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The Canadian Reconciliation Barometer: a rigorous tool for tracking reconciliation in Canada

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Indigenous peoples in Canada have resisted centuries of colonial harm. In response to their resurgence and calls for justice, Canada is now on what is likely to be a long and winding truth and reconciliation journey. To help monitor perceptions of reconciliation progress in a good way, our team of Indigenous and non-Indigenous researchers created the Canadian Reconciliation Barometer. In Study 1, we wrote 89 self-report items representing 13 factors of reconciliation, which reflected what we learned from Elders, Survivors, and reconciliation leaders. A national sample of 592 Indigenous and 1,018 non-Indigenous participants completed the initial item pool. Exploratory factor analyses indicated that a 13-factor model had excellent fit, with only two factors needing minor conceptual modifications. We retained 64 internally consistent items representing 13 factors of reconciliation: Good Understanding of the Past and Present, Acknowledgment of Government Harm, Acknowledgment of Residential School Harm, Acknowledgment of Ongoing Harm, Engagement, Mutually Respectful Relationships, Nation-to-Nation Relationships, Personal Equality, Systemic Equality, Representation and Leadership, Indigenous Thriving, Respect for the Natural World, and Apologies. In Study 2, a national sample of 599 Indigenous and 1,016 non-Indigenous participants completed the retained items. The hypothesized factors had excellent fit, and the factor structure did not differ between Indigenous and non-Indigenous participants. We conclude by discussing contributions to social-psychological conceptualizations of reconciliation and how to use the Canadian Reconciliation Barometer to monitor social change.

KEYWORDS

reconciliation, Canada, Indigenous, barometer, psychometrics, public polling, political psychology, intergroup relations

1 Introduction

First Nations, Métis, and Inuit people are the original inhabitants of what many now call Canada (Chartrand, 2002; Palmater, 2011). These diverse peoples have resisted centuries of widespread and harmful colonial practices, policies, and systems (Adams, 1989; Truth and Reconciliation Commission of Canada, 2015a,b; Government of Canada, 2018, 2020; Lux, 2016; Sinclair, 2007; Woolford et al., 2014). For example, from the 1830s to 1996, Canada and partnered

religious institutions established and operated residential schools for Indigenous children (Fontaine, 2010; Fontaine et al., 2015; Joseph, 2018; Miller, 1996; Regan, 2010). The goal of the schools was to assimilate Indigenous children into Eurocentric ways and destroy Indigenous cultures. Historical records and Survivor statements indicate these schools were sites of abuse and neglect (Truth and Reconciliation Commission of Canada, 2015a,b). For example, thousands of children died in the schools, and at much higher rates than if they had stayed with their families, because of the poor conditions at the schools in which children lived (Corrado and Cohen, 2003; Wilk et al., 2017). Further, much subsequent research has illustrated the lasting harms associated with these schools (Elias et al., 2012; Bombay et al., 2014, 2011).

Canada is now on what is likely to be a long and winding truth and reconciliation journey in response to Indigenous peoples' resurgence and calls for justice (Moran, 2023). Our walk toward reconciliation thus far has been slow and involved many generations. One key step along the path occurred in the 1990s, when Survivors of residential schools (henceforth called "Survivors"), notably Phil Fontaine (CBC Archives, 1990) and a group of Survivors of Port Alberni Residential School, including Willie Blackwater (Blackwater v. Plint., 2005; Moran, 2023; Wright, 2016), came forward with their horrifying stories. Their disclosures inspired others to seek legal redress and Survivors did so in overwhelming numbers (Baxter v. Canada [Attorney General] et al., 2006; Moran, 2023), motivating the federal government and religious groups to pursue a class action settlement, reached in 2006. The Indian Residential Schools Settlement Agreement (Baxter v. Canada [Attorney General] et al., 2006; Government of Canada, 2021) included a negotiated formal apology in the House of Commons (Government of Canada, 2008), a first, as well as several reparations for individual Survivors and communities, such as funding for what would become the Truth and Reconciliation Commission of Canada (Government of Canada, 2022; National Centre for Truth Reconciliation, 2024a; Niezen, 2013). In 2015, the Truth and Reconciliation Commission of Canada ended its transformative work by releasing the Final Report (Truth and Reconciliation Commission of Canada, 2015a,b) and 94 Calls to Action (Truth and Reconciliation Commission of Canada, 2015c). The Calls to Action, along with other important guiding documents like the Commission's ten principles of truth and reconciliation (Truth and Reconciliation Commission of Canada, 2015d) and the United Nations Declaration on the Rights of Indigenous Peoples (United Nations, 2007; see also Hartley et al., 2010; Henderson, 2008; United Nations Declaration on the Rights of Indigenous Peoples Act SC c. 14., 2021), chart a path toward a more just country. In the same year, the National Centre for Truth and Reconciliation was established to host an archive of Survivors' experiences, photos, and memories; continue the research of the Truth and Reconciliation Commission; and educate the public about residential schools' past and ongoing impacts on First Nations, Métis, and Inuit people (National Centre for Truth Reconciliation, 2024b).

In response to the Call to Action 65 (as well as 53–56), a small group of like-minded researchers and practitioners met in 2015 through the partnership and staff support of the National Centre for Truth and Reconciliation to discuss whether and how to measure reconciliation. Reflecting the idea that reconciliation requires both Indigenous and non-Indigenous people, approximately half of the team that developed the barometer was Indigenous (Anishinaabe, Cree, Haida, and Métis) and approximately half was non-Indigenous (Canadian, European, and other backgrounds). Now, our team includes more Indigenous than non-Indigenous members, but this ratio has remained relatively constant since 2015. Collectively, we have a lived understanding of Canada's colonial projects, and a deep understanding of many varied and rich Indigenous cultural traditions. Our goal was to create a way to track progress toward reconciliation in Canada because tracking progress can guide and motivate action. We considered a variety of complementary approaches and ultimately created a set of self-report questions that assessed perceptions of progress toward reconciliation in national polls with samples of Indigenous and non-Indigenous people in Canada. With large samples, we have reported on the progress toward reconciliation widely, now twice. Our first report was covered in over 200 media publications nationwide. In the current paper, we detail the creation and some psychometric assessment of this measure.

In creating the Canadian Reconciliation Barometer, we have contributed to both reconciliation efforts and the literature. We contributed to reconciliation efforts by developing an understanding of what reconciliation means to Indigenous and non-Indigenous people in Canada. We view this understanding as evolving and our approach as complementary to other applied and scholarly work, such as tracking progress toward fulfilling the Calls to Action (Jewell and Mosby, 2023; Indigenous Watchdog, 2024); tracking differences in outcomes for Indigenous vs. non-Indigenous people in Canadian education and health systems (Adelson, 2005; Layton, 2023; Melvin, 2023; Palmater, 2022; Statistics Canada, 2023, 2024); and Survivors, Elders, and Knowledge Keepers sharing teachings about reconciliation (e.g., Traditional Knowledge Keepers Forum, 2023). Our multifaceted and novel construction of reconciliation aligns with and extends existing models (e.g., Nadler and Shnabel, 2008; Shnabel and Nadler, 2008; United Nations Development Program, 2015) and pushes against the colonial status quo in psychology (Adams et al., 2015; Ansloos et al., 2022; Fellner et al., 2020). We hope our collective efforts can contribute to ongoing public discourse and progress so that everyone in Canada can live a good life.[1]

To measure reconciliation in Canada, we must first understand what exactly reconciliation is. Part of the current project included creating a conceptualization of reconciliation, which was no small feat. The paradox of reconciliation is that it is at once a seemingly simple idea, and, as a United Nations Development Program (2015) framing paper argues, a "contested and controversial term." Why do experts and stakeholders sometimes disagree? One reason is that the construct of "reconciliation" is multifaceted; some aspects are not directly measurable and must be inferred from people's self-reports or actions in what is most often an intergroup context, surrounded by systems. A second factor is that some

1 "A good life" is a rough translation of a concept common in Anishinaabe, Cree, and other Indigenous nations in Canada. Direct translation is difficult, but the phrase refers to living a fulfilling, worthwhile, and respectful, life. The concept is often situated within one's social and spiritual relations (Debassige, 2010).

perceive reconciliation as a process and others perceive it as an end-state, though we conceptualize it as both. A third factor is that the meaning of reconciliation varies across contexts—what constitutes reconciliation in one culture, country, or group may not in another, though some themes should commonly occur. Our conceptualization of reconciliation aligns with those coming from both academics and practitioners.

Our understanding of reconciliation is consistent with prominent social psychological theories, of which there are several. One influential theory is the needs-based model of reconciliation (Nadler and Shnabel, 2008; Shnabel and Nadler, 2008). According to this model, conflict is rooted in threats to basic psychological needs rather than in competition for resources (e.g., land; Shnabel et al., 2020, 2023). Emotional barriers, such as distrust in the other and threat toward the worth of one's group, prevent peacemaking (Nadler, 2002; Shnabel and Nadler, 2015). Such barriers can be overcome when both victims and perpetrators engage in the mutually interdependent processes of *instrumental* and *socioemotional* reconciliation. Instrumental reconciliation requires conflict resolution through repeated cooperation to reach common goals (Nadler and Shnabel, 2015). Socioemotional reconciliation involves the social exchange of commodities that perpetrators and victims value, such as restored moral image and power, respectively (Nadler and Shnabel, 2015). In an interactive *apology-forgiveness cycle,* perpetrators admit to past wrongdoings and victims grant forgiveness and, over time, in place of victimhood and guilt, victims acquire a restored sense of power and perpetrators a restored moral image (Nadler and Shnabel, 2015; Shnabel, 2018). Shnabel and Nadler (2008) suggest four ways in which socioemotional and instrumental reconciliation differ. First, the goal of socioemotional reconciliation is a secure, equal, and worthy identity for each party, whereas instrumental reconciliation aims to establish a trustworthy relationship between parties. Second, socioemotional reconciliation occurs relatively instantaneously after an apology-forgiveness cycle, whereas instrumental reconciliation proceeds more slowly as collaboration on projects builds mutual trust. Third, socioemotional reconciliation requires conflicting groups to address the past pain of humiliation, whereas instrumental reconciliation requires ongoing cooperation in the present. Finally, the goal of socioemotional reconciliation is an integrated identity or sense of "we-ness," whereas the goal of instrumental reconciliation is peaceful coexistence. As is true for other similar theories, we agree with these ideas in principle and think this theory is a valuable one.

Our understanding is also consistent with a United Nations Development Program (2015) (UNDP) definition of reconciliation as "transforming relationships between people and groups in society as well as between society and the state, toward a future goal based on political, social, and economic inclusivity and fairness" (p. 9). This definition emerged out of a UNDP workshop organized in 2014 in South Africa to develop innovative approaches to sustainable reconciliation. Participants, one of whom is a co-author here, were approximately 70 on-the-ground practitioners (e.g., worldwide UNDP office representatives and non-governmental offices such as Interpeace), a small number of academics, and inter-governmental officials. A UNDP framing paper followed with several recommendations, such as that reconciliation can proceed top-down or bottom-up, sometimes simultaneously, and any barometer of reconciliation should reflect local concerns (Murithi and du Toit, 2015).

Compared to these definitions, however, our conceptualization of reconciliation is more specific and inclusive. Our work suggests reconciliation requires a good understanding of the past and present, acknowledging harm, and meaningful apologies. It also requires engaging with Indigenous communities and respectful relationships at individual and group levels. Key also is equality between Indigenous and non-Indigenous peoples and thriving Indigenous families, youth, cultures, and languages. Lastly, reconciliation means respect for the natural world around us. Our components align with the principles of socioemotional and instrumental reconciliation but are situated within our Canadian context. This specificity reflects the culturally appropriate, bottom-up process through which we developed the Canadian Reconciliation Barometer. Our definition is also more inclusive because we contend that reconciliation between Indigenous and non-Indigenous people also requires reconciliation with the natural world. This perspective represents the idea that we should live reciprocally and respectfully with all our relatives—animals, plants, rivers, and more.

In the following, we describe our rigorous process of item development through two nationally representative studies of participants living in Canada (Study 1: 592 Indigenous and 1,018 non-Indigenous participants; Study 2: 599 Indigenous and 1,016 non-Indigenous participants). Together, the two studies demonstrate the Canadian Reconciliation Barometer is a reliable and face valid measure of reconciliation in Canada.

2 Study 1

Our goal in Study 1 was to develop a measure of reconciliation between Indigenous and non-Indigenous peoples in Canada and evaluate some of the measure's psychometric properties. We evaluated the initial pool of items for their factor structure and internal consistency within factors. Our study is preregistered at https://osf.io/b7s8g.

Importantly, we grounded the Barometer in Indigenous perspectives and several years of discussions, planning, and consultation predated our item writing (Starzyk et al., in preparation).[2] Our team of Indigenous and non-Indigenous researchers thematically analyzed the transcripts of sacred testimonies given by 100 Survivors to the Truth and Reconciliation Commission of Canada (Fontaine et al., in preparation).[3] We also held focus groups and interviews with Elders, Survivors, and other reconciliation leaders across the country (Efimoff et al., in preparation).[4] Finally, we reviewed other measures of reconciliation in Canada and internationally. This long and varied consultation provided the groundwork for the items we would

2 Starzyk, K. B., Neufeld, K. H. S., Moran, R., Efimoff, I. H., Fontaine, A. S. M., Peachey, D., et al. (in preparation). *The Canadian Reconciliation Barometer: Process of development.* Department of Psychology, University of Manitoba.

3 Fontaine, A. S. M., Efimoff, I. H., Neufeld, K. H. S., Starzyk, K. B., Moran, R., Fontaine, L. S., et al. (in preparation). *What does reconciliation mean to you? An archival analysis of Indian Residential School Survivors' testimony to the Truth and Reconciliation Commission of Canada.*

write. We began discussing what a reconciliation barometer for Canada should look like in 2015 and started polling in December 2020.

Throughout, we learned much from Indigenous people about how to conduct research *in a good way*. For example, after receiving feedback from Indigenous Elders on our focus group question prompts, we ensured that the last question we asked would leave participants with a sense of hope. In writing the Barometer items, we also strove to incorporate and carefully apply the best practices from both Western scientific methods and Indigenous knowledges and voices. Thus, we carefully applied psychometric principles and methods (Furr, 2011) and chose to write the items from a strength-based perspective to avoid furthering damage- and deficit-focused narratives. Throughout, we kept Survivors and those who contributed to our understanding of reconciliation in mind.

2.1 Item writing

Our item writing team included three Indigenous and three non-Indigenous team members, with backgrounds in Indigenous studies, journalism, polling, peace and conflict studies, as well as social and personality psychology, including psychometrics. One member (Ry Moran) was the Director of Statement Gathering for the Truth and Reconciliation Commission of Canada. Another member (Lorena Fontaine) was a task force member and contributor to the Assembly of First Nations' Report on Canada's Dispute Resolution Plan to compensate for abuses in residential schools. This diversity was a strength because it allowed us to think more deeply and broadly about how to measure reconciliation. With a group of invested team members, however, the process also took longer. It included regular, often weekly, item-writing meetings from June to November 2020. We developed our items through a seven-step process. The first five steps included only team members in psychology. Reflecting the same racial/ethnic composition of our larger team, this smaller team included two Indigenous members (Anishinaabe, British, German; Haida, Irish, Russian) and two non-Indigenous members (Polish; Mennonite).

In Step 1, each member of the psychology team drew on what they had learned from the testimonies, focus groups, interviews, and other barometers to independently develop a list of constructs they thought represented reconciliation in Canada.

In Step 2, the psychology team worked to develop consensus among our lists from Step 1. Through several weeks of discussion, we identified, named, and defined the hypothesized constructs (see Table 1 of the pre-registration).

In Step 3, the psychology team identified psychometric principles for good item writing: to write short and clear statements (Holden et al., 1985) in small and simple words as well as to avoid negations (e.g., "not"), conjunctions ("and") or other double-barreled statements, qualifiers (e.g., "usually"), and value-laden words (e.g., "important"). We chose a rating scale with five options as the response format, with the anchor labels "strongly disagree," "disagree," "neither agree nor disagree," "agree," and "strongly agree." We chose this format because we were interested in self-reports and 5-point rating scales are optimal for survey research. Compared to 7-point rating scales, 5-point rating scales increase the chances that respondents will complete a longer survey and typically have adequate variability (Furr, 2011; Krosnick and Fabrigar, 1997; Krosnick and Presser, 2010). We also used the same rating scale for all items so that we could compare them to each other and create composites to take advantage of the increased reliability that accompanies aggregation (Furr, 2011). This contrasts with the approach polling companies usually take, which is to build the question into the response options and thereby frequently create different response options across questions (e.g., Environics Institute, 2019). Our team agreed we would write items that would be relevant for a long period of time so that we could continue using the items to track reconciliation progress over the long term. Finally, we agreed we would take a positive or strengths-based approach when writing the items so that high scores would represent reconciliation and no item would reinforce negative stereotypes about Indigenous people in Canada.

In Steps 4 and 5, the psychology team first independently wrote 3–4 items per factor and then collaboratively decided on the items to bring to the rest of the team for feedback. This team also collaboratively revised these items for clarity and to map the content domains of our factors well.

In Steps 6 and 7, we sought feedback from the larger team and revised the wording of items accordingly.

2.2 Materials and methods

2.2.1 Sample

Qualtrics Panels, a survey panel provider, recruited our respondents and provided them an incentive to participate (i.e., points redeemable toward things like travel and gift cards). To be eligible, participants had to live in Canada, be 18 years or older, and represent an unfilled quota in our sample.

We planned to recruit 611 Indigenous and 1,032 non-Indigenous respondents in Canada. We aimed for a sample that was nationally representative on the highest level of education, visible minority status (proportion), age (nested within five regions; British Columbia, the Prairies, Ontario, Quebec, and Atlantic Canada), and gender (nested within region). We also added extra quotas for Indigenous participants including Indigenous identity group (First Nations, Métis, Inuit), residence (on or off reserve), age (nested within region), and gender (nested within region). Our goal was to achieve a sample size large enough to reach national representation on the above variables, have at least 100 men and women in each region, and allow us to explore regional differences in attitudes; these are all goals of our public knowledge translation activities. Never having recruited such a sample, we agreed with Qualtrics Panels to begin with these targets and release quotas that proved to be challenging to fill. Unfortunately, many were. Ultimately, we only obtained intersecting quotas by region, age, and gender within the two racial/ethnic groups. We excluded participants whom Qualtrics did not deem as a "good complete," dropped out of the survey and did not consent for us to use their partial responses, completed the survey more than once,

4 Efimoff, I. H., Neufeld, K. H. S., Fontaine, A. S. M., Starzyk, K. B., Peachey, D., Moran, R., et al. (in preparation). *Conceptions of reconciliation: Nation-wide focus groups with Indigenous and non-Indigenous leaders.*

TABLE 1 Study 1 descriptive statistics.

Factor	Item	*N*	*M*	*SD*	Skew	Kurtosis
Truthful Understanding: Past and Present	TRUTH1	1,609	3.72	1.01	−0.75	0.14
	TRUTH2	1,610	3.42	0.99	−0.41	−0.31
	TRUTH3	1,608	3.49	1.00	−0.55	−0.12
	TRUTH4	1,608	3.83	0.99	−0.90	0.53
	TRUTH5	1,608	3.46	1.01	−0.45	−0.35
	TRUTH6	1,608	3.66	1.00	−0.71	0.10
Acknowledgment of Past Harm	HARM1	1,609	3.59	1.14	−0.50	−0.52
	HARM2	1,609	3.83	1.06	−0.81	0.18
	HARM3	1,608	3.98	1.02	−0.99	0.63
	HARM4	1,609	3.81	1.10	−0.79	−0.05
	HARM5	1,609	4.06	1.09	−0.97	0.13
	HARM6	1,608	4.08	1.01	−0.99	0.55
	HARM7	1,609	4.08	1.01	−0.96	0.38
	HARM8	1,609	3.93	1.08	−0.78	−0.07
Acknowledgment of Harm: Private	PRIV1	1,610	3.70	1.09	−0.54	−0.40
	PRIV2	1,610	4.05	0.99	−1.06	0.84
	PRIV3	1,610	4.02	1.01	−0.98	0.50
	PRIV4	1,610	3.76	1.08	−0.66	−0.16
	PRIV5	1,610	3.95	0.99	−0.87	0.45
	PRIV6	1,609	3.94	1.04	−0.88	0.23
	PRIV7	1,610	4.00	1.00	−0.96	0.55
Indigenous Cultural Fluency	ICF1	1,610	3.85	0.93	−0.79	0.63
	ICF2	1,609	3.61	1.01	−0.57	−0.01
	ICF3	1,610	4.21	0.83	−1.26	2.27
	ICF4	1,609	3.43	1.09	−0.41	−0.54
	ICF5	1,610	3.07	1.20	−0.06	−0.97
	ICF6	1,610	3.49	1.08	−0.50	−0.36
	ICF7	1,610	3.43	1.08	−0.43	−0.46
Solidarity with Indigenous Peoples	SOL1	1,610	4.31	0.86	−1.38	2.11
	SOL2	1,610	3.88	1.01	−0.77	0.23
	SOL3	1,610	3.13	1.12	0.00	−0.62
	SOL4	1,610	3.52	1.11	−0.43	−0.41
	SOL5	1,610	3.86	1.02	−0.75	0.21
Mutually Respectful Relationships	RESP1	1,610	3.04	1.16	0.01	−0.88
	RESP2	1,609	3.28	1.07	−0.25	−0.58
	RESP3	1,609	3.24	1.14	−0.16	−0.84
	RESP4	1,610	3.23	1.15	−0.15	−0.88
	RESP5	1,610	3.22	1.10	−0.16	−0.73
	RESP6	1,609	3.13	1.13	−0.10	−0.77
	RESP7	1,610	3.07	1.22	−0.03	−0.99
Nation-to-Nation Relationships	NTNR1	1,610	2.77	1.23	0.13	−0.99
	NTNR2	1,610	2.88	1.14	−0.03	−0.80

(Continued)

TABLE 1 (Continued)

Factor	Item	*N*	*M*	*SD*	Skew	Kurtosis
	NTNR3	1,609	2.86	1.13	−0.06	−0.80
	NTNR4	1,610	2.84	1.22	0.03	−0.99
	NTNR5	1,610	2.96	1.09	−0.06	−0.59
	NTNR6	1,610	2.68	1.14	0.19	−0.80
Intergroup Equality/Equity: Personal	IEPER1	1,610	2.59	1.18	0.33	−0.84
	IEPER2	1,610	2.72	1.17	0.19	−0.93
	IEPER3	1,609	2.57	1.20	0.36	−0.87
	IEPER4	1,610	2.52	1.16	0.44	−0.70
	IEPER5	1,610	2.53	1.16	0.44	−0.68
	IEPER6	1,610	2.64	1.18	0.31	−0.85
Intergroup Equality/Equity: Systemic	IESYS1	1,610	2.81	1.12	0.10	−0.78
	IESYS2	1,610	2.51	1.21	0.38	−0.82
	IESYS3	1,610	2.81	1.22	0.08	−1.00
	IESYS4	1,609	2.85	1.19	0.09	−0.94
	IESYS5	1,610	2.77	1.15	0.10	−0.83
	IESYS6	1,610	2.69	1.20	0.22	−0.91
	IESYS7	1,610	2.60	1.23	0.27	−0.95
	IESYS8	1,609	2.99	1.06	−0.05	−0.53
	IESYS9	1,610	3.22	1.08	−0.32	−0.45
Intergroup Equality/Equity: Representation and Leadership	IEREP1	1,610	2.74	1.12	0.17	−0.68
	IEREP2	1,610	2.54	1.13	0.34	−0.61
	IEREP3	1,609	2.68	1.14	0.22	−0.75
	IEREP4	1,610	2.76	1.12	0.14	−0.74
	IEREP5	1,609	2.70	1.11	0.20	−0.69
	IEREP6	1,610	2.65	1.14	0.25	−0.72
	IEREP7	1,610	2.62	1.15	0.27	−0.74
	IEREP8	1,610	2.77	1.11	0.16	−0.61
	IEREP9	1,609	3.10	1.10	−0.18	−0.61
Indigenous Thriving	IT1	1,609	2.92	1.02	−0.01	−0.49
	IT2	1,610	2.89	1.07	0.06	−0.63
	IT3	1,610	2.79	1.10	0.19	−0.68
	IT4	1,610	2.76	1.08	0.16	−0.70
	IT5	1,610	3.03	1.08	−0.12	−0.72
	IT6	1,610	2.79	1.15	0.02	−0.87
	IT7	1,610	3.05	1.10	−0.15	−0.74
Respect for the Natural World	RNW1	1,610	3.56	0.98	−0.52	−0.05
	RNW2	1,610	3.05	1.02	−0.15	−0.46
	RNW3	1,610	3.10	0.97	−0.12	−0.30
	RNW4	1,609	2.87	1.08	−0.07	−0.73
	RNW5	1,609	2.61	1.17	0.20	−0.88
	RNW6	1,609	2.89	1.01	−0.04	−0.45

(Continued)

TABLE 1 (Continued)

Factor	Item	*N*	*M*	*SD*	Skew	Kurtosis
Apologies	APOL1	1,610	2.86	1.15	0.05	−0.82
	APOL2	1,609	3.04	1.14	−0.14	−0.80
	APOL3	1,608	3.25	1.14	−0.35	−0.70
	APOL4	1,609	2.86	1.14	0.06	−0.79
	APOL5	1,609	2.89	1.16	0.03	−0.86
	APOL6	1,607	3.66	1.14	−0.67	−0.27

or provided invalid or low-quality responses throughout (e.g., a number pattern in their responses).

Our final sample included 592 Indigenous (243 men, 338 women, 11 another gender) and 1,018 non-Indigenous respondents (559 men, 439 women, 20 another gender).

2.2.2 Procedure

Respondents first read a description of the study and decided whether they wanted to participate. Those who consented then completed demographic questions that pertained to our quotas. Eligible respondents then completed the rest of the survey, which included questions to increase conscientious responding, items to assess reconciliation, further demographic questions, and the debriefing.

An initial item pool of 89 barometer questions assessed 13 indicators of reconciliation, which we initially called: Truthful Understanding: Understanding of Past and Present (6 items); Acknowledgment of Past Harm (8 items); Acknowledgment of Harm: Privity (7 items); Indigenous Cultural Fluency (7 items); Solidarity with Indigenous Peoples (5 items); Mutually Respectful Relationships (7 items); Nation-to-Nation Relationships (6 items); Intergroup Equality/Equity: Personal (6 items); Intergroup Equality/Equity: Systemic (9 items); Intergroup Equality/Equity: Representation and Leadership (9 items); Indigenous Thriving (7 items); Respect for the Natural World (6 items); and Apologies (6 items). Readers interested in the initial item pool may contact the authors for access. For each of the items that comprised the 13 indicators, respondents rated their agreement or disagreement with statements on a 5-point rating scale with anchors "strongly disagree," "disagree," "neither agree nor disagree," "agree," and "strongly agree." Higher scores are indicative of reconciliation.

2.3 Results

2.3.1 Preliminary analyses

Our analyses conducted in R software (v. 4.3.1) indicated that the data were appropriate for exploratory factor analysis (Watkins, 2018). The data were univariate normal, in that skew was < 2 and kurtosis was < 7 for all items (West et al., 1995). Most items correlated between the absolute values of .30 and .90 (Hair et al., 2010). The correlation matrix's determinant score was $< .001$, indicating non-multicollinearity (Yong and Pearce, 2013). The KMO measure of sampling adequacy was a "marvelous" (Kaiser, 1974, p. 1) 0.98, signaling the correlation matrix is factorable. And Bartlett's test of sphericity was statistically significant, meaning the correlation matrix was not an identity matrix. See Table 1 for the descriptive statistics.

2.3.2 Exploratory factor analysis

We conducted an exploratory factor analysis on all 89 items. Except where noted, we used Revelle's (2024) psych package in R software (v. 4.3.1).

2.3.2.1 Estimation method

Given that the data were sufficiently normal, it was appropriate to use maximum likelihood estimation.

2.3.2.2 Number of factors to retain for rotation (*m*)

To identify the upper bounds of the number of factors to rotate, we conducted a parallel analysis wherein we specified a 95th percentile and that eigenvalues be found after estimated communalities using squared multiple correlations (Horn, 1965). The results suggested 16 factors as an upper limit; see Figure 1 [created using the ggplot2 package (Wickham, 2016) by adapting Sakaluk and Short's, 2016 code].

We then calculated RMSEA and BIC for models with 1–16 factors (Table 2). We also calculated the chi-square goodness of fit statistics for convention's sake; however, they did not inform our decisions as they are unlikely to be helpful at our sample size (Kenny, 2015).

We had decided a priori to retain *m* for rotation when the lower bound of the RMSEA point estimate's 90% confidence interval is near or below .06 (Hu and Bentler, 1999; Preacher et al., 2013), with the smallest *m* with a lower bound below .06 being most indicative of verisimilitude; $m = 7$–16 fit these criteria. We had also decided a priori to retain *m* for rotation in cases with smaller and negative BIC values. We say "smaller" and not "smallest" because with our number of parameters and sample size, BIC will underfactor (Preacher et al., 2013). Smaller BIC values are indicative of more generalizable factor structures. The smallest BIC observed was for $m = 16$. As this information did not yield clear-cut guidance, we decided to use an additional tool: identifying the largest *m* with a confidence interval that did not overlap with those of the neighboring *m*'s, which was 13. We therefore decided to start by rotating a 13-factor solution, examine its properties, and then look to neighboring *m*s.

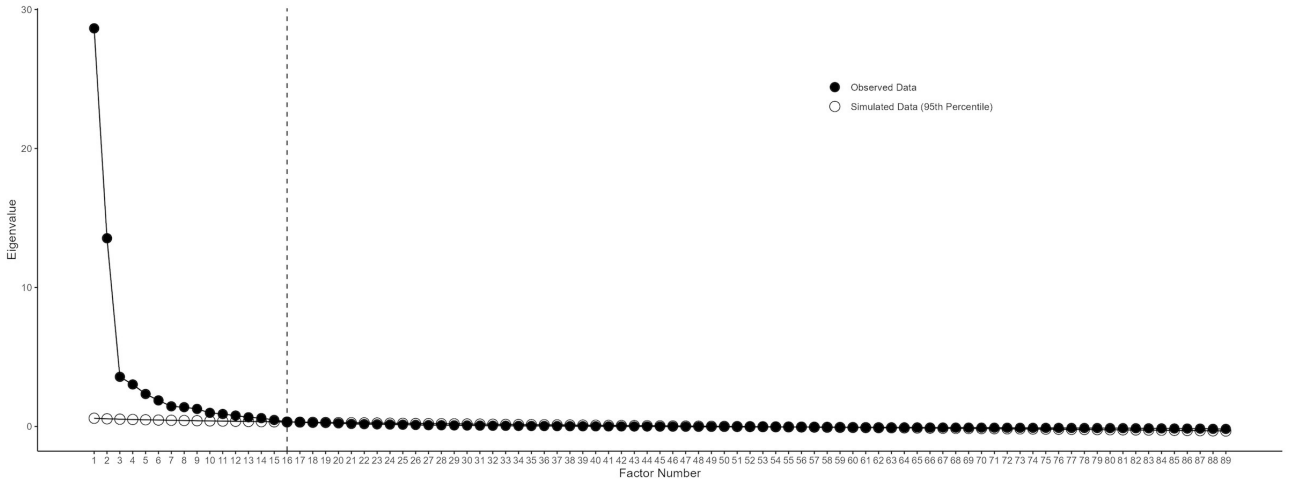

FIGURE 1
Study 1 parallel analysis.

TABLE 2 Study 1 1–16 factor model RMSEA.LB, BIC, and goodness of fit indices.

m	RMSEA.LB		BIC	χ^2
	Point estimate	90% CI		
1	.108	.107, .109	47,547.49	75,806.02
2	.087	.086, .088	21,737.97	49,346.71
3	.078	.078, .079	12,909.03	39,875.36
4	.072	.072, .073	7,217.68	33,548.99
5	.066	.065, .066	−1,933.46	27,637.13
6	.061	.060, .061	−1,535.06	23,548.36
7	.057	.056, .058	−3,885.75	20,584.79
8	.053	.052, .053	−6,216.85	17,648.21
9	.050	.049, .050	−7,630.37	15,636.58
10	.046	.046, .047	−8,975.86	13,700.37
11	.043	.042, .044	−10,232.00	11,860.90
12	.039	.039, .040	−11,346.78	10,170.16
13	.036	.035, .037	−12,198.10	8,750.28
14	.033	.032, .034	−12,743.59	7,643.60
15	.031	.030, .032	−13,101.11	6,732.29
16	.029	.028, .030	−13,177.53	6,109.45

m = number of factors to retain, RMSEA.LB = Root Mean Squared Error of Approximation – Lower Bound, 90% CI = 90 percent confidence interval, BIC = Bayesian Information Criterion, χ^2 = Chi-Square Goodness of Fit Index; $p < .001$ for all χ^2 values.

2.3.2.3 Model selection

We rotated (Direct Oblimin rotation, delta = 0) 13, 12, and 14-factor solutions, inspecting their factor loadings and interpretability (Tables 3–5, respectively).

We first rotated the 13-factor model, which was primarily as hypothesized. In this model, 11 of the 13 factors represented the hypothesized constructs, with only two factors needing minor conceptual modifications: Splitting the Acknowledgment of Past Harm items into two factors, Acknowledgment of Government Harm and Acknowledgment of Residential School Harm, and combining Solidarity and Indigenous Cultural Fluency into one factor renamed as Engagement.

Given the preference for simple structure, we next rotated the 12-factor model. The main change from the 13-factor solution

TABLE 3 Study 1 13-factor model factor loadings, communality, uniqueness, and item complexity.

Expected factor	Item	Factor													C	U	IC
		1	2	3	4	5	6	7	8	9	10	11	12	13			
IEREP	IEREP4	.86													.78	.22	1.0
	IEREP5	.86													.77	.23	1.0
	IEREP8	.84													.74	.26	1.0
	IEREP1	.83													.78	.22	1.0
	IEREP3	.83													.78	.22	1.0
	IEREP2	.83													.78	.22	1.1
	IEREP7	.80													.77	.23	1.0
	IEREP6	.77													.71	.29	1.1
	IEREP9	.72													.58	.42	1.3
PRIV	PRIV5		.91												.79	.21	1.0
	PRIV3		.82												.80	.20	1.0
	PRIV2		.82												.78	.22	1.1
	PRIV1		.78												.67	.33	1.1
	PRIV6		.77												.76	.24	1.0
	PRIV7		.76												.78	.22	1.1
	PRIV4		.73												.69	.31	1.1
APOL	APOL6														.22	.78	4.7
RESP	RESP4			.91											.82	.18	1.0
	RESP5			.90											.80	.20	1.0
	RESP7			.89											.81	.19	1.0
	RESP2			.88											.77	.23	1.0
	RESP1			.88											.82	.18	1.0
	RESP6			.86											.80	.20	1.0
	RESP3			.86											.77	.23	1.0
ICF	ICF4				.81										.71	.29	1.1
	ICF6				.79										.67	.33	1.0
	ICF5				.77										.61	.39	1.1
	ICF7				.76										.66	.34	1.0
SOL	SOL4				.75										.68	.32	1.1
	SOL3				.72										.54	.46	1.1
	SOL5				.61										.54	.46	1.2
ICF	ICF2				.60										.59	.41	1.4
SOL	SOL2				.44										.60	.40	2.2
ICF	ICF1				.37										.38	.62	2.7
SOL	SOL1				.30										.46	.54	4.1
IEPER	IEPER6					.73									.73	.27	1.0
	IEPER1					.72									.75	.25	1.1
	IEPER2					.72									.73	.27	1.0
	IEPER4					.72									.78	.22	1.1
	IEPER5					.71									.78	.22	1.1
	IEPER3					.70									.76	.24	1.1

(Continued)

TABLE 3 (Continued)

Expected factor	Item	Factor													C	U	IC
		1	2	3	4	5	6	7	8	9	10	11	12	13			
IT	IT5						.81								.73	.27	1.1
	IT7						.81								.72	.28	1.1
	IT2						.74								.73	.27	1.1
	IT3						.70								.72	.28	1.1
	IT1						.68								.69	.31	1.1
	IT4						.67								.68	.32	1.2
	IT6						.67								.63	.37	1.1
TRUTH	TRUTH4							.82							.67	.33	1.1
	TRUTH6							.81							.67	.33	1.0
	TRUTH5							.79							.70	.30	1.1
	TRUTH3							.75							.59	.41	1.0
	TRUTH1							.74							.62	.38	1.0
	TRUTH2							.73							.63	.37	1.1
NTNR	NTNR1								.69						.74	.26	1.2
	NTNR4								.69						.71	.29	1.1
	NTNR2								.63						.65	.35	1.2
	NTNR3								.63						.69	.31	1.2
	NTNR5								.51						.50	.50	1.2
	NTNR6								.51						.55	.45	1.3
HARM	HARM2									.86					.82	.18	1.0
	HARM1									.82					.72	.28	1.0
	HARM4									.80					.73	.27	1.0
	HARM3									.70					.68	.32	1.1
APOL	APOL2										.80				.67	.33	1.0
	APOL4										.76				.68	.32	1.1
	APOL5										.75				.71	.29	1.1
	APOL1										.72				.72	.28	1.1
	APOL3										.68				.46	.54	1.1
RNW	RNW6											.76			.68	.32	1.0
	RNW2											.74			.59	.41	1.0
	RNW3											.73			.61	.39	1.1
	RNW4											.65			.63	.37	1.2
	RNW5											.50			.52	.48	1.4
	RNW1											.37			.26	.74	3.1
IESYS	IESYS9												.56		.60	.40	1.3
	IESYS8												.53		.69	.31	1.4
	IESYS4												.48		.74	.26	1.8
	IESYS1												.47		.73	.27	1.7
	IESYS3												.42		.69	.31	2.0
	IESYS5												.40		.67	.33	2.2

(Continued)

TABLE 3 (Continued)

Expected factor	Item	Factor													C	U	IC
		1	2	3	4	5	6	7	8	9	10	11	12	13			
	IESYS7												.35		.72	.28	3.3
	IESYS6								.30				.35		.74	.26	3.1
	IESYS2												.30		.72	.28	4.1
HARM	HARM5													.63	.71	.29	1.2
	HARM6													.57	.66	.34	1.5
	HARM7													.54	.78	.22	1.7
	HARM8													.49	.67	.33	2.0
ICF	ICF3														.39	.61	4.8

C = Complexity; U = Uniqueness; IC = Item Complexity. Factor loadings < .30 are not presented. APOL = Apologies; ICF = Indigenous Cultural Fluency; HARM = Acknowledgment of Past Harm; ICF = Indigenous Cultural Fluency; IEPER = Intergroup Equality/Equity: Personal; IEREP = Intergroup Equality/Equity: Representation and Leadership; IESYS = Intergroup Equality/Equity: Systemic; IT = Indigenous Thriving; Truthful Understanding: Past and Present; NTNR = Nation-to-Nation Relationships; PRIV = Acknowledgment of Harm: Privity; RESP = Respect for the Natural World; RNW = Respect for the Natural World; SOL = Solidarity with Indigenous Peoples.

was the dissolution of the Nation-to-Nation Relationships factor. Because Elders, Survivors, and other reconciliation leaders (Efimoff et al., in preparation; Fontaine et al., in preparation; Starzyk et al., in preparation) (see text footnotes 2, 4) stressed that these relationships are central to reconciliation, we did not want to drop this factor from our mapping of reconciliation in Canada, and therefore did not select this model.

We also rotated the 14-factor model. The only meaningful difference between it and the 13-factor solution was an additional, weak, two-item factor represented by ICF3 and SOL1, which loaded at .36 and .34 respectively. Given that this factor was weakly defined by only two items (a minimum of three is desirable; Watkins, 2018), we did not select this model.

As the 13-factor model was the most conceptually clear and theoretically aligned (e.g., it contained a well-defined Nation-to-Nation Relationships factor unlike the 12-factor model), we selected this model for the Canadian Reconciliation Barometer. This slightly revised 13-factor model fit the data exceptionally well (e.g., RMSEA = .036; 90% CI [.035, .037]) and better than other factor models. Further, the factors generally correlated as we expected and did not correlate too strongly (i.e., none above .80; Supplementary Table S1).

2.3.2.4 Item selection

To choose items to represent each of the 13 factors, we considered factor loadings, item communalities and complexity, that the items for each factor had diversity in their meanings and mean scores, and that items for each factor were internally consistent. Ultimately, we retained 64 items (four to nine per factor) to represent reconciliation in Canada in factors we called Good Understanding of the Past and Present, Acknowledgment of Government Harm, Acknowledgment of Residential School Harm, Acknowledgment of Ongoing Harm, Engagement, Mutually Respectful Relationships, Nation-to-Nation Relationships, Personal Equality, Systemic Equality, Representation and Leadership, Indigenous Thriving, Respect for the Natural World, and Apologies (factor definitions are in Table 6). All retained items significantly loaded onto their factors and no items cross-loaded onto other factors. The subscales also had excellent internal consistency, ranging from .85–.96 (Table 7). We did not compute an internal consistency statistic for all retained 64 items simultaneously because the correlations among the factors varied considerably, and the measure is not intended to be used as a singular composite. The retained items are listed at https://katherinestarzyk.com/s/frontiers.pdf.

2.4 Summary

We initially hypothesized a 13-factor model. Through exploratory factor analyses, we found that 11 of the 13 factors represented the hypothesized constructs, with only two factors needing minor conceptual modifications. We retained 64 internally consistent items, ultimately representing 13 factors, with very similar meaning to our original hypotheses. The scales representing these factors were highly internally consistent.

3 Study 2

The goal of the second study was to understand whether the factor structure we identified in the first study would replicate with a new sample and hold for both Indigenous and non-Indigenous people. We did so by obtaining a very similar sample with the same final quotas and exclusion criteria as in Study 1.

3.1 Materials and methods

In Study 2, 599 Indigenous (269 men, 323 women, and 7 another gender) and 1,016 non-Indigenous (510 men, 497 women, and 9 another gender) participants completed the 64 retained Canadian Reconciliation Barometer items. We pre-registered our analysis (https://osf.io/4ztbe/).[5]

5 As per the pre-registration, participants completed additional measures to assess convergent and discriminant validity. We intend to report these findings in a future paper.

TABLE 4 Study 1 12-factor model factor loadings, communality, uniqueness, and item complexity.

Expected factor	Item	Factor												C	U	IC
		1	2	3	4	5	6	7	8	9	10	11	12			
IEREP	IEREP4	.86												.78	.22	1.0
	IEREP5	.85												.77	.23	1.0
	IEREP8	.84												.74	.26	1.0
	IEREP3	.82												.78	.22	1.0
	IEREP1	.82												.78	.22	1.0
	IEREP2	.80												.78	.22	1.1
	IEREP7	.78												.77	.23	1.0
	IEREP6	.73												.71	.29	1.1
	IEREP9	.72												.58	.42	1.3
PRIV	PRIV5		.92											.79	.21	1.0
	PRIV3		.83											.80	.20	1.0
	PRIV2		.83											.78	.22	1.1
	PRIV1		.78											.66	.34	1.1
	PRIV6		.78											.76	.24	1.0
	PRIV7		.76											.78	.22	1.1
	PRIV4		.74											.69	.31	1.1
APOL	APOL6													.22	.78	3.6
RESP	RESP4			.91										.82	.18	1.0
	RESP5			.91										.80	.20	1.0
	RESP7			.89										.80	.20	1.0
	RESP2			.89										.77	.23	1.0
	RESP1			.88										.82	.18	1.0
	RESP6			.87										.80	.20	1.0
	RESP3			.86										.77	.23	1.0
ICF	ICF4				.82									.70	.30	1.0
	ICF6				.79									.67	.33	1.0
	ICF5				.78									.61	.39	1.1
	ICF7				.77									.66	.34	1.0
SOL	SOL4				.75									.68	.32	1.1
	SOL3				.73									.54	.46	1.1
	SOL5				.61									.54	.46	1.2
ICF	ICF2				.60									.59	.41	1.4
SOL	SOL2				.44									.59	.41	2.3
ICF	ICF1				.37									.38	.62	2.4
SOL	SOL1													.45	.55	4.2
IT	IT5					.84								.72	.28	1.0
	IT7					.84								.72	.28	1.1
	IT2					.76								.73	.27	1.1
	IT3					.72								.72	.28	1.1
	IT1					.71								.69	.31	1.1

(Continued)

TABLE 4 (Continued)

Expected factor	Item	Factor												C	U	IC
		1	2	3	4	5	6	7	8	9	10	11	12			
	IT4					.70								.68	.32	1.2
	IT6					.69								.63	.37	1.1
IEPER	IEPER5						.65							.78	.22	1.1
	IEPER1						.64							.75	.25	1.2
	IEPER4						.63							.77	.23	1.2
	IEPER2						.63							.72	.28	1.2
	IEPER6						.63							.71	.29	1.2
	IEPER3						.62							.75	.25	1.2
NTNR	NTNR1						.34							.61	.39	4.7
	NTNR4						.33							.58	.42	4.1
	NTNR6													.48	.52	3.7
IESYS	IESYS9							.63						.59	.41	1.2
	IESYS8							.58						.68	.32	1.2
	IESYS4							.55						.74	.26	1.4
	IESYS1							.54						.73	.27	1.4
	IESYS3							.50						.69	.31	1.5
	IESYS5							.48						.66	.34	1.6
	IESYS6							.45						.74	.26	1.9
	IESYS7							.43						.72	.28	2.1
	IESYS2							.38						.72	.28	2.6
APOL	APOL2								.80					.65	.35	1.0
	APOL4								.78					.67	.33	1.1
	APOL5								.78					.70	.30	1.1
	APOL1								.75					.72	.28	1.0
	APOL3								.67					.44	.56	1.2
NTNR	NTNR3													.59	.41	4.8
	NTNR2													.55	.45	5.3
	NTNR5													.44	.56	5.1
TRUTH	TRUTH4									.81				.67	.33	1.1
	TRUTH6									.81				.67	.33	1.0
	TRUTH5									.79				.70	.30	1.1
	TRUTH3									.75				.59	.41	1.0
	TRUTH1									.74				.62	.38	1.0
	TRUTH2									.73				.63	.37	1.1
HARM	HARM2										.85			.81	.19	1.0
	HARM1										.79			.71	.29	1.0
	HARM4										.79			.72	.28	1.0
	HARM3										.71			.68	.32	1.1
RNW	RNW6											.78		.68	.32	1.0
	RNW2											.75		.57	.43	1.0
	RNW3											.73		.60	.40	1.1

(Continued)

TABLE 4 (Continued)

Expected factor	Item	Factor												C	U	IC
		1	2	3	4	5	6	7	8	9	10	11	12			
	RNW4											.69		.63	.37	1.1
	RNW5											.53		.52	.48	1.3
	RNW1											.34		.24	.76	3.6
HARM	HARM5												.66	.71	.29	1.2
	HARM6												.60	.67	.33	1.4
	HARM7												.57	.78	.22	1.6
	HARM8												.52	.68	.32	1.8
ICF	ICF3												.31	.38	.62	4.1

C = Complexity; U = Uniqueness; IC = Item Complexity. Factor loadings < .30 are not presented. APOL = Apologies; ICF = Indigenous Cultural Fluency; HARM = Acknowledgment of Past Harm; ICF = Indigenous Cultural Fluency; IEPER = Intergroup Equality/Equity: Personal; IEREP = Intergroup Equality/Equity: Representation and Leadership; IESYS = Intergroup Equality/Equity: Systemic; IT = Indigenous Thriving; Truthful Understanding: Past and Present; NTNR = Nation-to-Nation Relationships; PRIV = Acknowledgment of Harm: Privity; RESP = Respect for the Natural World; RNW = Respect for the Natural World; SOL = Solidarity with Indigenous Peoples.

3.2 Results

3.2.1 Preliminary analyses

We first inspected the data for multivariate normality using Korkmaz et al. (2014) MVN package (version 5). All tests suggested the data were not multivariate normal: Mardia test: Mardia skewness = 105,037.75, $p < .001$, and Mardia kurtosis = 280.65, $p < .001$; Henze-Zirkler = 1.18, $p < .001$; Royston's H = 8,458.99, $p < .001$; and a Chi-square q-q plot (Figure 2).

3.2.2 Confirmatory factor analysis

To test whether the 13-factor model from Study 1 held in Study 2, we conducted a confirmatory factor analysis on the 64 items. We used the lavaan (version 0.6–16; Rosseel, 2012) and semTools (version 0.5–6; Jorgensen et al., 2022) packages with the MLR estimator (because the data were not multivariate normal), which has robust standard errors, test statistics, and fit statistics; we estimated missing data using Full Information Maximum Likelihood (FIML). All items loaded onto their hypothesized factors significantly, with standardized factor loadings ranging from .72–.92 (see Table 8 for CFA factor loadings). The hypothesized model fit the data well on our a priori indices of model fit, Robust CFI = .97, Robust RMSEA = .032, 90% CI [.031, .033]. For convention, we report robust $\chi^2(1,874) = 4,262.83$, $p < .001$.

3.2.3 Measurement invariance

One of the goals of the Canadian Reconciliation Barometer is to compare the mean scores of Indigenous and non-Indigenous people on each subscale. To do that validly, we had to establish strong invariance, meaning that the factor loadings and intercepts did not vary across groups. To test this, we first ran the above model, specified identity as a grouping variable, and constrained the factor loadings and intercepts to be equal across groups. This model fit the data well, Robust CFI = .96, Robust RMSEA = .034, 90% CI [.033, .035], and all items loaded strongly onto their hypothesized factors (Indigenous: .60–.92; non-Indigenous: .72–.92; Table 9). For convention, we report Robust $\chi^2(3,850) = 6,723.86$, $p < .001$. For comparison, we ran the model for weak invariance: it was the same as the above but only the factor loadings were constrained as equal. Again, this model fit the data well, Robust CFI = .97, Robust RMSEA = .033, 90% CI [.032, .035], Robust $\chi^2(3,799) = 6,52.90$, $p < .001$, and all items loaded strongly and significantly onto their hypothesized factors (Indigenous: .60–.92; non-Indigenous: .72–.92; Table 10). As the fit was relatively similar between the two, we took this as evidence of strong invariance.

3.3 Summary

Through confirmatory factor analysis, we established the 13 factors identified in Study 1 fit the data excellently in Study 2 (Robust CFI = .97; Robust RMSEA = .032, 90% CI [.031, .033]). Further, the factor structure and intercepts did not differ among Indigenous and non-Indigenous participants (Robust CFI = .96; Robust RMSEA = .034, 90% CI [.033, .035]). As such, we retained the same 64 items and 13 factors as in Study 1 for the final Canadian Reconciliation Barometer.

4 General discussion

The goal of the current paper was to detail the creation and psychometric assessment of the Canadian Reconciliation Barometer. After carefully constructing the Canadian Reconciliation Barometer, we established the excellent psychometric properties of the measure in two studies with large and nationally representative samples in Canada. Together, the two studies demonstrate the 13-factor Canadian Reconciliation Barometer is a reliable and face valid measure of reconciliation perceptions in Canada.

We believe these results will be of interest in multiple ways to those involved in reconciliation initiatives around the world. Survivors and perpetrators of mass atrocity, governments, governmental organizations, non-governmental organizations, not-for-profit groups, and academics, to name but a few.

TABLE 5 Study 1 14-factor model factor loadings, communality, uniqueness, and item complexity.

Expected factor	Item	Factor														C	U	IC
		1	2	3	4	5	6	7	8	9	10	11	12	13	14			
IEREP	IEREP4	.85														.79	.21	1.0
	IEREP5	.85														.77	.23	1.0
	IEREP8	.83														.75	.25	1.0
	IEREP1	.81														.78	.22	1.0
	IEREP3	.81														.78	.22	1.0
	IEREP2	.81														.79	.21	1.1
	IEREP7	.78														.77	.23	1.1
	IEREP6	.75														.71	.29	1.1
	IEREP9	.73														.63	.37	1.3
RESP	RESP4		.90													.82	.18	1.0
	RESP5		.90													.80	.20	1.0
	RESP7		.89													.81	.19	1.0
	RESP2		.88													.78	.22	1.0
	RESP1		.88													.82	.18	1.0
	RESP6		.86													.80	.20	1.0
	RESP3		.86													.77	.23	1.0
PRIV	PRIV5			.90												.79	.21	1.0
	PRIV3			.80												.80	.20	1.0
	PRIV2			.80												.78	.22	1.1
	PRIV1			.77												.67	.33	1.1
	PRIV6			.75												.76	.24	1.0
	PRIV7			.74												.79	.21	1.1
	PRIV4			.72												.69	.31	1.1
APOL	APOL6															.24	.76	4.9
ICF	ICF4				.79											.71	.29	1.1
	ICF6				.76											.67	.33	1.1
	ICF5				.76											.62	.38	1.2
	ICF7				.75											.66	.34	1.0
SOL	SOL4				.73											.68	.32	1.1
	SOL3				.71											.54	.46	1.1
	SOL5				.59											.56	.44	1.3
ICF	ICF2				.58											.59	.41	1.5
SOL	SOL2				.42											.62	.38	2.7
ICF	ICF1				.34											.40	.60	3.3
IEPER	IEPER2					.79										.75	.25	1.0
	IEPER6					.78										.73	.27	1.0
	IEPER1					.78										.76	.24	1.0
	IEPER5					.76										.78	.22	1.0
	IEPER4					.74										.78	.22	1.0
	IEPER3					.73										.76	.24	1.1

(Continued)

TABLE 5 (Continued)

Expected factor	Item	Factor														C	U	IC
		1	2	3	4	5	6	7	8	9	10	11	12	13	14			
IT	IT5						.79									.74	.26	1.1
	IT7						.79									.73	.27	1.1
	IT2						.75									.74	.26	1.1
	IT3						.71									.73	.27	1.1
	IT1						.69									.70	.30	1.1
	IT4						.68									.68	.32	1.2
	IT6						.67									.63	.37	1.1
IESYS	IESYS8							.58								.69	.31	1.3
	IESYS9							.57								.62	.38	1.5
	IESYS1							.57								.74	.26	1.2
	IESYS4							.56								.74	.26	1.3
	IESYS3							.51								.69	.31	1.4
	IESYS5							.49								.67	.33	1.4
	IESYS7							.48								.75	.25	1.8
	IESYS6							.45								.75	.25	2.0
	IESYS2							.44								.75	.25	2.1
TRUTH	TRUTH6								.81							.67	.33	1.0
	TRUTH4								.81							.67	.33	1.1
	TRUTH5								.79							.71	.29	1.1
	TRUTH3								.74							.59	.41	1.0
	TRUTH1								.74							.63	.37	1.1
	TRUTH2								.73							.63	.37	1.1
NTNR	NTNR1									.70						.76	.24	1.1
	NTNR4									.70						.73	.27	1.1
	NTNR3									.60						.68	.32	1.2
	NTNR2									.60						.64	.36	1.2
	NTNR5									.50						.50	.50	1.3
	NTNR6									.48						.54	.46	1.4
APOL	APOL2										.79					.67	.33	1.0
	APOL4										.76					.68	.32	1.1
	APOL5										.75					.71	.29	1.1
	APOL1										.72					.72	.28	1.1
	APOL3										.67					.46	.54	1.1
HARM	HARM2											.85				.82	.18	1.0
	HARM1											.79				.72	.28	1.1
	HARM4											.78				.72	.28	1.0
	HARM3											.71				.69	.31	1.1
	HARM5												.84			.74	.26	1.0
	HARM6												.76			.69	.31	1.0
	HARM7												.73			.81	.19	1.1
	HARM8												.68			.70	.30	1.1

(Continued)

TABLE 5 (Continued)

Expected factor	Item	Factor														C	U	IC
		1	2	3	4	5	6	7	8	9	10	11	12	13	14			
RNW	RNW6													.75		.68	.32	1.0
	RNW2													.73		.59	.41	1.0
	RNW3													.71		.61	.39	1.1
	RNW4													.64		.63	.37	1.2
	RNW5													.49		.53	.47	1.4
	RNW1													.37		.28	.72	3.2
ICF	ICF3														.36	.45	.55	3.7
SOL	SOL1														.34	.52	.48	3.6

C = Complexity; U = Uniqueness; IC = Item Complexity. Factor loadings < .30 are not presented. APOL = Apologies; ICF = Indigenous Cultural Fluency; HARM = Acknowledgment of Past Harm; ICF = Indigenous Cultural Fluency; IEPER = Intergroup Equality/Equity: Personal; IEREP = Intergroup Equality/Equity: Representation and Leadership; IESYS = Intergroup Equality/Equity: Systemic; IT = Indigenous Thriving; Truthful Understanding: Past and Present; NTNR = Nation-to-Nation Relationships; PRIV = Acknowledgment of Harm: Privity; RESP = Respect for the Natural World; RNW = Respect for the Natural World; SOL = Solidarity with Indigenous Peoples.

TABLE 6 Study 1 retained factors and items.

Factor (Definition)	Item names
Good Understanding of the Past and Present (Respondents have a good understanding of Indigenous peoples' experiences past and present.)	TRUTH1, TRUTH3, TRUTH4, TRUTH6
Acknowledgment of Government Harm (Respondents acknowledge that governments in Canada have harmed Indigenous peoples intentionally, systematically, and for a long time.)	HARM1, HARM2, HARM3, HARM4
Acknowledgment of Residential School Harm (Respondents acknowledge that residential schools have harmed Indigenous peoples.)	HARM5, HARM6, HARM7, HARM8
Acknowledgment of Ongoing Harm (Respondents acknowledge that past harmful actions continue to negatively affect Indigenous peoples.)	PRIV1, PRIV2, PRIV6, PRIV7
Engagement (Respondents are interested in and support Indigenous causes and communities.)	ICF4, ICF5, ICF6, SOL3, SOL4
Mutually Respectful Relationships (Indigenous and non-Indigenous people in Canada have relationships with each other that they value and that are characterized by mutual personal and cultural respect, interpersonal trust, and comfort.)	RESP1, RESP2, RESP3, RESP4, RESP5
Personality Equality (Indigenous and non-Indigenous people in Canada have equal life outcomes.)	IEPER1, IEPER2, IEPER3, IEPER5, IEPER6
Systemic Equality (Indigenous and non-Indigenous peoples are treated fairly in social systems.)	IESYS1, IESYS2, IESYS3, IESYS4, IESYS5, IESYS7, IESYS8, IESYS9
Representation and Leadership (Indigenous peoples are decision-makers or leaders in key sectors of society.)	IEREP1, IEREP2, IEREP3, IEREP4, IEREP5, IEREP6, IEREP7, IEREP8, IEREP9
Nation-to-Nation Relationships (Indigenous nations are in a nation-to-nation relationship with Canada with the rights and resources to achieve their goals.)	NTNR1, NTNR2, NTNR3, NTNR6
Indigenous Thriving (Indigenous individuals, communities, and cultures in Canada are doing well.)	IT2, IT4, IT5, IT6
Respect for the Natural World (Groups in Canada are acting so that the natural world can be healthy now and in the future.)	RNW3, RNW4, RNW5, RNW6
Apologies (Groups who have harmed Indigenous peoples have responded appropriately, by acknowledging the harm as well as their responsibility for the harm, showing remorse, and providing sincere apologies.)	APOL1, APOL2, APOL4, APOL5

We believe evidence of the psychometric performance of the Canadian Reconciliation Barometer will be of particular interest to those interested in a rigorous measurement of perceptions of reconciliation because carefully designed measures of reconciliation are an important part of creating social change. Also, we believe our unique process of creating the items will be of interest to Indigenous academics and those involved in Indigenous research. Finally, we believe our novel conceptualization of

reconciliation will also be of interest to those involved in reconciliation research. We expand upon these three pieces below in more detail.

First, careful measurement of variables that represent social change is important to establish our progress toward said change. Without a clear understanding of our status on a specific social issue, we cannot hope to know our progress toward social change.

TABLE 7 Study 1 internal consistency of composites.

Composite	α
Good Understanding of the Past and Present	.88
Acknowledgment of Government Harm	.91
Acknowledgment of Residential School Harm	.91
Acknowledgment of Ongoing Harm	.92
Engagement	.89
Mutually Respectful Relationships	.95
Personality Equality	.94
Systemic Equality	.94
Representation and Leadership	.96
Nation-to-Nation Relationships	.88
Indigenous Thriving	.89
Respect for the Natural World	.85
Apologies	.90

An understanding of our progress toward reconciliation, then, can help keep us on track by highlighting areas in which we need to improve and areas in which we are doing well. Such an understanding can help to motivate action toward reconciliation. This is the approach our research team is taking (Reconciliation Barometer, 2023). In our public polling reports of Indigenous and non-Indigenous people in Canada, we operationalize reconciliation progress on the thirteen factors in two ways: Higher scores represent reconciliation, as do agreement between Indigenous and non-Indigenous respondents. To help influence reconciliation policy and programming, we share our findings—both areas to celebrate and areas needing attention—widely through our extensive and varied knowledge mobilization efforts, including public reports, academic pieces, mass media, and podcasts (see https://www.reconciliationbarometer.ca/links-and-resources/ for more details), as well as ongoing discussions with government at various levels.

Second, our process of item development was unique in multiple ways and is perhaps best described as reflecting *Two-Eyed Seeing*. Mi'kmaw Elder, Dr. Albert Marshall, describes Two-Eyed Seeing as "learning to see from one eye with the strengths of Indigenous knowledges and ways of knowing, and from the other eye with the strengths of Western knowledges and ways of knowing, and to using both these eyes together, for the benefit of all" (Bartlett et al., 2012, p. 335). Rather than creating items through discussion with academic experts, as is the norm in psychology, we created items through engagement with Survivor statements, discussions with reconciliation leaders across the country, and discussions among our team of Indigenous and

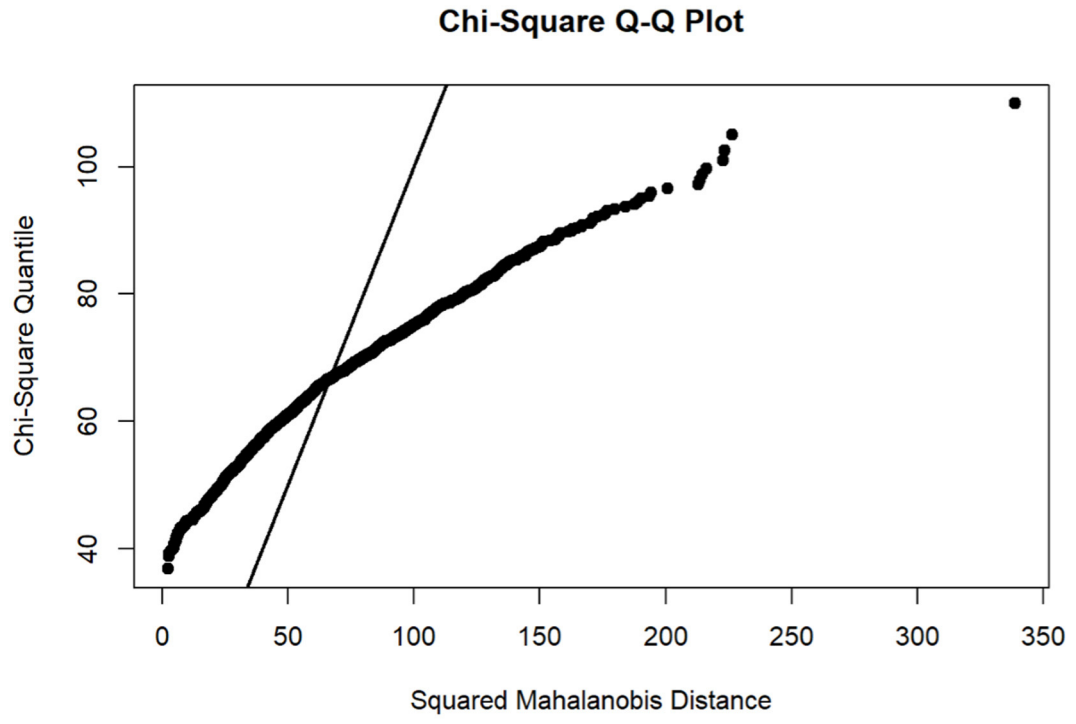

FIGURE 2
Study 2 chi-square Q-Q plot.

TABLE 8 Study 2 confirmatory standardized factor loadings.

Factor	Item	Loading
Good Understanding of the Past and Present	TRUTH1	.83
	TRUTH3	.79
	TRUTH4	.80
	TRUTH6	.79
Acknowledgment of Government Harm	HARM1	.83
	HARM2	.91
	HARM3	.85
	HARM4	.89
Acknowledgment of Residential School Harm	HARM5	.86
	HARM6	.87
	HARM7	.91
	HARM8	.86
Acknowledgment of Ongoing Harm	PRIV1	.81
	PRIV2	.92
	PRIV6	.91
	PRIV7	.91
Engagement	ICF4	.85
	ICF5	.80
	ICF6	.81
	SOL3	.76
	SOL4	.84
Mutually Respectful Relationships	RESP1	.87
	RESP2	.87
	RESP3	.88
	RESP4	.89
	RESP5	.89
Personality Equality	IEPER1	.88
	IEPER2	.87
	IEPER3	.88
	IEPER5	.90
	IEPER6	.89
Systemic Equality	IESYS1	.87
	IESYS2	.86
	IESYS3	.84
	IESYS4	.85
	IESYS5	.82
	IESYS7	.87
	IESYS8	.81
	IESYS9	.72
Representation and Leadership	IEREP1	.90
	IEREP2	.89
	IEREP3	.90
	IEREP4	.88
	IEREP5	.87
	IEREP6	.86
	IEREP7	.87
	IEREP8	.85
	IEREP9	.74
Nation-to-Nation Relationships	NTNR1	.83
	NTNR2	.83
	NTNR3	.86
	NTNR6	.77
Indigenous Thriving	IT2	.88
	IT4	.87
	IT5	.84
	IT6	.82
Respect for the Natural World	RNW3	.78
	RNW4	.80
	RNW5	.81
	RNW6	.84
Apologies	APOL1	.88
	APOL2	.80
	APOL4	.87
	APOL5	.89

(Continued)

TABLE 8 (Continued)

For all factor loadings, $p < .001$.

non-Indigenous scholars. We were also guided by Indigenous perspectives as we refined questions, ensuring we used a strength-based approach, created items that assessed constructs relevant to reconciliation that were beyond the individual experience, and ended on a hopeful note. In some cases, we deferred to Indigenous perspectives, such as in our decision to retain the 13-factor model containing the Nation-to-Nation Relationships factor. The concept of Two-Eyed Seeing has gained traction in the academic world in recent years (e.g., Roher et al., 2021), but to our knowledge, the current study is the first to demonstrate the concept within the domain of psychometry. This approach resulted in a unique and novel conceptualization of reconciliation.

Third, our conceptualization of reconciliation reflects many aspects of Nadler and Shnabel's model as well as the UNDP definition of reconciliation. For example, our conceptualization, as well as Nadler and Shnabel's, includes socioemotional and instrumental aspects. Specifically, like Nadler and Shnabel, we put emphasis on concepts like trust, relationships among the two groups in need of reconciliation (Mutually Respectful Relationships factor), and apologies (Apologies factor). Similarly, our conceptualization mirrors the UNDP definition in that

TABLE 9 Study 2 standardized factor loadings for strong invariance.

Factor	Item	Indigenous	Non-indigenous
Good Understanding of the Past and Present	TRUTH1	.75	.84
	TRUTH3	.70	.80
	TRUTH4	.71	.82
	TRUTH6	.71	.79
Acknowledgment of Government Harm	HARM1	.87	.81
	HARM2	.92	.90
	HARM3	.87	.84
	HARM4	.90	.88
Acknowledgment of Residential School Harm	HARM5	.89	.83
	HARM6	.88	.86
	HARM7	.92	.89
	HARM8	.88	.83
Acknowledgment of Ongoing Harm	PRIV1	.83	.80
	PRIV2	.91	.92
	PRIV6	.91	.91
	PRIV7	.90	.91
Engagement	ICF4	.77	.83
	ICF5	.71	.79
	ICF6	.73	.78
	SOL3	.60	.78
	SOL4	.74	.83
Mutually Respectful Relationships	RESP1	.85	.89
	RESP2	.85	.88
	RESP3	.87	.89
	RESP4	.87	.90
	RESP5	.89	.89
Personality Equality	IEPER1	.88	.87
	IEPER2	.87	.88
	IEPER3	.87	.89
	IEPER5	.90	.90
	IEPER6	.88	.90
Systemic Equality	IESYS1	.85	.88
	IESYS2	.84	.86
	IESYS3	.84	.85
	IESYS4	.85	.86
	IESYS5	.80	.84
	IESYS7	.86	.87
	IESYS8	.80	.81
	IESYS9	.72	.72
Representation and Leadership	IEREP1	.89	.90
	IEREP2	.88	.89
	IEREP3	.88	.91
	IEREP4	.88	.87
	IEREP5	.86	.87
	IEREP6	.86	.86
	IEREP7	.85	.89
	IEREP8	.85	.86
	IEREP9	.75	.73
Nation-to-Nation Relationships	NTNR1	.86	.80
	NTNR2	.84	.82
	NTNR3	.87	.86
	NTNR6	.80	.74
Indigenous Thriving	IT2	.86	.89
	IT4	.86	.88
	IT5	.83	.85
	IT6	.83	.82
Respect for the Natural World	RNW3	.78	.77
	RNW4	.82	.78
	RNW5	.84	.80
	RNW6	.84	.84
Apologies	APOL1	.88	.88
	APOL2	.80	.80
	APOL4	.87	.87
	APOL5	.89	.88

For all factor loadings, $p < .001$.

we include concepts like relationships between people and groups (Mutually Respectful Relationships factor and Nation-to-Nation Relationships factor) as well as concepts related to fairness (Systemic Equality, Personal Equality, Representation, and Leadership factors). We think, however, that our conceptualization of reconciliation extends existing models or definitions of reconciliation in important ways.

One way that our conceptualization of reconciliation extends existing models and definitions is that it pushes against the status quo within psychology. Though a fulsome discussion of the colonial status quo, and corresponding harms, underlying psychology is beyond the scope of this paper (though see Adams et al., 2015; Ansloos et al., 2022; Fellner et al., 2020), we think it is important to note that our work pushes against this status quo. For example, it is quite normative in psychology to strive to decontextualize research from the broader sociocultural and historical context in which phenomena occur (Adams et al., 2015). Even social psychology, which takes context into account, often disregards broader systemic and structural contextual factors in pursuit of universal findings (Adams et al., 2015). Reflecting the impact of the broader

TABLE 10 Study 2 standardized factor loadings for weak invariance.

Factor	Item	Indigenous	Non-Indigenous
Good Understanding of the Past and Present	TRUTH1	.75	.84
	TRUTH3	.70	.80
	TRUTH4	.71	.82
	TRUTH6	.71	.79
Acknowledgment of Government Harm	HARM1	.86	.80
	HARM2	.92	.90
	HARM3	.87	.84
	HARM4	.90	.88
Acknowledgment of Residential School Harm	HARM5	.89	.83
	HARM6	.88	.86
	HARM7	.92	.89
	HARM8	.88	.83
Acknowledgment of Ongoing Harm	PRIV1	.83	.80
	PRIV2	.91	.92
	PRIV6	.91	.91
	PRIV7	.90	.91
Engagement	ICF4	.78	.84
	ICF5	.69	.77
	ICF6	.75	.79
	SOL3	.60	.78
	SOL4	.74	.82
Mutually Respectful Relationships	RESP1	.85	.89
	RESP2	.85	.88
	RESP3	.87	.89
	RESP4	.87	.90
	RESP5	.89	.89
Personality Equality	IEPER1	.88	.87
	IEPER2	.87	.88
	IEPER3	.87	.89
	IEPER5	.90	.90
	IEPER6	.88	.90
Systemic Equality	IESYS1	.85	.88
	IESYS2	.85	.86
	IESYS3	.84	.85
	IESYS4	.85	.86
	IESYS5	.81	.84
	IESYS7	.86	.87
	IESYS8	.81	.81
	IESYS9	.72	.72
Representation and Leadership	IEREP1	.89	.90
	IEREP2	.88	.89
	IEREP3	.88	.91
	IEREP4	.88	.87
	IEREP5	.86	.87
	IEREP6	.87	.86
	IEREP7	.85	.89
	IEREP8	.85	.86
	IEREP9	.75	.72
Nation-to-Nation Relationships	NTNR1	.86	.80
	NTNR2	.84	.82
	NTNR3	.87	.86
	NTNR6	.80	.74
Indigenous Thriving	IT2	.86	.89
	IT4	.86	.88
	IT5	.83	.85
	IT6	.83	.82
Respect for the Natural World	RNW3	.78	.77
	RNW4	.82	.78
	RNW5	.84	.80
	RNW6	.84	.84
Apologies	APOL1	.88	.88
	APOL2	.80	.80
	APOL4	.87	.87
	APOL5	.89	.88

For all factor loadings, $p < .001$.

sociocultural and historical context on processes like reconciliation, we intentionally designed a measure of reconciliation from the ground up, rather than adapting an existing barometer of reconciliation. As such, we privileged the local context (Adams et al., 2015) and ensured our measure was appropriate for this local context.

Another way our conceptualization of reconciliation extends existing work on the topic is that we widen our understanding of reconciliation beyond the individual, and even beyond the species. Of particular relevance are the factors that assessed participants' perceptions of reconciliation in the realms of nation-to-nation relationships, systemic equality, and the natural world. A focus on factors outside the individual are important, especially given norms in psychology to situate the harms that come from inequitable systems as deficits within a person (Fine and Cross, 2016). A focus on maladaptive coping mechanisms within the individual, rather than the systems that create the need for such mechanisms, means that psychologists do not get at the roots of a problem. The benefit of expanding our conceptualization of reconciliation beyond the individual is evident when comparing our Systemic Equality factor, which has consistently had some of the lowest scores and smallest progress across time in the

last two rounds of polling (Reconciliation Barometer, 2023), to factors that reflect those common to other models of reconciliation, such as the Acknowledgment of Government Harm factor. We contend that assessing both individual and systemic aspects, as well as aspects outside of the species, makes it more likely that researchers will gain a wholistic understanding of reconciliation in a Canadian context.

5 Limitations

This work is not without limitation. Though we were able to obtain nationally representative samples for Indigenous and non-Indigenous participants on region, age, and gender through releasing quotas and weighting, no polling company in Canada was able to meet all of our requested quotas. This means we were not able to obtain national representation on some variables we thought were important for our research (e.g., living on or off the reserve, education level). Another limitation is the lack of representation of people in Canada living in the North. We will continue to encourage our polling partners to expand their panels to ensure researchers and pollsters can obtain samples that are more inclusive and representative, particularly of Indigenous people.

6 Conclusion

Over the course of several years, we designed the Canadian Reconciliation Barometer, embedding both Indigenous and Western research approaches throughout the process. Through two nationally representative studies, we established the excellent psychometric properties of the Canadian Reconciliation Barometer, for both Indigenous and non-Indigenous participants. This process resulted in a novel conceptualization of reconciliation that both reflected and extended existing models and definitions of reconciliation. We hope that researchers and professionals of varying fields will find the work helpful to measure and understand reconciliation in their own contexts as a tool to fuel social change.

Data availability statement

The datasets presented in this article are not readily available because terms of use are not yet finalized. Requests to access the datasets should be directed to katherine.starzyk@umanitoba.ca.

Ethics statement

The studies involving humans were approved by the University of Manitoba Fort Garry Campus Research Ethics Board 1. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their informed consent to participate in this study.

Author contributions

KS: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. KN: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. IE: Conceptualization, Investigation, Writing – original draft, Writing – review & editing, Formal analysis, Visualization. AF: Conceptualization, Investigation, Writing – review & editing. EW: Conceptualization, Writing – review & editing. RM: Conceptualization, Funding acquisition, Methodology, Resources, Writing – review & editing. DP: Conceptualization, Funding acquisition, Methodology, Writing – review & editing. LF: Conceptualization, Writing – review & editing. MW: Funding acquisition, Investigation, Methodology, Resources, Writing – review & editing.

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Conflict of interest

A potential perceived conflict of interest is that MW is a Principal at Probe Research Inc., which financially contributed to KN's Mitacs Accelerate Industrial Fellowship, which KN held at both Probe Research and the University of Manitoba.

The remaining authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/frsps.2024.1369816/full#supplementary-material

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