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**Testing the Correspondence Between Self-Reported and Actual Culturally Valued
Behaviours in Māori Students Across Māori and Non-Māori Environments**

A thesis
submitted in partial fulfilment
of the requirements for the degree
of
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MARIAH-PAIGE SHADROCK



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Abstract

Keywords: Applied behaviour analysis (ABA); Culturally valued behaviour (CVB); Māori Cultural Embeddedness Scale (MaCES); helping behaviour; correspondence; self-report; Kaupapa Māori

Applied Behaviour Analysis (ABA) views culture as a network of interrelated behaviours maintained by social reinforcement within a shared verbal community (Baer et al., 2005; Bishop et al., 2009; Skinner, 1957). Within this framework, culturally valued behaviours (CVBs) for Māori—such as helping and contributing to the collective—are shaped and sustained through social consequences that reflect shared cultural practices (Baum, 2005; Bishop et al., 2009; Skinner, 1957). Despite their importance, these behaviours are rarely observed directly; researchers often rely on self-report measures, which represent a form of verbal behaviour available only to the speaker (Nisbett & Wilson, 1977; Skinner, 1957). Studies indicate that self-reported behaviours and observable actions often correlate only modestly (Baumeister et al., 2007; Dang et al., 2020), suggesting that verbal endorsements of values or intentions may not reliably predict actual behaviour.

The Māori Cultural Embeddedness Scale (MaCES; Durie, 2001; Fox et al., 2023; Mead, 2003) was developed to assess engagement with Māori cultural values and practices. However, it remains unclear whether Māori individuals' self-reported behaviours, as measured by the MaCES, reflect their actual behaviour (Durie, 2001; Fox et al., 2023; Mead, 2003). From an ABA perspective, correspondence between reported and observed behaviours must be demonstrated empirically rather than assumed (Cooper et al., 2020; Michael, 1982; Skinner, 1953).

Guided by both ABA and Kaupapa Māori principles (Bishop, 1996; Bishop & Berryman, 2006, 2009; Smith, 1999), the present study addressed this gap by examining the

alignment between Māori students' self-reported and directly observed helping behaviour in Māori and non-Māori environments. Self-reported CVB was assessed using the Culturally Valued Behaviour Scale (CVB), a Māori cultural values and practices survey. One item (Q12) was drawn from the MaCES and was explicitly related to helping and used to analyse culturally valued helping behaviour (Durie, 2001; Fox et al., 2023).

Twenty-three Māori students participated and were randomly assigned to either Te Kohinga Mārama Marae or a standard university psychology laboratory. Participants set up the room, completed the CVB (during which the observer intentionally dropped papers), and then packed up, while helping behaviours were recorded. Spearman's rho assessed the correspondence between self-reported and observed helping within each context (Field, 2018). An independent t-test examined differences by environment and sex, while ANOVA assessed differences across age groups (Cohen, 1992).

Results showed no significant correspondence between self-reported helping (Q12) and observed helping in either setting. Helping frequency remained consistently high across both environments, with no significant differences by environment, sex, or age. The CVB demonstrated acceptable internal consistency ($\alpha = .743$), although item-level analyses suggested that behaviours clustered rather than showing uniform endorsement (Fox et al., 2023). Qualitative responses indicated that participants' helping was motivated by intrinsic prosocial values rather than direct demands or perceived obligation (Baum, 2005; Biglan & Glenn, 2013).

Overall, the findings suggest limited “say-do” correspondence for culturally valued behaviour in this sample (Baer et al., 1968; Nisbett & Wilson, 1977). Verbal endorsements of helping appeared to be governed by different contingencies than overt behaviour. Contrary to expectations, the Māori environment did not increase helping frequency or strengthen correspondence relative to the non-Māori setting. These results contribute to Māori-centred

behavioural research by highlighting the complexity of measuring culturally valued behaviours and emphasizing the value of multimethod approaches that combine Kaupapa Māori perspectives with direct behavioural observation (Bishop et al., 2009; Smith, 1999). Future research should explore additional culturally grounded behaviours, expand opportunities for helping, examine how environmental contingencies within Māori settings may more strongly evoke or differentiate culturally valued actions, and investigate the difference between mandated versus naturalistic behaviours to better understand how culturally valued actions are expressed across contexts (Cooper et al., 2020; Michael, 1993).

Preface and Acknowledgements

“He aha te mea nui o te ao? He tāngata, he tāngata, he tāngata.”

(What is the most important thing in the world? It is people, it is people, it is people.)

I would like to acknowledge the people who have supported me throughout this journey.

To my whānau and friends – thank you for your ongoing encouragement, love, and belief in me. Your support carried me through long nights of study and moments of doubt.

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To Emerge Aotearoa – thank you for providing an environment where I could grow both personally and professionally. My mahi with Rangatahi has shaped my passion and strengthened the purpose behind this work.

To everyone who has offered guidance, kindness, or encouragement – thank you. I am deeply grateful.

Karakia

Kia hora te marino

Kia whakapapa pounamu te moana

Hei huarahi mā tātou i te rangi nei

Aroha atu, aroha mai

Tātou I a tatou katoa

Hui e! Tāiki e!

May peace be widespread

May the sea be like greenstone

A pathway for all this day

Let us show respect for each other

For one another

Bind us all together!

Table of contents

Abstract	ii
Preface and Acknowledgements	v
Table of contents	vii
List of Tables	xi
List of Figures	xii
Glossary	1
Chapter 1: Introduction	1
Culture and Applied Behaviour Analysis (ABA)	1
Culturally Valued Behaviour and Māori	2
<i>Behaviour Principles in Context</i>	4
Cultural Embeddedness	6
Self-Reports as Verbal Behaviour	9
Observable Behaviour and Self-Reports	11
The Present Study	12
Statement of the Problem	14
Research Questions and Hypotheses	15
Significance of the Study and Its Contributions	16
Chapter 2: Literature Review	17
Operant and Respondent Foundations	17
<i>Operant Behaviour</i>	17
<i>Respondent Behaviour</i>	18
Self-Reports as Verbal Behaviour	21
Behavioural Correspondence	22
Cultural Embeddedness	25
Educational and Cultural Context Research	26
Gaps in the Literature	28
<i>Lack of Māori Observed Behaviour-Correspondence Research in Indigenous Cultural Settings</i>	28
<i>Lack of Culturally Responsive Instruments in Psychology, Education, and Health</i>	29
<i>Over-Reliance on Self-Report Measures in Cultural Participation Research</i>	29
<i>Lack of Applied Behaviour Analysis (ABA) Integration with Māori Cultural Research</i>	30

<i>Lack of Context-Specific Environmental Comparisons Between Māori and Non-Māori Settings</i>	30
<i>Limited Research on Cultural Embeddedness and Helping Behaviour</i>	31
Chapter Summary.....	31
Purpose of the study	32
Chapter 3: Method	33
Participants	33
<i>Sample and Recruitment</i>	33
<i>Allocation</i>	33
<i>Exclusion Criteria</i>	33
Research Design	34
<i>Predictor Variable</i>	34
<i>Rationale</i>	34
Materials.....	34
<i>Culturally Valued Behaviour Survey</i>	34
<i>Cultural Embeddedness</i>	35
<i>Post-Session Questionnaire</i>	35
<i>Behavioural Observation Forms</i>	36
<i>Staged Tasks Materials</i>	36
<i>Environments</i>	36
Procedure.....	37
<i>Recruitment and Consent</i>	37
<i>Session Preparation</i>	37
<i>Māori Environment Protocol (Te Kohinga Mārama Marae)</i>	38
<i>Non- Māori Environment Protocol (Psychology Lab)</i>	38
Observer Role and Interobserver Agreement (IOA)	39
Ethical considerations	39
Data Analysis	40
<i>Software and data handling</i>	40
<i>Coding Measures</i>	40
<i>CVB Scoring and Reliability</i>	41
<i>Descriptive Statistics</i>	41
<i>Between-group comparisons</i>	41

<i>Correlation Analyses</i>	41
<i>Missing data</i>	42
<i>Visualization</i>	42
Replication guidelines	43
Chapter Summary	44
Chapter 4: Results	45
<i>Internal Consistency of the CVB Scale</i>	45
Descriptive Statistics	47
Scatterplots and Bar Graphs	49
Spearman's rank-order correlations	52
Independent T-Tests	54
ANOVA Test	55
Post-Session Questionnaire data	56
Chapter 5: Discussion	57
Overview and Key Findings	57
What the Findings Mean	58
<i>Limited Correspondence Between Saying and Doing</i>	58
<i>No Environmental Effects</i>	59
<i>Procedural Equivalence may Have Flattened Differences.</i>	61
<i>Helping Behaviour Generalisation.</i>	61
<i>Opportunity Density and Ceiling Effects.</i>	62
<i>No Differences by Sex or Age</i>	62
<i>Behavioural Clustering</i>	63
Comparing Previous Research	63
Methodological Considerations and Limitations	64
<i>Small, Imbalanced Subgroups</i>	64
<i>Opportunity Density and Range</i>	65
<i>Mand vs. Spontaneous Helping</i>	65
<i>Ecological Fidelity of Cues</i>	66
<i>Measurement Pairing and Scale</i>	66
<i>Demand and Reactivity Checks</i>	66
Theoretical and Practical Implications	67
<i>Verbal Behaviour (Self-Report)</i>	68

<i>Observed Behaviour (Overt)</i>	68
Applied Practice	69
<i>Engineering Antecedents and Motivating Operations That Invited Spontaneous Helping.</i>	69
<i>Teach for Generalisation of Helping Behaviours</i>	70
<i>Use Behaviour-Congruent Feedback.</i>	70
Future Research.....	71
<i>Increase Opportunity Density and Observation Duration</i>	71
<i>Disaggregating Different Types of Helping Behaviours</i>	72
<i>Task-Proximal Verbal Probes</i>	72
<i>Stronger Environmental Cultural Signals</i>	73
<i>Manded vs. Spontaneous Helping</i>	74
<i>Sample size and Demographic Balance</i>	75
Conclusion.....	75
References.....	1
Appendix.....	1

List of Tables

Table	Title	Page
Table G1	Inter-Item Correlation Matrix for Scale Items (Q1–Q25)	103
Table G2	Item-Total Statistics for Scale Items (Q1–Q25)	46
Table G3	Scale Reliability Statistics	47
Table G4	Descriptive Statistics for Self-Reported Rating and Observed Behaviours in the Laboratory Environment (N = 12)	48
Table G5	Descriptive Statistics for Self-Reported Rating and Observed Behaviours in the Marae Environment (N = 11)	49
Table G6	Spearman correlations among self-reported rating and observed behaviours (N = 23)	53
Table G7	Spearman correlations among self-reported rating of the Culturally Valued Behaviour Scale, Total Observed Behaviour and Question 12(N = 23)	53
Table G8	Independent Samples t Tests Comparing Total Frequency Across Sex and Environment	55
Table G9	One-Way ANOVA Comparing Self-Reported Helping Behaviour (Q12) and Total Observed Helping Behaviour Across Sex Groups	56

List of Figures

Figure	Title	Page
Figure F1	Total Observed Helping Behaviour versus Self-Reported Helping Behaviour (Q12.)	50
Figure F2	Total Observed Helping Behaviour across age groups in different environments	51
Figure F3	Total Observed Helping Behaviour across sex groups in different environments	51
Figure F4	Mean score for observed helping behaviours, the total frequency and self-reported scores (Q12).	52

Glossary

Term	Definition
Hui	A meeting or gathering for discussion, planning, collective decision-making, or strengthening relationships, guided by tikanga.
Kai	Food
Karanga	A ceremonial call performed by women during a pōwhiri, initiating the connection between hosts and visitors and guiding the spiritual and relational transition onto the marae
Karakia	A prayer, incantation, or spiritual invocation used to open, guide, and close gatherings or activities, providing protection and alignment with tikanga.
Kaitiakitanga	Stewardship, or a cultural and spiritual responsibility of guardianship, involving care and protection of people, land, natural resources, and taonga for current and future generations.
Kohitanga	A principle emphasising unity, togetherness, and collective action in pursuit of shared goals and communal wellbeing.
Mahi rangatira	Collective wellbeing or behaviours and leadership actions that uphold collective wellbeing, humility, integrity, and cohesion within a group or community.
Manaakitanga	A core Māori value involving generosity, respect, and care toward others, enhancing the mana of both host and guest.
Manuhiri	Visitors or guests welcomed onto a marae or into a space, typically cared for and hosted with manaakitanga.
Marae	A traditional Māori communal space, including the wharehau (meeting house) and surrounding grounds, where cultural practices, gatherings, and ceremonies occur.
Pōwhiri	A formal welcoming ceremony, typically held on a marae, involving karanga, whaikōrero, waiata, and hongi to establish relationships and mutual respect.
Pūrākau	Traditional Māori narratives, stories, and oral histories used to teach cultural values, ethics, identity, and knowledge across generations.
Tangihanga	A formal Māori mourning and funeral process held on the marae, guided by tikanga, honouring the deceased and supporting the bereaved whānau.

Taonga tuku iho	Heirloom, something handed down, cultural property, heritage.
Tino rangatiratanga	Self-determination, sovereignty, autonomy, self-government, domination, rule, control, power.
Tikanga-guided practice	Actions or behaviours carried out according to tikanga — Māori customs, values, and protocols — ensuring culturally respectful and appropriate conduct.
Wairua	The spiritual dimension or essence of a person, place, or situation, referring to intuition, energy, connectedness, and non-physical aspects of wellbeing.

Māori Dictionary. (n.d.). *Māori Dictionary* | *Te Aka*. <https://maoridictionary.co.nz/>

Chapter 1: Introduction

Culture and Applied Behaviour Analysis (ABA)

Applied Behaviour Analysis (ABA) examines how behaviours are shaped and maintained through interactions with the environment (Cooper et al., 2020; Skinner, 1953). It focuses on the functional relationships between behaviour and environmental contingencies, emphasising observable, measurable actions (Cooper et al., 2020; Skinner, 1953). Central to ABA is the idea of *socially important behaviour*, actions that matter in individuals' daily lives and communities (Baer et al., 1968). Importantly, socially important behaviours are culturally defined; they depend on the values, expectations, and reinforcement contingencies specific to a particular community (Baum, 2005; Glenn, 2004). Within Māori contexts, these socially important behaviours gain meaning through *tikanga* (customs, practices and protocols) (Durie, 2001; Mead, 2003). As well as behaviours such as *manaakitanga* (providing care and hospitality), *whanaungatanga* (building and maintaining relationships), and the collective preparation and sharing of *kai* (food) are highly valued (Durie, 2001; Mead, 2003). For example, on a marae, individuals of all generations work together to prepare food, organise spaces, and care for elders (Mead, 2003). These practices reinforce social relationships and cultural identity, showing what is considered socially important in Māori settings (Durie, 2001; Mead, 2003).

From a behavioural perspective, culture itself can be seen as patterns of shared contingencies that shape and sustain behaviour over time (Baum, 2005; Glenn, 1988, 2004). Cultural practices persist because they are continuously reinforced within families, schools, communities, and broader social institutions, forming functionally maintained behavioural systems rather than abstract customs (Baum, 2005; Biglan & Glenn, 2013; Glenn, 1988,

2004). Understanding cultural contingencies allows researchers to identify the factors that promote prosocial and adaptive behaviours at both individual and community levels. Recognising culture as a system of contingencies also shapes research methodology because behavioural studies must be sensitive to the cultural settings where behaviours occur (Smith, 1999). Indigenous scholarship highlights the need for approaches that validate local knowledge and avoid imposing external assumptions (Smith, 1999). In Aotearoa, New Zealand, research consistently shows that culturally sensitive environments are essential for Māori wellbeing and educational success (Bishop et al., 2009; Durie, 2001). Collectively, these insights highlight that Māori behaviour can only be fully understood within the cultural systems that shape it (Durie, 2001; Mead, 2003).

This thesis situates culturally valued behaviours within an ABA framework while acknowledging the influence of Māori cultural settings. It examines the correspondence between self-reported and directly observed helping behaviours among Māori students, using an operant framework grounded in *Te Ao Māori* (The Māori world). Rather than treating culture as broader it is conceptualised as an active system of contingencies that prompt, reinforce, and sustain behaviour (Baum, 2005; Glenn, 2004). Integrating behavioural science with culturally grounded perspectives allows this research to advance a contextually responsive application of ABA in Aotearoa (Durie, 2001; Smith, 1999). The methodology aligns with Kaupapa Māori ethics, incorporating principles such as *tino rangatiratanga* (self-determination) and *taonga tuku iho* (cultural heritage) while ensuring ongoing consultation and partnership with Māori community representatives. This collaboration reflects relational accountability and reciprocity throughout the research process (Durie, 2001; Mead, 2003; Smith, 1999).

Culturally Valued Behaviour and Māori

Culture is a living system of shared meanings, values, practices, and learned

contingencies that guide behaviour in specific social, historical, and environmental contexts (Durie, 2001; Mead, 2003). Within Applied Behaviour Analysis (ABA), *culturally valued behaviours (CVBs)*, as examined in this thesis concerning Māori, are conceptualised as operant responses selected and maintained by culturally mediated reinforcement (Baum, 2005; Skinner, 1953). Cultural norms therefore are not just beliefs they are behaviours maintained by communities that systematically reinforce them (Cooper et al., 2020 Michael, 1993; Skinner, 1953). In Māori contexts, cultural norms function as both rules and *discriminative stimuli* (SDs), signalling the availability of reinforcement for behaviours that correspond to group expectations (Baum, 2005; Michael, 1993; Skinner, 1953) Over time, these contingencies generate stable behaviours recognised by Māori communities as *tikanga* (customs and traditions) and *kawa* (protocols) (Baum, 2005; Mead, 2003). Behaviour can be analysed at three levels: (1) *individual operant contingencies*, where immediate consequences select behaviours; (2) *interlocking behavioural contingencies (IBCs)*, where multiple individuals coordinate actions towards shared goals, such as supporting effective hui; and (3) *metacontingencies*, where collective outcomes of these interactions reinforce and sustain wider community practices (Biglan & Glenn, 2013; Glenn, 2004; Skinner, 1953). From this perspective, culturally valued behaviour develops through individual learning histories and through reinforcement systems operating within communities (Baum, 2005; Glenn, 2004; Skinner, 1953;). Therefore, the behaviours examined in this study can be understood as behaviourally maintained expressions of Māori relational and collective values (Baum, 2005; Durie, 2001; Mead, 2003).

Core values like *manaakitanga* (care and hospitality), *whanaungatanga* (connectedness), *kohitanga* (unity), and *kaitiakitanga* (stewardship) are enacted through observable, repeated behaviours (Durie, 2001; Mead, 2003; Smith, 1999). These include helping spontaneously, sharing resources, preparing and serving food, cleaning shared spaces,

and participating in formal proceedings (Durie, 2001; Mead, 2003; Walker, 2004). For example, on the marae, tasks like organising seating, assisting elders, and preparing food are coordinated through tikanga and role expectations toward shared outcomes. These behaviours are reinforced by social approval, strengthen relationships, affirm cultural identity, and help sustain cultural practices across generations (Bishop et al., 2009; Mead, 2003).

Behaviour Principles in Context

Whether culturally valued behaviours occur depends on the cues people notice beforehand, the situations that make certain outcomes desirable, and the consequences that follow their actions (Baum, 2005; Michael, 1993; Skinner, 1953). In behaviour terms *antecedent cues* are signals in the environment that prompt a behaviour, while *motivating operations (MOs)* are events or conditions that temporarily increase or decrease the importance of a particular outcome, affecting how likely someone is to act in ways that have produced that outcome before (Laraway et al., 2003; Michael, 1982, 1993). Different environments can encourage, support, or reduce these behaviours (Baum, 2005; Skinner, 1953). For Māori, cultural settings provide both clear cues—such as seeing elders model helping or being asked to contribute—and structured occasions, like ceremonies or shared gatherings, which make actions such as helping, maintaining relationships, or respecting shared resources more desirable. These cues and motivating operations together increase the likelihood that people engage in culturally valued behaviours (Durie, 2001; Laraway et al., 2003; Mead, 2003).

Situational demands can further strengthen these effects (Cooper et al., 2020; Michael, 1993). For example, when labour is limited, or tasks must be completed within time constraints—such as preparing *kai* before a gathering—this pressure can act as an *establishing operation (EO)*, increasing the immediate value of contributing and reducing the time it takes for individuals to step in and help (Cooper et al., 2020; Laraway et al., 2003;

Michael, 1993). These processes suggest that culturally valued behaviour is not simply a reflection of internalised beliefs. Instead, it is shaped dynamically by environmental conditions, highlighting the importance of group responsibility, relational care, and actions that enhance *mana* (supernatural authority or prestige) (Cooper et al., 2020; Laraway et al., 2003; Michael, 1993).

In contrast, many mainstream (non-Māori) settings tend to operate under different motivational systems. In these environments, motivating operations may place greater emphasis on individual autonomy or personal efficiency (Baum, 2005; Bishop et al., 2009). Social reinforcement is also less consistently tied to collective contribution. As a result, abolishing operations (AOs, temporary reduces the power of a reinforcer)—such as anonymity or the absence of shared responsibility—may reduce the reinforcing value of helping behaviours (Cooper et al., 2020; Michael, 1993). Consequently, culturally valued helping behaviours may occur less often or take longer to emerge in these contexts (Baum, 2005; Bishop et al., 2009). From a behaviour analytic perspective, differences in behaviour across settings are best understood as the result of changing environmental control rather than differences in personal identity or cultural commitment (Baum, 2005; Skinner, 1953).

Taken together, these dynamics illustrate how motivating operations, discriminative stimuli, and broader metacontingencies interact to shape the expression of culturally valued behaviour across settings (Glenn, 2004; Michael, 1993). Variations in behaviour therefore reflect differences in environmental contingencies rather than deficiencies in cultural identity (Baum, 2005; Glenn, 2004; Skinner, 1953). This perspective leads into the next section on cultural embeddedness. Cultural embeddedness is important because it connects abstract behavioural principles with the real-world contexts in which collective, relational, and historical systems organise and give meaning to behaviour (Fox et al., 2023). Emphasising embeddedness helps clarify how these broader systems sustain, transmit, and reinforce

culturally valued behaviours across generations and settings.

Cultural Embeddedness

Cultural embeddedness refers to the extent to which individuals are immersed in, connected to, and behaviourally engaged with their cultural environment (Fox et al., 2023). Within *Te Ao Māori* (the Māori world) and a *Kaupapa Māori perspective* cultural embeddedness goes beyond simply identifying with a cultural group (Durie, 2001; Fox et al., 2023; Mead, 2003; Walker, 2004). It involves active participation in culturally structured practices, reciprocal relationships, and the fulfilment of collective responsibilities (Durie, 2001; Mead, 2003). On the marae, for instance, cultural embeddedness becomes visible through shared action. Whānau members and community participants work together to prepare and share *kai* (food), welcome guests, organise formal proceedings, and carry out responsibilities such as caring for elders or cleaning communal spaces (Durie, 2001; Mead, 2003; Walker, 2004). These activities represent *tikanga* in practice, where behavioural roles, interactional expectations, and coordinated community action are guided by shared cultural understandings (Bishop, 1996; Skinner, 1953; Smith, 1999). These relational ethics are often reinforced through the guidance of *mana whenua* (local elders), who often shape both community participation and research processes (Bishop, 1996; Skinner, 1953; Smith, 1999). Their involvement ensures that research activities are grounded in reciprocity, respect, and partnership, aligning with Māori expectations for ethical engagement (Bishop, 1996; Durie, 2001; Smith, 1999).

From an Applied Behaviour Analysis (ABA) perspective, cultural embeddedness can be understood through an individual's learning history within culturally organised systems of reinforcement (Baum, 2005; Cooper et al., 2020; Skinner, 1953). Cultural embeddedness behaviour develops through repeated interactions with environmental consequences that occur within social and cultural contexts (Baum, 2005; Cooper et al., 2020; Skinner, 1953).

Individuals with frequent experience in Māori cultural settings are likely to become more sensitive to the discriminative stimuli and motivating operations associated with those environments from their previous experiences (Baum, 2005; Cooper et al., 2020 Michael, 1993). Therefore, they may be more likely to engage in helping behaviours such as preparing and serving food, arranging communal spaces, cleaning shared areas, or hosting visitors (Durie, 2001; Mead, 2003; Skinner, 1953). Because they are aware these behaviours are typically maintained through naturally occurring social reinforcement, including relational affiliation, social approval, and affirmation of cultural identity (Biglan, 1995; Mead, 2003). Through repeated participation in these practices, individuals gradually develop behavioural repertoires that reflect the expectations and relational values embedded within their cultural environments (Baum, 2005; Fox et al., 2023).

Helping behaviours also emerge on maraes through *interlocking behavioural contingencies* coordinated by *tikanga* (Glenn, 1988; Skinner, 1953). This happens when multiple individuals respond to shared cultural expectations and combine their actions to produce outcomes such as the successful organisation of a *hui* or the smooth running of a *tangihanga* (funeral) (Glenn, 1988; Mead, 2003; Skinner, 1953; Walker, 2004). In this sense, culturally valued practices persist not only because individuals learn them, but because communities collectively reinforce the outcomes those behaviours produce (Baum, 2005; Glenn, 1988; Skinner, 1953).

At the individual level, differences in behaviour across Māori and non-Māori environments understood as examples of contextually controlled behaviour (Baum, 2005; Glenn, 1988; Skinner, 1953). This process reflects the concept of *metacontingencies*, which describes how patterns of coordinated behaviour are selected and maintained through cultural-level consequences (Glenn, 1988; Michael, 1993; Skinner, 1953). Behaviour reflects the interaction between an individual's learning history, and the contingencies present in the

current environment (Baum, 2005; Michael, 1993; Skinner, 1953). For example, when Māori students move between culturally distinct environments, the cues that signal appropriate helping behaviour—and the reinforcement available for such behaviour—may differ substantially. These contextual changes can influence whether culturally valued behaviours are expressed, even when the underlying cultural values remain meaningful to the individual.

To examine these contextual influences empirically, measurement tools such as the *Māori Cultural Embeddedness Scale (MaCES)* enable researchers to investigate cultural participation and behavioural connectedness systematically (Fox et al., 2023). The MaCES is a 43-item self-report instrument designed to assess the extent to which individuals are behaviourally and relationally embedded within *Te Ao Māori* (Fox et al., 2023). The scale is organised across three domains: values, practices, and beliefs (Fox et al., 2023).

The *values* domain includes dimensions such as *Whakapapa* (ancestral lineage), *Whanaungatanga* (relational connectedness), *Manaakitanga* (hospitality and care), *Kaitiakitanga* (stewardship), and *Mahi rangatira* (collective wellbeing) (Fox et al., 2023). Together, these constructs capture the extent to which individuals endorse and enact principles of relational responsibility, care for others, resource stewardship, and collective leadership (Fox et al., 2023). The *practices* domain assesses participation in tikanga-guided behaviours and individuals' sense of comfort within Māori cultural environments, reflecting their engagement in structured cultural activities (Fox et al., 2023). The *beliefs* domain includes constructs such as *Pūrākau* (the transmission of cultural knowledge through stories) and *Wairua* (spiritual essence), acknowledging the importance of cultural narratives and spiritual connectedness in shaping behavioural meaning and participation (Fox et al., 2023). By organising items across these three domains, the MaCES conceptualises cultural embeddedness as a multidimensional construct rather than reducing it to identity alone (Fox et al., 2023). From a behaviour-analytic perspective, responses to the MaCES represent forms

of *verbal behaviour*, which states that verbal responses (writing, talking) are shaped by social contingencies and an individual's learning history (Skinner, 1953, 1957). When these verbal reports are analysed alongside directly observed behaviour, researchers can begin to evaluate the degree of correspondence between individuals' descriptions of culturally valued behaviour and their actual behavioural performance (Baum, 2005; Catania, 2013; Skinner, 1953).

Self-Reports as Verbal Behaviour

Verbal behaviour can be understood as behaviour shaped and maintained through social interaction within a community of listeners, in which reinforcing consequences are delivered through social processes rather than directly through the physical environment (Catania, 2013; Skinner, 1957). It includes spoken, written, or symbolic responses that function to influence others, describe events in the environment, or help individuals navigate their interactions with the world around them (Catania, 2013; Skinner, 1957). Within this framework, verbal behaviour always involves at least two participants: the *speaker*, who emits the verbal response, and the *listener*, whose behaviour forms part of the reinforcing environment that supports and maintains verbal responding (Catania, 2013; Skinner, 1957).

Skinner (1957) identified several forms of verbal operants that describe how verbal responses come under different types of control. Two key examples are *tacts* and *mands*. Tacts are verbal responses that occur under the control of environmental stimuli and function to describe or label events in the environment (e.g., "It is raining outside"). In contrast, mands are verbal responses controlled by motivating operations and are typically associated with requests or expressions of need (e.g., "Can you help me?") (Skinner, 1957, 1969). These different operants illustrate how verbal behaviour is shaped not only by what individuals experience but also by the social contexts in which those experiences are communicated.

Responses provided on self-report instruments can therefore be understood as forms of verbal behaviour that reflect culturally learned ways of describing behaviour, participation, and values within socially meaningful contexts (Baum, 2005; Catania, 2013; Skinner, 1953, 1957). When individuals complete surveys or questionnaires, they engage in verbal responses shaped by prior learning histories and the social contingencies associated with discussing culturally valued behaviour. In research examining cultural embeddedness, such responses may function primarily as tact-like verbal operants that describe behaviour in situations where direct observation would be impractical or impossible (Catania, 2013; Cooper et al., 2020; Skinner, 1953). Therefore, self-report data can provide valuable insight into how individuals perceive their own behavioural patterns and cultural participation (Cooper et al., 2020; Fox et al., 2023; Skinner, 1953). However, one of the most widely recognised concerns of self-reports is the potential influence of reactivity effects, particularly *social desirability bias* (Paulhus, 1991; Podsakoff et al., 2003).

This bias may occur when participants provide responses, they believe are socially acceptable or culturally valued rather than responses that accurately reflect their typical behaviour (Paulhus, 1991; Podsakoff et al., 2003). The likelihood of this bias may increase when individuals feel that their responses will be evaluated against culturally respected practices or expectations (Paulhus, 1991; Podsakoff et al., 2003). Researchers have proposed several strategies to reduce these effects. These include ensuring anonymity and confidentiality, involving culturally knowledgeable facilitators who can help establish trust with participants, and designing survey instruments that incorporate culturally appropriate language and formats (Podsakoff et al., 2003; Smith, 1999). Such approaches may reduce participants' concerns about judgment and encourage more open and honest responses. Even so, these strategies can only partially mitigate bias. Memory inaccuracies may still influence self-reported data, changing social norms at the time of data collection, and the tendency for

individuals to over-report behaviours that are culturally valued (Paulhus, 1991; Podsakoff et al., 2003).

For these reasons, self-report measures should be interpreted with caution. While they provide valuable insight into participants' perceptions, beliefs, and self-understandings, they do not necessarily offer direct evidence of behaviour in natural settings (Baumeister et al., 2007; Nisbett & Wilson, 1977). Consequently, research on cultural embeddedness and behavioural expression is strengthened when direct behavioural observation methods complement self-report data (Baer et al., 1968; Cooper et al., 2020). Combining these approaches allows researchers to gain a more comprehensive understanding of how culturally valued behaviours are described, experienced, and enacted across different contexts.

Observable Behaviour and Self-Reports

Observable behaviour refers to actions that can be directly measured within a particular environmental context (Skinner, 1953, 1957). In the present study, observable helping behaviours were operationalised as instances of culturally valued actions performed within Māori and non-Māori environments. This approach allows examination of the functional relationship between environmental context and observable behaviour. Combining measures of observable behaviour with self-report data provides a useful way to assess the correspondence between verbal and observable responding (Baer et al., 1968; Kazdin, 1974). Self-reports represent forms of operant behaviour shaped by social contingencies, whereas observable behaviour reflects individuals' direct interactions with environmental stimuli and consequences (Skinner, 1953, 1957). Importantly, differences between self-reported and observable behaviour do not necessarily indicate measurement error or internal inconsistency. Instead, such differences may arise because verbal and non-verbal behaviour are maintained by different contingencies (Baum, 2005; Skinner, 1953). For example, individuals may report engaging in culturally valued behaviours in ways that align with learned social expectations

or cultural norms. At the same time, their actual behaviour in a given situation may vary depending on the immediate environmental conditions, including the availability of reinforcement, the presence of discriminative stimuli, and the demands of the context (Baum, 2005; Cooper et al., 2020; Skinner, 1953). As a result, behaviour that is verbally endorsed as important may not always occur at the same frequency across different environments (Baum, 2005; Cooper et al., 2020; Skinner, 1953).

Examining the relationship between self-reported and observable behaviour, therefore, allows researchers to evaluate the degree of functional correspondence between different forms of responding (Baer et al., 1968; Cooper et al., 2020; Kazdin, 1974). High correspondence suggests that verbal reports and observable behaviour align under similar contextual conditions. In contrast, lower correspondence may indicate that behaviour is strongly influenced by contextual variables or that verbal and non-verbal behaviour have been shaped by different reinforcement histories (Baer et al., 1968; Baum, 2005; Skinner, 1953).

The Present Study

This study aims to examine whether Māori students' self-reported culturally valued helping behaviours correspond with their directly observed helping behaviours across Māori and non-Māori environments. The primary objective is to assess the extent of alignment between self-reported and observed behaviour in each context, thereby clarifying how cultural settings influence behavioural expression (Baer et al., 1968; Baum, 2005; Skinner, 1953). Guided by operant learning theory, the study conceptualises behaviour as a product of environmental contingencies rather than as a reflection of fixed internal traits or dispositions (Cooper et al., 2020; Skinner, 1953, 1957). From this perspective, helping behaviours are understood as actions shaped and maintained through interactions with culturally organised reinforcement systems (Baum, 2005; Durie, 2001).

The central hypothesis predicts that greater correspondence between self-reported and observed helping behaviours will occur in Māori environments compared with non-Māori environments. This prediction is based on the assumption that culturally meaningful contexts, such as marae settings, contain clearer discriminative stimuli and reinforcement contingencies associated with collective responsibility and relational engagement (Durie, 2001; Mead, 2003; Walker, 2004). By contrast, environments in which these culturally organised cues are less salient may produce lower correspondence between verbal reports and observable behaviour (Baum, 2005; Skinner, 1953).

Identifying variations in behavioural correspondence across settings can provide practical insights for educators and institutional leaders by indicating whether particular environments support or inhibit the enactment of culturally valued behaviours (Baer et al., 1968; Cooper et al., 2020). Understanding these contextual influences may help schools and educational institutions adjust environmental contingencies to promote meaningful participation and relational responsibility among Māori students (Bishop et al., 2009; Macfarlane et al., 2007). Additionally, analysing which specific behaviours demonstrate higher or lower correspondence may assist in identifying opportunities for targeted interventions and the development of professional practices that strengthen culturally responsive educational environments (Baer et al., 1968; Bishop et al., 2009; Macfarlane, 2013).

By applying behavioural correspondence analysis within culturally embedded contexts, this study seeks to understand better how cultural environments influence the relationship between verbal descriptions of behaviour and directly observable helping actions (Skinner, 1953; Baum, 2005; Fox et al., 2023). In doing so, the research addresses an important gap within Applied Behaviour Analysis regarding the functional measurement of culturally valued behaviour in Indigenous contexts (Cooper et al., 2020; Fox et al., 2023).

More specifically, it contributes to understanding how participation in *Te Ao Māori* may shape the expression of helping behaviours across different environmental settings (Durie, 2001; Mead, 2003; Fox et al., 2023).

Statement of the Problem

Although behavioural science has long established that environmental contingencies play a central role in shaping behaviour, relatively little research has examined the correspondence between self-reported cultural behaviours and directly observed behaviour across different contexts (Baum, 2005; Cooper et al., 2020; Skinner, 1953). In Aotearoa New Zealand, persistent disparities in educational outcomes for Māori learners highlight the importance of better understanding the conditions that support culturally meaningful engagement in learning environments (Bishop et al., 2009; Macfarlane, 2007, Macfarlane et al., 2013).

Research suggests that many teachers report only moderate levels of culturally responsive practice, indicating that Māori students may not consistently experience educational environments that fully support their cultural values and relational ways of learning (Highfield et al., 2024; Macfarlane, 2007; Macfarlane et al., 2013). Despite the central role of these practices within Māori social life, empirical research examining behavioural correspondence in Māori contexts remains limited (Fox et al., 2023; Highfield & Webber 2021). This gap shows the need for evidence-based approaches that are informed by observable behaviour rather than relying solely on reported attitudes or intentions (Baer et al., 1968; Cooper et al., 2020). Consequently, a greater understanding is needed of how verbal behaviour, as measured by self-report instruments, relates to directly observable behaviour across culturally distinct environments (Baum, 2005; Skinner, 1957).

Previous studies investigating culturally embedded behaviour have provided valuable insights into identity, cultural participation, and self-reported engagement in Māori practices

(Durie, 2001; Fox et al., 2023; Smith, 1999). However, these studies have generally focused on participants' descriptions of behaviour rather than examining the functional relationship between environmental contexts and directly observable behavioural expression (Baum, 2005; Skinner, 1953). As a result, relatively little is known about how accurately self-reported culturally valued behaviours reflect the behaviours that individuals enact in specific environments.

Research Questions and Hypotheses

RQ1. To what extent do Māori students' self-reported culturally valued behaviours correspond to their actual behaviours in Māori environments?

H1. Correspondence between self-reported culturally valued behaviours and observed helping behaviours will be higher in Māori environments.

RQ2. How does this alignment itself differ when Māori students are in non-Māori environments?

H2. Correspondence between self-report and observed behaviour will be lower in non-Māori environments relative to Māori environments.

RQ3. Are there specific behaviours that show higher or lower correspondence between self-report and actual practice across these settings?

H3. Mand helping behaviours will show higher frequency correspondence between self-report and observed behaviours than spontaneous helping behaviours.

RQ4. What role does the cultural context (Māori vs. non-Māori environment) play in forming the expression of culturally valued behaviours?

H4. The Māori cultural environment will be associated with higher frequencies of helping behaviour and stronger alignment between verbal self-reports and observed behaviour, driven by contextually relevant discriminative stimuli and reinforcement

contingencies.

Significance of the Study and Its Contributions

Little research has systematically examined the correspondence between self-reported culturally valued helping behaviours and directly observed helping behaviours among Māori students across both Māori and non-Māori environments (Glynn et al., 1997; Fox et al., 2023). The present study seeks to address this gap and contribute to culturally responsive research within Applied Behaviour Analysis. In doing so, it extends operant theory beyond traditional laboratory settings by examining behavioural correspondence within culturally organised environments (Baum, 2005; Skinner, 1953). By investigating the alignment between self-reported verbal behaviour and directly observed helping behaviour, the study applies core principles of behaviour analysis to culturally embedded social practices (Baum, 2005; Skinner, 1953, 1957). This approach strengthens understanding of how environmental contingencies operate within Indigenous cultural contexts rather than assuming behavioural processes function independently of culture (Durie, 2001; Mead, 2003; Fox et al., 2023).

Second, the study contributes methodologically by integrating direct behavioural observation with self-report measurement and explicitly linking these methods to the research questions on behavioural correspondence across cultural settings (Baer et al., 1968; Cooper et al., 2020). Behavioural correspondence research has historically focused on controlled or clinical environments, with comparatively little work examining correspondence within naturalistic cultural contexts (Baer et al., 1968; Durie, 2001; Mead, 2003). By systematically assessing helping behaviours across Māori and non-Māori settings, this study directly addresses questions concerning the alignment between self-reported and observable behaviours in real-world environments (Baum, 2005; Cooper et al., 2020). In doing so, it provides empirical insight into how contextual variables influence behavioural expression outside of controlled laboratory conditions (Baum, 2005; Skinner, 1953).

To honour principles of partnership and collaboration, the study also reflects the whakataukī “*Nā tō rourou, nā taku rourou ka ora ai te iwi*” (With your food basket and my food basket, the people will thrive), which highlights the value of shared effort and collective contribution (Poutama Pounamu, 2013; Smith, 1999). Embedding Māori perspectives through whakataukī supports relational ethics and aligns with kaupapa Māori approaches to research (Durie, 2001; Smith, 1999). This perspective reinforces the importance of collaborative knowledge production and acknowledges the cultural context within which behavioural research is conducted (Durie, 2001; Smith, 1999). In the present study, this approach also strengthens the measurement of culturally valued behaviour by clearly distinguishing between verbal endorsement via self-report and enacted behaviour via direct observation (Cooper et al., 2020; Skinner, 1957).

Third, the study contributes to Indigenous scholarship by situating behavioural analysis within *Te Ao Māori*. Māori scholarship consistently emphasises that behaviour is embedded within collective responsibility, tikanga-guided practice, and relational obligations (Durie, 2001; Mead, 2003; Walker, 2004). By examining how culturally valued helping behaviours are expressed across different environments, the study provides empirical evidence that informs discussions of cultural embeddedness and behavioural expression among Māori students (Fox et al., 2023). Importantly, this approach avoids reducing culture to identity labels or attitudinal measures by operationalising cultural participation as observable action (Baum, 2005; Skinner, 1953).

Chapter 2: Literature Review

Operant and Respondent Foundations

Operant Behaviour

Within behaviourism, behaviour is understood as an interaction between the individual and their environment, where patterns of responding are shaped and maintained by

their consequences (Baum, 2005; Skinner, 1953). Operant behaviour refers to the actions an individual emits, which are then strengthened or weakened depending on the consequences they produce (Baum, 2005; Skinner, 1953). Central to operant theory is the *three-term contingency*, involving an *antecedent/discriminative stimulus*, the *behaviour* itself, and the resulting *consequence* (Michael, 1982; Skinner, 1953). Discriminative stimuli signal the availability of reinforcement, increasing the likelihood that certain responses will occur in similar contexts (Catania, 2013; Cooper et al., 2020). When the behaviour is reinforced (consequence), it becomes more likely to occur in the future, whereas extinction and punishment reduce its future probability (Baer et al., 1968; Cooper et al., 2020).

Within a *marae* context, the presence of *manuhiri* (guests), collective food preparation tasks, and guidance from *kaumatua* act as culturally structured antecedent conditions (Durie, 2001; Mead, 2003). These stimuli may serve as discriminative stimuli, signalling that helping behaviour is socially appropriate and likely to be reinforced (Catania, 2013; Cooper et al., 2020). The behaviour of a student demonstrating *manaakitanga* (respect) by assisting with preparing *kai* or cleaning shared spaces represents the operant response. Which reflects participation in relational and collective responsibilities embedded within *Te Ao Māori* (Bishop & Berryman, 2006; Durie, 2001; Mead, 2003). Consequently, social approval, expressions of gratitude, or increased group inclusion may function as reinforcing outcomes, increasing the likelihood of similar helping behaviour in future *marae* contexts (Baum, 2005; Biglan & Glenn, 2013). The absence of these culturally organised contingencies in non-Māori laboratory environments, may reduce the probability of such behaviour occurring (Baum, 2005; Skinner, 1953). This demonstrates contextual variation, a core principle of operant behaviour, where responses are selected and maintained by contingencies operating within specific environments (Cooper et al., 2020; Skinner, 1953).

Respondent Behaviour

Behaviour can also be understood as, respondent behaviour, or classical conditioning, which, involves reflexive responses elicited by antecedent stimuli (Cooper et al., 2020; Pavlov, 1927). Classical conditioning occurs when a previously neutral stimulus becomes capable of eliciting an automatic response after repeated pairing with an unconditioned stimulus (Cooper et al., 2020; Pavlov, 1927). This process explains emotional and physiological reactions, such as anxiety, salivation, or arousal, that are automatically triggered by contextual cues (Cooper et al., 2020; Pavlov, 1927). Respondent processes are understood as stimulus–stimulus pairings that alter the eliciting functions of environmental events (Catania, 2013; Cooper et al., 2020).

Respondent processes are seen in culturally significant environments (Pihama et al., 2025; Te Huia & Liu, 2012). For instance, stimuli commonly encountered on a *marae*—such as the sound of *karanga* (ritual welcome), the presence of extended *whānau*, or the structured *pōwhiri* (welcome ceremony)—may, through repeated cultural pairing, elicit strong emotional responses (Mead, 2003; Pihama et al., 2025; Te Huia & Liu, 2012). These reactions occur independently of explicit reinforcement contingencies and represent conditioned emotional reflexes formed through prior experience (Michael, 1993; Skinner, 1953).

Although operant and respondent processes are distinct conceptually, they operate simultaneously and interactively in natural settings (Cooper et al., 2020; Skinner, 1953). Environmental stimuli may elicit conditioned emotional responses through respondent conditioning while also acting as discriminative stimuli that signal reinforcement contingencies for specific behaviours (Catania, 2013; Cooper et al., 2020; Skinner, 1953). For example, entering a *marae* may automatically evoke feelings of belonging, reverence, or heightened social awareness due to prior stimulus–stimulus pairings established through repeated cultural participation (Pavlov, 1927; Pihama et al., 2025; Skinner, 1953). At the

same time, communal tasks and respected cultural role models may function as discriminative stimuli indicating that helping behaviour is likely to be socially reinforced (Biglan & Glenn, 2013; Cooper et al., 2020). These behaviours may be reinforced through relational affirmation, and the strengthening of *whanaungatanga*, reflecting culturally organised reinforcement contingencies (Biglan & Glenn, 2013; Mead, 2003). Emotionally responsive behaviour shaped through classical conditioning may further increase the likelihood of operant helping behaviour by influencing motivational states, while repeated engagement in reinforced helping behaviour may strengthen positive emotional associations with culturally meaningful environments over time (Glenn, 2004; Skinner, 1953).

Motivating operations also influence the momentary effectiveness of reinforcers and modify the likelihood of behaviours that have historically produced reinforcement (Michael, 1982, 1993). In this study, collective expectations, relational obligations, or the presence of *manuhiri* may act as establishing operations, temporarily increasing the reinforcing value of social approval or contribution and thus raising the probability of helping behaviour (Laraway et al., 2003; Michael, 1982, 1993). In contrast, different contingencies in non-Māori environments may alter both emotional outcomes and the likelihood of culturally valued helping behaviour (Baum, 2005; Skinner, 1953). Moreso, in unfamiliar settings or testing conditions, physiological responses or performance-related anxiety may be encountered if previously associated with similar contexts (Dang et al., 2020; Skinner, 1953). Such conditioned emotional responses can influence operant behaviour by modifying motivational states or response probabilities (motivating operations) within specific contexts (Cooper et al., 2020; Michael, 1993). These contextual differences demonstrate how behaviour is controlled by the interaction between learning history and current environmental variables (Biglan & Glenn, 2013; Glenn, 2004).

Understanding the interaction between operant and respondent processes is essential when analysing socially and culturally structured environments (Cooper et al., 2020; Skinner, 1953). Culturally valued behaviours are supported not only by reinforcement contingencies but also by conditioned emotional responses linked to collective practices and relational obligations (Biglan & Glenn, 2013; Glenn, 2004; Pihama et al., 2025). This integrated behavioural framework provides the conceptual foundation for examining how culturally valued behaviours manifest across different environments and for analysing the correspondence between verbal reports and overt actions (Baumeister et al., 2007; Dang et al., 2020).

Self-Reports as Verbal Behaviour

From a behaviourist perspective, verbal reports are statements about cultural values or intended behaviours, and they constitute instances of verbal behaviour maintained by social contingencies within a community of listeners (Catania, 2013; Skinner, 1957). When individuals' complete questionnaires or describe their own actions, they engage in verbal responding shaped by prior reinforcement histories and influenced by contingencies present at the time of reporting (Baer et al., 1968; Skinner, 1957). The context and form of such responses are determined not only by past experiences but also by social influences, anticipated expectations, and the evaluative conditions under which reports occur (Baumeister et al., 2007; Skinner, 1957). Self-report measures (verbal reports) are typically maintained by generalised social reinforcement, including approval, agreement, credibility, or avoidance of disapproval (Baum, 2005; Podsakoff et al., 2003; Skinner, 1953).

In research contexts, additional variables—such as perceived social desirability, cultural expectations, and institutional authority—may act as discriminative stimuli that influence how individuals describe their behaviour (Catania, 2013; Dang et al., 2020). However, the variables controlling verbal accounts may differ from those controlling the

behaviours in action being described (Baumeister et al., 2007; Dang et al., 2020; Skinner, 1957). This difference is widely observed in psychological research, where correlations between self-report and direct behavioural measures are often modest (Baumeister et al., 2007; Dang et al., 2020). Functionally, self-reports commonly operate as tact-like responses, describing events, actions, or participation patterns (Catania, 2013; Skinner, 1957). However, these responses may be shaped by multiple factors, reflecting not only direct contact with past behaviour but also culturally reinforced narratives concerning identity, obligation, and belonging (Biglan & Glenn, 2013; Glenn, 2004; Pihama et al., 2025).

In culturally embedded contexts, statements about participation in *tikanga*-based practices or cultural values may therefore represent socially reinforced articulations of identity-consistent behaviours rather than precise behavioural frequencies (Baum, 2005; Fox et al., 2020; Skinner, 1957). This interpretation aligns with behaviour-analytic accounts of rule-governed behaviour, in which verbal statements may be controlled by socially mediated contingencies distinct from direct environmental consequences (Baum, 2005; Cooper et al., 2020; Skinner, 1957).

This distinction is particularly relevant to the present study, which examines the correspondence between reported culturally valued behaviours and directly observed helping behaviours across Māori and non-Māori environments. If verbal responding is governed by antecedents and consequences different from those controlling overt helping behaviour, correspondence between the two cannot be assumed (Johnston & Pennypacker, 2009; Skinner, 1953). Instead, the degree of correspondence is an empirical question requiring systematic behavioural analysis. Recognising the difference between verbal and non-verbal behaviour emphasises the importance of behavioural correspondence as a central construct in this study (Baer et al., 1968; Cooper et al., 2020).

Behavioural Correspondence

Behavioural correspondence refers to the degree of agreement between verbal reports of behaviour and directly observed behavioural performance (Baumeister et al., 2007; Johnston & Pennypacker, 2009; Skinner, 1953). Within behaviour analysis, studies of correspondence examine the functional relationship between verbal behaviour and overt action, recognising that these behaviours may be controlled by separate environmental contingencies (Catania, 2013; Johnston & Pennypacker, 2009; Skinner, 1953). Research has identified several forms of alignment, including *say-do correspondence*, in which spoken statements predict subsequent behaviours, and *do-say correspondence*, in which behaviour is later accurately reported verbally (Dang et al., 2020; Johnston & Pennypacker, 2009). Correspondence is influenced by reinforcement histories, stimulus control, and social consequences related to verbal reporting (Baer et al., 1968; Stokes & Baer, 1977). High correspondence is more likely when spoken and overt behaviours are maintained by similar environmental contingencies, as commonly observed in structured settings such as schools (Baer et al., 1968; Mackay et al., 2007; Risley & Hart, 1968).

Divergence between self-report and direct behavioural measures is frequently observed in psychological research, with correlations between reported and observed behaviour are often moderate (Dang et al., 2020; Risley & Hart, 1968). Such divergence does not necessarily indicate measurement error but may reflect differences in the variables controlling verbal and non-verbal responding (Baum, 2005; Podsakoff et al., 2003; Skinner, 1953). In the present study, behavioural correspondence is conceptualised as a function of environmental context. The degree of correspondence between self-reported culturally valued helping behaviour and observed helping behaviour may vary depending on whether the behaviour occurs within Māori or non-Māori environments. Cultural settings may serve as discriminative environments, signalling the availability of social reinforcement and increasing the likelihood of culturally appropriate responding (Durie, 2001; Mead, 2003;

Michael, 1993). These variations illustrate the broader principle of environmental control in behaviour analysis, in which behavioural output emerges from the interaction between learning history and contingencies operating within specific settings (Baum, 2005; Glenn, 2004; Skinner, 1953). From this perspective, behaviour is not assumed to reflect stable internal traits; rather, it is influenced by antecedent stimuli, motivating operations, and reinforcement structures within a given environment (Baum, 2005; Michael, 1993). Variability in behavioural expression across settings is therefore interpreted as sensitivity to environmental control, rather than inconsistency in underlying valued or cultural commitments (Baum, 2005; Biglan & Glenn, 2013; Skinner, 1953).

This study recognises that Māori and non-Māori environments may organise contingencies differently, consequently influencing helping behaviour. Māori cultural settings, such as *marae* contexts, often provide structural social cues, relational expectations, and collective reinforcement systems that act as discriminative stimuli for culturally valued helping responses (Biglan & Glenn, 2013; Durie, 2001; Mead, 2003; Pihama et al., 2025). In contrast, non-Māori laboratory environments may offer fewer culturally relevant social reinforcers or organise contingencies around different performance expectations, likely altering response probabilities (Baumeister et al., 2007; Durie, 2001; Mead, 2003). Conceptualising behaviour as environmentally controlled provides a framework for examining how behaviour is organised within culturally structured contexts. While operant processes explain how immediate contingencies shape responding, behaviour is also influenced by cumulative learning histories embedded within social and cultural environments (Baum, 2005; Glenn, 2004; Skinner, 1953). Accordingly, behavioural expression reflects not only momentary environmental stimuli but also long-term participation in culturally structured practices (Durie, 2001; Mead, 2003; Pihama et al., 2025).

Cultural Embeddedness

Cultural embeddedness refers to how behaviour is shaped through participation in culturally meaningful social systems and relational practices (Fox et al., 2023; Pihama et al., 2025). Within *Te Ao Māori*, cultural embeddedness is shown through active involvement in relational, collective, and responsibility-focused practices that support *whānau* and the wider community (Durie, 2001; Highfield & Webber, 2021; Highfield et al., 2024; Mead, 2003;). From a Kaupapa Māori perspective, culture is enacted through practice—through taking part in organised activities that maintain collective wellbeing—rather than simply holding abstract beliefs (Bishop, 1996; Smith, 1999).

In behaviour analysis, cultural embeddedness is seen as the extent to which a person's learning history has been shaped by repeated interactions with culturally structured reinforcement systems (Baum, 2005; Cooper et al., 2020). It is not a fixed trait but a dynamic process that develops through ongoing participation in culturally meaningful settings (Michael, 1982; Skinner, 1953). Māori cultural participation goes beyond identifying with culture; it involves actively taking part in *tikanga*-guided activities, offering reciprocal support, and fulfilling collective obligations. These behaviours are maintained through everyday social reinforcement, such as relational connections, group approval, and recognition of cultural identity (Biglan & Glenn, 2013; Durie, 2001; Mead, 2003).

To measure this, the Māori Cultural Embeddedness Scale (MaCES) was developed to assess engagement with *Te Ao Māori* (Fox et al., 2023). The MaCES is a self-report questionnaire with 43 items grouped into three domains: values, practices, and beliefs. This reflects the idea that being culturally oriented involves both valuing Māori principles and actively practising them (Fox et al., 2023). The values domain looks at endorsement and practice of principles like *Whakapapa* (ancestral lineage), *Whanaungatanga* (relational connectedness), *Manaakitanga* (hospitality and care), *Kaitiakitanga* (stewardship), and *Mahi*

rangatira (collective wellbeing). The practices domain focuses on actually doing *tikanga*-based activities, and the beliefs domain includes *Pūrākau* (storytelling and knowledge transmission) and *Wairua* (spiritual essence), highlighting the cultural and spiritual frameworks that guide behaviour (Mead, 2003; Fox et al., 2023).

By separating values, practices, and beliefs, the MaCES treats cultural embeddedness as a behavioural process rather than just an identity label (Fox et al., 2023; Te Huia & Liu, 2012). From a behaviourist view, responses on the MaCES are examples of verbal behaviour shaped by past experiences and social reinforcement (Baumeister et al., 2007; Skinner, 1957). The scale provides a clear way to measure culturally organised behaviour in a way that fits with operant theory (Baum, 2005; Bishop, 1996; Skinner, 1953) while remaining grounded in Māori concepts.

Understanding cultural embeddedness in this way is important for looking at behaviour in different settings (Fox et al., 2023; Skinner, 1953). Because behaviour is influenced by the environment, culturally shaped actions may appear differently depending on the rules and reinforcement available in a particular context (Bishop, 1996; Durie, 2001; Skinner, 1957). Schools and other institutions have their own expectations, reinforcement systems, and norms, which may support or conflict with culturally organised behaviours (Bishop, 1996; Durie, 2001; Skinner, 1957). For Māori students, whether culturally shaped behaviours are recognised, encouraged, or rewarded can influence both how they participate and how they perform (Highfield & Webber 2021; Highfield et al., 2024; Macfarlane et al., 2007).

Educational and Cultural Context Research

Research on educational outcomes for Māori students consistently highlights the importance of cultural context in shaping engagement, participation, and achievement

(Bishop, 1996; Durie, 2001; Macfarlane et al., 2007). Rather than attributing differences in performance to individual deficits, culturally responsive scholarship emphasises the interaction between learners and institutional environments (Bishop & Berryman, 2006, 2009, 2010; Smith, 1999). In particular, it focuses on how schooling systems recognise and support culturally grounded ways of knowing and behaving (Bishop & Berryman, 2006, 2009, 2010; Smith, 1999). From a behaviour-analytic perspective, behaviour is always contextually controlled (Baum, 2005; Skinner, 1953). Teaching environments therefore act as settings in which behaviours are reinforced, punished, or ignored (Bishop & Berryman, 2006, 2009, 2010; Baum, 2005; Skinner, 1953; Smith, 1999). Classroom practices, teacher expectations, peer dynamics, and assessment structures collectively function as contingencies of reinforcement that shape student behaviour over time (Baer et al., 1968; Pennypacker, 2009; Cooper et al., 2020; Smith, 1999). When classroom or learning environment contingencies align with culturally learned values, practices, and language, behaviours are more likely to occur. Conversely, when contingencies differ from culturally grounded expectations, observable responding may change (Baer et al., 1968; Cooper et al., 2020; Skinner, 1953, 1957).

This perspective aligns with research showing that culturally responsive educational settings are associated with greater engagement and relational trust among Māori learners (Bishop & Berryman, 2006; Macfarlane et al., 2007; Macfarlane, 2013; Highfield and Webber 2021; Highfield et al., 2024). These outcomes can be explained behaviourally: when institutional contingencies reinforce relational responsibility, joint responsibility, and respectful interactions—values central to *Te Ao Māori*—participation is more likely (Baer et al., 1968; Bishop & Berryman, 2006; Skinner, 1953). Where such contingencies are absent or applied inconsistently, behaviours shaped within the Māori cultural context may not be reinforced, reducing their likelihood of occurring (Baum, 2005; Biglan & Glenn, 2013;

Skinner, 1953). Variation in behaviour across educational and cultural settings should not be seen as inconsistency in cultural identity or values. Behaviourism interprets this variation as lawful and predictable, reflecting differences in discriminative stimuli, motivating operations, and reinforcement histories across environments (Cooper et al., 2020; Johnston & Pennypacker, 2009; Michael, 1993).

Educational settings can be understood as organised systems of environmental contingencies, where student behaviour is influenced by social expectations, cues, and reinforcement within the learning context (Baum, 2005; Bishop, 1996; Skinner, 1953). Student responding does not occur in isolation but emerges from the interaction between past learning experiences and the current environment (Catania, 2013; Skinner, 1953). Examining cultural embeddedness alongside behavioural outcomes in educational contexts provides a framework for understanding how learning histories interact with institutional structures to shape observable behaviour (Baum, 2005; Cooper et al., 2020; Skinner, 1953). By observing helping behaviour in both Māori and non-Māori learning settings, the present study extends culturally sensitive educational research through direct behavioural measurement (Bishop & Berryman, 2006, 2009, 2010; Macfarlane et al., 2007). This approach allows for an empirical assessment of how culturally structured contingencies influence overt behaviour, rather than relying solely on self-reported data (Baer et al., 1978; Cooper et al., 2020)

Gaps in the Literature

Lack of Māori Observed Behaviour-Correspondence Research in Indigenous Cultural Settings

Although correspondence research has explored the relationship between self-reported behaviour and observed behaviour in general populations (Baer et al., 1968; Johnston & Pennypacker, 2009), very little work has examined behavioural correspondence within Māori

or broader Indigenous cultural settings (Bishop & Berryman, 2006; Fox et al., 2023; Macfarlane et al., 2007) Existing Māori educational and cultural research has often described culturally valued practices or engagement conceptually (Bishop & Berryman, 2006; Macfarlane et al., 2007) but rarely combines self-reported cultural values with direct behavioural measurement in real-time settings. As a result, the degree to which Māori students reported cultural helping aligns with observable helping behaviour in culturally meaningful environments remains unknown.

Lack of Culturally Responsive Instruments in Psychology, Education, and Health

Across psychology, health, and education systems in Aotearoa, New Zealand, there remains a shortage of validated, culturally grounded measurement tools for Māori (Durie, 2001; Smith, 1999). Many instruments are adapted from non-Māori frameworks or used without evidence of cultural validity. The development of the Māori Cultural Embeddedness Scale (MaCES) represents a significant advancement in this area (Fox et al., 2023). Few tools measure behaviour through a *tikanga*-aligned, Kaupapa Māori lens or translate Māori cultural constructs into behavioural terms. This gap limits researchers' and practitioners' ability to accurately assess Māori cultural engagement and its relationship to observable behaviour (Cooper et al., 2020; Skinner, 1953).

Over-Reliance on Self-Report Measures in Cultural Participation Research

Much research on Māori cultural engagement relies heavily on self-report surveys, interviews, or reflective narratives (Bishop, 1996; Pihama et al., 2025). While these methods are valuable, self-report measures can be influenced by social desirability, identity expectations, and reinforcement from listeners (Dang et al., 2020; Skinner, 1957). As a result, the extent to which self-reports reflect actual behaviour remains unclear, particularly in contexts where cultural norms may shape verbal and non-verbal responses differently. This

creates a methodological imbalance, where cultural participation is described verbally but rarely assessed through direct behavioural observation (Baum, 2005; Dang et al., 2020; Skinner, 1957). Because self-reports are verbal behaviours maintained by social contingencies, such as perceived social approval or expectations, they do not necessarily reflect the same controlling variables as overt actions (Dang et al., 2020; Skinner, 1957). This reliance on verbal measures limits understanding of the actual behavioural expression of cultural values, such as *manaakitanga* or *whanaungatanga*, in naturalistic settings (Fox et al., 2023).

Lack of Applied Behaviour Analysis (ABA) Integration with Māori Cultural Research

Although Applied Behaviour Analysis (ABA) provides tools for understanding environmentally controlled behaviour (Cooper et al., 2020; Skinner, 1953;), there has been little integration between ABA and Māori cultural or educational research (Baum, 2005; Michael, 1982). Kaupapa Māori scholarship usually draws on sociocultural, critical, or relational approaches (Bishop & Berryman, 2006, 2009, 2010; Durie, 2001), while ABA is rarely applied to *tikanga*-based behaviours or Māori social systems. This gap limits the functional analysis of how *tikanga*-aligned behaviours are shaped, maintained, or reinforced by cultural contingencies, such as collective tasks and relational obligations (Baum, 2005; Michael, 1982).

Lack of Context-Specific Environmental Comparisons Between Māori and Non-Māori Settings

Although context is recognised as central to Māori learner engagement (Macfarlane et al., 2007; Macfarlane, 2013; Mead, 2003), few studies have systematically compared Māori and non-Māori environments using behavioural methodologies. Behaviour analysis emphasises that behaviour is shaped by environmental contingencies (Michael, 1993;

Skinner, 1953). Yet, the specific discriminative stimuli, motivating operations, and reinforcement structures that differ between Māori and institutional settings remain understudied. As a result, there is limited understanding of how these environmental differences influence the likelihood of culturally valued helping behaviour

Limited Research on Cultural Embeddedness and Helping Behaviour

Furthermore, although cultural embeddedness has been behaviourally described as participation in culturally meaningful practices (Durie, 2001; Fox et al., 2023), there is limited empirical research linking cultural embeddedness to directly observed helping behaviour. Most studies rely on conceptual frameworks or self-report measures, leaving a gap in understanding how Māori cultural learning histories predict the frequency or quality of helping behaviour across different contexts (Baum, 2005; Skinner, 1953). This lack of research limits the ability to see how cultural repertoires generalise, change, or strengthen across various environments (Cooper et al., 2020; Michael, 1993).

Chapter Summary

This chapter outlined how operant and respondent processes work together to shape behaviour, showing that helping in Māori contexts is supported through culturally organised antecedents, reinforcement, and conditioned emotional reflexes (Mead, 2003; Pihama et al., 2025; Skinner, 1953). It highlighted that, self-reports function as verbal behaviour governed by social contingencies, which can differ from overt actions (Dang et al., 1968; Skinner, 1957), making behavioural correspondence a key concept to understand (Baer et al., 1978; Johnston & Pennypacker, 2009). The chapter also demonstrated that behaviour changes with environmental contingencies, with Māori and non-Māori settings likely to signal and reinforce helping behaviour differently (Durie, 2001; Michael, 1993). Cultural embeddedness was described as a behavioural process formed through participation in *tikanga*-guided

practices (Fox et al., 2023; Mead, 2003), and educational research showed that culturally aligned environments support Māori engagement and participation (Bishop & Berryman, 2006, 2009, 2010; Macfarlane et al., 2007). Finally, key gaps were identified, including limited Māori-specific correspondence research, reliance on self-report, lack of ABA integration, and minimal context-based comparisons, providing the rationale for directly examining helping behaviour across Māori and non-Māori environments (Macfarlane et al., 2007; Macfarlane, 2013; Mead, 2003).

Purpose of the study

The current study addresses these gaps by examining the correspondence between Māori students directly observed helping behaviour in two different settings and their self-reported culturally valued behaviours, specifically helping behaviours measured by the CVB. The research explored whether self-reported helping predicted observed helping, and whether this relationship was stronger in a Māori cultural context, where *tikanga Māori* is more salient and reinforced than in a non-Māori environment (Durie, 2001; Mead, 2003). The study was guided by principles of Applied Behaviour Analysis (ABA) alongside Kaupapa Māori frameworks (Bishop, 1996; Cooper et al., 2020; Smith, 1999). It was hypothesised that students who reported higher levels of helping behaviours on the CVB-25 would also help more frequently during observations, particularly within the Māori setting.

Looking forward, the findings of this research have the potential to inform meaningful change within education, health, and community policy. If evidence shows strong correspondence between self-reported and observable helping behaviours in culturally grounded environments, this could support the design of policies and practices that actively promote, resource, and reinforce Māori modes of communal responsibility and participation (Biglan & Glenn, 2013; Durie, 2001). Embedding this behavioural knowledge into institutional frameworks may help shift systems away from deficit-based approaches toward

recognising and celebrating Māori strengths (Bishop & Berryman, 2006, 2009, 2010; Macfarlane et al., 2007). Ultimately, the research aims to foster culturally sustaining environments where Māori students and communities can thrive and to contribute essential knowledge that informs responsive policy, professional practice, and future research in Aotearoa, New Zealand (Fox et al., 2023; Pihama et al., 2025).

Chapter 3: Method

Participants

Sample and Recruitment

The study included 23 Māori tertiary students (87.5% female, 12.5% male), aged 18-32 years. Participants were recruited through the University of Waikato SONA research participation system and through students' email invitations. To be eligible, individuals had to self-identify as Māori and (b) be enrolled in a tertiary program at the time of participation. Participants received course credit for taking part in the study.

Allocation

Following informed consent, participants were randomly assigned to one of two conditions: a Māori environment (Te Kohinga Mārama marae, n = 11) or a non-Māori environment (Standard laboratory, n=12). Randomization used a computer-generated simple random sequence, and allocation was recorded by a researcher who was present in the behavioural observations.

Exclusion Criteria

Participants were excluded if they (a) withdrew before completing the observation session or the CVB, (b) did not attend their scheduled session, (c) indicated before debriefing that they suspected the helping tasks were staged (to limit demand characteristics), or (d) left the room during any of the helping opportunities. To protect anonymity, participants' ages

and genders were collected as the only demographic information.

Research Design

A between-subjects experimental design was used to assess differences in the helping behaviour across two distinctive environments. The independent variable was the environmental condition (Māori vs non-Māori). The dependent variable was the number of helping behaviours displayed by each participant across the staged scenarios.

Predictor Variable

Self-reported helping behaviours were assessed using the CVB. For this study, the helping items were derived from the Māori Cultural Embeddedness Scale (MaCES, Fox et al., 2023). The focus was on item 12, assessing general prosocial helping tendencies (“I do my best to help people in need”). Cultural Embeddedness was assessed using the full CVB, which included questions about culturally valued practices, *tikanga*, and behaviours.

Rationale

A between-subject design was chosen to prevent contamination across cultural conditions, such as exposure to *karakia* or *whakawahanaugatanga*, while enabling standardised helping scenarios in each environment. This design also supports clear examination of contextual influences on behaviours, aligning with Applied Behaviour Analysis principles of experimental control (Baer, Wolf, & Risley, 1968; Kazdin, 2011).

Materials

Culturally Valued Behaviour Survey

The 25-item self-report Culturally Valued Behaviour (Figure A3) measure comprises of selected questions, designed to assess culturally valued practices, with one item particularly related to helping. Item 12 (“I do my best to help people in need”) was used as

the primary self-report indicator of helping, derived from the 49-item Māori Cultural Embeddedness Scale (MaCES, Fox et al., 2023), to complement this. Items are rated on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). As this item directly assesses helping behaviour, reverse scoring was not required. Internal consistency (Cronbach's α) was calculated for the full CVB scale within the present sample before analysis.

Cultural Embeddedness

Cultural embeddedness was assessed using the Culturally Valued Behaviour Survey which reflects the constructs outlined in the Māori Cultural Embeddedness Scale (MaCES; Fox et al., 2023). The questions were not directly taken from the scale but were informed by the MaCES concepts to complement the measure. A total of 25 items were created to measure participants' connection to Māori culture within tikanga-based contexts and their engagement in Māori cultural practices and behaviours. Items were rated on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Scores were computed such that higher scores reflected greater cultural embeddedness. Internal consistency (Cronbach's α) was calculated within the present sample before analysis. Cultural embeddedness was examined as a predictor of helping behaviour to determine whether participants with higher levels of embeddedness were more likely to demonstrate higher frequencies of observed helping behaviours.

Post-Session Questionnaire

Following completion of all behavioural sessions, participants completed a brief 6-item questionnaire assessing the perceived naturalism of the staged helping activities. Items evaluated whether participants experienced the situations as natural everyday situations or as research-imposed tasks (i.e. potential demand characteristics, e.g. task directives), as well as

describing the reasons they did or did not help. Example items included: “How did you feel when you were asked to help with a task? (e.g., did you feel like you had to help, wanted to help, or something else?” and “If you helped with one task (e.g., moving chairs), did you do this because others had completed the previous task first (e.g., moving the table)?” Responses were recorded as yes/no, unsure, and open-ended. Two versions of the questionnaire were distributed to participants. Both versions contained identical questions; however, one version included an additional item: “Why did you decide to help move both the table and the chairs, even after already completing one task?” This version was sent only to the two participants who assisted with moving both the table and chairs, while the other participants received the version without this additional question.

These qualitative responses were collected to explore participants' motivating operations (e.g. social influence, cultural values, spontaneity) and to provide contextual insight into observed helping behaviours. Qualitative data were analyzed descriptively to identify common themes and support the interpretation of behavioural outcomes.

Behavioural Observation Forms

Data sheets (Figures C1 & C2) were used to record participants' ID, scenario/task (e.g., tables, chairs, clipboards, dropped papers, lost key), helping response (binary: 1 = helped, 5 = did not help), and contextual notes (e.g., verbal or non-verbal cues, spontaneous collaboration, prompts).

Staged Tasks Materials

Materials used in the staged helping scenarios included pens, clipboards, bundles of A4 paper (for drop simulations), a plastic key on a lanyard (lost-key simulation), two folding tables, and 6 stackable chairs.

Environments

Māori environment: Te Kohinga Mārama Marae, a traditional Māori meeting house located at the University of Waikato. Non-Māori environment: A standard university psychology laboratory (6 × 8 m), neutral décor, room layout matched to the marae configuration (table and chair positions). Room seating layout and materials were held as constant as possible across conditions to ensure functional equivalence for observation (Johnston & Pennypacker, 2009).

Procedure

Recruitment and Consent

Participants signed up through the university's SONA platform. They received a Participant Information Sheet and Consent Form (Figures A1 & A2) that described the study as exploring students' cultural values, practices, and identity to minimise demand characteristics. The observation component and staged helping opportunities were not disclosed at this stage. Participants provided written consent before attendance. Deception procedures and full debrief are detailed in Section 3.6.

Session Preparation

Each session included four or six participants, observed by a trained researcher. Before each session, an environment setup checklist (Figure B1 & B2) was completed to ensure standardisation of layout and materials. A Marae environment checklist was used to guide the arrangement and placements of tables, chairs and props at Te Kohinga Mārama Marae. In contrast, a Laboratory environment checklist ensured consistent layout and materials in the psychology laboratory.

In each session, two tables are placed along the side of the room, and six chairs are stacked next to them. An observer's desk placed ~2 m from the activity area, equipped with clipboards, pens, observation recording sheets, and the CVB survey. The CVB was attached

to the clipboards to ensure all materials were organised and readily accessible during the session. To ensure consistency across sessions, an identical layout and set of props were used, and a short script was prepared and followed.

Māori Environment Protocol (Te Kohinga Mārama Marae)

Upon arrival, the research observer welcomed participants according to the *marae* protocol, including the customary removal of shoes before entering. A brief *karakia* was delivered at the start of the session, followed by *Whakawhanaungatanga* (Introductions), initiated by the observer. Participants were invited to share their name and iwi affiliation. The task was then introduced, with participants informed that they would help set up the room and then complete a short survey.

Staged Helping Opportunities (Standardised Across Sessions) were embedded throughout the session. One or two participants were invited to help move tables into position, arrange chairs, and distribute clipboards (with surveys attached) and pens. The observer recorded whether participants who volunteered immediately, refrained from helping or engaged in spontaneous helping behaviour. During survey collection, the observer intentionally dropped a stack of papers to create an additional opportunity to help.

During pack-down, participants were invited to return tables and chairs to their original positions and to collect clipboards and pens for placement on the observer's desk. The same behavioural categories were recorded during this phase. The session concluded with a closing of *karakia*.

Non- Māori Environment Protocol (Psychology Lab)

In the non-Māori environment (Psychology Laboratory condition), the research observer welcomed participants upon arrival; however, shoe removal was not required. The observer introduced themselves by name only, and no *Whakawhanaungatanga* or *karakia*

was conducted. The task was framed identically to the marae condition, with participants informed that they would assist with setting up the room before completing a short survey.

Staged helping opportunities and survey procedures were identical to the Māori environment (tables, chairs, clipboards/pens; paper drop during survey), including invitations to assist with tables, chairs and distribution of clipboards and pens, as well as the intentional dropping of papers during survey collection to create an additional helping opportunity. The session concluded without a formal closing ritual.

Observer Role and Interobserver Agreement (IOA)

A single trained observer conducted all sessions for procedural consistency. The observer remained neutral, avoided prompting and recorded who volunteered immediately, who hesitated before helping, who refrained from helping and any spontaneous helping from other participants. Interobserver Agreement. A second trained observer independently coded a subset ($\geq 33\%$) of sessions for IOA: Three sessions were conducted in each condition (marae and lab). One session per condition was video-recorded and randomly selected for independent coding by a second trained observer to assess the consistency and reliability of the measures and the observer. Frequency IOA was calculated as $\text{agreements} \div (\text{agreements} + \text{disagreements}) \times 100\%$ for help/no-help occurrences. Target IOA was $\geq .80$ for the measures (Cooper, Heron, & Heward, 2020; Kazdin, 2011). *IOA was 100% across both conditions.*

Ethical considerations

The study received approval from the University of Waikato Human Research Ethics Committee (ALPSS). Consistent with *Te Ara Tika* and *Kaupapa Māori* ethical principles, procedures upheld *whakapapa* (relationships), *tika* (sound design), *manaakitanga* (care and responsibility), and *mana* (power).

Use of minimal deception. To preserve naturalistic responding and avoid demand characteristics, the staged nature of the helping opportunities was not disclosed before participation. After participation, all students received a comprehensive debriefing that explained the observation component, the rationale for minimal deception, and the specific helping scenarios. Participants could withdraw their data up to 2 weeks after the debriefing without penalty.

Voluntariness and confidentiality. Participation was voluntary and anonymous; IDs were numeric only. Data were stored on password-protected devices and restricted to the research team. No personally identifiable information was retained.

Cultural safety. The Māori condition used appropriate *tikanga* (*karakia*, *whakawhanaungatanga*) and was conducted at a Marae with prior consultation. No content was culturally unsafe; participants could opt out of any component at any time.

Data Analysis

Software and data handling

Observational and self-report data were entered into Microsoft Excel and checked for accuracy. Analyses were conducted in SPSS. The primary independent variable was the environmental condition (Māori vs. non-Māori). The dependent variable was helping frequency. Predictors included the CVB helping endorsement and cultural embeddedness. A post-session questionnaire provided descriptive checks of perceived naturalism. It collected brief qualitative information about participants' motivations for helping, offering insight into why they chose to engage in helping behaviour. Qualitative data were analyzed descriptively to identify common themes and support the interpretation of behavioural outcomes.

Coding Measures

For each scenario, binary coding was applied (1= helped, 0 = did not help). A

combined helping frequency score per participant was computed across all opportunities.

CVB Scoring and Reliability

The CVB 25-item scale used a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). All items were positively worded, so reverse scoring was not needed. Cronbach's α was calculated for internal consistency. Corrected item-total correlations and inter-item correlations were reviewed to identify items with weak contributions (Tables G1-G3).

Descriptive Statistics

- For each group/condition, we computed: (Table G4 and G5)
- Mean and SD for helping frequency.
- Combined helping frequency per participant.
- Means/SDs for CVB-16 scores;
- Task-level breakdowns (tables, chairs, clipboards, papers dropped, lost key) to examine opportunity-specific patterns.

Between-group comparisons

Given small sample sizes and non-normal distributions, independent-samples t-tests (Table G8) were used to compare helping frequency between Māori and non-Māori environments, and between sex groups. Helping frequency was analysed using a one-way ANOVA (Table G9), as the age variable included three categorical groups. ANOVA is the recommended procedure when assessing mean differences across three or more independent groups. Where appropriate, rank-biserial correlation (r_{rb}) or Cliff's delta (δ) were reported as nonparametric effect sizes.

Correlation Analyses

Within each environment, Spearman's rank-order correlations (ρ) (Table G5) were conducted to examine the association between CVB item-12 helping score and the total frequency of observed helping responses across staged tasks for each participant. Analyses were two-tailed, with $\alpha = .05$ and $N = 12$ per environment.

Cultural embeddedness (full CVB scale) was examined as a predictor of helping behaviour to explore whether participants with higher levels of cultural embeddedness were more likely to demonstrate higher helping frequency. Correlations between cultural embeddedness scores and observed helping frequency were computed. Spearman's rank-order correlations (ρ) were conducted between cultural embeddedness scores and observed helping frequency. Results were interpreted alongside the CVB item-12 score to examine relationships between cultural values and helping behaviours.

Missing data

There was no missing data for the variables included in the analyses. No transformations were applied to outliers, as retaining the raw data allowed examination of whether these observations reflected genuine differences in helping behaviours rather than errors/anomalies in the data.

The assumptions of the independent-samples t-test include independence of observations, approximate normality of the dependent variable within each group, and homogeneity of variances. For Spearman's ρ , the assumption of a monotonic (as one variable increases, so does the other) was evaluated through visual inspection of scatterplots and deemed to be met. No linear relationships were found (See Figure 1).

Visualization

Scatterplots were used to assess the direction and form of relationships between variables (Figures F1-F3). Bar graphs (means with confidence intervals) were used to

visualise between-group differences and alignment between self-report and observed behaviours (Figure F4).

Replication guidelines

Measure: Use the CVB so that higher scores indicate stronger endorsements of helping behaviour; retain the helping item for item-level analyses.

Cultural embeddedness: Included the shortened 25-item MaCES derived from the 49-item cultural embeddedness scale to compare scores with the CVB and observed behaviours.

Post-Session Questionnaire: Email the 6-item naturalism questionnaire at the end of all sessions to assess whether participants perceived helping opportunities as natural interactions or as tasks/mands.

Environments: Match the room size, layout and materials across conditions; use a marae for the Māori condition.

Cultural procedures: Deliver *whakawhanaungatanga* and *karakia* only in the Māori condition; omit in the non-Māori condition.

Helping opportunities: Stage three primary opportunities (set-up tasks, paper dropped and packing-up tasks).

Observer training: Train observers to code consistently and conduct interobserver agreements on $\geq 33\%$ of sessions, targeting $\geq .80$.

Randomisation: Randomly assign participants to environmental conditions; run sessions with an equal number of participants.

Data recording: Use observation sheets to record participants' ID, tasks, helping behaviour (1-5) and contextual notes.

Ethics: Use minimal deception, with a full debrief after all sessions conclude; allow

withdrawal up to 2 weeks after the debrief.

Analysis: Use independent t-tests and One-way ANOVA for between-group comparisons and Spearman's ρ to assess correspondence; report effect sizes (r_{rb} or Cliff's δ ; Cohen's d where appropriate).

Chapter Summary

This chapter outlined the methodological framework used to examine the correspondence between Māori students' self-reported culturally valued helping behaviours (measured by the CVB) and directly observed helping in one of two distinct environments. The study drew on principles of Applied Behaviour Analysis (ABA), emphasising precise operational definitions, direct measurement of observable behaviour, and controlled manipulation of environmental variables to assess contextual influences on helping (Baer et al., 1968; Cooper, Heron, & Heward, 2020).

The study compared two environments: a Māori cultural setting (marae) and a non-Māori setting (laboratory), matched in physical layout and materials. The Māori context additionally incorporated culturally salient practice (*Karakia, whakawhanaungatanga*) to examine the impact of culturally embedded antecedents on helping behaviour. Staged helping opportunities were designed to be both standardised and naturalistic, allowing repeated measurement of helping frequency and capturing spontaneous, contingency-shaped responses.

Procedure accuracy was ensured through observer training, interobserver agreement checks, drift monitoring, randomisation, and alignment with Kaupapa Māori research principles and ABA. Participants completed the 25-item CVB, which measured cultural values, practices, and behaviours, to explore its relation to helping, and a post-session naturalism questionnaire to assess the perceived authenticity of the tasks.

Together, these methods enabled a robust investigation of whether self-reported helping behaviour corresponds with overt helping under contextual conditions. The following chapter presents internal consistency, descriptive statistics, between-group comparisons (independent t-tests and tests of correspondence Spearman's ρ), highlighting how environmental contingencies, sex and age differences, and cultural embeddedness influence helping behaviour.

Chapter 4: Results

Internal Consistency of the CVB Scale

The 25-item CVB scale was reduced to 23 items by removing Questions 15 and 18 due to zero variance, yielding $\alpha = .743$ for the remaining items. Standardising item variances slightly increased internal consistency $\alpha = .807$, indicating that the scale reliably measures culturally valued behaviour across participants.

Inter-item correlations varied widely from $r = -.488$ to $.904$, reflecting a mix of weak, moderate and strong correlations among items. Consistent with these patterns, items formed three clusters (Tables G1 –G3, See Appendix G for Table G1):

- *Strongly correlated items* (e.g., Q7, Q10, Q21; $r = .67-.90$), reflecting high contributions and strong alignment with the overall construct.
- *Moderately correlated items* (e.g., Q1, Q2, Q6, Q11, Q12, Q13, Q14, Q19, Q22, Q24, Q25; $r = .31-.61$), indicating moderate contributions to scale reliability.
- *Weakly or negatively correlated items* (e.g., Q3, Q5, Q8, Q9, Q16, Q17, Q20; $r = -.49-.29$), suggesting inconsistent performance.

Corrected item-total correlations reflected similar patterns:

- *Strong contributors* ($r = .57-.70$)

- *Moderate contributors ($r = .32-.49$)*
- *Weak contributors ($r < .19$)*

Table G2

Item-Total Statistics for Scale Items (Q1–Q25)

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q1	96.09	48.29	0.32	0.734
Q2	95.91	46.09	0.47	0.724
Q3	96.45	47.47	0.19	0.743
Q4	96.55	47.47	0.26	0.736
Q5	96.36	49.46	0.08	0.748
Q6	95.91	47.49	0.45	0.729
Q7	95.64	47.86	0.70	0.728
Q8	95.73	49.82	0.16	0.742
Q9	96.55	51.27	-0.10	0.768
Q10	96.00	43.00	0.57	0.711
Q11	96.91	41.89	0.48	0.716
Q12	96.55	43.47	0.49	0.717
Q13	96.00	46.80	0.38	0.729
Q14	95.82	46.76	0.61	0.723
Q16	96.09	51.49	-0.11	0.762
Q17	96.82	53.36	-0.23	0.783
Q19	95.82	46.76	0.61	0.723
Q20	96.45	48.47	0.09	0.753
Q21	95.73	47.42	0.59	0.726

Q22	96.00	44.80	0.49	0.719
Q23	96.64	39.46	0.65	0.697
Q24	95.82	48.16	0.38	0.732
Q25	96.18	45.96	0.39	0.727

Note. Items Q15 and Q18 were removed due to zero variance.

Table G3

Scale Reliability Statistics

Statistic	Value
Cronbach's Alpha	0.743
Cronbach's Alpha Based on Standardized Items	0.807
Number of Items	23
Scale Mean	100.55
Scale Variance	50.87
Standard Deviation	7.13

Note. Items Q15 and Q18 were excluded due to zero variance.

Overall, these findings indicate that most items reliably measured Māori cultural values, practices, and behaviours. However, some weaker items may benefit from revision in future applications to improve internal consistency.

Descriptive Statistics

Table G4 presents descriptive statistics for self-reported ratings and observed behaviours among the 12 participants in the *Laboratory* environment. For the self-reported question 12 rating, scores ranged from 2 to 5 with a mean of 3.83 ($SD = 1.11$). Indicating moderate to relatively high self-ratings for helping behaviours. Total observed behaviours had a mean frequency of 3.08 ($SD = 0.80$), ranging from 2 to 4. Individual behaviours showed varying engagement: Table Set Up ($M = 1.50$, $SD = 0.52$), Chair Set Up ($M = 1.33$, $SD = 0.49$), Clipboard Set Up ($M = 1.75$, $SD = 0.45$), and Pen Set Up ($M = 1.92$, $SD = 0.29$).

Participants collected pens and clipboards less frequently ($M = 0.67$, $SD = 0.48$). Certain behaviours were consistently performed or absent: Packing Up had a mean of 1.00 ($SD = 0.00$), while Picking Up Papers was never observed ($M = 0.00$, $SD = 0.00$).

Table G4

Descriptive Statistics for Self-Reported Rating and Observed Behaviours in the Laboratory Environment (N = 12)

Variable	N	Minimum	Maximum	M	SD
Q12 Rating	12	2	5	3.83	1.11
Total Frequency	12	2	4	3.08	.80
Table Set Up	12	0	1	1.5	.52
Chair Set Up	12	0	1	1.33	.49
Clipboard Set Up	12	0	1	1.75	.45
Pen Set Up	12	0	1	1.92	.29
Pens/Clipboards	12	0	1	.67	.48
Packing up	12	1	1	1.00	.00
Picking Up Papers	12	0	0	.00	.00

Note. M = mean; SD = standard deviation.

In the *Marae environment* (N = 11), participants' Q12 ratings were slightly higher ($M = 4.18$, $SD = 0.60$), indicating stronger self-reported engagement (Table G5). Total observed behaviour frequency was comparable to the laboratory ($M = 3.18$, $SD = 0.87$). Individual behaviours followed a similar pattern: Table Set Up ($M = 1.55$, $SD = 0.52$), Chair Set Up ($M = 1.18$, $SD = 0.41$), Clipboard Set Up ($M = 1.55$, $SD = 0.52$), Pen Set Up was consistently observed ($M = 2.00$, $SD = 0.00$), and Pens/Clipboards collection had a moderate mean ($M = 1.55$, $SD = 0.52$). Packing Up remained consistent ($M = 1.00$, $SD = 0.00$), and Picking Up Papers was not observed ($M = 0.00$, $SD = 0.00$).

Table G5

Descriptive Statistics for Self-Reported Rating and Observed Behaviours in the Marae Environment (N = 11)

Variable	N	Minimum	Maximum	M	SD
Q12 Rating	11	3	5	4.18	.60
Total Frequency	11	2	4	3.18	.87
Table Set Up	11	0	1	1.55	.52
Chair Set Up	11	0	1	1.18	.41
Pen Set Up	11	1	1	2.00	.00
Clipboard Set Up	11	0	1	1.55	.52
Pens/Clipboards	11	0	1	1.55	.52
Packing up	11	1	1	1.00	.00
Picking Up Papers	11		0	.00	.00

Note. M = mean; SD = standard deviation.

Overall, participants generally reported high engagement on Q12 and demonstrated moderate to high frequencies of culturally valued behaviours across both environments, with some variation depending on specific behaviours and settings

Scatterplots and Bar Graphs

Scatterplots (Figures F1-F3) were used to examine relationships between Q12 self-reported ratings, total frequency of helping behaviours, and overall performance across sex and age groups. These plots revealed no strong linear relationships between self-reported engagement and observed helping behaviours. A small trend was observed for sex, with female participants generally scoring higher than male participants, while age showed no noticeable association with either self-reports or observed behaviour.

Figure F1.

Total Observed Helping Behaviour versus Self-Reported Helping Behaviour (Q12.)

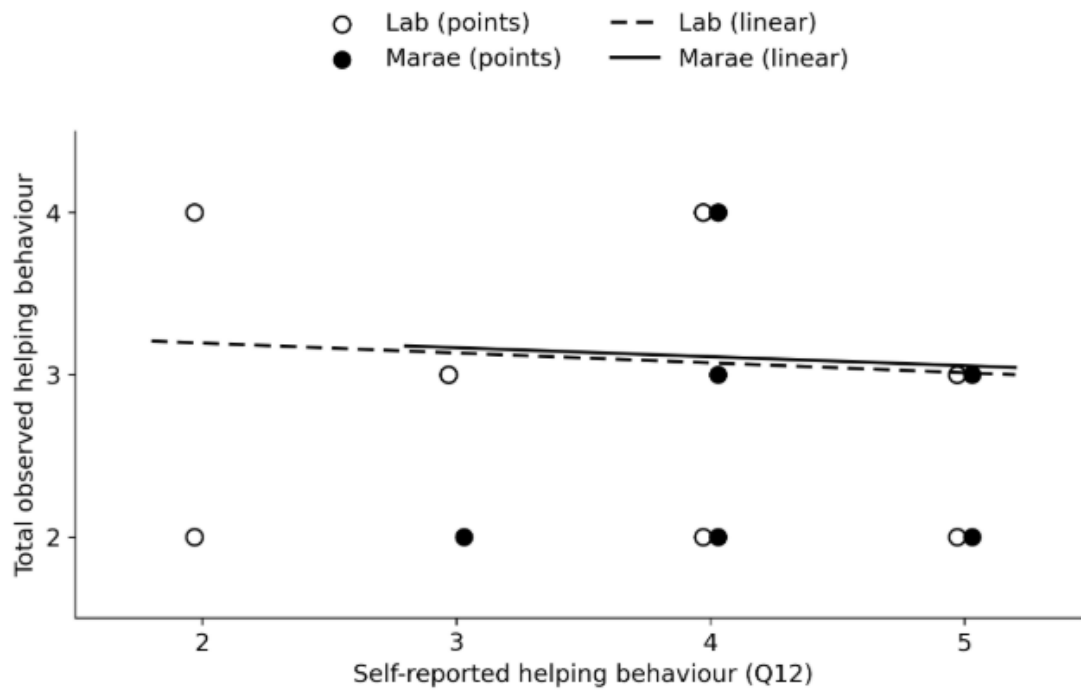


Figure F2.

Total Observed Helping Behaviour across age groups in different environments

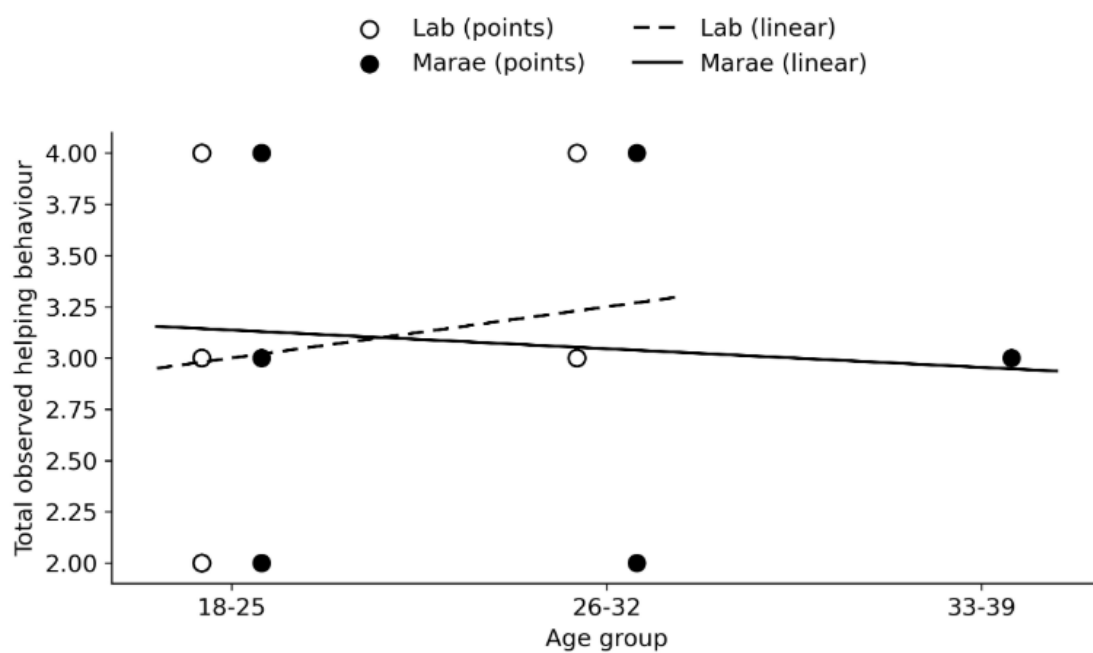
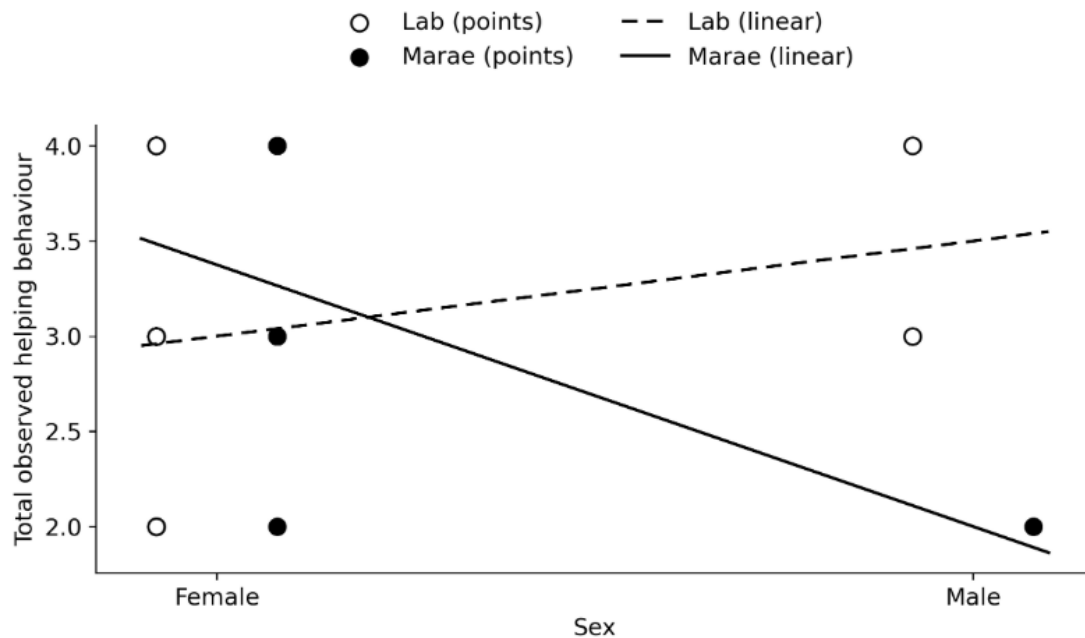


Figure F3.

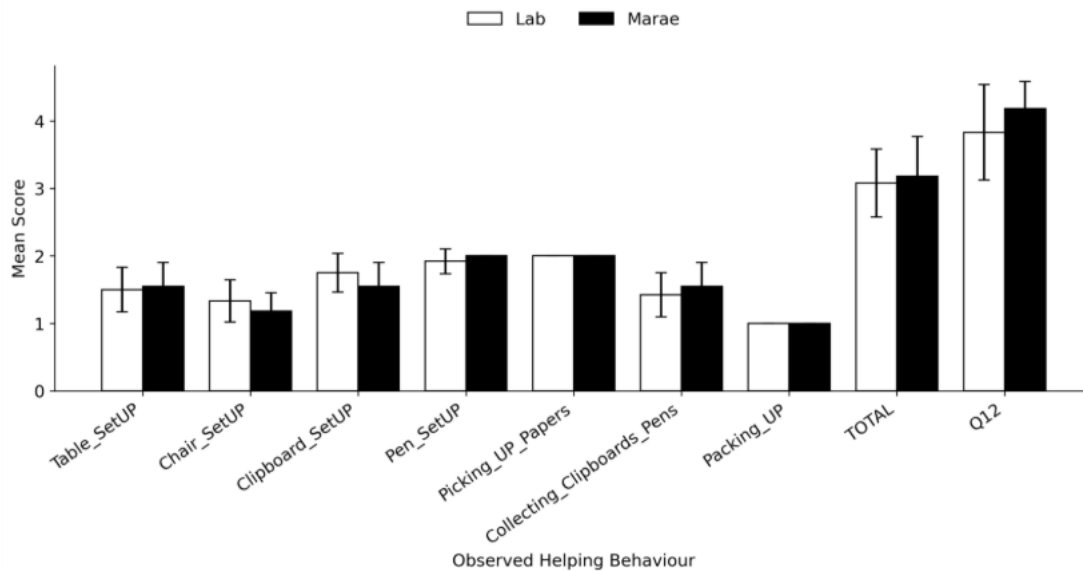
Total Observed Helping Behaviour across sex groups in different environments



Bar graphs (Figure F4) were used to visualise completion of individual helping tasks across the laboratory and marae environments. These graphs showed variability in task performance among participants, but no consistent differences between environments were evident. Together, the scatterplots and bar graphs support the statistical findings, indicating that helping behaviours and self-reported engagement were largely unaffected by environment, with only minor variation related to sex.

Figure F4.

Mean score for observed helping behaviours, the total frequency and self-reported scores (Q12).



Spearman's rank-order correlations

Table G6 presents Spearman's rank-order correlations examining the relationships among observed task behaviours and total performance scores ($N = 23$). Table setup was strongly negatively correlated with chair setup ($r_s = -.62, p < .01$), suggesting that participants who scored higher on table setup were less likely to score higher on chair setup. Chair setup was positively correlated with clipboard setup ($r_s = .43, p < .05$) and Q12 self-reported ratings ($r_s = .48, p < .05$), indicating that participants who scored higher on chair setup also scored higher on clipboard setup and reported higher self-ratings. Total score was negatively correlated with clipboard setup ($r_s = -.82, p < .001$) and collecting clipboards and pens ($r_s = -.46, p < .05$), suggesting that participants with higher overall performance scored lower on these specific tasks. Correlations between total score and table setup ($r_s = -.05$), chair setup ($r_s = -.37$), pen setup ($r_s = .05$), picking up papers, and packing up were not statistically significant. No other correlations among the task variables reached significance.

Table G6*Spearman correlations among self-reported rating and observed behaviours (N = 23)*

Variable	1	2	3	4	5	6	7	8	9
1. Table Setup	—								
2. Chair Setup	-.62**	—							
3. Clipboard Setup	-.15	.43*	—						
4. Pen Setup	.22	-.36	-.16	—					
5. Picking Up Papers	—	—	—	—	—				
6. Collecting Clipboards & Pens	-.30	.03	0.15	-.22	—	—			
7. Packing Up	—	—	—	—	—	—	—		
8. Total Score	-.05	-.37	-.82***	0.05	—	-.46*	—	—	
9. Q12	-.22	.48*	.26	-.28	—	-.14	—	-.14	—

Note. Values represent Pearson's r correlations. $p < .05$. ** $p < .01$. *** $p < .00$

Table G7 presents Spearman's rank-order correlations between individual item scores, total score, and Q12 self-reported ratings ($N = 23$). Several items were significantly correlated with total score, including Q1 ($r_s = .38, p < .05$), Q4 ($r_s = .38, p < .01$), Q9 ($r_s = .43, p < .05$), and Q20 ($r_s = .43, p < .05$), suggesting that participants who scored higher on these items also had higher overall observed behaviour total scores. For Q12 self-reported ratings, significant positive correlations were observed with Q1 ($r_s = .42, p < .05$), Q4 ($r_s = .60, p < .01$), Q13 ($r_s = .52, p < .05$), Q14 ($r_s = .52, p < .05$), Q16 ($r_s = .52, p < .05$), and Q22 ($r_s = .45, p < .05$), indicating that participants who scored higher on these items also reported higher self-ratings. Other item correlations with the total score and Q12 were not statistically significant. Overall, these findings suggest that higher scores on specific items are associated with higher overall performance and self-reported engagement.

Table G7*Spearman correlations among self-reported rating of the Culturally Valued Behaviour Scale,**Total Observed Behaviour and Question 12(N = 23)*

Item	TOTAL	Q12
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<i>Q1</i>	<i>0.38</i>	<i>0.42*</i>
<i>Q2</i>	<i>0.03</i>	<i>0.35</i>
<i>Q3</i>	<i>0.27</i>	<i>0.28</i>
<i>Q4</i>	<i>0.38</i>	<i>0.60*</i>
<i>Q5</i>	<i>0.38</i>	<i>0.00</i>
<i>Q6</i>	<i>-0.24</i>	<i>0.32</i>
<i>Q7</i>	<i>0.25</i>	<i>0.36</i>
<i>Q8</i>	<i>0.35</i>	<i>0.26</i>
<i>Q9</i>	<i>0.43*</i>	<i>0.19</i>
<i>Q10</i>	<i>0.23</i>	<i>0.19</i>
<i>Q11</i>	<i>0.23</i>	<i>0.29</i>
<i>Q13</i>	<i>0.07</i>	<i>0.52*</i>
<i>Q14</i>	<i>0.30</i>	<i>0.52*</i>
<i>Q15</i>	<i>-0.06</i>	<i>0.28</i>
<i>Q16</i>	<i>-0.26</i>	<i>0.52*</i>
<i>Q17</i>	<i>0.03</i>	<i>0.10</i>
<i>Q18</i>	<i>0.06</i>	<i>0.29</i>
<i>Q19</i>	<i>0.05</i>	<i>0.26</i>
<i>Q20</i>	<i>0.43*</i>	<i>-0.08</i>
<i>Q21</i>	<i>0.33</i>	<i>0.14</i>
<i>Q22</i>	<i>-0.07</i>	<i>0.45*</i>
<i>Q23</i>	<i>0.29</i>	<i>0.20</i>
<i>Q24</i>	<i>0.35</i>	<i>0.41</i>
<i>Q25</i>	<i>0.14</i>	<i>0.29</i>

Note. * $p < .05$, ** $p < .01$, $N = 23$

Independent T-Tests

Independent-samples *t*-tests were conducted (Table G8) to examine differences in total helping behaviour frequency across environment and sex. Because there were three age

categories, a one-way ANOVA was used to analyze age-related differences. Due to the small sample size and unequal group sizes, the assumption of equal variances could not be met; therefore, Welch's *t*-test results are reported.

For sex, females ($n = 19$, $M = 3.21$, $SD = 0.79$) did not differ significantly from males ($n = 4$, $M = 2.75$, $SD = 0.96$), $t(3.90) = 0.90$, $p = .420$. The mean difference of 0.46 (95% CI [-0.97, 1.90]) indicates that females reported slightly higher helping frequency on average, although this difference was not statistically significant. The effect size was moderate ($d = 0.55$), suggesting a small but non-reliable trend.

Similarly, the environmental context showed no significant differences. Participants in the lab setting ($n = 12$, $M = 3.08$, $SD = 0.79$) reported similar helping frequency to those in the marae setting ($n = 11$, $M = 3.18$, $SD = 0.87$), $t(20.29) = -0.28$, $p = .781$. The mean difference was very small (-0.10, 95% CI [-0.83, 0.63]), and the effect size was negligible ($d = -0.12$). Together, these findings indicate that the total frequency of helping did not differ significantly by sex or environmental context.

Table G8

*Independent Samples *t* Tests Comparing Total Frequency Across Sex and Environment*

Comparison	Group 1 (n, M, SD)	Group 2 (n, M, SD)	t	df	p	Mean Diff	95% CI [LL, UL]	d
Sex	19, 3.21, 0.79	4, 2.75, 0.96	0.90	3.90	.420	0.46	[-0.97, 1.90]	0.55
Environment	12, 3.08, 0.79	11, 3.18, 0.87	-0.28	20.29	.781	-0.10	[-0.83, 0.63]	-0.12

Note. Equal variances were not assumed; Welch's *t*-test results are reported. Mean differences are calculated as Group 1 minus Group 2. Cohen's *d* is reported using pooled standard deviations. Values are rounded to two decimal places.

ANOVA Test

A one-way ANOVA was conducted to examine whether Q12 scores and total

frequency of helping differed across sex categories. ANOVA was appropriate for this analysis because age in the broader study design included three categorical groups, requiring a method capable of comparing more than two groups simultaneously. For Q12, the results indicated no significant effect of sex, $F(2, 20) = 0.85, p = .441$, suggesting that mean Q12 scores did not differ across sex groups. Similarly, the ANOVA for total frequency of helping showed no significant differences between sex groups, $F(2, 20) = 0.02, p = .983$. Overall, these findings suggest that neither Q12 responses nor total helping behaviour varied meaningfully by sex.

Table G9

One-Way ANOVA Comparing Self-Reported Helping Behaviour (Q12) and Total Observed Helping Behaviour Across Sex Groups

Variable	Source	SS	df	MS	F	p
Q12	Between groups	1.42	2	0.71	0.85	.441
	Within groups	16.58	20	0.83	—	—
	Total	18.00	22	—	—	—
Total Observed Helping Behaviour	Between groups	0.03	2	0.01	0.02	.983
	Within groups	14.58	20	0.73	—	—
	Total	14.61	22	—	—	—

Post-Session Questionnaire data

Descriptive analysis of participant responses ($N = 4$) indicated consistent endorsement of intrinsic motivation to help. All participants (100%) reported they wanted to help when asked to assist with a task (Q1). Responses regarding turn-taking following task completion (Q2) were more variable: one participant (25%) reported that someone else should take a

turn, and one participant (25%) reported that someone else should not. Two participants (50%) indicated that they allowed another person to have a turn. For Q3, examining whether helping was contingent on others having completed a previous task, responses were evenly split, with two participants (50%) responding “yes” and two (50%) responding “no.”

Regarding the researcher turning away while picking up dropped papers (Q4), two participants (50%) reported that this did not affect their sense of invitation to help (“no”), and two (50%) reported that they did not notice the manipulation. Finally, most participants (75%) described the tasks as naturalistic, while one participant (25%) indicated that the tasks felt like a mix of both naturalistic and directive contexts (Q5).

Chapter 5: Discussion

Overview and Key Findings

This study examined whether Māori students’ self-reported helping behaviour aligned with directly observed helping behaviour, and whether helping differed across a culturally salient environment (marae) and a non-Māori environment (laboratory). Three main findings emerged. First, there was no statistically significant difference in total observed helping behaviour between the marae and laboratory settings (Welch’s $t(20.29) = -0.28$, $p = .781$). Similarly, comparisons by sex were non-significant (Welch’s $t(3.90) = 0.90$, $p = .420$), and age comparisons analysed using a one-way ANOVA also showed no group differences.

Second, self-reported helping behaviour (Q12) was moderately high in both environments (Lab: $M = 3.8$; Marae: $M = 4.2$), whereas the frequency of observed helping behaviour was moderate and similar across the two settings (Lab: $M = 3.1$; Marae: $M = 3.2$). Third, scatterplots and correlation analyses suggested limited correspondence between Q12 and total observed helping behaviour, with no clear monotonic increase in observed helping as self-reported helping scores increased within either environment.

Taken together, these findings suggest three key patterns: (a) the frequency of observed helping behaviour was relatively consistent across the two environments and across demographic subgroups, (b) participants generally reported positive attitudes toward helping, and (c) there was only a weak relationship between participants' self-reported helping tendencies and their actual behaviour in staged helping situations. These results have implications for how culturally valued behaviours such as helping are conceptualised and measured in applied settings, and for understanding when and how environmental cues influence the likelihood of observable helping behaviour.

What the Findings Mean

Limited Correspondence Between Saying and Doing

Across both settings, self-reported helping scores were higher than the observed helping averages and did not show a strong clear relationship with the total observed helping behaviour. Scatterplots of Q12 and total observed helping—both combined and separated by environment—showed no clear positive trend, even when linear fits were applied. This suggests that verbal endorsements of helping (e.g., “I do my best to help people in need”) were not closely aligned with how participants behaved during the brief, staged helping opportunities included in the study procedure. This pattern is consistent with longstanding findings showing that self-reports of behaviour often display only low to moderate correspondence with directly observed behaviour (Dang et al., 2020; Risley & Hart, 1968).

From an Applied Behaviour Analysis (ABA) perspective, this difference is not unexpected because verbal and non-verbal behaviour may be maintained by different contingencies (Cooper et al., 2020; Michael, 1993; Skinner, 1953;). As a result, the two forms of behaviour can diverge even when they refer to the same topic or intention. Verbal responding is often shaped by social reinforcement—such as maintaining credibility,

expressing identity-consistent values, or aligning with cultural expectations—whereas helping behaviour in the moment depends on the immediate discriminative stimuli and motivating operations present in the environment (Cooper et al., 2020; Michael, 1982, 1993; Skinner, 1953;).

Responses from the post-questionnaire support this interpretation. Although participants frequently reported a willingness to help, their comments suggested that the tasks felt like a mixture of naturalistic and directive situations. Participants also differed in how they interpreted environmental cues, such as whether they should take turns or whether the researcher's behaviour signalled that help was expected. This variation suggests that stimulus control may have been relatively weak or inconsistent across the staged situations (Baum, 2005; Cooper et al., 2020).

Thus, the low correspondence observed here likely reflects a functional divergence between rule-governed verbal behaviour and contingency-shaped behaviour rather than simply indicating measurement error (Johnston & Pennypacker, 2009; Skinner, 1953;). Practically, this reinforces the value of integrating direct observation with self-report measures when evaluating culturally valued behaviours, as verbal reports alone may not fully capture enacted behaviour (Baum, 2005; Cooper et al., 2020).

No Environmental Effects

Contrary to the hypothesis that helping behaviour would be higher in the marae condition—where tikanga, relational expectations, and collective responsibilities might strengthen relevant stimulus control—results showed no significant differences between environments (Durie, 2001; Mead, 2003). Participants did not demonstrate higher levels of helping behaviour in the culturally salient marae setting compared with the laboratory setting (Baum, 2005; Skinner, 1953;). Several possible explanations may account for this outcome,

and these interpretations are consistent with both behaviour analytic perspectives and kaupapa Māori understandings of social behaviour (Durie, 2001; Mead, 2003; Walker, 2004).

One explanation is that the cues present in the marae setting were not sufficiently distinct or consistently interpreted to reliably increase helping behaviour across participants (Baum, 2005; Michael, 1993; Skinner, 1953, 1957). From a behaviour analytic perspective, helping behaviour occurs when particular antecedent conditions signal that such responding will be reinforced (Cooper et al., 2020; Skinner, 1953;). If those discriminative stimuli were not clearly differentiated between the two settings, participants may have responded in similar ways regardless of location (Baer et al., 1968; Baum, 2005; Skinner, 1953;). In addition, the helping tasks used in this study were intentionally brief and structured to allow replication across both environments (Baer et al., 1968; Cooper et al., 2020). While this standardisation was necessary for comparison, it may have reduced some of the contextual differences that would normally influence behaviour in more natural marae interactions (Durie, 2001; Mead, 2003).

Another possible explanation relates to participants' prior learning histories (Baum, 2005; Michael, 1993;). Many Māori students are likely to encounter expectations around helping behaviour across a range of settings, including family, educational, and community contexts (Durie, 2001; Mead, 2003; Stokes & Baer, 1977). Over time, helping behaviour reinforced across these contexts may become generalised rather than strongly tied to a single cultural environment (Baum, 2005; Stokes & Baer, 1977). Behavioural research has demonstrated that behaviours reinforced in one context can occur in other contexts that share similar social cues or expectations (Skinner, 1953; Stokes & Baer, 1977). If helping has been broadly reinforced across participants' experiences, similar levels of responding would be expected in both environments (Baum, 2005; Cooper et al., 2020).

A kaupapa Māori perspective further suggests that culturally valued behaviours, such

as helping, are shaped through relationships and collective responsibility rather than being restricted to a particular physical setting (Durie, 2001; Mead, 2003). Concepts such as manaakitanga emphasise care for others and the maintenance of respectful relationships across many areas of life (Royal, 2003; Walker, 2004). From this viewpoint, Māori students may carry these relational expectations with them across contexts, meaning that helping behaviour can occur in both Māori and non-Māori environments (Durie, 2001; Mead, 2003). This interpretation highlights that cultural behaviour is not solely determined by the setting itself, but by the social and relational frameworks that individuals bring into different situations (Bishop et al., 2009; Fox et al., 2023).

Procedural Equivalence may Have Flattened Differences.

This study intentionally matched room layouts, materials, and tasks across conditions to focus on cultural antecedents, such as karakia and whakawhanaungatanga, rather than differences in physical affordances (Baer et al., 1968; Johnston & Pennypacker, 2009). By controlling these aspects of the environment, variability in discriminative stimuli and opportunities for reinforcement was reduced, which likely limited divergence in helping behaviour between settings (Baer et al., 1968; Johnston & Pennypacker, 2009).

Helping Behaviour Generalisation.

The participants, Māori tertiary students who reported strong helping values, may already demonstrate helping behaviours that carry over across different settings (Cooper et al., 2020; Stokes & Baer, 1977). In other words, these behaviours can generalise to new contexts that share similar functions or reinforcement histories, meaning that prior experiences may have established helping as a consistent way of responding (Baum, 2005; Cooper et al., 2020). Moreover, when participants already strongly endorse helping, there may be less room for environmental cues to influence behaviour, which could explain why

differences between settings were minimal (Michael, 1982, 1993; Skinner, 1953).

Opportunity Density and Ceiling Effects.

Several tasks showed very little variation—for example, packing up was completed by almost all participants, and one helping opportunity, picking up papers, was not observed at all. This pattern reflects a ceiling effect, which occurs when a task or measure is so straightforward, obvious, or universally completed that most participants score at or near the maximum possible level (Kazdin, 2011). When data cluster at the top end in this way, there is little room for differences to emerge between individuals (Kazdin, 2011). As a result, limited behavioural variability reduces the analysis's sensitivity to detecting context-based differences (Kazdin, 2011). Consequently, subtle shifts in motivating operations across the marae and lab environments may have gone unnoticed (Cooper et al., 2020; Michael, 1982, 1993).

No Differences by Sex or Age

Sex differences between female and male participants were not statistically significant, and the one-way ANOVA for age groups also showed no differences in either Q12 self-reports or total helping frequency (Kazdin, 2011). The small and uneven subgroup sizes limited statistical power, especially where degrees of freedom were very low (e.g., Welch's $df = 3.9$) (Cohen, 1992; Field, 2018). Given the generally low behavioural variability and the relatively uniform helping observed, the absence of significant differences should be interpreted as a lack of evidence for large effects rather than as proof of no effect (Kazdin, 2011; Michael, 1982, 1993). These findings are consistent with the idea that brief, staged helping opportunities produced similar behaviour across subgroups (Baum, 2005; Cooper et al., 2020), or that any meaningful demographic differences are more likely to appear in longer-term, naturalistic cultural contexts (Durie, 2001; Mead, 2003).

Behavioural Clustering

Task-level patterns revealed noticeable clustering across participants. For example, pen set-up was completed by all marae participants, packing up was consistently completed across both environments, and picking up papers was never observed (Mead, 2003).

Differences between chair, table, and clipboard set-up tasks were relatively modest (Bishop & Berryman, 2006, 2009, 2010). This pattern suggests that the specific features and clarity of each task influenced participants' responses (Macfarlane et al., 2007; Macfarlane, 2013).

Tasks that clearly signalled group obligation or collective responsibility likely acted as stronger discriminative stimuli, prompting more consistent helping (Mead, 2003). In contrast, tasks perceived as ambiguous (e.g., dropped papers) or individually assigned (e.g., collecting clipboards and pens) elicited less helping (Bishop & Berryman, 2006; Macfarlane et al., 2008). These findings align with previous research showing that helping behaviour varies according to environmental cues, task structure, and perceived social or cultural role expectations (Bishop & Berryman, 2006; Macfarlane et al., 2007).

Comparing Previous Research

These findings align with behaviour-analytic perspectives that distinguish verbal from non-verbal behaviour and emphasise the role of environmental control in shaping moment-to-moment responding (Catania, 2013; Michael, 1982; Skinner, 1957, 1969). Within this framework, statements about behaviour and the behaviour itself may be governed by different contingencies (Catania, 2013; Skinner, 1957).

From a Kaupapa Māori-aligned interpretation, the absence of large differences between environments does not suggest that marae contexts are unimportant for helping behaviours (Durie, 2001; Mead, 2003). Instead, in brief, matched, low-stakes tasks, the discriminative stimuli and motivating operations present may not have been sufficiently

distinctive to shift already generalised helping behaviours (Laraway et al., 2003; Michael, 1982, 1993). The influence of the Māori environment may be stronger when tasks are embedded in authentic roles, involve interlocking behavioural contingencies (e.g., coordinated hosting), or when cultural leadership and relational obligations are made salient over longer timeframes than a single session allows (Mead, 2003; Durie, 2001). These are precisely the contexts in which marae-based social organisation and cultural practices are rich, layered, and sustained (Mead, 2003; Durie, 2001).

The modest correspondence between Q12 self-reports and observed helping is consistent with broader research showing that self-report measures often correlate only modestly with direct measures of behaviour, especially for socially valued actions or when behaviour is strongly controlled by situational contingencies (Baumeister et al., 2007; Podsakoff et al., 2003). Functionally, verbal endorsements of helping can be understood as rule-governed or tact-like responses maintained by social reinforcement (Hayes et al., 2001; Skinner, 1957), whereas overt helping within a specific micro-context is more likely to be contingency-shaped, responding to immediate antecedents and local consequences (Catania, 2013; Skinner, 1969). The results of this study illustrate this functional distinction in a sample of Māori students under culturally respectful procedures (Catania, 2013; Skinner, 1969).

Methodological Considerations and Limitations

Several design choices—made to ensure feasibility and cultural safety—also limit the strength of inferences that can be drawn from the present findings and highlight opportunities for methodological improvement in future research.

Small, Imbalanced Subgroups

The male participant group was particularly small ($n = 4$), and age groups were unevenly distributed (Cohen, 1992; Field, 2018). These imbalances constrain statistical

power and precision and increase sampling variability in effect size estimates (Cohen, 1992; Field, 2018). Consequently, non-significant results should be interpreted with caution (Lakens, 2017). Specifically, the absence of statistically significant differences does not provide evidence of equivalence between groups; rather, it reflects insufficient evidence to detect large or meaningful differences under the present sample conditions (Cohen, 1992; Lakens, 2017).

Opportunity Density and Range

The study included relatively few and brief staged opportunities (Baer et al., 1968; Skinner, 1953). As a result, several behavioural measures showed near-zero variance, and at least one behaviour was not observed at all (Kazdin, 2011; Skinner, 1969). Restricted behavioural variability reduces statistical sensitivity and can weaken correlations between measures (Kazdin, 2011; Skinner, 1969). Increasing the number and diversity of helping opportunities—particularly those that occur naturally within social interactions—may improve measurement sensitivity and enable a broader range of behavioural responses to be captured (Baum, 2005; Cooper et al., 2020).

Mand vs. Spontaneous Helping

Some helping opportunities involved direct requests, or manded behaviour, whereas others were intended to allow spontaneous helping to occur (Michael, 1993; Skinner, 1957, 1969). Compliance with direct requests can be relatively high even when motivating operations are weak, meaning that manded tasks may inflate baseline helping rates and reduce contrasts between conditions (Cooper et al., 2020; Skinner, 1957, 1969). To more accurately capture contextual variation in helping, future research may benefit from analysing manded and spontaneous behaviours separately or developing task-specific indices that distinguish between these forms of responding (Baum, 2005; Cooper et al., 2020).

Ecological Fidelity of Cues

While the marae condition included culturally relevant elements such as *karakia* and *whakawhanaungatanga*, research constraints required a simplified version of the social environment compared with an authentic marae gathering (Durie, 2001; Mead, 2003). For example, the absence of manuhiri performing explicit hosting roles and the lack of extended coordination over time may have reduced the salience of collective responsibilities and shared cultural contingencies (Durie, 2001; Mead, 2003). These simplifications likely diminished the environmental cues and social contingencies that normally guide helping behaviour, which could have contributed to the limited differences observed between the marae and laboratory settings (Durie, 2001; Mead, 2003). Consequently, while the staged marae environment captured key cultural features, it may not have fully elicited the contextual nuances that shape helping behaviours in authentic, extended marae experiences.

Measurement Pairing and Scale

The Q12 item represents a global self-report of helping tendency, whereas the behavioural measure captured a smaller set of observed tasks (Ajzen et al., 1980; Baumeister et al., 2007). This mismatch between a broad self-assessment and specific, task-level observations can weaken correlations, because the two measures operate at different levels of analysis (Ajzen et al., 1980; Baumeister et al., 2007). For example, a participant might report that they “often help others in need,” but the study presented only a few brief helping opportunities, which may not reflect their overall helping tendencies. Future research may therefore benefit from incorporating task-proximal self-report items that correspond directly to the observed behaviours, improving alignment between verbal accounts and actual behavioural expression (Baum, 2005; Cooper et al., 2020).

Demand and Reactivity Checks

Participants reported that the setting felt generally naturalistic but somewhat directive (Kazdin, 2011). Being aware of observation can influence behaviour, introducing reactivity effects that may alter how participants respond compared with typical contexts (Kazdin, 2011). Extending observational periods and reducing explicit instructions in future research may help to minimise these reactivity effects and capture behaviour that more accurately reflects natural tendencies (Cooper et al., 2020; Kazdin, 2011)

Theoretical and Practical Implications

The findings of this study support a distinction between two complementary systems for measuring culturally valued behaviour: the verbal system and the behavioural system (Skinner, 1957, 1969). Verbal behaviour and non-verbal behaviour are functionally distinct, influenced by different contingencies and forms of environmental control (Baer et al., 1968; Skinner, 1957). Self-reports reflect verbal behaviour maintained through social reinforcement or culturally shared expectations, while direct observation captures contingency-shaped behaviour responsive to immediate cues and motivating operations (Cooper et al., 2020; Skinner, 1957, 1969). Therefore, imperfect alignment between self-reported and observed helping reflects these functional differences rather than measurement error (Baer et al., 1968; Skinner, 1957, 1969).

For Māori students, this distinction is particularly relevant: culturally embedded helping is guided by socially transmitted rules, relational obligations, and collective responsibilities (Durie, 2001; Mead, 2003; Fox et al., 2023). Students may verbally endorse helping without demonstrating it in every brief, staged opportunity, especially when discriminative stimuli or motivating operations differ from authentic cultural contexts (Michael, 1993; Baum, 2005). Recognising the separate but complementary nature of verbal and behavioural systems helps interpret self-report and observation data together, showing how culture, context, and learning history shape behaviour (Baer et al., 1968; Fox et al., 2023

Skinner, 1957, 1969).

Verbal Behaviour (Self-Report)

Verbal behaviour is typically assessed through self-report measures, which reflect participants endorsed valued, culturally aligned identities, and verbally mediated rules about appropriate behaviour (Skinner, 1953, 1957, 1969). Self-reports therefore function as an indicator of what individuals believe they should do, what behaviours they value, and how they describe their cultural commitments. These responses are often maintained by socially mediated contingencies such as approval, identity affirmation, and alignment with cultural expectations (Skinner, 1953, 1957, 1969). In this sense, self-reports provide valuable insight into the verbal and cultural frameworks through which individual interpret and organise their behaviour.

Observed Behaviour (Overt)

In contrast, the behavioural system, assessed through direct observation, reflects the moment-to-moment interaction between individuals and their environments (Baer et al., 1968; Cooper et al., 2020). Observed helping behaviours are shaped by immediate antecedent stimuli, motivating operations (MOs), and reinforcing consequences (Baer et al., 1968; Cooper et al., 2020; Skinner, 1969). These environmental variables influence whether a behaviour occurs at a given moment, regardless of whether the individual verbally endorses that behaviour as important or desirable. Consequently, observation provides a direct measure of contingency-shaped responding within specific contexts (Baer et al., 1968; Cooper et al., 2020; Skinner, 1969).

Importantly, neither system is inherently superior; each addresses different empirical questions. Self-report measures are well-suited to understanding culturally valued beliefs, personal values, and identity-based commitments (Ajzen, 1991; Baer et al., 1968), whereas

observational measures assess how these values translate into actual behaviour under specific environmental conditions (Cooper et al., 2020; Skinner, 1957, 1969). Discrepancies between reported values and observed behaviour are well documented and often arise when environmental contingencies differ from verbally endorsed expectations (Ajzen, 1991; Baer et al., 1968).

When research aims to examine the correspondence between what individuals say they value and what they do, both systems are essential. The present findings reinforce the importance of multi-method approaches in studying culturally valued behaviour. Combining self-report with direct observation allows researchers to capture the complex relationship between culturally endorsed values, verbal rules, and environmental contingencies (Durie, 2001; Fox et al., 2023). Practically, such designs should aim to: (a) maintain cultural safety and respect for participants' cultural contexts, (b) provide sufficiently rich opportunities for behaviours to occur naturally, and (c) pair task-proximal verbal probes with clearly defined behavioural observations to better examine correspondence between the two systems (Baer et al., 1968; Cooper et al., 2020).

Applied Practice

The findings of this study have several practical implications for supporting the expression of culturally valued helping behaviours within educational and community settings (Bishop et al., 2009; Macfarlane et al., 2007).

Engineering Antecedents and Motivating Operations That Invited Spontaneous Helping.

Helping behaviours are most likely to occur when individuals encounter clear opportunities where assistance is visibly needed and socially valued (Michael, 1982, 1993; Skinner, 1957, 1969). Future studies and applied settings should structure environments so that roles, responsibilities, and expectations around helping are explicit. For example, making

manaakitanga-related responsibilities visible during group activities, clarifying when assistance is needed, and providing immediate social acknowledgement when helping occurs may increase the salience of contingencies that support these behaviours (Cooper et al., 2020; Mead, 2016).

Teach for Generalisation of Helping Behaviours

Although participants demonstrated moderate levels of helping across both environments, transferring culturally valued behaviours between contexts is not always automatic (Baum, 2005; Stokes & Baer, 1977). Behaviour-analytic research suggests that generalisation requires deliberate programming through shared stimuli, reinforcement contingencies, and common behavioural expectations across settings (Stokes & Baer, 1977). Educational settings can therefore benefit from establishing shared cues across environments, using consistent language around group responsibilities and helping roles, and ensuring that similar reinforcement systems support helping in both Māori and non-Māori contexts (Bishop & Berryman, 2006; Macfarlane et al., 2007).

Use Behaviour-Congruent Feedback.

Practitioners should prioritise behaviour-congruent feedback when the goal is to increase observed helping behaviour (Cooper et al., 2020). Behaviour is strengthened most effectively when reinforcement is contingent on specific actions. In practice, this means acknowledging specific helping behaviours when they occur rather than relying solely on general encouragement or identity-based appeals (Skinner, 1957, 1969). Immediate, culturally congruent forms of acknowledgement – such as recognition from group leaders or peers – may be particularly effective in strengthening helping behaviours within collective environments (Durie, 2001; Mead, 2003).

Together, these strategies highlight that culturally valued behaviours are most likely

to occur when the environment actively supports and reinforces them, rather than when they are only verbally endorsed (Baum, 2005; Skinner, 1957, 1969).

Future Research

The present study offers an initial examination of the correspondence between self-reported and observed helping behaviours among Māori students. However, several methodological refinements could strengthen future research and provide a richer understanding of how culturally valued behaviours are expressed and maintained across different contexts (Baum, 2005; Cooper et al., 2020).

Increase Opportunity Density and Observation Duration

Future studies should aim to increase both the number of helping opportunities and the length of observation periods. In the current study, opportunities to help were brief and intentionally limited to maintain experimental control and comparability across environments (Baer et al., 1968; Johnston & Pennypacker, 2009). While this approach ensured consistency, it may have restricted the range of behaviours participants could display. Observing helping behaviours across multiple sessions or during extended activities – such as authentic marae preparation or hosting events – could allow broader cultural contingency systems to emerge (Glenn, 2004; Skinner, 1969). These extended activities often involve coordinated social participation and shared responsibilities, which may produce interlocking behavioural contingencies that shape cooperative responding (Glenn, 2004; Michael, 1982).

Longer observation periods would also allow researchers to use more nuanced behavioural measures beyond simple occurrence or frequency. For example, time-based measures such as latency to help, duration of participation, persistence across tasks, or responsiveness to repeated requests could provide a more detailed understanding of helping behaviour (Cooper et al., 2020). These measures may reveal subtle patterns of engagement

that single-task observations cannot capture. Extended observations can also show whether helping behaviours are sustained over time or diminish once immediate task demands are removed. By increasing both the number of opportunities and the duration of observation, future research could better capture the dynamic and context-dependent nature of culturally valued helping behaviours (Baum, 2005; Glenn, 2004)

Disaggregating Different Types of Helping Behaviours

The results also emphasise the importance of supporting the generalisation of helping behaviours across different contexts. While participants in this study demonstrated moderate levels of helping in both environments, the transfer of culturally valued behaviours between settings is not always automatic (Baer et al., 1968; Cooper et al., 2020). Helping behaviours differ in response effort, social visibility, and cultural significance. For instance, moving large furniture may require more effort and provide stronger social cues than smaller cooperative acts, such as arranging chairs or tidying shared spaces (Baer et al., 1968; Cooper et al., 2020).

Analysing these behaviours separately may reveal different patterns of correspondence between self-reported and observed behaviour. Behaviour-analytic research highlights the importance of defining behaviour operationally and examining response classes in detail, because behaviours that appear similar may be controlled by different antecedents and consequences (Baer et al., 1968; Cooper et al., 2020). Distinguishing between types of helping behaviours can therefore provide a more precise understanding of how culturally valued behaviours are expressed across contexts and situations (Baer et al., 1968; Cooper et al., 2020).

Task-Proximal Verbal Probes

Third, future research could benefit from incorporating task-proximal verbal probes

that assess participants' interpretations of a situation more closely to the moment when behaviour occurs (Skinner, 1957, 1969). Behaviour-analytic theory distinguishes between verbal reports about behaviour and the contingencies that control responding (Baum, 2017; Skinner, 1957, 1969). Self-reports often function as verbal behaviour shaped by social reinforcement histories rather than as direct indicators of the environmental variables guiding action (Baum, 2017).

By asking brief questions immediately after tasks, or during pauses within an activity, researchers may capture participants' rule statements, expectations, or interpretations of social responsibility more accurately than retrospective self-report alone (Baer et al., 1968; Catania, 2013). These task-proximal probes can also help identify whether helping behaviour is primarily guided by rule-governed verbal behaviour or by direct contact with environmental contingencies (Baer et al., 1968; Catania, 2013). Incorporating such measures may provide valuable insight into how culturally valued behaviours are maintained and expressed in different social settings (Baum, 2017; Skinner, 1957).

Stronger Environmental Cultural Signals

Fourth, future research could examine helping behaviour in settings where cultural signals are more salient or naturally embedded within ongoing social practices (Glenn, 2004; Skinner, 1969). In the present study, the marae and non-Māori environments were deliberately structured to keep task demands and instructions comparable, allowing for controlled comparison of behavioural responding (Baer et al., 1968; Cooper et al., 2020). However, settings that include stronger environmental cues—such as the presence of elders, coordinated preparation for a shared event, or explicit cultural protocols—may function as more potent discriminative stimuli and motivating operations for culturally valued behaviours (Durie, 2001; Mead, 2003).

From a behaviour-analytic perspective, actions are shaped and maintained by the contingencies present in the environment (Durie, 2001; Skinner, 1957, 1969). Within cultural contexts, behaviour may also be influenced by interlocking behavioural contingencies and broader social consequences, often conceptualised as metacontingencies (Baer et al., 1968; Glenn et al., 2016). Investigating helping behaviours in richer, more culturally embedded environments may therefore reveal stronger contextual effects and provide deeper insight into how cultural practices are sustained through socially mediated reinforcement systems (Baum, 2005; Glenn et al., 2016).

Manded vs. Spontaneous Helping

Fifth, helping behaviours can be manded (elicited through direct requests) or spontaneous (initiated without prompts) (Michael, 1982, 1993; Skinner, 1957). In this study, some tasks involved explicit instructions, such as handing out materials, while others allowed participants to help voluntarily, such as tidying shared spaces. Compliance with direct requests can be high even when motivating operations are weak, which may inflate baseline helping rates and reduce contrasts between conditions (Cooper et al., 2020).

Spontaneous helping, on the other hand, depends more on environmental cues and motivating operations rather than verbal prompts (Baum, 2005). Manded and spontaneous behaviours may be controlled by different antecedents and consequences even if the outward actions appear similar (Baer et al., 1968; Cooper et al., 2020). Separating these behaviours in analysis can clarify functional relationships between self-reported and observed helping, revealing which actions are context-sensitive versus socially cued. Developing task-specific indices to distinguish between manded and spontaneous helping could improve measurement precision and understanding of culturally valued behaviours (Baum, 2005; Cooper et al., 2020).

Sample size and Demographic Balance

Lastly, future research would benefit from larger and more demographically balanced samples. The current study included a relatively small number of participants, which limits statistical power and reduces the ability to detect subtle patterns of correspondence or context-dependent differences (Johnston & Pennypacker, 2009). Expanding the sample size would enable more robust statistical analyses and allow exploration of potential moderating variables, such as gender, prior marae experiences, or levels of cultural engagement. Behavioural research emphasises the importance of repeated observations and sufficient sampling of behaviour to ensure reliable measurement and interpretation (Johnston & Pennypacker, 2009). By including larger and more diverse participant groups, future studies could improve generalisability and provide a more nuanced understanding of how cultural contexts interact with helping behaviours among Māori students.

Conclusion

In summary, the present study provides an initial behaviour analytic examination of the correspondence between self-reported and observed culturally valued helping behaviours among Māori students across different environmental contexts. Although participants reported moderately high helping values, the observed behaviours showed only modest alignment with self-reported ratings, and minimal differences emerged between the two settings. These findings reinforce the importance of distinguishing between verbal reports of culturally valued behaviour and the contingencies that shape actual responding in the moment (Baum, 2017; Skinner, 1957, 1969). From a behaviour analytic perspective, culturally valued behaviour is best understood as an environmentally situated action rather than solely as an expression of internal attitudes or identity. By integrating culturally responsive research contexts with precise behavioural measurement, future research can further clarify how cultural values are translated into observable practice across settings and social contingencies

(Baer et al., 1968; Glenn et al., 2016).

These findings emphasise that supporting culturally valued behaviours in Māori students requires more than promoting positive intentions or self-reported values. Environments, social cues, and contingent reinforcement play a central role in whether helping behaviour is enacted. Practically, this suggests that educators and community leaders can strengthen culturally valued actions by designing settings and tasks that make opportunities for helping clear, socially acknowledged, and culturally meaningful, ensuring that values are translated into observable practice.

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Appendix
Appendix A

Required Forms for Participants

Figure A1.

Research Information Sheet

Exploring Māori Students' Identification with Cultural Values and Practices"

DIVISION OF ARTS, LAW, PSYCHOLOGY & SOCIAL SCIENCES
HUMAN ETHICS RESEARCH

This research project has been approved by the Human Research Ethics Committee of the Division of Arts, Law, Psychology and Social Sciences. Any questions about the ethical conduct of this research may be sent to the Secretary of the Committee, email alpss-ethics@waikato.ac.nz .

Researcher: *Mariah-Paige Shadrock*
Institution: *The University of Waikato*
Contact Email: ms485@students.waikato.ac.nz
Supervisor: *Ririwai Fox [Supervisor's Title]*
Ethics Reference Number: *[To be added]*

What is the purpose of this research?

This study aims to explore how students identify with Māori cultural values. Specifically, the goal is to gain a deeper understanding of the extent to which Māori students identify with, or differ from, certain Māori customs and practices. Your participation will contribute to a broader body of research that informs the development of inclusive and effective practices within educational and social contexts.

What will participation involve?

If you agree to take part:

You will attend a one-time session lasting approximately 40 minutes.

You will be randomly placed in one of two group environments.

You will complete a short survey and take part in some basic group tasks (e.g., setting up a room, completing a form).

A researcher will be present to guide the study. There are no right or wrong responses — this is not a test.

Who can participate?

You must identify as Māori.

You must be currently enrolled in an educational institution.

You must be 18 years or older.

Participation is completely voluntary.

What are the risks and benefits?

There are no known risks. The session involves common social activities like what you might experience in a classroom or group setting. While there may be no direct personal benefit, your participation will support research that seeks to better understand student experiences.

Will my information be kept confidential?

Yes. Your identity will not be shared in any reports, publications, or presentations. All data will be anonymized, stored securely for up to five years, and accessed only by the research team. You have the option to not respond to any of the survey's questions and to inquire further about the study that takes place during the observation. Up to two weeks following your session, you are free to withdrawal from the study at any moment without facing any repercussions.

What happens to the results?

The results will be used for academic purposes, including the researcher's thesis, and may be included in publications or presentations. All findings will be reported in a way that protects your identity.

Who can I contact if I have questions?

Researcher: Mariah-Paige Shadrock – ms485@students.waikato.ac.nz

Supervisor: Ririwai Fox – ririwaifox@waikato.ac.nz

If you have concerns about the ethical conduct of this research, you may contact:
The Waikato university Human Research Ethics for Arts, Law, Psychology and Social Sciences (ALPSS) – alpss-ethics@waikato.ac.nz

Thank you for considering participation. Your time and contribution are greatly appreciated.

“I wish to receive a copy of the findings

YES | NO (Please circle your choice)”

Figure A2.

Participation Consent Form

UNIVERSITY OF WAIKATO
DIVISION of ARTS, LAW, PSYCHOLOGY & SOCIAL SCIENCES

PARTICIPANT CONSENT FORM

[A completed copy of this form should be retained by both the researcher and the participant]

Name of person observed:

I have received a copy of the Information Sheet describing the research project. Any questions that I have, relating to the research, have been answered to my satisfaction. I understand that I can ask further questions about the research at any time during my participation, and that I can withdraw my participation at any time *[up to two weeks]* after the observation.

During the observation, I understand that I do not have to answer questions unless I am happy to talk about the topic. I can stop the interview at any time, and I can ask to have the recording device turned off at any time.

When I sign this consent form, I will retain ownership of my observation/survey, but I give consent for the researcher to use the observation/survey for the purposes of the research outlined in the Information Sheet.

I understand that my identity will remain confidential in the presentation of the research findings

Please complete the following checklist. Mark [×] the appropriate box for each point.	YES	NO
<i>I wish to receive a copy of my survey.</i>		
<i>I wish to receive a copy of the findings.</i>		

Participant :	_____	Researcher :	Mariah-Paige Shadrock
Signature :	_____	Signature :	_____
Date :	_____	Date :	_____
Contact Details :	_____	Contact Details :	ms485@students.waikato.ac.nz
	_____		_____

Figure A3.

The Māori Cultural Embeddedness Scale

Item code	Primary Factor: Secondary Subfactor
Values: Whakapapa	
V1	It is important to know your pepehā (historical links to people and places)
V2	It is NOT important to know how you are connected to other people (r)
V3	Whakapapa/pepehā (connections to people and places) is a good way to connect with other people
V4	We don't need to learn about our tīpuna (ancestors) (r)
V5	We should learn our whakapapa/history to strengthen our identity
Values: Whanaungatanga	
V7	Relationships should be nourished and maintained
V8	You should try to get to know the people that you work/study with
V9	Building relationships is NOT important (r)
V10	It is always important to support whanau in their achievements
Values: Manaakitanga	
V12	It is always important to look after your manuhiri (guests)
V13	We should always act in ways that enhance mana (prestige/honour)
V14	Generosity and hospitality are key indicators of a good person
V15	We should have respect for others and encourage them to do their best
V16	Those with more experience in a particular context should support those who are new to that context
Values: Kaitiakitanga	
V18	Because we can whakapapa (relate) to the natural environment around us, it is our duty to care for and protect it.
V19	It is NOT important to maintain balance in the world around us (including social, environmental

and spiritual) (r)

V20 People should be especially mindful of protecting the natural resources of their hau kāinga (home lands)

V21 It is important not to be wasteful. We shouldn't take more than what we need

Values: Mahi Rangatira

V22 A good leader is able to unify people in a positive and supportive environment

V23 I respect people who are humble

V24 It is NOT important for people to act with integrity (r)

V25 Kaumātua (elders) are important to society

V26 It is important that issues are resolved 'face-to-face'

Practises: Tikanga

P2 Greeting someone with a hongi (pressing noses) helps me feel more connected to that person

P3 Preparing the kai is equally as important as whaikorero and karanga

P4 It is NOT important to begin hui with karakia (prayer/ancient incantations) (r)

P5 Kai (food) is an essential part of any hui (meeting)

P6 Te reo Māori (Māori language) helps to deepen cultural understanding

P7 It feels appropriate to remove my shoes when entering a whare (house)

P8 Kapa haka and other cultural arts are important ways that we can express ourselves as Māori

P9 It is important to me that people respect rāhui (area restrictions)

P10 It is NOT important to know and follow the tikanga (customs) of the area (r)

Practises: Cultural Comfort

P12 I know what my role is when helping at the marae

P13 I'm comfortable sharing my pepehā with others

P14 I DON'T feel comfortable during formal Māori practises such as pōwhiri (r)

P15 My whānau and friends often use Māori words and phrases

Beliefs: Pūrākau

-
- B1 Māori stories, myths and legends are relevant today
 - B2 It is important to know and acknowledge atua Māori (traditional gods)
 - B3 Traditional knowledge systems can help us make sense of the world today

Beliefs: Wairua

-
- B4 I believe that our tupuna (ancestors) can guide us in life.
 - B5 Wairuatanga (Māori spirituality) is NOT an important aspect of life. (r)
 - B6 Some things are tapu (sacred), and noa (balance) must be restored after these experiences.
 - B7 Reciprocity (giving back) is important and helps to maintain balance
-

Boldfaced item codes indicate an item considered for deletion. **item deleted*; ^item retained despite low loading; (r) indicates item is reverse worded

Figure A4.

Debrief Sheet

Debrief Sheet

Exploring Māori Students' Self-Reported and Observed Culturally Valued Behaviours

DIVISION OF ARTS, LAW, PSYCHOLOGY & SOCIAL SCIENCES

HUMAN ETHICS RESEARCH

This research project has been approved by the Human Research Ethics Committee of the Division of Arts, Law, Psychology and Social Sciences. Any questions about the ethical conduct of this research may be sent to the Secretary of the Committee, email alpss-ethics@waikato.ac.nz

Researcher: Mariah-Paige Shadrock

Institution: The University of Waikato

Contact Email: ms485@students.waikato.ac.nz

Supervisor: Ririwai Fox [Supervisor's Title]

Ethics Reference Number: [To be added]

Thank you for participating in this research!

Now that the study is complete, we would like to explain the full purpose of this research, including aspects that were not disclosed beforehand to ensure the integrity of the data.

What was this research about?

The true purpose of this study was to investigate the relationship between Māori students' self-reported culturally valued behaviours and how these behaviours are actually expressed in different environments — specifically, a culturally familiar setting (e.g., a marae or similar space) and a non-cultural setting (e.g., a standard lab or classroom).

The focus was on helping behaviours, drawn from a previously validated Māori values measure (CVB-16). Examples include acts such as helping to set up a space, picking up dropped items, or assisting someone in need.

Why weren't you told the full purpose earlier?

To obtain accurate and unbiased data, it was necessary to withhold the specific behaviours being observed during the session. Telling participants in advance that helping behaviours were being studied could have influenced their actions (a phenomenon known as demand characteristics), where people change how they behave because they know what the researcher is looking for.

Similarly, revealing the cultural focus of the study up front might have led to conscious or unconscious efforts to act in culturally expected ways, rather than how one would naturally behave in each setting. This would have compromised the study's ability to measure genuine behaviour in real-time.

Why is this important?

This research helps us understand whether cultural identity and environment affect the way students' express behaviours that are considered culturally important. It also allows us to compare what people say they value with how they behave in context.

The findings will contribute to improving culturally responsive approaches in psychology, education, and community engagement, particularly when working alongside Māori individuals and communities.

Your Rights and Next Steps

Your data remains confidential and anonymous.

You may request that your data be withdrawn from the study up to [insert final withdrawal date], by contacting the researcher.

Your participation was completely voluntary, and we appreciate your time and contribution.

If you would like to receive a summary of the results, please indicate below.

Need to talk?

If this study raised any concerns or discomfort for you, or if you would like to talk to someone about your experience, support is available:

Researcher: Mariah-Paige Shadrock – ms485@students.waikato.ac.nz

Supervisor: Ririwai Fox – ririwaifox@waikato.ac.nz

Ethics Concerns?

If you have any concerns about the ethical conduct of this research, you can contact: Waikato University Human Research Ethics Committee (ALPSS) – alpss-ethics@waikato.ac.nz

Would you like a copy of the study's findings?

Please circle: YES | NO

Appendix B

Set up checklists

Figure B1

Marae Environment Set-up

Marae Environment Set up

Observer Name: _____ Date: _____ Time: _____

Session Number: _____ Participant Numbers: 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6

☐

Before Participants Arrive

Step	Task	Completed? (✓/X)
1	Arrive early and ensure access to Marae is granted	☐
2	Check that doors and facilities are unlocked	☐
3	Ensure space is prepared for	☐

	whakatau/karakia and circle formation (inside wharehenui).	
4	Place shoe removal signage if necessary.	☐
5	Arrange layout for chairs and tables so they are accessible in a designated area	☐
6	Check all materials are ready: surveys, pens, clipboards	☐
7	Set up clipboards and pens in a designated area	☐
8	Prepare printed consent forms and spares.	☐
9	Ensure recording/data sheets are prepared for observer	☐
10	Set up observer table	☐
11	Place paper stack in position for CVB-16 prompt	☐

Figure B2

Lab Environment Set-up

Setup Checklist: Lab Environment

Observer Name: _____ Date: _____ Time: _____

Session: _____ Participant Numbers: 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐

Before Participants Arrive

Step	Task	Completed? (✓/X)
1	Arrive early and ensure access to lab is granted	☐
2	Ensure lab doors are unlocked and accessible	☐
3	Ensure table/chair layout mirrors Marae setup for consistency	☐
4	Check all materials are ready: surveys, pens, clipboards	☐
5	Set up clipboards and pens in a designated area	☐
6	Prepare printed consent forms and spares	☐
7	Ensure recording/data sheets are prepared for	☐

	observer	
8	Place paper stack in position for CVB-16 prompt	☐
10	Hide the car keys in the designated location	☐
11	Ensure no distractions or unrelated materials are present in the lab	☐
12	Set up observer table	☐

Appendix C

Recording Sheets

Figure C1

Māori Environment Recording Sheet

Session	Participant		Task	Behaviour	Comments (e.g. offered help, had to be asked)
	ID	Environment		Observed?	
		Māori	Table Setup	Yes/No	
		Māori	Chair Setup	Yes/No	
		Māori	Clipboard Setup	Yes/No	
		Māori	Pen Setup	Yes/No	
		Māori	Picking up Papers	Yes/No	
		Māori	Collecting Clipboards and pens	Yes/No	
		Māori	Packing up	Yes/No	

Figure C2

Lab Environment Recording Sheet

Session	Participant		Behaviour		Comments (e.g. offered help, had to be asked)
	ID	Environment	Task	Observed?	
		Lab	Table Setup	Yes/No	
		Lab	Chair Setup	Yes/No	
		Lab	Clipboard Setup	Yes/No	
		Lab	Pen Setup	Yes/No	
		Lab	Picking up Papers	Yes/No	
			Collecting Clipboards		
		Lab	and pens	Yes/No	
		Lab	Packing up	Yes/No	

Appendix D.

Figure D1

Survey

Survey: Personal Values and Identity

Upon the study's conclusion, further details will be disclosed.

Please indicate the extent to which you agree or disagree with the following statements. Use the scale below to select the option that best reflects your typical behaviour.

1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

1. I go out of my way to support my whānau. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
2. When visitors come over, I go out of my way to help them feel at home. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
3. I always follow through on my promises. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
4. I try to help people work together and get along. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
5. I always clean up after myself. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
6. I try to make people feel comfortable, especially when they are new to a situation. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
7. When someone looks after me, I try to pay it back or pay it forward. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
8. I always show respect to kaumātua (elders). ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
9. I do whatever I can to maintain harmony in the world around me. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
10. If am in a sacred place, it is important to me to follow the protocols of the area. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
11. As often as possible, I will participate in a karakia before important hui (meetings). ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
12. I do my best to help people in need. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
13. It is important to know your pepehā (historical links to people and places). ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
14. Whakapapa/pepehā is a good way to connect with other people. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
15. We should learn our whakapapa/history to strengthen our identity. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
16. Relationships should be nourished and maintained. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
17. You should try to get to know the people that you work/study with. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
18. It is always important to support whānau in their achievements. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
19. It is always important to look after your manuhiri (guests). ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
20. Generosity and hospitality are key indicators of a good person. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
21. Preparing the kai is equally as important as whaikōrero and karanga. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
22. Kapa haka and cultural arts help us express ourselves as Māori ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
23. I know what my role is when helping at the marae. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
24. Reciprocity (giving back) is important and helps maintain balance. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

25. I believe that our tūpuna (ancestors) can guide us in life. ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Optional Reflection

Is there a time when you helped someone in need in a culturally meaningful way? (You can write as much or as little as you like.)

I wish to receive a copy of my results

Please circle: **YES** | **NO**

Appendix E

Fidelity checklists

Figure E1

Fidelity Checklist: Marae Environment

Fidelity Checklist: Marae Environment

Observer Name: _____ **Date:** _____ **Session:** _____

Session: _____ **Participant Numbers:** 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐

Arrival & Introduction

Step	Task	Completed? (✓/X/N/A)	Notes
1	Confirm participants completed consent forms before going to marae	☐	
2	Provide Consent forms if necessary	☐	
3	Conduct	☐	

	whakawhanaungatanga (introduction)		
4	Ask participants to introduce themselves	☐	
5	Review study script	☐	
6	Lead participants to marae	☐	

Entry into the Marae

Step	Task	Completed? (✓/X/N/A)	Notes
1	Observe if each participant removes shoes (with/without prompt)	☐	
2	Ask participants to form a circle	☐	
3	Join or listen to karakia	☐	

Observation Tasks

Step	Task	Completed? (✓/X/N/A)	Notes
1	Ask 2 students to move tables – record who helps/does not help	☐	
2	Ask 2 students to	☐	

	place chairs – record who helps/does not help		
3	Ask 2 students to place clipboards and pens – record who helps/does not help	☐	
4	Instruct participants to complete the survey	☐	
5	Drop stack of surveys (CVB-16) – observe who helps pick them up	☐	
6	Ask students to place surveys on observers' desk/table	☐	
7	Ask 1 student to collect the pens	☐	
8	Ask others to help move tables and chairs	☐	
9	Thank participants and close with karakia		

Figure E2

Fidelity Checklist: Lab Environment

Fidelity Checklist: Lab Environment

Observer Name: _____ **Date:** _____ **Time:** _____

Session: _____ **Participant Numbers:** 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐

Arrival & Introduction

Step	Task	Completed? (✓/✗/N/A)	Notes
1	Confirm participants completed consent forms	☐	
2	Provide Consent forms if necessary	☐	
3	Introduce self (name, master's student)	☐	
4	Do not ask participants to introduce themselves	☐	
5	Review study script	☐	
6	Lead participants to lab	☐	

Entry into the Lab

Step	Task	Completed? (✓/✗/N/A)	Notes
1	Note whether each	☐	

	participant removes shoes (not required)		
2	Do not conduct karakia	☐	

Observation Tasks

Step	Task	Completed? (✓/✗/N/A)	Notes
1	Ask 2 students to move tables – record who helps/does not help	☐	
2	Ask 2 students to place chairs – record who helps/does not help	☐	
3	Ask 2 students to place clipboards and pens – record who helps/does not help	☐	
4	Instruct participants to complete the survey	☐	
5	Ask students to place surveys on observers' desk/table	☐	

6	Ask 1 student to collect the pens	☐	
8	Ask others to help move tables and chairs	☐	

Closure

Step	Task	Completed? (✓/✗/N/A)	Notes
1	Do not conduct karakia at the end of the session but thank participants	☐	

Appendix F

Graphs

Figure F1.

Total Observed Helping Behaviour versus Self-Reported Helping Behaviour (Q12.)

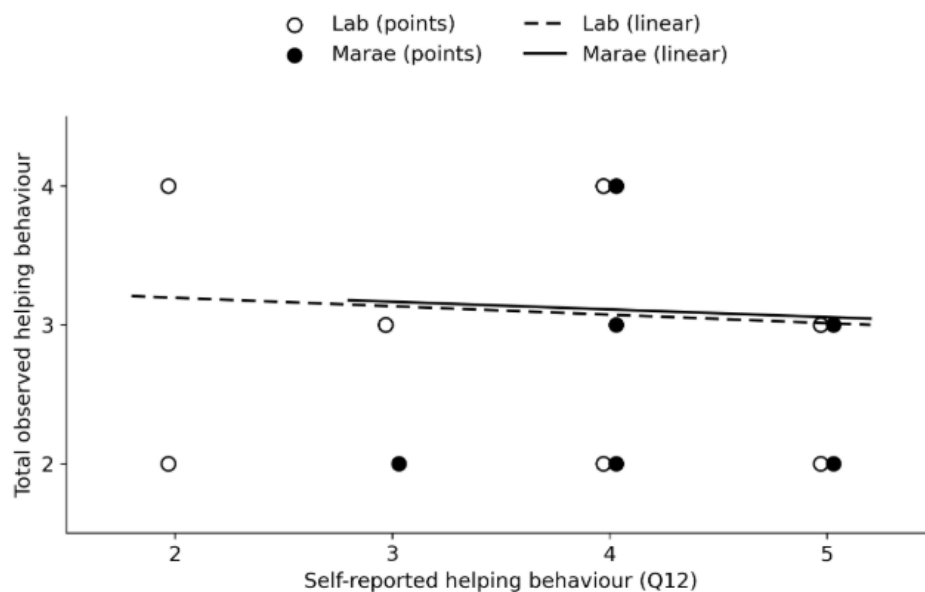


Figure F2.

Total Observed Helping Behaviour across age groups in different environments

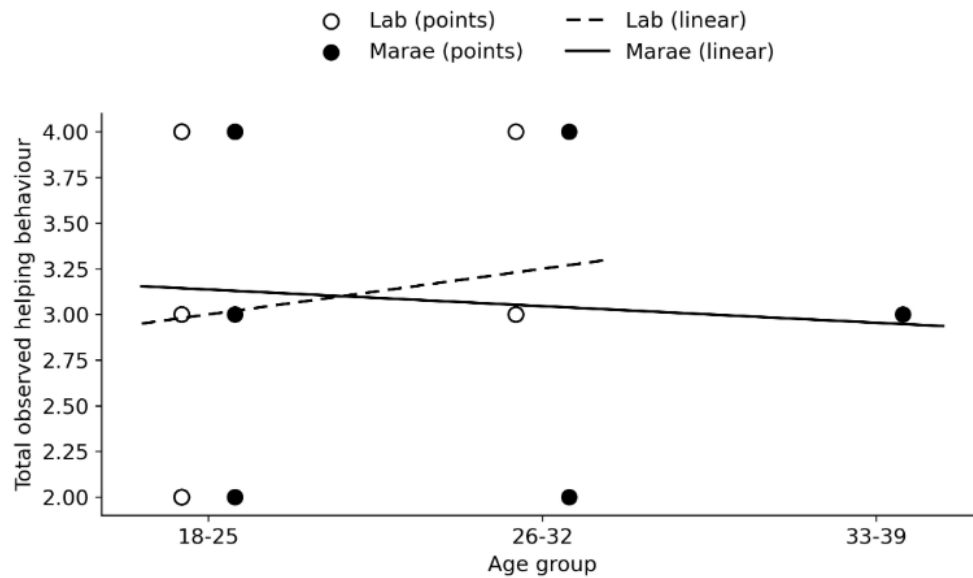


Figure F3.

Total Observed Helping Behaviour across sex groups in different environments

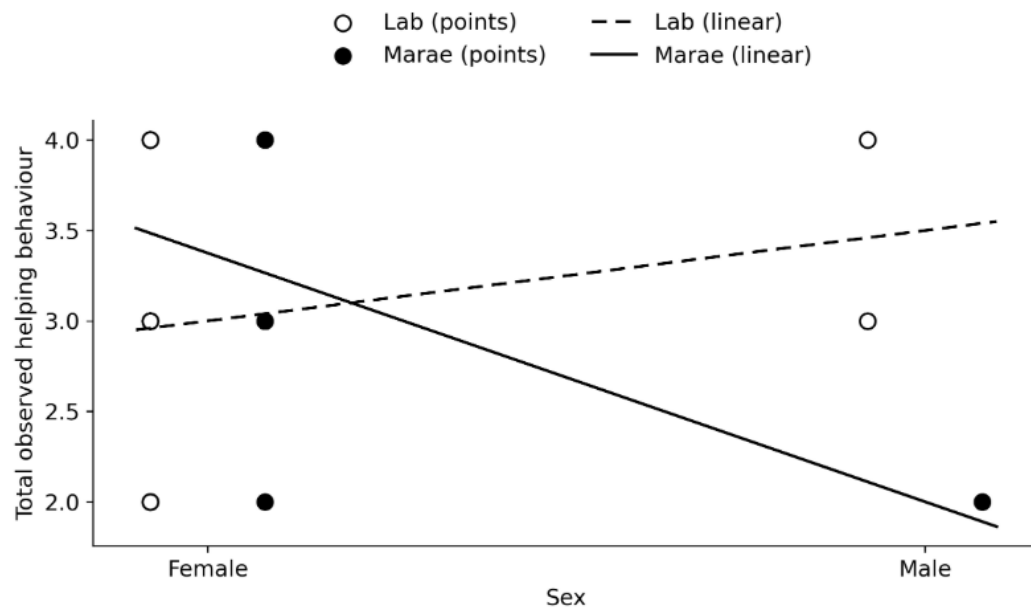
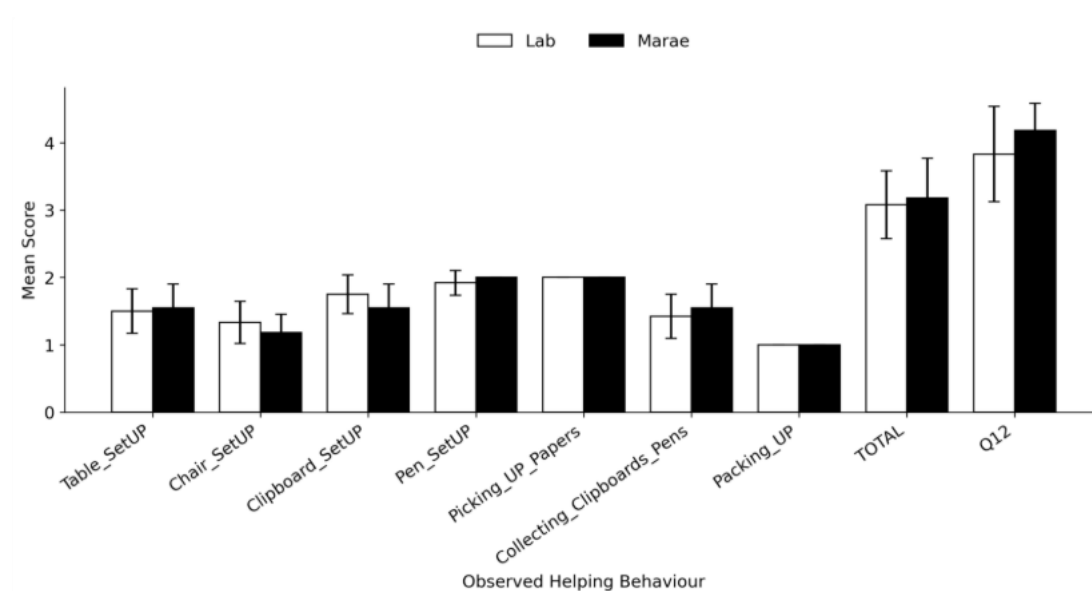


Figure F4.

Mean score for observed helping behaviours, the total frequency and self-reported scores (Q12).



Appendix G

Tables

Table G1

Inter-Item Correlation Matrix for Scale Items (Q1–Q25)

Item	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25
Q1	—																								
Q2	.52**	—																							
Q3	.31	-.10	—																						
Q4	.00	.19	.00	—																					
Q5	.28	.54**	-.17	.00	—																				
Q6	-.07	.45*	-.13	.00	.46*	—																			

2

Q 2 3	.07	.44 *	.10	.21	.0 2	.27	.52 **	.1 7	-.25	.4 0 *	.3 8	.4 9 *	.5 4 *	.4 8 *	.0 5	.3 5	.4 8 *	.0 7	.3 7	.7 5 *	—		
Q 2 4	-.2 6	-.0 3	.29	.28	.1 6	.39	.52 **	.2 9	.64 **	.6 0 *	.1 9	.2 1	.1 1	.5 4 *	.1 7	.3 5	.0 8	.0 6	.7 7 *	.1 0	.1 3	—	
Q 2 5	.04	.27	.35	.32	.5 4 * *	.60 **	.56 **	.0 8	.74 **	.5 1 *	.0 6	.2 5	.2 1	.2 9	.4 3 *	.4 4 *	.2 9	.1 6	.5 3 * *	.1 8	.0 4	.8 2 * *	—

Note. All correlations are Pearson's r. Items Q15 and Q18 were removed due to zero variance.

Table G2

Item-Total Statistics for Scale Items (Q1–Q25)

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
Q1	96.09	48.29	.32	.734
Q2	95.91	46.09	.47	.724
Q3	96.45	47.47	.19	.743
Q4	96.55	47.47	.26	.736
Q5	96.36	49.46	.08	.748
Q6	95.91	47.49	.45	.729
Q7	95.64	47.86	.70	.728
Q8	95.73	49.82	.16	.742
Q9	96.55	51.27	-.10	.768
Q10	96.00	43.00	.57	.711
Q11	96.91	41.89	.48	.716

Q12	96.55	43.47	.49	.717
Q13	96.00	46.80	.38	.729
Q14	95.82	46.76	.61	.723
Q16	96.09	51.49	-.11	.762
Q17	96.82	53.36	-.23	.783
Q19	95.82	46.76	.61	.723
Q20	96.45	48.47	.09	.753
Q21	95.73	47.42	.59	.726
Q22	96.00	44.80	.49	.719
Q23	96.64	39.46	.65	.697
Q24	95.82	48.16	.38	.732
Q25	96.18	45.96	.39	.727

Note. Items Q15 and Q18 were removed due to zero variance.

Table G3

Scale Reliability Statistics

Statistic	Value
Cronbach's Alpha	.743
Cronbach's Alpha Based on Standardized Items	.807
Number of Items	23
Scale Mean	100.55
Scale Variance	50.87
Standard Deviation	7.13

Note. Items Q15 and Q18 were excluded due to zero variance.

Table G4

Descriptive Statistics for Self-Reported Rating and Observed Behaviours in the Laboratory

Environment (N = 12)

Variable	N	Minimum	Maximum	M	SD
Q12 Rating	12	2	5	3.83	1.11
Total Frequency	12	2	4	3.08	.80
Table Set Up	12	0	1	1.5	.52
Chair Set Up	12	0	1	1.33	.49
Clipboard Set Up	12	0	1	1.75	.45
Pen Set Up	12	0	1	1.92	.29
Pens/Clipboards	12	0	1	.67	.48
Packing up	12	1	1	1.00	.00
Picking Up Papers	12	0	0	.00	.00

Note. M = mean; SD = standard deviation.

Table G5

Descriptive Statistics for Self-Reported Rating and Observed Behaviours in the Marae Environment (N = 11)

Variable	N	Minimum	Maximum	M	SD
Q12 Rating	11	3	5	4.18	.60
Total Frequency	11	2	4	3.18	.87
Table Set Up	11	0	1	1.55	.52
Chair Set Up	11	0	1	1.18	.41
Pen Set Up	11	1	1	2.00	.00
Clipboard Set Up	11	0	1	1.55	.52
Pens/Clipboards	11	0	1	1.55	.52
Packing up	11	1	1	1.00	.00
Picking Up Papers	11		0	.00	.00

Note. M = mean; SD = standard deviation.

Table G6*Spearman correlations among self-reported rating and observed behaviours (N = 23)*

Variable	1	2	3	4	5	6	7	8	9
1. Table Setup	—								
2. Chair Setup	-.62**	—							
3. Clipboard Setup	-.15	.43*	—						
4. Pen Setup	.22	-.36	-.16	—					
5. Picking Up Papers	—	—	—	—	—				
6. Collecting Clipboards & Pens	-.30	.03	0.15	-.22	—	—			
7. Packing Up	—	—	—	—	—	—	—		
8. Total Score	-.05	-.37	-.82***	0.05	—	-.46*	—	—	
9. Q12	-.22	.48*	.26	-.28	—	-.14	—	-.14	—

Note. Values represent Pearson's r correlations. $p < .05$. ** $p < .01$. *** $p < .001$.

Table G7

Spearman correlations among self-reported rating of the Culturally Valued Behaviour Scale, Total Observed Behaviour and Question 12 (N = 23)

Item	TOTAL	Q12
Q1	.38	.42*
Q2	.03	.35
Q3	.27	.28
Q4	.38	.60**
Q5	.38	.00
Q6	-.24	.32

Q7	.25	.36
Q8	.35	.26
Q9	.43*	.19
Q10	.23	.19
Q11	.23	.29
Q13	.07	.52*
Q14	.30	.52*
Q15	-.06	.28
Q16	-.26	.52*
Q17	.03	.10
Q18	.06	.29
Q19	.05	.26
Q20	.43*	-.08
Q21	.33	.14
Q22	-.07	.45*
Q23	.29	.20
Q24	.35	.41
Q25	.14	.29

Note. * $p < .05$, ** $p < .01$, $N = 23$

Table G8

Independent Samples t Tests Comparing Total Frequency Across Sex and Environment

Comparison	Group 1 (n, M, SD)	Group 2 (n, M, SD)	t	df	p	Mean Diff	95% CI [LL, UL]	d
Sex	19, 3.21, .79	4, 2.75, .96	.90	3.90	.420	.46	[-.97, 1.90]	.55
Environment	12, 3.08, .79	11, 3.18, .87	-.28	20.29	.781	-.10	[-.83, 0.63]	-.12

Note. Equal variances were not assumed; Welch's *t*-test results are reported. Mean differences are calculated as Group 1 minus Group 2. Cohen's *d* is reported using pooled standard deviations. Values are rounded to two decimal places.

Table G9

One-Way ANOVA Comparing Self-Reported Helping Behaviour (Q12) and Total Observed Helping Behaviour Across Sex Groups

Variable	Source	SS	df	MS	F	p
Q12	Between groups	1.42	2	.71	.85	.441
	Within groups	16.58	20	.83	—	—
	Total	18.00	22	—	—	—
Total Observed Helping Behaviour	Between groups	.03	2	.01	.02	.983
	Within groups	14.58	20	.73	—	—
	Total	14.61	22	—	—	—