



# Indigenous ethnic identity, in-group warmth, and psychological wellbeing: A longitudinal study of Māori

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## Abstract

Longitudinal studies into the relationship between affect (positive or negative feelings) towards one's own ethnic group and wellbeing are rare, particularly for Indigenous peoples. In this paper, we test the longitudinal effects of in-group warmth (a measure of ethnic identity affect) and ethnic identity centrality on three wellbeing measures for New Zealand Māori: life satisfaction (LS), self-esteem (SE), and personal wellbeing (PW). Longitudinal panel data collected from Māori ( $N = 3803$ ) aged 18 or over throughout seven annual assessments (2009–2015) in the New Zealand Attitudes and Values Study were analyzed using latent trajectory models with structured residuals to examine cross-lagged within-person effects. Higher in-group warmth towards Māori predicted increases in all three wellbeing measures, even more strongly than ethnic identity centrality. Bidirectionally, PW and SE predicted increased in-group warmth, and SE predicted ethnic identification. Further, in sample-level (between-person) trends, LS and PW rose, but ethnic identity centrality interestingly declined over time. This is the first large-scale longitudinal study showing a strong relationship between positive affect towards one's Indigenous ethnic group and wellbeing. Efforts at cultural recovery and restoration have been a deliberate protective response to colonization, but among Māori, enculturation and access to traditional cultural knowledge varies widely. The data reported here underline the role of ethnic identity affect as an important dimension of wellbeing and call for continued research into the role of this dimension of ethnic identity for Indigenous peoples.

**Keywords** Ethnic identity centrality · Māori · In-group warmth · Ethnic affect · Indigenous · Wellbeing

## Introduction

Ethnic identity is a multidimensional construct that includes self-categorization (identifying as a member of a particular social grouping); positive feelings about one's group membership (referred to here as *ethnic identity affect*); attachment (a strong attachment and personal investment in a group); participation in cultural activities; and knowledge of shared

culture (Phinney, 1990, 1992; Phinney & Ong, 2007). Ethnic identity is considered an important construct within the social sciences, and developing a sense of ethnic identity is considered a key task of adolescence (Phinney, 1990).

Although peoples of all ethnic categories “have” an ethnicity, the term “ethnic” is typically used to refer to ethnic minorities. A minority group, by definition, refers to a group of people whose ethnicity, race, religion, or other characteristics

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comprise a numerical minority in any given society; however, the term also applies to any group of people who experience relative disadvantage compared to members of the dominant social group (or groups) in society (Healey et al., 2018). Ethnic minorities are often visible minorities (physically distinct), who may be socio-economically and educationally disadvantaged and subject to negative stereotypes and racism in their respective societies (Allport, 1954; Hutnik, 1991; Porter & Washington, 1993).

Social Identity Theory (SIT) (Tajfel & Turner, 1986) provides a foundation for understanding the psychological and experiential consequences of ethnic minority status. According to SIT, social identity is a part of one's self-concept that originates from the knowledge that one is a member of a social group, combined with that membership's value and emotional significance. Social psychological research posits three related themes regarding ethnic identity (which is a social identity category): (1) identity significance: minority status foregrounds race/ethnicity for minorities due to discrimination (e.g., Douglass et al., 2016; Sellers et al., 1998); (2) racism and discrimination have a negative impact on ethnic identity and wellbeing (e.g., Houkamau et al., 2017; Hughes et al., 2015); and (3) ethnic minority individuals who value their ethnic group fare better psychologically (e.g., Williams, & T, C., & Lewycka, S., 2018).

SIT attributes the significance of ethnic identity among ethnic minorities to experiences of marginality and discrimination (Tajfel & Turner, 1986). Two terms are commonly used to refer to ethnic or racial identity significance: *salience* and *centrality* (Sellers et al., 1998). Both salience and centrality are indicators of the importance of ethnic or racial identity to the person. Centrality has been defined as a stable self-concept – that is, how important ethnicity is to one's overall sense of self over time. Salience is defined in the literature as a situational variable that indicates how relevant ethnicity is to an individual at a specific moment in time. Thus, salience is a function of how central ethnicity is to an individual in their immediate setting (Sellers et al., 1998; Yip, 2013). In this paper, given we report longitudinal data, we assess centrality, which refers to how significant ethnic identity is to an individual over time (see Leach et al., 2008, for discussion).

SIT proposes that individuals strive for favorable evaluations of their group or a “positive social identity”, yet the process of “developing” an ethnic identity is seen as more problematic for ethnic minorities because of the discrimination they face (Tajfel & Turner, 1986). This is the key theoretical argument that specifies the psychological disadvantage of membership in a socially marginalized ethnic group – that is, negative evaluations threaten group members' psychological wellbeing because they internalize those ideas “into” their self-concept. Indeed, extensive research indicates a range of adverse psychological outcomes associated with experiencing stereotyping, stigma, and racism linked to ethnicity, such as

decreased self-esteem and feelings of frustration, stress, and anxiety (Brittian et al., 2015; Britt-Spells et al., 2016; Jones & Neblett, 2016; Liu & Lau, 2013; Nyborg & Curry, 2003; Thibeault et al., 2018).

SIT theorizes that developing positive regard for one's own identity group can buffer the negative impacts of marginalization and discrimination (Tajfel & Turner, 1986). Consequently, ethnic minorities can learn to value their ethnicity as a protective mechanism against negative social evaluations. Using varied conceptualizations of ethnic identity and a plethora of assessment tools to measure it, researchers have consistently shown a positive association between ethnic identity affirmation and psychological wellbeing (James et al., 2000; Jones & Galliher, 2007; Karaš et al., 2014; Rivas-Drake et al., 2014a; Rivas-Drake et al., 2014b; Smith & Silva, 2011; Umaña-Taylor, 2011; Verkuyten, 2018).

In attempting to evaluate the impact of ethnic identity on wellbeing, researchers have assessed key components of ethnic identity by examining multiple aspects, including self-identification, language, social networks, religious affiliation, and traditional customs and practices (Phinney, 1992). Individuals' perceptions of their own ethnic identity vary markedly within groups; therefore, focusing on particular dimensions in isolation may not provide an accurate picture of the extent to which individuals have a “positive” or “negative” ethnic identity (Phinney, 1990). Māori, for example, show marked cultural heterogeneity (Greaves et al., 2015), and therefore the association between positive Māori identity and wellbeing may vary according to the tools used to measure Māori identity (discussed below). One construct which holds promise for providing insights into the relevance of ethnic identity for wellbeing among Māori, as well as other ethnic groups, is positive ethnic affect – that is, how people feel towards their ethnic group. Ethnic affect captures an emotional element of ethnic affiliation, such as warmth and liking for one's ethnic group. Rivas-Drake et al. (2014a) define positive affect as referring to a sense of affirmation, regard, and pride that stems from the individual's own evaluations of affect towards their group. Rivas-Drake et al. (2014b) meta-analyses of 46 studies involving ethnic and racial minorities found that the more positively minority youth feel about their ethnicity or race, the fewer symptoms of depression they reported. Building on this work, we explore the relationship between ethnic affect (which we measure by assessing in-group warmth) and wellbeing for a Māori adult sample. Following Rivas-Drake et al. (2014b), we propose that the more positively Māori feel about their ethnic group, over time, the better they will score on measures of wellbeing. To capture wellbeing comprehensively, we examine three aspects of wellbeing – self-esteem, life satisfaction, and personal wellbeing – and how they interact with in-group warmth and ethnic identity centrality over time. These measures and the rationale for using them are discussed further below.

The paper is positioned to address three main gaps in the literature. First, we offer insight into Indigenous ethnic minority experience and do so in a core psychology journal. As a discipline, psychological science has been criticized for its focus on “Western, educated, industrialized, rich, and democratic (WEIRD)” populations (Henrich et al., 2010), its bias towards research samples typically composed of American undergraduate students (Arnett, 2008), and its neglect of ethnic diversity within the samples studied to extend psychological knowledge (Arnett, 2008; Meadon & Spurrett, 2010). A particular limitation reported in the psychological literature is the sheer lack of research that has focused on Indigenous peoples’ identities and experiences (Allwood, 2018). We note research on ethnic populations in the United States, including Asian American, Latino (Phinney, 1990), African American (Sellers et al., 1998) and Native American (Zimmerman et al., 1998); however, Indigenous groups outside of the United States are rarely discussed in international psychological journals (Allwood, 2018; Groot et al., 2018).

Secondly, this paper helps address the lack of research into the relationship between ethnic identity and wellbeing for ethnic minority adults. Mainly due to the influential impact of Erikson’s (1968) theory of psychosocial development, which holds that the adolescent years are critical for identity formation, most research into ethnic identity development has focused on youth, adolescents, and American college students (Phinney, 1990; Smith & Silva, 2011). As a result, there are significant gaps in the literature and little is known about ethnic identity development during adulthood. Our paper addresses this gap by longitudinally examining a population of adults (over 18 years of age).

A third gap we address concerns the study’s longitudinal nature: few identity studies examine relationships between ethnic identity and wellbeing over time. Specifically, our longitudinal trajectory model investigates the relationships between in-group warmth, ethnic identity centrality, and three wellbeing measures for a seven-year period. One of these measures – self-esteem – is the subject of considerable work in psychology. Defined as the subjective evaluation of one’s worth, self-esteem is recognized as central to psychological functioning and personal wellbeing and relates strongly to many variables, including general life satisfaction (see Leary & Baumeister, 2000; Pyszczynski et al., 2004; Rosenberg, 1965). Self-esteem is an aspect of psychological wellbeing that contributes to personal wellbeing and has been found to play a protective role for minorities, particularly youth, in Western countries (Carlson et al., 2000; Kiang et al., 2006; Phinney, 1990; Phinney et al., 1997; Verkuyten, 1994, 2003). Self-esteem is both situational (how individuals feel about themselves at a certain time) and stable (how individuals feel about themselves generally) (Rosenberg, 1965; Verkuyten, 2018). Cross-sectional studies have supported a positive relationship between ethnic identification and self-esteem (Lee

et al., 2018; Umaña-Taylor et al., 2002). A few have also investigated the link between self-esteem and ethnic identity over time for ethnic minorities, but they focused primarily on child, youth, and young adult populations (often college students) (Phinney & Chavira, 1992; Syed & Azmitia, 2009; Whitesell et al., 2009). However, only longitudinal data can give insights into the direction of relationships and how these may change over time.

The rest of the paper proceeds as follows. First, in the remainder of the introduction we background the New Zealand context, then set out a conceptual overview and our hypotheses in accordance with the predictions of SIT. We then discuss the methods used to collect data (including additional information about the measures used for in-group warmth, ethnic identity centrality, and personal wellbeing), followed by results and finally a discussion including contributions, limitations followed by results, a discussion including contributions, and finally limitations and suggested further research.

### The New Zealand Context

Māori were formally colonized from 1840 following the Treaty of Waitangi with British settlers, whom they referred to as *Pākehā* (now often translated as New Zealanders of European descent). The colonization of New Zealand had dire consequences for Māori (Belich, 2013; Reid et al., 2017). Māori lost the vast majority of their lands and political control to *Pākehā* by the close of the nineteenth century (Walker, 2004). For generations, Māori have resisted the processes of colonization and cultural assimilation (Williams, 2019); however, largely dispossessed of lands and natural resources, Māori have been alienated from their traditional way of life and culture. Māori are now an ethnic minority, making up 16.5% of the New Zealand population (Stats NZ, 2019), and they experience pervasive racism (New Zealand Human Rights Commission, 2013). Like Indigenous peoples in Australia, Canada, and the United States, Māori are overrepresented in negative socio-economic statistics, including poverty and unemployment, life expectancy, and poor mental and physical health outcomes (Anderson et al., 2016; Leske et al., 2016; Ministry of Health, 2014, 2016; Ministry of Social Development, 2016; Mitrou et al., 2014). Most starkly, Māori suicide rates far exceed those for *Pākehā* and other non-Māori in New Zealand. This is said to symptomatize cultural alienation and social disintegration under colonization (Langford et al., 1998; Lawson-Te Aho, 1998).

Within the context of colonization, enculturation, the process by which individuals learn about and identify with their traditional ethnic culture, has been seen as crucial for wellbeing (Zimmerman et al., 1998). Research supports this rationale (Dockery, 2020; Gfeller, 2016) and finds a strong sense of cultural awareness and knowledge mitigates negative mental health outcomes for Indigenous populations (e.g.,

Zimmerman et al., 1998). On that basis, Māori writers have argued that Māori need to learn about their language, heritage, and culture to fortify their personal self-esteem and promote mental and physical health (Durie, 1997a; Durie, 1984, Durie, 1985, Durie, 1997b; Rangihau, 1975). Yet, reflecting New Zealand's colonial history, many Māori grow up without knowing Māori traditions and practices (Greaves et al., 2015; Te Huia, 2015). A relatively small minority of Māori (less than 20%) can speak the Māori language fluently (Stats NZ, 2014) while, according to the New Zealand census, 95.7% of Māori are English speakers (Stats NZ, 2018).

In recent years, the Multidimensional Model of Māori Identity and Cultural Engagement, a self-report questionnaire that measures eight distinct dimensions of subjective identity as Māori (cultural efficacy, authenticity beliefs, spiritual beliefs, interdependence, family relationships, socio-political consciousness, physical appearance, and group membership evaluation) has been used to assess the extent to which various aspects of Māori identity shape outcomes in multiple domains (Greaves et al., 2015; Greaves et al., 2017; Houkamau & Sibley, 2011, 2018). High Māori cultural efficacy (confidence in expressing the self by drawing on knowledge of traditional Māori culture and language) has been associated with lower psychological distress (Muriwai et al., 2018) and higher life satisfaction (Matika et al., 2017). Yet, other studies that have measured Māori identity using different tools have found different associations with wellbeing. For example, Stevenson (2001) found that aspects of Māori cultural identity (such as cultural activities, connection with tribal lands, and speaking Māori) were not directly correlated to better health indicators – although collective involvement in sporting activities was moderately correlated. Such findings indicate that Māori identity is a complex aspect of self-experience, and it is difficult to capture exactly what aspects of Māori identity are psychologically protective.

## Overview and Guiding Hypotheses

Following from Rivas-Drake et al. (2014b), this study seeks to focus on one dimension that has been found to be positively related to wellbeing for ethnic minorities in a range of studies; that is, positive ethnic affect – how people feel about their ethnic identity. We proposed that ethnic affect may capture different dimensions of ethnic identity not typically assessed in ethnic identity measurement tools such as warmth, liking, and positive feelings. Ethnic affect may be applicable to Māori regardless of the extent to which they are enculturated, thereby providing a novel approach to studying the link between ethnic identity and wellbeing in this population. Working from the SIT approach, this study explores the relationship between ethnic identity and wellbeing for Māori using a very broad measure of ethnic affect – namely, in-group warmth.

In social psychology, in-group warmth has been associated with the stereotype content model proposed by Fiske et al. (2002), which is concerned with explicating the role of warmth and competence perceptions in the stereotypes individuals hold towards ethnic groups – their own and others. Cuddy et al. (2008) defined in-group warmth as indicative of positive feelings towards an ethnic group – including liking, trustworthiness, and morality. Recently, Hamley et al. (2019) found Māori tend to feel more warmth towards their own in-group and less towards New Zealand Europeans, but to date, we know of no additional studies which have examined relationships between in-group warmth and wellbeing for Māori or other Indigenous populations.

Our analyses are also concerned with the role of ethnic centrality for wellbeing outcomes among Māori. Like enculturation, variability in ethnic identity centrality can occur within ethnic groups and across individuals contingent on their situation (Douglass et al., 2016). Greaves et al. (2015) found marked variation in the extent to which individuals rated their Māori ethnicity/culture as personally important to how they see themselves as individuals. In fact, around 25% of those surveyed placed little-to-moderate importance on their Māori identity, in contrast to around 30% who placed Māori identity as important for how they see themselves as a person. Although ethnic identity may be a more important aspect of identity among ethnic minorities (Sellers et al., 1997), the extent to which individuals define themselves by ethnicity may be influenced by a variety of factors, including personal social networks (Phinney, 1990). For example, Yip and Fuligni (2002) found that Chinese adolescents reported feeling more “Chinese” on days in which they participated in ethnic-related events. Similarly, in a qualitative study of the lives of 35 women (aged 18–75), Houkamau (2011) found the importance of being Māori changed for women over their lives, shaped significantly by parents, family, and friends as well as prevailing societal ideologies of each decade. These data show that ethnic identity reflects social contexts and may change over a lifetime for the same person. Therefore, understanding the link between ethnicity and wellbeing requires longitudinal data that explore centrality (the extent to which identity is significant to individuals over time).

Based on SIT's prediction that positive in-group evaluations will predict positive psychosocial outcomes, such as self-esteem and personal wellbeing, we propose that levels of in-group warmth towards Māori will predict positive wellbeing over time. Like ethnic identity, wellbeing is a broad, multidimensional construct (VanderWeele et al., 2020). To capture multiple aspects of wellbeing in this study, we selected three measures: life satisfaction, personal wellbeing, and self-esteem. Like most marginalized Indigenous groups, Māori face challenges in multiple life domains, therefore our measures also had the advantage of including domain-specific factors as well as overall measures of self-evaluation,



psychological adjustment, and life satisfaction. Specifically, three hypotheses were examined:

1. In-group warmth and ethnic identity centrality will have significant positive effects on life satisfaction over time.
2. In-group warmth and ethnic identity centrality will have significant positive effects on personal wellbeing over time.
3. In-group warmth and ethnic identity centrality will have significant positive effects on self-esteem over time.

In all three hypotheses, we expect the positive relationship between in-group warmth, ethnic identity, and positive psychosocial outcomes to increase over time for those who see their identity as personally significant (central).

## Methods

### Participants

The New Zealand Attitudes and Values Study (NZAVS), which began in 2009, is a 20-year longitudinal mail survey study (in English, which nearly all Māori speak as their first language) that examines attitudes, personality, and health over time for over 60,000 New Zealanders. The participants were initially randomly sampled from the New Zealand electoral roll, followed by a series of booster samples (further details are in Sibley, 2020). Participant retention has generally been high (wave-on-wave retention >80%), with efforts to keep participants in the study entailing posted reminders, phoning participants, prize draws, emails, and newsletters. The analyses in this study are based on data from 3803 participants who self-identified as Māori over the first seven annual waves of the NZAVS: from 2009 (Time 1) to 2015 (Time 7).

Differences for key variables were identified between the sample of participants meeting the selection criterion (those retained over time) and the sample of participants not meeting this criterion. Specifically, looking at differences at Time 1, those who met the selection criterion tended to be slightly younger ( $M = 41.31$ ,  $SD = 13.46$ ) than those not selected ( $M = 43.90$ ,  $SD = 14.93$ ,  $d = -.18$ ). Gender distribution differed little (64.8% and 61.4% women, respectively). The selected sample tended to live in more deprived neighbourhoods – that is, those with higher scores on the New Zealand Index of Deprivation ( $M = 6.24$ ,  $SD = 2.90$ ) – than those not selected ( $M = 4.75$ ,  $SD = 2.75$ ,  $d = .52$ ). That index (Salmond et al., 2007) employs aggregate census information about the residents of each neighbourhood “mesh block” to assign a decile-rank index from 1 (most affluent) to 10 (most impoverished) to each mesh block unit. For a more detailed analysis of sample retention and bias associated with the longitudinal nature of the NZAVS, please refer to Satherley et al. (2015).

Of our sample, 44.5% identified as religious, 77% reported having children, 65.2% reported being in a serious romantic relationship, 78.9% were in some kind of paid employment, and 51% lived in urban rather than rural areas. As seen from comparisons above, the average age of the sample at Time 1 was 41.31 years ( $SD = 13.46$ ), women made up 64.8% of the sample, and the mean deprivation index was 6.24 ( $SD = 2.90$ ). Table 1 provides a summary of the demographic characteristics of the sample used in the analyses.

### Measures

We used a consistent battery of measures that were in the NZAVS over all seven time points.

**In-Group Warmth** No scale has been universally accepted as a measure of in-group warmth (Aragonés et al., 2015). Like Hamley et al. (2019), this study employed the so-called “thermometer scale”, or “feeling thermometer”, created for the United States National Election Study as a general-purpose measure of feelings towards social and political entities. The scale arrays feelings from very cold and highly unfavorable (0 degrees) to very warm and highly favorable (10 degrees) (Kinder & Drake, 2009). A single item assessed Māori in-group warmth, with the following instructions: Please rate the warmth of your feelings towards the following groups using the “feeling thermometer scale” for each group. A rating of “1” indicates your feelings toward that group to be least warm (least favorable) while a rating of “10” indicates your feeling is most warm (most favorable). The in-group warmth item used in these analyses was concerned with the “Māori” group.

**Table 1** Demographic characteristics of the sample used in the analyses

| Characteristic              |                        |               |
|-----------------------------|------------------------|---------------|
| Gender                      | Female                 | Male          |
|                             | 64.8%                  | 35.2%         |
| Religion                    | Religious              | Non-religious |
|                             | 44.5%                  | 55.5%         |
| Parenthood                  | Children               | No children   |
|                             | 77%                    | 23%           |
| Relationship                | Committed relationship | Single        |
|                             | 65.2%                  | 34.8%         |
| Employment                  | Employed               | Unemployed    |
|                             | 78.9%                  | 21.9%         |
| Residential characteristics | Urban                  | Rural         |
|                             | 51%                    | 49%           |

Percentages refer to valid percentage of those responding to the relevant items at the first point of measurement

**Ethnic Identity Centrality** Working within the SIT paradigm and following Phinney and Ong’s (2007) conceptualization and measurement of ethnic identity, our study also examines how far individuals find in-groups psychologically significant, or central to the individual’s sense of self (Leach et al., 2008). Ethnic identity centrality was assessed using a three-item centrality scale (Leach et al., 2008;  $\alpha_{\text{Time 1}} = .83$ ). Participants rated the following items from 1 (strongly disagree) to 7 (strongly agree): “I often think about the fact that I am a member of my ethnic group”, “The fact that I am a member of my ethnic group is an important part of my identity”, and “Being a member of my ethnic group is an important part of how I see myself”.

## Wellbeing Variables

**Life Satisfaction** Life satisfaction is “a global assessment of a person’s quality of life according to his or her chosen criteria” (Shin & Johnson, 1978, p. 478) and is a significant subjective indicator of wellbeing (Diener et al., 1985). Life satisfaction scales ask a person to compare the current state of their life with their standard of what is appropriate or desirable (Diener, 1984). If these match, then they are likely to experience high life satisfaction. Life satisfaction was measured using two items ( $\alpha_{\text{Time 1}} = .74$ ) from the Satisfaction with Life Scale (Diener et al., 1985) – “I am satisfied with my life” and “In most ways my life is close to ideal” – which the participants rated from 1 (strongly disagree) to 7 (strongly agree).

**Personal Wellbeing** We also used additional measures to evaluate more domain-specific aspects of life satisfaction, employing four items from the Personal Wellbeing Index (Cummins et al., 2003). Personal wellbeing was thus assessed using those four items ( $\alpha_{\text{Time 1}} = .74$ ) rated from 1 (completely dissatisfied) to 10 (completely satisfied). The participants were asked to rate their satisfaction with “Your standard of living”, “Your health”, “Your future security”, and “Your personal relationships”. Note, the Personal Wellbeing Index has been validated with Māori, and support has been found for cross-cultural construct validity (Ganglmair-Wooliscroft & Lawson, 2008).

**Self-Esteem** Self-esteem, defined as an individual’s evaluation of their worth, is widely recognized as central to psychological functioning and personal wellbeing and is strongly related to many other variables, including general life satisfaction (see Leary & Baumeister, 2000; Pyszczynski et al., 2004). The Rosenberg Self-Esteem Scale (Rosenberg, 1965) was chosen because it is widely used, it has been tested for reliability and validity in many settings, and it has been used previously in research with Māori (Matika et al., 2017) as well as other ethnic minority populations (e.g., Umaña-Taylor, 2004). We used three items from the scale ( $\alpha_{\text{Time 1}} = .67$ ) – “On the whole

I am satisfied with myself”, “On the whole I take a positive attitude towards myself”, and “On the whole I am inclined to feel that I am a failure” – which the participants rated from 1 (very inaccurate) to 7 (very accurate).

## Results

Descriptive statistics and bivariate correlations for the variables used in the model detailed below are presented in Table 2.

## Latent Trajectory Models with Structured Residuals

To investigate the causal longitudinal effects between Māori ethnic identity centrality, Māori in-group warmth, and wellbeing (life satisfaction, personal wellbeing, and self-esteem), we estimated a multivariate latent trajectory model with structured residuals (Curran et al., 2014). Recently developed and still rarely used in the field, this approach nevertheless allows for explicit modelling of between-person and within-person effects. Specifically, the approach incorporates a latent growth model with an auto-regressed, cross-lagged structure at the level of the residuals. Thus, with the latent growth model component accounting for the between-person change and stability, the auto-regressed cross-lagged structure among the residuals estimates the point-to-point within-person stability and cross-lagged effects. A schematic figure of the model structure, with two variables, is presented in Fig. 1 below.

In our analyses, we estimated a latent trajectory model with structured residuals estimating relationships between in-group warmth, ethnic identity centrality, life satisfaction, personal wellbeing, and self-esteem over seven waves of annual assessments. Thus, five simultaneous – one for each variable – latent growth models were estimated, estimating the latent intercepts and the latent linear slope for each process.<sup>1</sup> Furthermore, a complex auto-regressed structure was estimated among the residuals of the five processes. Specifically, for each variable residual, the variable at time point  $T$  was regressed on the same variable residual at time point  $T-1$ . The cross-lagged structure was estimated such that the variable residual  $X$  at time point  $T$  was regressed on the variable residual  $Y$  at time point  $T-1$ . As we had no theoretical reason to expect the year-to-year relationships among the variables to vary with time, a stationary process was assumed, such that auto-regressed and cross-lagged processes were constrained to equality for each year-to-year period.

<sup>1</sup> Within the present model, the random variances of the latent slopes for all five processes were constrained to 0. This restriction was implemented to allow for model convergence, consistent with the recent Berry and Willoughby (2017) analyses.

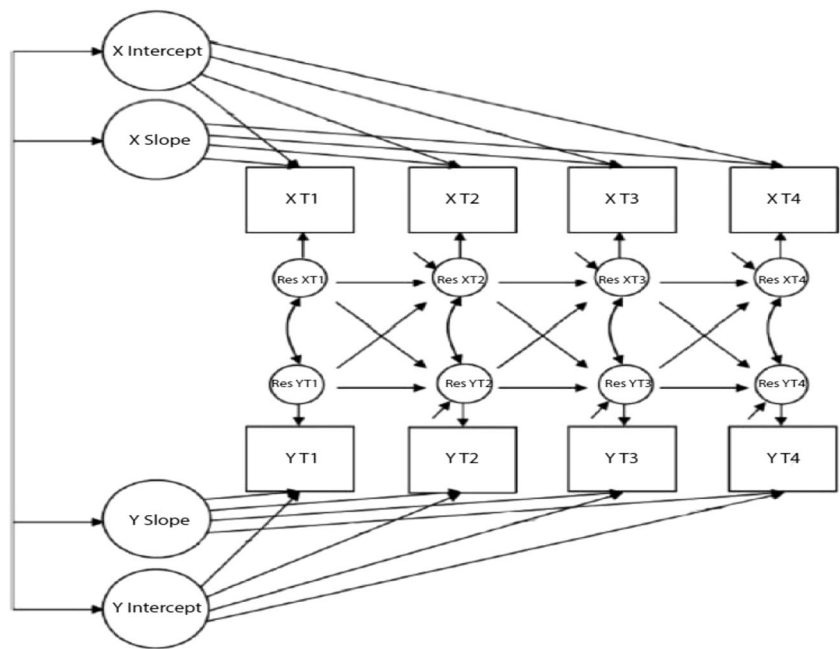
**Table 2** Bivariate correlations and descriptive statistics for the variables used in the models

|                       | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9        | 10       | 11       | 12       | 13       | 14       | 15     | 16     | 17     |
|-----------------------|--------|--------|--------|--------|--------|--------|--------|--------|----------|----------|----------|----------|----------|----------|--------|--------|--------|
| 1. IWT <sub>1</sub>   |        |        |        |        |        |        |        |        |          |          |          |          |          |          |        |        |        |
| 2. IWT <sub>2</sub>   | .525** |        |        |        |        |        |        |        |          |          |          |          |          |          |        |        |        |
| 3. IWT <sub>3</sub>   | .513** | .547** |        |        |        |        |        |        |          |          |          |          |          |          |        |        |        |
| 4. IWT <sub>4</sub>   | .457** | .520** | .568** |        |        |        |        |        |          |          |          |          |          |          |        |        |        |
| 5. IWT <sub>5</sub>   | .414** | .512** | .512** | .478** |        |        |        |        |          |          |          |          |          |          |        |        |        |
| 6. IWT <sub>6</sub>   | .391** | .517** | .541** | .469** | .530** |        |        |        |          |          |          |          |          |          |        |        |        |
| 7. IWT <sub>7</sub>   | .427** | .505** | .548** | .486** | .531** | .571** |        |        |          |          |          |          |          |          |        |        |        |
| 8. EICT <sub>1</sub>  | .385** | .387** | .347** | .377** | .331** | .331** | .329** |        |          |          |          |          |          |          |        |        |        |
| 9. EICT <sub>2</sub>  | .307** | .362** | .325** | .314** | .300** | .333** | .345** | .746** |          |          |          |          |          |          |        |        |        |
| 10. EICT <sub>3</sub> | .310** | .333** | .389** | .341** | .322** | .333** | .348** | .728** | .737**   |          |          |          |          |          |        |        |        |
| 11. EICT <sub>4</sub> | .289** | .318** | .307** | .333** | .364** | .292** | .317** | .707** | .753**   | .770**   |          |          |          |          |        |        |        |
| 12. EICT <sub>5</sub> | .282** | .307** | .357** | .334** | .380** | .326** | .357** | .705** | .732**   | .759**   | .719**   |          |          |          |        |        |        |
| 13. EICT <sub>6</sub> | .296** | .356** | .375** | .354** | .373** | .373** | .388** | .679** | .709**   | .736**   | .732**   | .780**   |          |          |        |        |        |
| 14. EICT <sub>7</sub> | .339** | .363** | .360** | .351** | .389** | .374** | .427** | .665** | .715**   | .739**   | .725**   | .764**   | .810**   |          |        |        |        |
| 15. SWLT <sub>1</sub> | .056*  | .073*  | .093*  | .116** | .092*  | .115** | .088*  | .005   | -0.01    | 0.06     | 0.05     | 0.05     | 0.01     | 0.01     |        |        |        |
| 16. SWLT <sub>2</sub> | 0.06   | .096** | .115** | .117** | .07    | .142** | .102*  | 0.01   | 0.00     | 0.02     | 0.02     | 0.02     | 0.02     | 0.01     | .679** |        |        |
| 17. SWLT <sub>3</sub> | .084*  | .124** | .143** | .095** | .096*  | .084*  | .104** | 0.05   | 0.00     | 0.06     | 0.06     | .124**   | 0.06     | 0.05     | .633** | .732** |        |
| 18. SWLT <sub>4</sub> | 0.04   | .085*  | .108** | .125** | .066** | .083** | .107** | 0.01   | -0.02    | 0.02     | .054*    | 0.04     | .056*    | 0.05     | .598** | .690** | .676** |
| 19. SWLT <sub>5</sub> | 0.07   | .112** | .109** | .088** | .093** | .078** | .064** | 0.05   | -0.01    | 0.02     | .083**   | 0.04     | 0.02     | 0.03     | .582** | .649** | .699** |
| 20. SWLT <sub>6</sub> | 0.03   | 0.07   | 0.06   | .092** | .094** | .093** | .085** | 0.04   | -0.02    | -0.03    | 0.03     | 0.02     | .056**   | 0.04     | .570** | .671** | .701** |
| 21. SWLT <sub>7</sub> | 0.07   | 0.09   | 0.06   | .064*  | .087** | .103** | .084** | 0.05   | -0.02    | -0.03    | 0.03     | .056*    | .075**   | .087**   | .551** | .659** | .675** |
| 22. PWIT <sub>1</sub> | 0.01   | 0.01   | 0.01   | 0.02   | 0.02   | 0.01   | 0.02   | 0.04   | -0.03    | -0.04    | -0.04    | -0.04    | -0.06    | -0.04    | .658** | .557** | .557** |
| 23. PWIT <sub>2</sub> | 0.04   | 0.02   | 0.04   | .082*  | 0.00   | 0.05   | 0.04   | -0.03  | -0.091** | -0.07    | -0.08    | -0.04    | -0.08    | -0.091*  | .591** | .708** | .662** |
| 24. PWIT <sub>3</sub> | 0.03   | 0.04   | .072*  | 0.06   | 0.06   | 0.04   | 0.02   | -0.03  | -0.092** | -0.03    | -0.02    | 0.01     | -0.03    | -0.03    | .578** | .605** | .677** |
| 25. PWIT <sub>4</sub> | -0.01  | -0.01  | 0.01   | .052*  | -0.02  | 0.01   | 0.03   | -0.06  | -0.083*  | -0.127** | -0.066** | -0.04    | -0.04    | -0.03    | .526** | .569** | .549** |
| 26. PWIT <sub>5</sub> | 0.03   | 0.04   | 0.02   | 0.03   | .047*  | .051*  | 0.02   | -0.02  | -0.06    | -0.06    | -0.03    | -0.048*  | -0.04    | -0.03    | .546** | .595** | .606** |
| 27. PWIT <sub>6</sub> | -0.01  | -0.02  | -0.02  | -0.03  | 0.00   | 0.00   | 0.02   | -0.04  | -0.08    | -0.129** | -0.110** | -0.087** | -0.085** | -0.078** | .539** | .584** | .598** |
| 28. PWIT <sub>7</sub> | 0.03   | 0.03   | -0.02  | -0.01  | 0.00   | 0.02   | 0.03   | -0.05  | -0.097*  | -0.120** | -0.070*  | -0.074** | -0.03    | -0.03    | .524** | .555** | .558** |
| 29. SET <sub>1</sub>  | .144** | .101** | .158** | .171** | .131** | .191** | .144** | .092** | 0.06     | .098**   | .100**   | 0.06     | .076*    | 0.07     | .505** | .412** | .458** |
| 30. SET <sub>2</sub>  | .147** | .147** | .147** | .131** | .100*  | .167** | .139** | 0.02   | 0.01     | 0.06     | 0.02     | 0.05     | 0.07     | 0.03     | .449** | .557** | .515** |
| 31. SET <sub>3</sub>  | .122** | .144** | .138** | .172** | .152** | .119*  | .095** | .081*  | 0.02     | .110**   | .116**   | .103**   | .099**   | 0.06     | .461** | .452** | .525** |
| 32. SET <sub>4</sub>  | .132** | .119** | .139** | .139** | .111** | .098** | .148** | .074*  | 0.07     | .095**   | .073**   | .083**   | .075**   | .093**   | .437** | .467** | .486** |
| 33. SET <sub>5</sub>  | .119** | .149** | .127** | .125** | .108** | .147** | .125** | 0.07   | 0.04     | 0.06     | .068**   | .079**   | .077**   | .090**   | .483** | .529** | .506** |
| 34. SET <sub>6</sub>  | .090*  | .134** | .104** | .090** | .106** | .138** | .140** | 0.04   | 0.04     | 0.05     | 0.05     | .057**   | .083**   | .088**   | .436** | .485** | .551** |
| 35. SET <sub>7</sub>  | 0.07   | .115*  | .102** | .061*  | .148** | .155** | .130** | .099*  | 0.05     | 0.07     | .057*    | .080**   | .101**   | .103**   | .445** | .490** | .549** |
| M.                    | 5.63   | 5.55   | 5.57   | 5.64   | 5.68   | 5.63   | 5.58   | 4.79   | 4.59     | 4.53     | 4.67     | 4.57     | 4.52     | 4.51     | 4.95   | 5.00   | 5.01   |
| SD.                   | 1.33   | 1.32   | 1.29   | 1.30   | 1.30   | 1.25   | 1.29   | 1.67   | 1.66     | 1.68     | 1.67     | 1.72     | 1.67     | 1.68     | 1.29   | 1.31   | 1.30   |
| α                     | -      | -      | -      | -      | -      | -      | -      | 0.84   | 0.82     | 0.84     | 0.83     | 0.83     | 0.83     | 0.84     | 0.75   | 0.78   | 0.80   |





**Fig. 1** Schematic overview of the latent growth model with structured residuals as estimated in this study. *Note.* A schematic overview of a model with two processes is presented here, while the models presented in the study tested five processes



The estimated parameters and model fit indices for the model detailed above are presented in Tables 3, 4, 5. Reasonable model fit was observed with RMSEA = .022, CFI = .973, TLI = .971, and sRMR = .037.

Table 3 presents the estimated cross-lagged effects on the three wellbeing variables: life satisfaction, personal wellbeing,

**Table 3** Cross-lagged effects of ethnic identity centrality and Māori in-group warmth (italicised) on wellbeing (life satisfaction, personal wellbeing, and self-esteem)

| Fixed effects                  | Est    | SE   | p    | $\beta$ |
|--------------------------------|--------|------|------|---------|
| <b>Life satisfaction T</b>     |        |      |      |         |
| Life satisfaction T-1          | .116*  | .022 | .000 | .121    |
| In-group warmth T-1            | .058*  | .012 | .000 | .074    |
| Ethnic identity centrality T-1 | .039*  | .013 | .002 | .047    |
| Personal wellbeing T-1         | -.026* | .012 | .023 | -.036   |
| Self-esteem T-1                | -.008  | .016 | .465 | -.007   |
| <b>Personal wellbeing T</b>    |        |      |      |         |
| Personal wellbeing T-1         | .095*  | .019 | .000 | .096    |
| In-group warmth T-1            | .072*  | .016 | .000 | .067    |
| Ethnic Identity Centrality T-1 | .066*  | .017 | .000 | .058    |
| Life satisfaction T-1          | -.049* | .021 | .022 | -.037   |
| Self-esteem T-1                | .018   | .022 | .801 | .013    |
| <b>Self-esteem T</b>           |        |      |      |         |
| Self-esteem T-1                | .122*  | .019 | .000 | .122    |
| In-group warmth T-1            | .064*  | .012 | .000 | .082    |
| Ethnic identity centrality T-1 | .039*  | .012 | .001 | .047    |
| Life satisfaction T-1          | -.003  | .015 | .865 | -.003   |
| Personal wellbeing T-1         | .001   | .011 | .930 | .001    |

\* $p < .05$

and self-esteem. Looking specifically at our focal effects, which informed the three hypotheses, both in-group warmth and ethnic identity centrality had significant positive effects on life satisfaction ( $\beta = .074$  and  $\beta = .047$ , respectively), upholding Hypothesis 1. Similarly, both in-group warmth and ethnic identity centrality had significant positive effects on personal wellbeing ( $\beta = .067$  and  $\beta = .058$ , respectively), upholding Hypothesis 2. Finally, both in-group warmth and ethnic identity centrality had significant positive effects on self-esteem ( $\beta = .082$  and  $\beta = .047$ , respectively), upholding Hypothesis 3. In other words, both Māori in-group warmth and Māori ethnic identity centrality led to increases in wellbeing (as indexed by life satisfaction, personal

**Table 4** Cross-lagged effects on māori ethnic identity centrality and Māori In-group warmth

| Fixed effects                       | Est   | SE   | p    | $\beta$ |
|-------------------------------------|-------|------|------|---------|
| <b>In-group warmth T</b>            |       |      |      |         |
| In-Group warmth T-1                 | .081* | .018 | .000 | .081    |
| Ethnic identity centrality T-1      | .030* | .013 | .025 | .028    |
| Life satisfaction T-1               | .002  | .019 | .904 | .002    |
| Personal wellbeing T-1              | .032* | .014 | .021 | .035    |
| Self-esteem T-1                     | .082* | .020 | .000 | .064    |
| <b>Ethnic identity centrality T</b> |       |      |      |         |
| Ethnic identity centrality T-1      | .154* | .019 | .000 | .159    |
| In-group warmth T-1                 | .007  | .014 | .618 | .008    |
| Life satisfaction T-1               | -.020 | .018 | .264 | -.018   |
| Personal wellbeing T-1              | .014  | .013 | .283 | .017    |
| Self-esteem T-1                     | .067* | .018 | .000 | .057    |

\* $p < .05$

**Table 5** Between-person sample level effects (latent slopes and latent intercepts) of the latent trajectory model with structured residuals testing the longitudinal auto-regressed cross-lagged effects of Māori ethnic identity centrality and Māori in-group warmth on wellbeing

| Means                                | <i>Est</i> | <i>SE</i> | <i>p</i> |         |
|--------------------------------------|------------|-----------|----------|---------|
| In-group warmth intercept            | 5.673*     | .026      | .000     |         |
| Ethnic identity centrality intercept | 4.766*     | .032      | .000     |         |
| Life satisfaction intercept          | 4.931*     | .025      | .000     |         |
| Personal wellbeing intercept         | 6.132*     | .036      | .000     |         |
| Self-esteem intercept                | 5.176*     | .024      | .000     |         |
| In-group warmth slope                | −.003      | .005      | .575     |         |
| Ethnic identity centrality slope     | −.029*     | .006      | .000     |         |
| Life satisfaction slope              | .016*      | .005      | .000     |         |
| Personal wellbeing slope             | .048*      | .006      | .000     |         |
| Self-esteem slope                    | .008       | .004      | .094     |         |
| (Co)Variances – intercepts           | <i>Est</i> | <i>SE</i> | <i>p</i> | $\beta$ |
| In-group warmth*                     | .720*      | .030      | .000     | .574    |
| Ethnic identity centrality           |            |           |          |         |
| In-GROUP WARMTH*                     | .86*       | .021      | .000     | .092    |
| Life satisfaction                    |            |           |          |         |
| In-group warmth*                     | −.023      | .031      | .472     | −.016   |
| Personal wellbeing                   |            |           |          |         |
| In-group warmth*                     | .129*      | .020      | .000     | .150    |
| Self-esteem                          |            |           |          |         |
| Ethnic identity centrality*          | .040       | .029      | .172     | .027    |
| Life satisfaction                    |            |           |          |         |
| Ethnic identity centrality*          | −.265*     | .044      | .000     | −.116   |
| Personal wellbeing                   |            |           |          |         |
| Ethnic identity centrality*          | .103*      | .027      | .000     | .075    |
| Self-esteem                          |            |           |          |         |
| Life satisfaction*                   | 1.503*     | .042      | .000     | .877    |
| Personal wellbeing                   |            |           |          |         |
| Life satisfaction*                   | .754*      | .025      | .000     | .739    |
| Self-esteem                          |            |           |          |         |
| Personal wellbeing*                  | .933*      | .035      | .000     | .590    |
| Self-esteem                          |            |           |          |         |
| In-group warmth                      | .792*      | .028      | .000     |         |
| Ethnic identity centrality           | 1.985*     | .055      | .000     |         |
| Life satisfaction                    | 1.106*     | .032      | .000     |         |
| Personal wellbeing                   | 2.656*     | .072      | .000     |         |
| Self-esteem                          | .941*      | .028      | .000     |         |

Co-variances and variances for intercepts only

\* $p < .05$

wellbeing, and self-esteem) over time, with in-group warmth having a consistently stronger effect.

Table 4 presents the estimated cross-lagged effects on the two group-related variables: in-group warmth and ethnic identity centrality. As it shows, increases in in-group warmth are predicted by personal wellbeing ( $\beta = .035$ ) and by self-esteem ( $\beta = .064$ ), and increases in ethnic identity centrality are predicted by self-esteem ( $\beta = .057$ ). As such, reciprocal causal effects can be observed between in-group warmth and personal wellbeing and self-esteem, and between ethnic identity centrality and self-esteem. Finally, looking at the relationship between the two group-related variables, increases in in-group

warmth were predicted by ethnic identity centrality ( $\beta = .028$ ), but no reciprocal effect was found.

In addition to the within-person cross-lagged effects detailed above, between-person, sample-level, longitudinal effects were also observed, as shown in Table 5. Because we assessed only people who completed the study every year, sample-level effects captured what was happening in the same 3803 individuals over seven years rather than changes as any new cohorts were added. Specifically, a significant positive latent slope was observed for life satisfaction ( $b = .016$ ), indicating that life satisfaction has increased over the seven years among Māori in New Zealand. Similarly, a significant positive

latent slope was observed for personal wellbeing ( $b = .048$ ), indicating increases in personal wellbeing among Māori over the seven years of assessment. Finally, a significant negative slope was observed for ethnic identity centrality ( $b = -.029$ ), indicating that ethnic identity centrality decreased among Māori from 2009 to 2015.

## Discussion

The goal of this study was to examine longitudinal relationships between in-group warmth, ethnic identity centrality, life satisfaction, personal wellbeing, and self-esteem among New Zealand's Indigenous Māori over a seven-year period. We address particular gaps in the literature on ethnic identity (an Indigenous adult focus, longitudinal research) and estimated a latent trajectory model with structured residuals (Curran et al., 2014), which allowed us to explicitly and simultaneously model between-person and within-person longitudinal effects.

Our approach afforded significantly better interpretability than traditional cross-lagged modelling approaches. In terms of our focal effects, the model revealed significant simultaneous effects of both in-group warmth and ethnic identity centrality for predicting increases in reported life satisfaction, personal wellbeing, and self-esteem over time, upholding all three hypotheses.

Simultaneous reciprocal relationships were also observed for some variables, with increases in in-group warmth being predicted by personal wellbeing and self-esteem (but not life satisfaction). Somewhat similarly, self-esteem (but not life satisfaction or personal wellbeing) was found to predict increases in Māori ethnic identity centrality over time. Finally, ethnic identity centrality was found to lead to increases in in-group warmth over time. This effect, however, was not reciprocated, suggesting a unidirectional causal relationship between ethnic identity centrality and in-group warmth.

While there has so far been little evidence for the directionality of the causal relationships between ethnic identity affect (here in-group warmth) and centrality on one hand and wellbeing measures on the other among Indigenous adults, this study presents evidence for a bi-directional, reciprocal dynamic for some of these relationships, and a unidirectional dynamic for others. For example, Māori ethnic identity centrality leads to increases in personal wellbeing and life satisfaction, as well as to increases in in-group warmth; however, it is itself only predicted by self-esteem. Thus, our findings suggest that in-group warmth and ethnic identity centrality are each at once causal factors and also outcomes of psychological wellbeing among Māori.

Both in-group warmth and ethnic identity centrality had significant positive effects on life satisfaction, personal wellbeing, and self-esteem over time. In addition, personal wellbeing and self-esteem predict increases in in-group

warmth and ethnic identity centrality over time, thus in-group warmth, personal wellbeing and self-esteem have a mutually reinforcing role. This pattern may be due to social and cultural factors. As noted above, ethnic identity is shaped by relationships and is experienced through interactions with family and friends who promote (or demote) a sense of belonging and connection with the larger ethnic identity group. In this respect, ethnic identity reflects social contexts. For individuals, being accepted by others as a group member on the basis of shared culture and ethnicity may provide a sense of belonging and self-worth that is not offered by wider society. This may therefore increase wellbeing and self-esteem, whilst simultaneously making relationships with other ethnic group members an important source of validation (and rendering ethnic identity a more central aspect of identity). It could be also that higher self-esteem makes individuals more confident to reach out and connect with other ethnic group members, more likely to invest time and energy into learning about their own culture or heritage, and more likely to join Māori cultural events and groups to learn more. Over time, relationships based on shared ethnic identity may further elevate ethnic affect (in-group warmth). These findings demonstrate the usefulness of within-person longitudinal designs in understanding the intertwined and mutually reinforcing associations between multiple aspects of ethnic identity over time.

Notably, our data indicate that in-group warmth increases over time, and this positively affects wellbeing, a finding which is consistent with the predictions of SIT and aligned research cited earlier supporting the positive link between ethnic identity affirmation and wellbeing. At the sample or between-person level, life satisfaction and personal wellbeing rose over time for Māori, while ethnic identity centrality scores fell – that is, even if people feel positive about their ethnicity, and have higher levels of wellbeing, the centrality of ethnicity grows less important to them as they age. This unexpected result is hard to fully explain given the nature of quantitative data which does not provide insights into personal experiences. Perhaps this finding is not so unusual though when one considers previous research that shows that people tend to experience more positive emotions as they age generally (regardless of ethnicity) (Yang, 2008). Moreover, previous research does show that ethnic identity tends to become less relevant to wellbeing as people age. For example, Smith and Silva's (2011) meta-analysis of 184 studies on people of color in North America found the relationship between ethnic identity and personal wellbeing generally positive, but stronger for adolescents and young adults than for adults over 40. From these data it could be inferred that ethnic identity may be more central to adolescents and young adults as they seek to establish a clear sense of ethnic identity and strive to clarify what their ethnic identity means to them personally. Adults, on the other hand, may have passed through this stage, and established a clear sense of ethnic identity that they take for

granted. SIT predicts ethnic identity centrality is reinforced by experiences of discrimination which render ethnicity more salient to individuals; however, adults may have a broader repertoire of skills to resist the impact of discrimination, therefore rendering ethnic identity a less absorbing aspect of self-experience. Our data support this inference, especially since, with a minimum age of 18 and mean of 41 years at Time 1, we have captured a seven-year window in which some respondents were moving into their mid- to late 40s and perhaps developing different perspectives on the role of their ethnicity in their lives.

Theoretically this finding is also consistent with developmental perspectives on identity such as that offered by Phinney (1989), which emphasize that individuals move through stages of exploration and learning to “achieve” identity during adolescence, therefore ideally “achieving” identity by the time they reach adulthood. An achieved ethnic identity is characterized by a sense of clarity about one’s own identity, as well as self-acceptance and acceptance of other ethnic groups in society (Phinney & Ong, 2007). This view is similar to other developmental models of ethnic and racial identity development which emphasize that as individuals clarify what ethnicity means to them personally, they come to accept other ethnic groups in society, a life stage associated with a decline in negative attitudes to ethnic and racial outgroups (Cross, 1971, 1978). Thus, our data may reflect not so much that being Māori is less central to our subjects, but that ethnicity generally as a source of self-definition has become less important to them as they age, perhaps as they become more conscious of the value of all ethnic groups in society.

This paper contributes to psychological literature not only for Māori but also, with some qualifications, on Indigenous populations more generally. This is the first large-scale longitudinal study to show a strong relationship between positive affect towards one’s own Indigenous ethnic group and greater psychological wellbeing. The article addressed gaps by using a longitudinal method, which therefore allows directional observations and causal inferences both within-person and between persons, and by focusing on adults rather than adolescents (and notably that large sample). As to more theoretical contributions, the use of in-group warmth, an affective aspect of ethnic identity, is relatively novel altogether and, to our knowledge, unique in studies of Māori or other Indigenous peoples. Importantly, having reasoned that cultural behaviors cannot capture the thoughts, attitudes, and feelings that are vital to a positive ethnic identity, we find evidence that in-group warmth has an important role in promoting personal wellbeing. At the same time, our data shows ethnic identity centrality may decrease over time, even for individuals who feel very positively towards their ethnic group. This finding highlights the importance of extending research on ethnic identity and wellbeing to adult populations. As noted above, most research into ethnic identity development has focused on

youth, adolescents, and American college students. This study helps to address gaps. However further research is needed to clarify the changing nature of ethnic identity beyond adolescence (Phinney, 1990) to explain why ethnic identity centrality seems to fade as people grow older.

### Limitations and Further Research

Globally, Indigenous peoples are often described in research as “marginal, minority, and vulnerable”. While frequently perhaps statistically true, the burdens of Indigenous people can be highlighted in a not-altogether-helpful way, or even magnified, by a deficit approach to Indigenous peoples or neglect of positive aspects of Indigeneity (Craven et al., 2016; Jacobs, 2019). This paper emphasizes the value of ethnic identity, focusing on the positive role of in-group warmth as a protective factor for Indigenous wellbeing. Each Indigenous group has unique cultural characteristics; however, throughout the world, many Indigenous peoples share socio-historical experiences, namely colonial dispossession and violence (United Nations Department of Economic and Social Affairs, 2017, 2019). Thus, although we focus on Māori, insights gleaned from this study may provide insights into the role of identity for Indigenous groups with a similar history to Māori – that is, sudden contact with a foreign cultural group followed by rapid mass settlement and subsequent political and economic takeover by that group (Samson & Gigoux, 2016). An examination of the history of Indigenous peoples’ experience in Australia, Canada, the United States of America, and New Zealand reveals notable similarities in this respect (Cassidy, 2003). The long-term consequences of colonization can be found in these nations today, where Indigenous peoples experience persistent discrimination (Martínez Cobo, 1983) as well as the worst statistics in the areas of health, crime, poverty, unemployment, incarceration, and alcohol and drug abuse in their respective societies (Adams et al., 2017; Anderson et al., 2016; Mitrou et al., 2014). Understanding the protective nature of in-group warmth for Māori may therefore shed light on in-group warmth as a protective factor for colonized Indigenous peoples who share a common history of marginalization. However, the study’s generalizability to other populations clearly needs scrutinizing. Indigenous peoples differ in many significant ways. It may be that degrees of commonality with respective Indigenous populations as to history and present-day advantage or disadvantage delimit generalizability. Ultimately, replication of similar research with different Indigenous populations can test the generalizability of findings and delineate which results are specific to Māori.

The paper has a number of other limitations. First there may be something unique about our sample of Māori who completed the NZAVS for the full seven-year period assessed compared to Māori who withdrew from the study during that period. Generally, Māori have been found to participate in



surveys at much lower rates than other New Zealanders (Fink et al., 2011; Ministry of Health, 2017) and are more likely to remove themselves from survey-based studies over time (Satherley et al., 2015). The fact that the survey was written in English may also be considered a limitation. Although nearly all Māori speak English as their first language, having the survey translated to *te reo Māori* (the Māori language) could enhance the validity of our findings by attracting a broader range of respondents, including Māori who are particularly enculturated (and perhaps experience higher level of ethnic identity centrality as a corollary).

The potential limitation of measures used also needs to be addressed. Because the in-group warmth measure we employed has not been widely employed as a measure among Indigenous peoples, further research is needed to ensure validity for assessing in-group warmth for Indigenous peoples. Notably, we used only three of the 10 items from the original Rosenberg Self-Esteem Scale (Rosenberg, 1965). The reason for use of the shorter scale is purely practical. The database we draw from, the New Zealand Attitudes and Values Study, is a 20-year longitudinal survey of social attitudes, personality, and health outcomes of more than 60,000 New Zealanders from all ethnic groups (Sibley, 2020). Because of the questionnaire's sheer length and breadth, and the challenge of retaining participants over many years, shorter scales are necessary to minimize participant burden and to maximize the chances of retention over time. In terms of Rosenberg Self-Esteem, shorter scales have been used for several decades and shown to have acceptable validity (Robins et al., 2001). The three-item self-esteem scale adopted for this analysis has been used elsewhere with Māori and found to correlate strongly with Māori cultural efficacy (that is confidence in expressing the self culturally as Māori including speaking the Māori language) (Matika et al., 2017), suggesting both reliability and validity. Even so, we acknowledge our measures for self-esteem (and in-group warmth) may be vulnerable to unknown biases in meaning and interpretation.

Indigenous peoples internationally have sought to counteract histories of cultural oppression and marginalization by emphasizing the value of enculturation (Zimmerman et al., 1992; Zimmerman et al., 1998). The reasoning is that understanding their own culture will instil in members the pride and self-worth to cope with and psychologically buffer discrimination and prejudice (Taylor, 1997). Congruent with previous research, our data show that ethnic minority individuals (in this case Māori) who feel positively about their ethnicity fare better on various measures of wellbeing. Given we did not study multiple dimensions of ethnic identity, however, we cannot say *why* these respondents feel warmly towards their group. We did not examine cultural levels of enculturation in this paper, nor did we ask respondents to report the extent to which they spent time with members from their own ethnic group. A sense of in-

group warmth may derive from expressing and sharing cultural skills and knowledge, as well as other sources which are not culturally unique to Māori, such as sporting or professional affiliations, shared formative conditions in urban contexts, and relationships with Māori in distinctively non-Māori cultural contexts. Further research should explore the relationships between cultural efficacy, wellbeing, and in-group warmth in order to clarify the patterns we see in these data.

**Author Contributions** This paper was initially conceptualized by CH, CS and JP, who contributed equally to the conception and design for this paper based on the work of JP. The data were gathered primarily by CS who leads the NZAVS. CH, PM, and LG are associated as researchers and therefore have access to the data for publishing purposes. All statistical analyses were conducted by PM, who also wrote the methodology section of the paper. CH wrote the first draft of the introduction and discussion, LG contributed by writing and editing sections and KD provided crucial feedback. CH addressed the required revisions once the paper had been reviewed and CS rechecked the statistical analyses and the accuracy of the tables and figures. LG, PM, CS and KD reviewed the final draft of the paper prior to submission.

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**Data Availability** Due to potentially identifying information, a copy of the anonymous data reported in each NZAVS publication is available from Chris Sibley upon request from appropriately qualified researchers. Such data will be provided with the explicit understanding that they are used solely for the purposes of replicating or otherwise checking the validity of analyses reported in scientific papers analysing NZAVS data. Mplus syntax for the models reported here will also be posted on the NZAVS website upon acceptance (<http://www.psych.auckland.ac.nz/uoa/NZAVS>).

## Declarations

**Ethics Approval** This study was approved by The University of Auckland Human Participants Ethics Committee on 3 June 2015 for the period of 3 June 2015 until 3 June 2018, and renewed on 5 September 2017 for the period of 5 September 2017 until 3 June 2021 (Reference Number: 014889). Informed consent was obtained from all individual participants included in the study.

**Competing Interests** The authors have declared that no competing interests exist.

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