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REDUCING HEALTH INEQUITIES THROUGH KĪ-O-RAHI: THE ROLE OF INTRINSIC MOTIVATION

Patrick Boudreau, Tyson Huia, Heperi Harris, Peter Olsen and Helen Marshall

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REDUCING HEALTH INEQUITIES THROUGH KĪ-O-RAHI: THE ROLE OF INTRINSIC MOTIVATION

Patrick Boudreau, Tyson Huia, Heperi Harris, Peter Olsen and
Helen Marshall

INTRODUCTION

Māori people face persistent health inequities compared to other groups in Aotearoa New Zealand (Gustafson et al., 2024; Hobbs et al., 2019). In a review of healthcare in Aotearoa New Zealand, Brown and Bryder (2023) found cultural and ethnic differences were not adequately accommodated by governmental policies, which may explain the Government's failure to reduce inequities. Nevertheless, recent Governments have set specific priorities to improve the health and wellbeing of Māori and Pacific peoples and have advocated that, to change the status quo for Māori, a whānau-centred approach that celebrates Māori culture is needed to improve health outcomes (Government of New Zealand, 2019). Consequently, there is a need to find innovative public health approaches to reduce health inequities that are designed for Māori by Māori (Eggleton et al., 2018; Rolleston et al., 2022; Severinsen & Reweti, 2017).

A review by McHugh et al. (2019) suggested that sport and recreation can offer Indigenous youth meaningful opportunities to strengthen community ties, engage with positive role models, and deepen their cultural connections. While McHugh et al.'s (2019) review was restricted to the Canadian context, the authors believe their findings may have relevance to Indigenous people in other countries where colonisation has occurred. A sport that may resonate with the Aotearoa New Zealand context is kī-o-Rahi. Kī-o-Rahi is a traditional Māori sport, inspired by the pūrākau (story) of Rahitutakahina and the rescue of his wife Tiarakurapakewai, played on a circular field and blending elements of tag, handball, and rugby. The sport incorporates te ao Māori (the Māori world view) and therefore can be a way of passing down beliefs, traditions, and protocols from one generation to the next within a physical activity context (Palmer et al., 2009). Specifically, kī-o-Rahi incorporates mātauranga Māori (traditional Māori knowledge) and tikanga (cultural practices, customs), and supports hauora (a holistic, Māori perspective of health). As a tākaro Māori (Māori sport or game), kī-o-Rahi all but disappeared in Aotearoa New Zealand due to European colonisation, as the sport was seen as a barrier to the uptake of Christianity by Māori (Smith & Smith, 2023). Owing to ongoing effects of colonisation, there has been minimal research on the sport, as participation in the tākaro was not encouraged and only played in informal settings. However, since the 1970s, kī-o-Rahi has been growing in popularity throughout Aotearoa New Zealand (Smith & Smith, 2023). The purpose of this research was to understand the motivations that underpin participation in kī-o-Rahi today.

A scoping report on kī-o-Rahi as a health-based intervention found that most participants felt they had a physical workout from kī-o-Rahi and increased their strength and coordination as a result of playing the game (Palmer et al., 2009). Other benefits of the game included that it catered to a wide range of skill and fitness levels, provided an opportunity for interaction between ethnicities, genders, age and peer groups, and allowed the expression of Māori identity and pride (Palmer et al., 2009). Consequently, Palmer and colleagues (2009) indicated that kī-o-Rahi could be used to encourage healthy living in groups at risk of poor health outcomes.

Research by Eggleton et al. (2018) found a kaupapa Māori exercise programme by Māori, for Māori, and underpinned by a Māori world view significantly reduced weight, and improved blood pressure and mental wellbeing measures. The authors attributed the success of the programme in part to the use of kaupapa Māori principles, and their findings strengthen the argument that health programmes need to be designed by Māori, for Māori to reduce health inequities. The findings of Eggleton et al. (2018) and research by Palmer and colleagues indicate an Indigenous sport such as kī-o-Rahi may be useful in health-based interventions for Māori. Harris et al. (2021) examined the physical demands of the tākaro in a secondary school tournament and found the game was of sufficient intensity and duration to improve health and fitness. Burton (2022) also found that kī-o-Rahi participants tended to perceive lower exertion levels than would typically be expected based on objective measurements of effort such as heart rate. The research on the physical demands of kī-o-Rahi by Harris et al. (2021) and Burton (2022) indicates that the tākaro may have positive hauora (wellbeing) outcomes for participants in an exercise or health programme.

A key aspect of encouraging people to be active is determining what motivates them to participate in physical activity (Rhodes et al., 2021). This information can then be used to design a programme that meets the specific needs of an individual or group. To date, however, the psychological antecedents that underpin participation in kī-o-Rahi remain understudied. A general motivational theory that may help to unpack the reasons for participation is the self-determination theory (SDT). According to the SDT, all individuals are motivated to satisfy three basic psychological needs: competence, autonomy, and relatedness (Ntoumanis, 2023). Competence relates to the need to feel accomplished, knowledgeable, and skilful (for instance, a kī-o-Rahi player may feel like they are a good thrower). Autonomy is the need to feel that one is in control of their own behaviours (for example, a kī-o-Rahi player may experience a sense of volition when choosing their position). Relatedness concerns one's sense of belonging and connectedness (a kī-o-Rahi player may feel like they are supported by their team, for example). According to Deci and Ryan (1985), the extent to which an athlete can have these psychological needs met in turn determines the type of motivation they will have. Namely, an athlete whose psychological needs are fulfilled will have more intrinsic motivation for the activity in question.

Self-determination theory provides an explanation of motivation that does not only consider the quantity of an individual's motivation (in other words, is an individual highly motivated to take part in an activity or not), but also the quality of an individual's motivation. According to Deci and Ryan (1985), motivation can be categorised into two main types: Controlled motivation, which is driven by external forces, and autonomous motivation, which stems from internal, self-directed processes. Within these categories, five different types of behavioural regulation are identified and positioned along a continuum of self-determination.

Intrinsic motivation represents the most self-determined form, where individuals engage in activities out of personal interest or enjoyment. While the developers of SDT initially viewed intrinsic motivation as a single construct, Vallerand (1997) later distinguished three facets: intrinsic motivation to know, intrinsic motivation toward accomplishments, and intrinsic motivation to experience stimulation. Regardless of this distinction, intrinsic motivation entails participating in activities for their inherent enjoyment value.

Extrinsic motivation involves engaging in activities because of forces outside the individual (to attain external rewards, for example). Four types of motivational regulation characterise extrinsic motivation: external and introjected are considered controlled styles, while identified and integrated regulations are seen as autonomous regulations. External regulation involves participating to obtain rewards or avoid punishment, while introjected regulation involves internal pressures such as guilt or shame. By contrast, identified regulation occurs when individuals personally value the outcomes of an activity (for instance, an athlete may exercise at the gym to become fitter for their preferred sport), while integrated regulation involves aligning the activity with deeply held values and one's sense of identity.

Finally, amotivation represents a state of lacking motivation, characterised by a sense of apathy or disengagement. Individuals experiencing amotivation lack self-determination and may question their continued participation. Deci and Ryan (1985) suggest that the type of motivation influences psychological outcomes. Autonomous motivation is linked to adaptive outcomes such as wellbeing, while controlled motivation is associated with maladaptive consequences like burnout and anxiety (Shannon et al., 2023).

High levels of intrinsic motivation and autonomously self-regulated forms of extrinsic motivation (integrated or identified) can have a positive impact on athletes' and exercisers' continued participation in physical activity. Therefore, we undertook a study to examine the types and levels of motivation that participants in kī-o-Rahi may have. The overall aim of this research was to determine if participation in kī-o-Rahi is motivated by autonomous or controlled types of motivation.

METHODOLOGY

Participants and procedures

Data was collected during a community kī-o-Rahi tournament (N = 34; 12 women, 22 men) in Ōtautahi Christchurch, Aotearoa New Zealand. Specifically, kī-o-Rahi players in a regional tournament were approached during rest periods between games. Sixteen participants agreed to complete the pen and paper Behavioural Regulation in Sport Questionnaire and demographic questions. An additional 18 participants completed the same questionnaire online, for a total of 34 participants. Participants recruited for online completion of the questionnaire were additionally invited to answer an open-ended question. Both face to face and online participants were afforded an opportunity to win one of two gift vouchers as compensation for participation.

The age of participants ranged from 13 to 69 years old (27.5 ± 14.3). Participants ranged from having only three days of kī-o-Rahi experience to six years (5.1 ± 4.1). Twenty-four participants identified as Māori and 10 participants identified as New Zealand European/Pākehā. Informed consent was gained prior to the completion of the survey and ethical approval was attained from the authors' Institutional Ethics Board. Players were informed of the benefits and risks of the investigation prior to giving written consent to participate in the study.

Instrument

The Behavioural Regulation in Sport Questionnaire (BRSQ) was used to quantify kī-o-Rahi participants' motivation. The BRSQ was designed to measure motivation in sport and is comprised of 24 items across six subscales to represent intrinsic motivation, the four extrinsically motivated regulations (integrated, identified, introjected, external), and a subscale for amotivation. The BRSQ was chosen for its reliability and validity as demonstrated in previous studies (Clancy et al., 2017), and because it provided a brief measure that was deemed convenient for participants. Lonsdale et al. (2008) reported a confirmatory factor analysis for the BRSQ that produced fit statistics that were considered strong and met cut-off criteria suggested by Hu and Bentler (1999).

Statistical analysis

Descriptive statistics regarding the mean and standard deviation of each type of motivation were provided. A comparison utilising an independent sample T-Test was made between the mean intrinsic motivation level of participants in the current study and previous published data on New Zealand athletes (Lonsdale & Hodge, 2011).

Qualitative content analysis

A qualitative content analysis was conducted to explore participants' motivation to take part in kī-o-Rahi. Participants who completed the online survey (n = 18), were asked to respond to the additional open-ended question: "What do you enjoy about kī-o-Rahi? (List up to 3 things)." The responses to this question are available

on request. The qualitative content analysis involved several key steps to ensure the robustness and credibility of findings (Charmaz, 2014). To achieve this, the initial coding of the responses was performed by the first author. This process involved reading all the responses multiple times to become thoroughly familiar with the data. The first author then identified initial codes that captured significant aspects of the participants' motivation to take part in kī-o-Rahi. These codes were derived directly from the data, ensuring that they were grounded in the participants' own words and experiences (Charmaz, 2014). Next, the initial codes were grouped under broader themes. This thematic analysis was an iterative process, involving comparison and refinement of the codes to ensure that they accurately represented the data. The first author developed a preliminary set of themes, which were then reviewed and refined in collaboration with all authors. This collaborative review process helped to enhance the credibility of the analysis by incorporating multiple perspectives and ensuring that the themes were comprehensive and representative of the data. The frequency of each theme was then calculated and reported.

RESULTS

Descriptive statistics

Overall, participants reported high levels of intrinsic motivation and relatively high levels of the autonomous forms of extrinsic motivation (integrated and identified regulation).

	INTRINSIC	INTEGRATED	IDENTIFIED	INTROJECTED	EXTERNAL	AMOTIVATION
MEAN	6.69	4.24	4.76	2.15	2.50	1.66
STD. DEVIATION	0.54	0.98	0.88	1.18	1.29	0.75

Table 1. Average mean and standard deviation for six diverse types of motivation reported by kī-o-Rahi players (N = 34) on a seven-point Likert scale.

Comparison with previous research

The average level of intrinsic motivation reported by participants in the current study appears to be meaningfully greater than the average intrinsic motivation levels of athletes from previous New Zealand studies on other sports, such as rugby and football. The average intrinsic motivation score in the present study ($M = 6.69$, $SD = 0.54$) was significantly higher than values previously reported for New Zealand athletes (Lonsdale & Hodge, 2011). The mean difference was 0.56, $t(213) = 3.18$, $p = .002$, 95 percent CI [0.21, 0.91], $SE = 0.18$.

Qualitative indicators of enjoyment

Connection to Māori culture and the opportunity to relate to others were the most frequent answers provided to the question of why participants enjoyed playing kī-o-Rahi. For instance, one participant shared that, for them, the most important thing about kī-o-Rahi was the people involved. Specifically, they used the whakataukī (saying): “He aha te mea nui o te ao? He tangata, he tangata, he tangata [What is the most important thing in the world? It is people!].”

In addition, the opportunity to be immersed in a game incorporating te ao Māori (the Māori worldview) was an essential aspect of participants' motivation to play kī-o-Rahi. For example, the rules of the game are agreed upon prior to the start of each tournament, which reflects community decision making. Participants also mentioned the importance of being able to speak te reo Māori during and between games. One participant specifically identified the meaning and purpose they found in kī-o-Rahi as a reason they continued playing. For instance, this participant said:

I love how [...] it is all about te ao Māori and actually connecting with our culture while also enjoying a game, I like how it brings different kura [schools] together allowing for new connections/friendships, [and] I also enjoy how competitive it is.

The opportunity for a more nuanced experience of competition was also enjoyed by participants. Although some participants mentioned the enjoyment they received from competition and winning, most participants described how competition was more of a means to an end, with the end being connection and community. One participant described how kī-o-Rahi allows athletes to “not feel the pressure of competition (being there to participate and being Māori first before being a number [and instead of] westernised ideologies of participating solely to win).”

Theme	Frequency Count (N = 18)
Whakawhānaungatanga (Connecting with others)	12
Te ao Māori (Culture)	10
Nuanced aspects of competition	3
Te reo Māori (Language)	2
Inclusivity	2

Table 2. Frequency count of themes for participating in kī-o-Rahi identified by respondents to the online version (n = 18) of the questionnaire's open-ended question.

DISCUSSION

The findings of this study underscore the potential of kī-o-Rahi as a culturally relevant intervention to address health inequities among Māori. The elevated levels of intrinsic motivation and autonomous forms of extrinsic motivation reported by participants suggest that kī-o-Rahi is not only enjoyable but also aligns well with the psychological needs outlined in self-determination theory (Ryan & Deci, 2020). This alignment is crucial as it indicates that participants are likely to engage in kī-o-Rahi out of genuine interest and personal value, which are key factors for sustained participation and positive health outcomes (Ntoumanis, 2023).

The literature highlights the persistent health inequities faced by Māori and the need for culturally tailored health interventions (Gustafson et al., 2024; Hobbs et al., 2019). Traditional health policies have often failed to accommodate cultural and ethnic differences, leading to ineffective outcomes (Brown & Bryder, 2023). In contrast, sport and recreation, particularly Indigenous sports like kī-o-Rahi, offer a promising avenue for health promotion. The cultural significance of kī-o-Rahi, which incorporates mātauranga Māori and tikanga, provides a unique platform for promoting physical activity while reinforcing cultural identity and community bonds (Palmer et al., 2009; Smith & Smith, 2023).

The motivational aspects of kī-o-Rahi are particularly noteworthy. The elevated levels of intrinsic motivation reported by participants are significantly higher than those found in previous studies of New Zealand athletes

(Lonsdale & Hodge, 2011). This suggests that *kī-o-Rahi* is particularly engaging for its participants, likely due to its cultural relevance and the fulfilment of psychological needs such as relatedness (Deci & Ryan, 1985). The qualitative data further supports this conclusion, with participants frequently citing connection to Māori culture and community as key reasons for their enjoyment of the sport.

Anecdotally, one participant in the current study indicated that they did not feel like they were working hard despite having an elevated heart rate during their games. This perception aligns with Burton's (2022) findings that *kī-o-Rahi* participants tend to perceive lower exertion levels than would typically be expected based on objective measurements of effort. This suggests that the enjoyment and engagement in the game may mask players' physical exertion, making it a particularly appealing form of exercise. These findings support the notion that *kī-o-Rahi* can be an effective health intervention, particularly for Māori communities.

The themes identified in the qualitative analysis, such as *whakawhānau* (connecting with others) and *te ao Māori* (cultural immersion), highlight the broader social and cultural benefits of *kī-o-Rahi*. These aspects are crucial for fostering a sense of belonging and identity, which are important for psychological wellbeing. The nuanced experience of competition in *kī-o-Rahi*, where the focus is on participation and community rather than solely on winning, aligns with Māori values and provides a more inclusive and supportive environment for physical activity.

The broader implications of these findings are significant. The integration of traditional Māori knowledge and practices into health interventions not only enhances their effectiveness but also ensures cultural relevance and acceptance. This approach aligns with the principles of *Te Tiriti o Waitangi*, which emphasises partnership, protection, and participation (Sheridan et al., 2024). By promoting *kī-o-Rahi* and similar Indigenous sports, policymakers and health practitioners can address health inequities in a manner that respects and celebrates Māori culture. Specific recommendations include further promoting *kī-o-Rahi* within *kura* (schools) and community centres. Additionally, public health agencies such as *Te Whare Hauora* could incorporate *kī-o-Rahi* into wellbeing programmes, particularly in regions with high Māori populations.

The current study provides compelling evidence that *kī-o-Rahi* can be an effective tool for reducing health inequities among Māori by promoting physical activity in a culturally relevant and intrinsically motivating way. Future research should continue to explore the long-term health impacts of *kī-o-Rahi* and other Indigenous sports, as well as their potential to be scaled up as public health interventions. Additionally, there is a need to investigate the specific mechanisms through which *kī-o-Rahi* influences health outcomes, including the roles of social support, cultural identity, and psychological wellbeing. This comprehensive approach will provide a deeper understanding of how Indigenous sports can contribute to health equity and inform the development of effective, culturally grounded health interventions.

Limitations

This study provides valuable insights into the motivational aspects of *kī-o-Rahi* and its potential as a culturally relevant health intervention for Māori. The use of the Behavioural Regulation in Sport Questionnaire provided a reliable and valid measure of diverse types of motivation, allowing for a nuanced understanding of participants' motivational profiles. However, several limitations should be acknowledged. First, some participants in the study had minimal experience with *kī-o-Rahi*, ranging from only a few days to several years. This variation in experience levels could have influenced the results. Participants with more experience might have different motivational drivers compared to those who are new to the sport. Future studies should consider stratifying participants based on experience level to better understand the impact of experience on motivation to take part in *kī-o-Rahi*. Furthermore, the generalisability of the findings might be impacted by the gender imbalance of participants and the small sample size. Finally, minimal qualitative data was obtained for this study, which limits the depth of understanding regarding why participants enjoyed *kī-o-Rahi*. While the open-ended question provided some insights, a more comprehensive qualitative approach, such as in-depth interviews or focus groups, could offer richer data.

CONCLUSION

This study highlights the significant potential of *kī-o-Rahi* as a culturally relevant intervention to address health inequities among Māori. The findings demonstrate that participation in *kī-o-Rahi* is driven by elevated levels of intrinsic motivation and autonomous forms of extrinsic motivation. This suggests that participants engage in *kī-o-Rahi* out of genuine interest and personal value, which are crucial for sustained participation and positive health outcomes. The elevated levels of intrinsic motivation reported by participants are significantly higher than those found in previous studies of New Zealand athletes, suggesting that *kī-o-Rahi* is particularly engaging, perhaps because of its cultural relevance and the fulfillment of psychological needs experienced by participants. Qualitative data further supports this, with participants frequently citing connection to Māori culture and community as key reasons for their enjoyment of the sport.

Patrick Boudreau, PhD (Otago), is a Senior Lecturer in Health, Sport, and Exercise Psychology at the Ara Institute of Canterbury. His research in behavioural medicine makes use of qualitative and quantitative methodologies.

 <https://orcid.org/0000-0002-5232-9348>

Tyson Huia (Ngāti Maniapoto, Ngāti Whātua, Ngāti Tama, Ngāruahine), MAppSc, is a Lecturer in Sport and Exercise Science. Previously, Tyson was a strength and conditioning coach in Southland, working with athletes across a variety of sports.

Heperi Harris, Master of Māori and Indigenous Studies, has spent 16 years in education, as a tutor, kaiako, manager, and now Kaupapa Māori Lead at Ara-Te Pūkenga. Heperi has developed a deep passion for Te Reo Māori, Indigenous Education, language revitalisation, giving effect to Te Tiriti o Waitangi, and Te Ao Māori pedagogical practice. He has also spent 11 years advocating for taonga tākaro, Māori games, and pastimes.

Peter Olsen, PhD (Otago), is a Principal Lecturer in Sport Science. His research has an applied focus that investigates sport performance in real world settings, with a specific interest in equity issues in the provision of sport science support and research.

 <https://orcid.org/0000-0001-7815-215X>

Helen Marshall, PhD, is a Senior Lecturer at Ara and the coordinator for the Health Promotion (BAppSci) degree. Helen's main interest lies within physical activity for health, particularly relating to the prevention and management of chronic disease.

 <https://orcid.org/0000-0002-8271-8969>

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