

Weaving Indigenous Methodologies to Enact, Extend, and Innovate Best Practice Survey Measure Development

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Insights in Public Health is a recurring column from the public health community and is coordinated by HJH&SW Contributing Editor Mapuana Antonio DrPH from the Office of Public Health Studies in the Thompson School of Social Work & Public Health at the University of Hawai'i at Mānoa and Contributing Editor Nichole J. Fukuda MS from the Hawai'i Department of Health.

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Introduction

Fruits of the global decolonial struggle and ferocious movements such as the Native Hawaiian cultural renaissance of the 1960's and 1970's allowed for the revitalization and resurgence of *'Ike Hawai'i* (Hawaiian knowledge, language, practices, values, and culture),^{1,2} heralding a powerful generation of *Kānaka Maoli* (Native Hawaiian) scholars.³⁻⁶ Renowned *Kānaka Maoli* scholars made waves across various disciplines, and their works continue to inform and inspire Hawaiian researchers and scholarly works today.⁷⁻⁹ One influential example of these efforts include *E Ola Mau – The Native Hawaiian Health Needs Assessment*, the first comprehensive health assessment primarily conducted by Native Hawaiian doctors and researchers.¹⁰ In addition to identifying stark health disparities experienced by Native Hawaiians, *E Ola Mau* served as a catalyst to better the health and wellbeing of Native Hawaiians through solutions and recommendations developed by, with, and for Hawaiians, including the integration of traditional Hawaiian practices for health and healing. In today's contemporary society, health disparities continue to persist, many of which stem from structural determinants of health, demonstrating the devastating impacts of continued root causes of inequities that should not be present in today's day and time.¹¹⁻¹³ Landback, demilitarisation, and deoccupation are key to addressing these health inequities at the most fundamental level. The decolonization and Indigenization of social, political, and economic institutions and systems is also central to addressing those health inequities caused by colonialism and occupation.

Measurement is an important site for continuing legacies of Indigenous resistance, especially in the social, behavioral, and health sciences. The movement to decolonize and Indigenize how health and wellbeing related surveys are developed is critical as it gives us the power to tell our stories, using data from our own tools, based on our own lived experiences and in our own unique Indigenous ways.

Decolonizing and Indigenizing are interconnected praxes that, although important, have received little attention in the discipline of psychometrics. While acknowledging that colonization and decolonization are complex dynamic processes and structures that continue to unfold and be (dis)established uniquely across different colonial contexts, there is scope to operationalize these imperatives in the survey development context. The authors hope these following articulations may help to spark dialogue about is-

suues relating to decolonizing and indigenizing within Psychometrics, a central feature of this column.

Decolonizing survey measure development could involve critically examining and rejecting the assumptions, structures, and values that are deeply embedded in mainstream psychometric research, which also stem from colonial logics. This could include addressing harmful notions like neutrality, objectivity, and universality, leveling power dynamics between researchers and participants (eg, communities as co-creators rather than passive subjects), and resisting the academic institutional expectations, incentives, priorities, and values that often direct and dictate research processes and outcomes (eg the "publish or perish" culture that pressures academics to produce quantity over quality).

Indigenizing survey measure development on the other hand, could be more about centering and prioritizing Indigenous knowledges, languages, practices, values, and worldviews in the design, development, and validation of survey tools. This could include taking more community-based participatory research (CBPR) approaches, prioritizing the measurement of Indigenous constructs, enacting Indigenous research methodologies, drawing upon diverse sources of traditional wisdom, and evaluating tools in relation to community and cultural standards.

The purpose of this column is to explore how Indigenizing methodologies are enacting, extending, and innovating survey measure development practices. In this column, the authors share examples of Indigenous survey development research to support the idea that although conventional Western psychometric measures have been useful, new and more appropriate psychometric tools must be developed at the interface of Indigenous knowledges and Western science. Tools that are deeply meaningful to Indigenous peoples and robust from both cultural and psychometric perspectives can only be developed by Indigenizing survey development research.

Indigenizing survey development enacts, extends, and innovates research for all

Enacts. In 2018, Boateng and colleagues published an article outlining best practices for developing and validating scales for health, social, and behavioral sciences.¹⁴ The authors break the process down into 9 steps across 3 phases (item development, scale development, and scale validation). Mixed-methods research methodologies in the forms of interviews, focus groups, cognitive interviews, and sur-

vey pilots are identified as important steps for identifying domains, item generation, assessing adequacy of items, and testing that the questions are meaningful. These more person-centered, face-to-face approaches are often pedagogically preferred in Indigenous research more broadly, and are often robust in Indigenous measure development research.¹⁵

For instance, *Kānaka Maoli* communities transmitted knowledge intergenerationally through various oral traditions, including rich storytelling and storykeeping practices. These strong legacies are foundational to Hawaiian research methodologies that closely align with qualitative and mixed method approaches. When done authentically, intentionally, and in a *pono* (morally good; upright; and in a rectitude of conduct) way, the research process can facilitate connection, trust, and healing. Developing survey items based on robust Indigenous practices and values, including the incorporation of storytelling and oral narratives, is one example of how Indigenizing this research process can enact best practice survey development.

Extends. Much of health, social, and behavioral sciences research are built upon weirdly scientifically unstable foundations.^{16,17} Weird refers to the fact that across the disciplines, the overwhelming majority of research participants have been Western, Educated, Industrialized, Rich, and Democratic (W.E.I.R.D) students from Europe and North America.^{16,18} This brings into question the generalizability of many of the longstanding findings, and the scientific rigor of much of the research.^{16,17} With more recent research highlighting the impacts of culture on behavior,^{16,19} biology,^{20,21} cognition,^{16,22} emotions,^{23,24} and language,^{25, 26} researchers are making increasing efforts to diversify the participants of their research.^{18,27} This speaks to the fact that to understand human health, research must be undertaken *with* people from all around the globe, especially those who are marginalized and underrepresented in research more broadly.

Research is often Indigenized through taking more collective and community-based approaches. This provides an opportunity to incorporate the voices and perspectives of more diverse and hard-to-reach (for outside researchers) peoples, providing rich and more representative data. Indigenous survey development research often features community-based participatory and co-design methods, resulting in much more iterative and thorough research protocols. An example of this can be seen in research by Howard and colleagues whose psychometric analysis alone weaved together perspectives from their Indigenous Project Advisory Group and multiple collaborative yarns with their Indigenous Research Group at different stages and iterations of the analyses.²⁸ These more collective Indigenous approaches to psychometric development and validation extend conventional procedures and enrich the analysis processes greatly.

In Hawai‘i, *Kānaka Maoli* scholars and allies continue to extend the work of health research by moving beyond community-based participatory research (CBPR) approaches by allowing communities to be in the driver’s seat and develop research with, for, and by Native Hawaiian communities.

For instance, in the Ke Ola O Ka ‘Āina project, the Research Team and Thought Partners co-developed an ‘Āina Connectedness Scale to explore the relationship between ‘Āina Connectedness, health, and health-related outcomes including resilience.²⁹ The Ke Ola O Ka ‘Āina Research Team and Thought partners comprised communities and organizations across the *Pae ‘Āina* of Hawai‘i (Hawaiian archipelago) and included broader Hawaiian communities from Waimānalo Community, Mauiola Ke‘ehi, O‘ahu Island, Ho‘okena Community, Hawai‘i Island, Maui, Moloka‘i, Lāna‘i, Kamāwaelualani, and Kaua‘i Island. Co-development of the survey required ongoing partnership with, for, and by various communities, including proper permissions and vetting to proceed with the various research processes. In another study, CBPR approaches and decade-long partnerships between academic and community partners led to the development of the Hawaiian Homestead Health Survey research team, who successfully implemented a comprehensive community-based survey in Hawaiian Homestead communities to address community priorities.³⁰⁻³²

Innovates. The interface of Indigenous knowledge and Western Science has long been recognized as a site of great potential for collaboration and innovation related to knowledge production and global flourishing.^{28,33} Research sitting at these interfaces often weaves together different cultural concepts, histories, practices, and protocols, resulting in new and unique tapestries of understanding.⁴¹ The indigenization of survey development research has resulted in the release of a number of new and unique measures that integrate Indigenous languages, concepts, and understandings, using innovative cultural methodologies.³⁴⁻³⁷

In Aotearoa, the Māori Cultural Embeddedness Scale is one example of how Indigenous scale development research has innovated the measurement of identity more broadly.³⁷⁻³⁹ Issues arising from the conflation of ethnic and cultural identities, and perceived contradictions between being Māori (through genealogy) and being Māori (through enacting cultural values) are addressed through re-examining the issue of identity through a new concept of cultural embeddedness. Cultural embeddedness reflects the extent to which a person has taken opportunities to become embedded in Māori cultural beliefs, values, and practices. This research highlights how bringing the lived experiences of Indigenous peoples to survey development can foster innovation. The many other aforementioned points relating to the Indigenisation process enacting and extending best practice survey development further demonstrate such innovation.

Conclusions

Embarking on the journey to decolonize and Indigenize survey measure development practices, contributes to a greater movement working towards the reclamation of science as a pluriversal project by peoples of the global majority for the collective health and wellbeing of everyone and everything that co-inhabits this earth.

An initial step that all can take on this journey is to identify, critically examine, and work to deconstruct the often invisible cultural and societal assumptions, priorities, values, and worldviews that underpin current approaches and practices. This allows people to reflect upon how they personally relate to these paradigms, better positioning them to decolonize and Indigenize survey development practices. To see more Indigenizing methodologies enacting, extending, and innovating best practice, 'Western Scientists' must exercise greater epistemic humility and make more room for Indigenous knowledges and peoples within academic and research institutions.

This insights column highlights the fruits of Indigenizing survey measure development for both Indigenous communities and scientific fields more broadly. The matters raised in relation to the themes enact, extend, and innovate are mere starting points in a broader conversation. They barely scratch the surface in describing the true benefits of

Indigenizing measurement processes to public health research and in addressing the persistent health inequities amongst Native Hawaiians and our other Indigenous relations, from across the Pacific.

We the authors want to close this column with an affirmation and reminder that us as Indigenous peoples have long been experts in measurement, utilizing everything from the movement of the stars, ecological cycles, objects fashioned from nature, and parts of our own bodies to measure changes in things that matter to us. Measurement will continue to be an important practice for us Indigenous peoples, especially in research contexts, as we continue to Indigenize survey development practices with and for Indigenous peoples. Finally, when researchers enact, extend and innovate best practices in any form of measurement, we honor our Indigenous ancestors, and make both our Indigenous ancestors and our future generations proud.

References

1. Pukui MK, Haertig EW, Lee CA. *Nana I Ke Kumu (Look to the Source) Volume I Paperback*. A Queen Lili'uokalani Children's Center Publication; 1972.
2. Pukui MK, Haertig EW, Lee CA. *Nana I Ke Kumu (Look to the Source) Volume II Paperback*. A Queen Lili'uokalani Children's Center Publication; 1979.
3. Blaisdell RK. Health Status of Kanaka Maoli (Indigenous Hawaiians). *Asian Am Pac Isl J Health*. 1993;1(2):116-160.
4. Blaisdell K. Historical and cultural aspects of Hawaiian health. *Social Process in Hawai'i*. 1989;32:1-21.
5. Trask HK. *From a Native Daughter: Colonialism and Sovereignty in Hawai'i*. University of Hawai'i Press; 1993.
6. Kanehele GS. *The Hawaiian Renaissance by George S. Kanehele, May 1979*. Polynesian Voyaging Society; 1979.
7. Lee WKM, Look MA, eds. *Ho'i Hou Ka Maui Ola: Pathways to Native Hawaiian Health*. University of Hawai'i Press; 2017. doi:[10.21313/hawaii/9780824872731.001.0001](https://doi.org/10.21313/hawaii/9780824872731.001.0001)
8. Oliveira KARKN, Wright EK. *Kanaka 'Ōiwi Methodologies: Moolelo and Metaphor*. University of Hawai'i Press; 2015. doi:[10.21313/hawaii/9780824855857.001.0001](https://doi.org/10.21313/hawaii/9780824855857.001.0001)
9. Yamashiro A, Goodyear-Ka'opua N. *The Value of Hawai'i 2: Ancestral Roots, Oceanic Visions*. University of Hawai'i Press; 2014.
10. Alu Like. *E Ola Mau The Hawaiian Health Needs Study, 1985*.; 1985.
11. King M, Smith A, Gracey M. Indigenous health part 2: the underlying causes of the health gap. *Lancet*. 2009;374(9683):76-85. doi:[10.1016/S0140-6736\(09\)60827-8](https://doi.org/10.1016/S0140-6736(09)60827-8)
12. Trask HK. Hawaiians, American colonization, and the quest for independence. *Social Process in Hawai'i*. 1984;31:101-136.
13. Kaholokula K. NIMHD Minority Health and Health Disparities Research Framework Adapted to reflect social and cultural influences of Native Hawaiian health. October 8, 2023. Accessed October 1, 2024. https://www.nimhd.nih.gov/docs/hawaiian-framework_2020.pdf
14. Boateng GO, Neilands TB, Frongillo EA, Melgar-Quinonez HR, Young SL. Best practices for developing and validating scales for health, social, and behavioral research: A primer. *Front Public Health*. 2018;6:149. doi:[10.3389/fpubh.2018.00149](https://doi.org/10.3389/fpubh.2018.00149)
15. Smith LT. *Decolonizing Methodologies: Research and Indigenous Peoples*. 2nd ed. Zed Books; 2012.
16. Henrich J, Heine SJ, Norenzayan A. The weirdest people in the world? *Behav Brain Sci*. 2010;33(2-3):61-83. doi:[10.1017/S0140525X0999152X](https://doi.org/10.1017/S0140525X0999152X)
17. Rad MS, Martingano AJ, Ginges J. Toward a psychology of Homo sapiens: Making psychological science more representative of the human population. *Proc Natl Acad Sci USA*. 2018;115(45):11401-11405. doi:[10.1073/pnas.1721165115](https://doi.org/10.1073/pnas.1721165115)
18. Apicella CL, Norenzayan A, Henrich J. The WEIRD challenge and the need for psychological science to diversify beyond Western undergraduate samples. *Behav Brain Sci*. 2020;43. doi:[10.1017/S0140525X19002017](https://doi.org/10.1017/S0140525X19002017)
19. Markus HR, Kitayama S. Cultures and selves: A cycle of mutual constitution. *Perspect Psychol Sci*. 2010;5(4):420-430. doi:[10.1177/1745691610375557](https://doi.org/10.1177/1745691610375557)
20. Kitayama S, Uskul AK. Culture, mind, and the brain: Current evidence and future directions. *Annu Rev Psychol*. 2011;62:419-449. doi:[10.1146/annurev-psych-120709-145357](https://doi.org/10.1146/annurev-psych-120709-145357)
21. Hertz U, Heekeren HR. A neurocognitive mechanism for decisions under uncertainty and the influence of culture. *Nat Hum Behav*. 2020;4(9):941-952. doi:[10.1038/s41562-020-0911-1](https://doi.org/10.1038/s41562-020-0911-1)
22. Nisbett RE, Peng K, Choi I, Norenzayan A. Culture and systems of thought: Holistic versus analytic cognition. *Psychol Rev*. 2001;108(2):291-310. doi:[10.1037/0033-295X.108.2.291](https://doi.org/10.1037/0033-295X.108.2.291)
23. Mesquita B, Walker R. Cultural differences in emotions: A context for interpreting emotional experiences. *Behav Res Ther*. 2003;41(1):777-793. doi:[10.1016/S0005-7967\(02\)00189-4](https://doi.org/10.1016/S0005-7967(02)00189-4)
24. Kitayama S, Markus HR. Emotion and culture: Empirical studies of mutual influence. In: Manstead ASR, ed. *The Social Context of Nonverbal Behavior*. Cambridge University Press; 2014:435-464.

25. Majid A, Bowerman M, Kita S, Haun DB, Levinson SC. Can language restructure cognition? The case for space. *Trends Cogn Sci*. 2004;8(3):108-114. doi:[10.1016/j.tics.2004.01.003](https://doi.org/10.1016/j.tics.2004.01.003)
26. Boroditsky L. How language shapes thought: The languages we speak affect our perceptions of the world. *Sci Am*. 2011;304(2):62-65. doi:[10.1038/scientificamerican0211-62](https://doi.org/10.1038/scientificamerican0211-62)
27. Muthukrishna M, Bell AV, Henrich J, et al. Beyond WEIRD psychology: Measuring and mapping scales of cultural and psychological distance. *Behav Brain Sci*. 2020;43. doi:[10.1017/S0140525X19002338](https://doi.org/10.1017/S0140525X19002338)
28. Bartlett C, Marshall M, Marshall A. Two-eyed seeing and other lessons learned within a co-learning journey of bringing together indigenous and mainstream knowledges and ways of knowing. *J Environ Stud Sci*. 2012;2(4):331-340. doi:[10.1007/s13412-012-0086-8](https://doi.org/10.1007/s13412-012-0086-8)
29. Antonio MCK, Keaulana S, Keli'i'iholokai L, et al. A Report on the Ke Ola O Ka 'Āina: 'Āina Connectedness Scale. *Int J Environ Res Public Health*. 2023;20(4):3302. doi:[10.3390/ijerph20043302](https://doi.org/10.3390/ijerph20043302)
30. Antonio MCK, Hishinuma ES, Ing CT, et al. A Resilience Model of Adult Native Hawaiian Health Utilizing a Newly Multi-Dimensional Scale. *Behav Med*. 2020;46(3-4):258-277. doi:[10.1080/08964289.2020.1758610](https://doi.org/10.1080/08964289.2020.1758610)
31. Antonio MCK, Keaulana S, Hishinuma ES, et al. Psychometric testing of the Brief Coping Orientation to Problems Experienced Inventory among diverse women from a rural community in Hawai'i. *Rural Ment Health*. 2024;48(2):132-142. doi:[10.1037/rmh0000258](https://doi.org/10.1037/rmh0000258)
32. Antonio MCK, Keaulana S, Ing CT, et al. A psychometric analysis of the adapted historical loss scale and historical loss associated symptoms scale among native Hawaiian adults. *Front Public Health*. 2024;12. doi:[10.3389/fpubh.2024.1356627](https://doi.org/10.3389/fpubh.2024.1356627)
33. Qina'au J, Antonio MCK. Wellbeing for all: Indigenizing theories and measures of wellbeing for equitable sustainability. *Front Psychol*. 2023;13. doi:[10.3389/fpsyg.2022.979109](https://doi.org/10.3389/fpsyg.2022.979109)
34. Howard K, Garvey G, Anderson K, et al. Development of the what matters 2 adults (WM2A) wellbeing measure for Aboriginal and Torres Strait Islander adults. *Soc Sci Med*. 2024;347:116694. doi:[10.1016/j.socscimed.2024.116694](https://doi.org/10.1016/j.socscimed.2024.116694)
35. Johnson FN, Wehi P, Neha T, et al. Introducing "Ngaruroro", A New Model for Understanding Māori Wellbeing. *Int J Environ Res Public Health*. 2024;21(4):445. doi:[10.3390/ijerph21040445](https://doi.org/10.3390/ijerph21040445)
36. Johnson FN. Wellbeing Hononga Index (WeHI): Instruction Manual. 2024. Accessed April 2025. <https://static1.squarespace.com/static/62914833516dfc387d142cea/t/67a2bacd772c0d3a818ddf0c/1738717912035/WeHI+instruction+manual+2025.pdf>
37. Fox R, Johnson FN, Winter T, Jose PE. The Māori Cultural Embeddedness Scale (MaCES): Initial evidence of structural validity. *Cult Divers Ethn Minor Psychol*. 2023;29(4):551-563. doi:[10.1037/cdp0000576](https://doi.org/10.1037/cdp0000576)
38. Fox R, Ward C, Neha T, Jose PE. Modelling cultural embeddedness for colonised indigenous minorities: The implicit and explicit pathways to culturally valued behaviours. *Cult Psychol*. 2021;27(2):189-207. doi:[10.1177/1354067X20988651](https://doi.org/10.1177/1354067X20988651)
39. Fox R, Fraser G, Neha T, Jose PE. Tuia i roto: A qualitative exploration of Māori cultural embeddedness. *MAI J*. 2022;11(2):140-156. doi:[10.20507/MAIjournal.2022.11.2.4](https://doi.org/10.20507/MAIjournal.2022.11.2.4)