completion options. School principals, boards of trustees and students actively consented to participate, and passive parental consent was obtained from whānau. Ethics approval was granted by the University of Auckland Human Participants Ethics Committee (#022244).

The participants included in our analyses were the 1,627 students (19.8% of the total sample) who selected Māori as their ethnicity; 39.9% of these also identified as Pākehā/NZ European, 12.2% as Pacific, 23.0% as Asian and 4.9% as another ethnicity. Of the participants, 20.9% were aged 13 and under, 25.0% were 14, 23.0% were 15, 16.2% were 16, and 14.9% were 17 and older. Girls/women comprised 53.1% of the sample, 45.4% identified as men/boys, and 1.5% identified as non-binary or similar. Data were collected across Te Tai Tokerau (23.7%), Tāmaki Makaurau (45.7%) and Waikato (30.6%) regions, and 21.4% of the sample attended kura kaupapa Māori. Participants' addresses were collected separately to ascertain their neighbourhood-level New Zealand Deprivation Index (NZDep) 2018 decile,

ranging from 1 (low deprivation) to 10 (high deprivation) on an ordinal scale. The NZDep mean decile for the Māori sample was 6.9; decile 5 represents the national median. We also conducted a multiple regression using the whanaungatanga subscales to determine if they predicted scores on the 5-item World Health Organization Well-Being Index (WHO-5; Collaborating Center for Mental Health, 1998).

Scale development

Following the literature review on whanaungatanga and utilising insights from the 51 rangatahi/whānau photo-elicitation qualitative interviews in Phase 1 of the larger project (Hamley et al., 2021), we devised a series of questions designed to measure "whanaungatanga from a rangatahi perspective" to include in the Youth19 survey series. The questions were based on high-level themes that rangatahi, their whānau and key stakeholders told us were important for whanaungatanga. The rōpū rangahau of Māori researchers listened and read the transcripts and identified common ways that rangatahi and their whānau engaged in whanaungatanga in an everyday and concrete manner by asking: Who do they consider to be whānau? How do these everyday practices of whanaungatanga look and how are they expressed in their lives? These common ways were shared with our rangatira advisory group and our rangatahi advisory groups. The advisory groups' suggestions were incorporated into several sets of questions. First, a "Māori Identity and Culture" set of specific questions were created regarding the cultural and everyday practices of whanaungatanga; comfort in Māori social and formal surroundings; connection to te reo Māori; identity as tangata whenua; pride when participating in cultural activities; importance of Māori values; sense of environmental protection (i.e., kaitiaki of whenua); spiritual connection to places, land, sea; and ongoing relationships with ancestors (see Table 1). These were based on the domains commonly found in past literature (e.g., R. Fox et al., 2018; Houkamau & Sibley, 2015; Williams et al., 2018).

In addition, we created whanaungatanga-focused items grouped into three sections: (1) whakapapa whānau or family where there was biological lineage (9 questions); (2) friends who are whānau, or friends who become family (8 questions); and (3) other supportive adults they perceive to be whānau or other adults who become whānau, like mentors, coaches, teachers, friends' parents, etc. (9 questions) (see Table 2). Once these questions were devised, we sought feedback from the wider survey research group and advisory groups. All questions were rated by participants on a five-point Likert scale with the options of "strongly agree", "agree", "neutral", "disagree", and "strongly disagree"; the Māori

TABLE 1 Full Question Wording for the Māori Identity and Culture Questions

Māori Identity and Culture (M) ***"Now we are going to ask you about Te Ao Māori (things in the Māori world)."***	
M1.	I feel comfortable in Māori social surroundings, events or gatherings (e.g. hui, sports, etc.)
M2.	I feel comfortable in formal Māori social surroundings, events or gatherings (e.g. tangi, speechmaking or whaikōrero, etc.)
M3.	When I hear, understand, learn or speak te reo Māori, it gives me a sense of belonging
M4.	It is important to me that others respect and value our status as tangata whenua
M5.	When I participate in activities like kapa haka, waka ama, sports, wānanga and other activities with Māori friends and whānau, I feel a sense of pride
M6.	I am proud to be Māori
M7.	Māori values are important to me (things like generosity, kindness, being a good host, manaakitanga, tika, pono and aroha)
M8.	I believe it is important to be kaitiaki to protect our environment for future generations (e.g. keep our sea clean so we can swim and safely collect seafood to eat in the future)
M9.	I have a strong spiritual connection and sense of belonging to certain places (e.g. mountain, river, sea, etc.)
M10.	I often feel the presence of my tīpuna or tūpuna (my ancestors and my whānau who have died)

TABLE 2 Full question wording for each of the three whanaungatanga-focused domains

Whanaungatanga with Whānau (Wh) *"Now we are going to ask you some questions about your whānau or family (e.g. parents, siblings, step-parent or other carer, aunty, grandparent, etc.)."*	
Wh1.	There is someone in my family/whānau who I can trust to share my feelings with
Wh2.	There is someone in my family/whānau who I can talk with about things that are worrying me
Wh3.	There is someone in my family/whānau who respects what is important to me
Wh4.	There is someone in my family/whānau who accepts me for who I am
Wh5.	There is someone in my family/whānau who I have a close bond with
Wh6.	There is someone in my family/whānau who will stick up for me and who has 'got my back'
Wh7.	There is someone in my family/whānau who I can have fun with, who makes me laugh
Wh8.	My family/whānau are proud and supportive of me participating in cultural, sporting and academic activities (e.g. my whānau attend my competitions, help fundraise, coach)
Wh9.	I feel like I get enough quality time with my family/whānau
Whanaungatanga with Friends (F) *"Now we are going to ask you about your friendships (e.g. people about the same age as you)."*	
F1.	I have at least one friend who I can trust to share my feelings with
F2.	I have at least one friend who I can talk with about things that are worrying me
F3.	I have at least one friend who understands what is important to me
F4.	I have at least one friend who accepts me for who I am
F5.	I have at least one friend who I have a close bond with
F6.	I have at least one friend who will stick up for me and who has 'got my back'
F7.	I have at least one friend who I have fun with, who makes me laugh
F8.	I have at least one friend that I can talk to face-to-face (not online, text or social media) most days
Whanaungatanga with Other Adults (OA) *"Now we are going to ask you some questions about adults you get support from outside your whānau/family (e.g. friend's parents, coaches, mentors, teachers, youth worker, kaiako, etc.)."*	
OA1.	There is an adult outside of my family/whānau who I can trust to share my feelings with
OA2.	There is an adult outside of my family/whānau who I can talk with about things that are worrying me
OA3.	There is an adult outside of my family/whānau who understands what is important to me
OA4.	There is an adult outside of my family/whānau who accepts me for who I am
OA5.	There is an adult outside of my family/whānau who I have a close bond with
OA6.	There is an adult outside of my family/whānau who will stick up for me and who has 'got my back'
OA7.	There is an adult outside of my family/whānau who I have fun with, who makes me laugh
OA8.	There is somewhere safe I can go and stay, other than with my family/whānau (e.g. a friend's home, church members home, coaches home, etc.)
OA9.	There is a place where I can go where I feel I belong with people who support me (e.g. community groups, kapa haka, clubs, church, rainbow diversity groups, activism groups)

Identity and Culture questions had an additional "I don't understand" option to account for Māori students' varying familiarity with Māori culture.

A small number of participants selected the "I don't understand" option for the Māori Identity and Culture questions. Eleven students (0.8%) selected that option for M6 ("I am proud to be Māori"), 34 (2.3%) selected it for M10 (feeling the presence of tīpuna/tūpuna), 38 (2.6%) for M3 (about te reo Māori and belonging) and 57 (3.7%) for M1 (about comfort in Māori social surroundings). Lastly, we made the decision to word all questions positively, although most guides encourage including reverse-worded items (e.g., de Vaus, 2014). Past work has discussed the suitability of using reverse-worded questions with Māori participants. Given the experience of colonisation (Smith, 2012) and the importance of whānau and culture for many Māori, it is inappropriate to ask Māori to agree to statements such as: "I do not have anyone I trust within my whānau" or "I do not feel proud to be Māori" (Greaves et al., 2017). As this work draws on a positive/mana-enhancing kaupapa, we did not want to negatively frame questions or frame them in ways that could reinforce racist discourses.

Analysis procedure

Once the questions were devised, we utilised quantitative analyses to test the properties of the scale. Firstly, these included EFA and CFA. Typically, if researchers have theoretical research questions, they move straight to a CFA. However, although the items were designed to load onto the three whanaungatanga factors (whānau, friends, other adults), there was the possibility that items could load onto factors based on emotion (e.g., trust and acceptance, shared humour) rather than the three whanaungatanga groups. The EFA was conducted in R using the psych package (Revelle, 2020), and the CFA used the sem package (J. Fox et al., 2020). Although not an exact science, several relative and absolute fit statistics are used in EFA and CFA to assess how well the model fits the scale; we report these and the cut-off values/widely used "rules-of-thumb" in the results (Bentler, 2007; Marsh et al., 2004). Factor loadings are also used as an indicator of model and item performance (how well an item relates to an underlying latent factor) and range from 0 to 1. An acceptable factor loading is above 0.4, whereas above 0.7 is excellent. For more information, please see textbooks such as Field (2017).

Results

Exploratory factor analysis

As a first step, we examined the correlations between items in order to reduce the number of questions (correlations of >0.8 indicate a question may be dropped). We found that the first two whanaungatanga items for each of the groups with the tails ". . . who I can trust to share my feelings with" and ". . . who I can talk with about things that are worrying me" for family/whānau (r = 0.73), friends (r = 0.76), and other adults (r = 0.83) were highly correlated, meaning that we could drop one question from each domain. We chose to retain the questions with the "trust" tail, as the "talk with about things" tail was more highly correlated with other items in the other adults domain. There were several high correlations between items in the other adults domain (~0.7), especially for items OA5 and OA7. We chose to retain these items because none were strictly over 0.8 and doing so maintained comparability across the whanaungatanga domains.

We randomly split the sample in half, meaning 813 participants were included in analyses for the EFA and 814 for the CFA. The EFA used oblique (oblimin) rotation due to the potential for there to be correlations between factors. Examination of the scree plot and eigenvalues led us to consider either a four- or five-factor model (9.67, 3.68, 3.04, 2.73, 1.08). However, the fifth eigenvalue was barely over 1 (eigenvalues of >1 may indicate a factor). Additionally, when comparing four- and five-factor models, the fifth factor contained items with low loadings (<0.4), excepting two questions about being comfortable in Māori social settings (loadings of 0.529 and 0.737, respectively). The Bayesian information criterion (BIC) was marginally lower for the four-factor model ($BIC_{four\text{-}factor}$ = -1140.39; $BIC_{five\text{-}factor}$ = -1143.99; BIC is a relative fit statistic: smaller values indicate better model fit).

Given this information, alongside considerations of parsimony, we adopted a four-factor model, which fit the data reasonably well ($\chi^2(402, N = 813) = 1553.30$, $p < 0.001$, Tucker-Lewis Index [TLI] = 0.893, root mean square error of approximation [RMSEA] = 0.059, standardised root mean residual [SRMR] = 0.04). A RMSEA of less than 0.08 is acceptable, and less than 0.05 indicates excellent fit. The TLI should be above 0.9 and the SRMR should be less than 0.08 (Bentler, 2007; Hu & Bentler, 1999; Marsh et al., 2004). As presented in Table 3, all factor loadings were over 0.4 (0.46–0.88) on one factor. Factor score correlations were all within the acceptable

TABLE 3 Factor loadings from the EFA using the four-factor model

	1	2	3	4
1. Māori Identity and Culture (M)				
M1.	0.587			
M2.	0.549			
M3.	0.647			
M4.	0.587			0.136
M5.	0.709			
M6.	0.591			
M7.	0.665			
M8.	0.455	-0.110		
M9.	0.675		0.121	-0.107
M10.	0.578			
2. Whanaungatanga with Whānau (Wh)				
Wh1.		0.646		
Wh3.		0.735		
Wh4.		0.718		
Wh5.		0.771		
Wh6.		0.662		
Wh7.		0.634		
Wh8.		0.603		
Wh9.		0.485		
3. Whanaungatanga with Friends (F)				
F1.			0.738	
F3.			0.702	
F4.			0.781	
F5.			0.868	
F6.			0.786	
F7.			0.714	
F8.			0.643	
4. Whanaungatanga with Other Adults (OA)				
OA1.				0.785
OA3.				0.823
OA4.				0.816
OA5.				0.884
OA6.				0.883
OA7.				0.869
OA8.			0.105	0.697
OA9.				0.727

Note. Factor loadings < 0.1 are not presented.

range (<0.6; between -0.20 and 0.46). There were small-to-moderate correlations between the whanaungatanga subscales (0.21–0.47).

Confirmatory factor analysis

We conducted a CFA on the remaining half of the sample (n = 814), dropping out item 2 across the three domains (as explained above). Many of the fit statistics for the CFA indicated the model fit the data well, although some were around the cut-off guidelines ($\chi^2(489, N = 814) = 1191.80$, $p < 0.001$, comparative fit index [CFI] = 0.914, goodness of fit index [GFI] = 0.863, RMSEA = 0.055, BIC = -0.1820.00). The CFI and GFI should ideally be above 0.9; the GFI was marginally below 0.9. The RMSEA should ideally be below 0.5 for excellent model fit but was marginally higher at 0.55 (but still well below 0.8). In summary, across the EFA and CFA we have shown that there are three reliable whanaungatanga subscales independent of a scale of Māori Identity and Culture.

Predictive validity

To test predictive validity (see, e.g., de Vaus, 2014), we used the whanaungatanga subscales: whanaungatanga with whānau (α = 0.86), friends (α = 0.91), and other adults (α = 0.93). We conducted a multiple regression to predict scores on the WHO-5 scale of well-being (see Table 4). The model explained 18.3% of the variance in well-being ($R^2 = 0.183$, $F_{(3, 1061)} = 79.221$, $p < 0.001$, N = 1,064). Higher scores on the whanaungatanga with whānau ($b = 2.987$, $SE = 0.285$, $t = 10.493$, $p < 0.001$), friends ($b = 0.816$, $SE = 0.294$, $t = 2.779$, $p = 0.006$) and other adults scales ($b = 0.683$, $SE = 0.194$, $t = 3.521$, $p < 0.001$) predicted higher well-being scores.

Discussion

Our aim in this article was to describe the development of a whanaungatanga scale to be used with rangatahi alongside, or independently of, Māori identity scales. We presented the rationale behind the scale, the steps around writing the questions, the sample they were tested with, and analyses to show the factor structure. We then showed the scale's predictive validity by predicting WHO-5 well-being scores from the three whanaungatanga subscales. Our results show a reliable three-factor whanaungatanga scale, which is based in the literature and has been developed alongside our qualitative work. The subscales show predictive validity for well-being. Predictive validity refers to the ability for a scale to relate to some outcome that, in theory, it should relate to or predict (de Vaus, 2014). These results indicate that building whanaungatanga is important for the well-being of rangatahi Māori. Policies that foster opportunities for whanaungatanga and strong connections within whakapapa whānau, and wider social networks, should be essential in any interventions to improve youth mental health.

Practically, we hope that this scale will be used by those seeking culturally relevant scales to research well-being in rangatahi for policy and clinical applications. Our intent was to create an open-access scale of whanaungatanga as a tool for researchers, policy makers, and communities to use. We hope that other researchers—including those outside of academia—utilise the scale in future because strengths-based scales created *by* Māori, *for* Māori are rare. We also hope that other researchers seek to develop scales based on Māori cultural concepts, or versions of Western concepts which take into account te ao Māori. For example, we used a scale of well-being from the WHO in this article, but future work could develop a short well-being scale specifically for Māori. In the interests of Māori data sovereignty, it is important to make such scales open-access and available to a wide range of Māori communities.

TABLE 4 Multiple regression predicting WHO-5 scores using the whanaungatanga subscales

	WHO-5		
	b	**SE**	**t**
Intercept/threshold	–3.978	1.383	
Whanaungatanga with whānau	2.987	0.285	10.493***
Whanaungatanga with friends	0.816	0.294	2.779**
Whanaungatanga with other adults	0.683	0.194	3.521***

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Limitations and future research directions

There are a number of directions in which this work could be extended. This article on scale development is rangatahi Māori-specific, but it could be modified to include adults and other ethnic groups. The whanaungatanga questions were written for rangatahi Māori, but many could be used for adults, or modified for use with them. For example, questions which refer to somewhere safe away from the *family* home or to family/whānau being proud and supportive of activities could be modified. Adults could find it hard to distinguish between friends and "other adults", but such questions could be modified. Furthermore, the whanaungatanga questions were left deliberately broad in order to be used across the full survey sample, regardless of ethnicity. We would encourage researchers to include questions based in te ao Māori, such as those presented here, in surveys that include both Māori and other ethnic groups. Often Māori are asked questions designed with applicability to Western contexts rather than to Māori culture. Additionally, Māori participants also face greater time burdens through being given supplementary Māori-focused questions. Here we focused exclusively on rangatahi Māori, which leaves scope for further strengths-based work exploring differences in scores and the protective functions of whanaungatanga across different ethnic groups.

Although we have discussed our rationale for not including reverse-worded items, this still presents as a limitation. Ideally, survey scales should have both positively and negatively worded items to avoid acquiescent response bias, or the tendency for people to agree (de Vaus, 2014). Acquiescent response bias can lead to lower-quality results: inaccurate correlation and regression coefficients, inflated reliability estimates, and misleading factor analytic solutions (Weijters et al., 2010). However, we wanted to avoid negatively worded items about participants' whānau, friends, and other adults. We thought that could be off-putting, especially for rangatahi Māori, given historical/colonial experiences of research (Greaves et al., 2017; Smith, 2012). Future work should explore the balance of meeting Māori cultural needs versus the fundamentals of Western scale development: Do Māori view surveys negatively? Are Māori less likely to respond or enjoy research if a survey seems negative?

Another limitation may be that we have defined whanaungatanga too narrowly to capture all definitions of the concept. We have not included spiritual aspects of whanaungatanga (McNatty & Roa, 2002) and based our subscales around living humans, rather than tūpuna, or other aspects of the environment which have their own mauri. We have also not explored aspects of whanaungatanga which may be built through a shared kaupapa, whether it be a sports team, a cultural activity or other shared work. Future development of this scale could address these aspects of whanaungatanga, perhaps through a qualitative scale development phase including seeking domain expert feedback, especially those with knowledge of te ao Māori.

A few wording changes may increase the utility of the scale. A caveat is that the questions use the term "family/whānau"; in order to make sure there was clear understanding of this term across cultures, we had to describe and define family/whānau as excluding other adults. This distinction might lack cross-cultural applicability and its applicability to rangatahi Māori may be limited. For example, some Māori may struggle to define their whānau without that "aunty" who is not related to them through biology or marriage (Kukutai et al., 2016). Future work could explore the meaning of whānau for rangatahi and who that includes/who they think of in these questions. Work with adults has suggested that the definition of whānau varies across Māori, from including friends and tens of people through to one's "nuclear" family (Tibble & Ussher, 2012). A different definition besides "other adults" may be useful in further scale development in order to make the third subscale more age-group inclusive. For instance, future work could trial the phrasing "members of the wider community" or "hapori whānui". This change would mean the third subscale could include tamariki and rangatahi who were not friends with the participant, as well as relationships at the hapū and iwi level.

This article did not predict outcomes beyond a Western-based well-being scale (the WHO-5). Future research could explore the links between the scale and health outcomes: whanaungatanga has been identified as important for health across multiple contexts (Clark, 2007; Huriwai et al., 2001; NiaNia et al., 2017; O'Carroll, 2013; Williams et al., 2018). There are places where the construct defined and measured here—whanaungatanga—might overlap with Western scale constructs such as social support, social connectedness, and attachment. Future work might seek to explore the shared variance and relationships between whanaungatanga and Western scales to explore where the two differ. We also did not draw upon how whanaungatanga may be created and

maintained on the internet or through social media (O'Carroll, 2013; Waitoa et al., 2015). Finally, there is also only so much that a quantitative scale can index. The qualitative segments of the project will further develop our understandings of what whanaungatanga means for rangatahi on a deeper level.

In conclusion, we have presented a scale of whanaungatanga situated in te ao Māori and developed from an emerging body of work which seeks to create quantitative scales using Māori concepts and identity. We created the scale's questions using the findings from a review of the academic literature, collaborative work with the rōpū rangahau, and the qualitative phase of the project. Factor analytic methods confirmed there is a reliable three-factor scale relating to whanaungatanga, with those factors being (1) whānau, (2) friends, and (3) other adults. We will seek to link this scale further to health and use it across population groups. We hope that other researchers will use it in future too.

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Glossary

aroha	love, caring, compassion, kindness
hapori whānui	broader community
hapū	kinship group, clan, a subgroup within iwi; section of a large kinship group and the primary political unit in traditional Māori society
iwi	extended kinship group, tribe, nation, people; often refers to a large group of people descended from a common ancestor
kaiako	teacher
kaitiaki	guardian, steward, trustee
kapa haka	traditional Māori performance; performing group
kaupapa	topic or matter for discussion
kotahitanga	unity, collective action, solidarity
kura kaupapa Māori	Māori-language immersion schools
mana	prestige, authority, control, power, influence, status, spiritual power, charisma; supernatural force in a person, place or object
manaakitanga	hospitality, kindness, support; the process of showing respect, generosity and care for others
marae	open area in front of the wharenui (meeting house), where formal greetings and discussions take place; often includes the complex of buildings around the marae
mauri	life force
-ngā	suffix used to make verbs into nouns
pono	to be true, honest, sincere
rangatahi	young people, youth
rangatira	high-ranking noble, chief; revered, chiefly
rangatiratanga	chieftainship, sovereignty; leadership of a social group
rōpū rangahau	research group
Tāmaki Makaurau	the greater Auckland region
tamariki	children
tangata whenua	the local people; Indigenous people
-tanga	suffix used to make verbs into nouns
tangi	funeral
te ao Māori	the Māori world
te reo	language; often used to refer to the Māori language
Te Tai Tokerau	the northernmost region of New Zealand
tika	being correct, true, fair, appropriate
tikanga	correct procedure, custom, manner, convention, protocol; customary system of values and practices that have developed over time and are deeply embedded in Māori social contexts
tīpuna/tupuna	ancestors

Waikato	geographic region associated with the Waikato River covering the area around Hamilton
wairuatanga	spirituality
waka ama	outrigger canoe sport
wānanga	deliberations, seminars, forums
whaikōrero	formal speeches
whakapapa	genealogy, lineage, descent
whānau	extended family
whanaungatanga	relationship, kinship, sense of family-like connections between people

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