

Re-conceptualising and Measuring Workplace Leader-
Member Dyadic Relationships: An Application arising
from Sport and Sporting Organisations

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Abstract

Background; Aims/ Objectives

This series of studies investigated the complex nature of leadership using interpersonal relationships to better understand reciprocity between conveniently formed leader-member relationships in sporting organisations. This thesis aimed to test whether the conceptualisation of the 4Cs model of the coach-athlete relationship (Jowett, 2007), as measured by the Coach-Athlete Relationship Questionnaire (CART-Q), is an appropriate model to examine the corresponding dyad between a leader and a member in a work context. Expressly, this thesis examined if the 4Cs model of relationship content and quality can be applied in a leadership setting between a leader and a member.

Three studies have been included in this thesis. The first study tested the validity and reliability of the direct and meta-perspective versions of the Coach-Athlete Relationship - Questionnaire (CART-Q) in the New Zealand sport context. The second study assessed the content of the leader-member relationship in a workplace setting using qualitative methods and content analysis, adopting the 4Cs model. The third study utilised cognitive interviewing techniques to investigate the content validity of the newly designed direct and meta-perspective version of the revised Coach-Athlete Relationship Questionnaire (CART-Q-R) to better assess the content and quality of the leader-member relationship.

Methodology/ Methods

This thesis utilised both quantitative and qualitative data collection and analysis techniques and took a mixed method explanatory sequential approach as outlined by Creswell and Plano Clark (2011). An overarching mixed methods approach guided the three studies being facilitated sequentially. Study One was a quantitative study, and Studies Two and Three were qualitative. Studies Two and Three used various techniques, including semi-structured interviews, content analysis, and cognitive interviewing. The participant cohort for Study One included 251 national representative coaches and athletes of football and futsal. Study Two and Three participants consisted of 10 then 8 permanently employed sport administrators from a prominent national sport organisation in New Zealand.

Results

Study One examined the validity and reliability of the CART-Q. The results demonstrated that the CART-Q successfully assesses the coaches' and athletes' emotions, cognitions, and behaviours. The constructs of closeness, commitment and complementarity are mutually and causally interconnected. Rasch analysis has highlighted that a unidimensional factor solution may be a more appropriate representation of the model than previously reported approaches and provides researchers with confidence in the CART-Q psychometric properties. Based on the findings of Study Two, the adapted 4Cs model and Interdependence Theory has the facility to capture the content and quality of the leader-member relationship in a workplace setting. The findings expose the relational connectedness of the dyadic partners utilising closeness, commitment, complementarity, and co-orientation. It was

found that the dimensions of integrity, honesty, openness and leading by example are essential ingredients of commitment and complementarity. Yet, mutual liking and obligation may no longer be crucial constructs of modern leader-member relationships in the workplace. Study Three demonstrated that the results provided evidence that the 4Cs and the CART-Q-R are appropriate to better measure the reciprocal nature of the leader-member relationship than LMX measures by adding a greater breadth and depth of psychosocial aspects not previously considered allowing both leaders and members to assess relationship quality simultaneously.

Discussion

In an attempt to advance relationship leadership research, this thesis attempted to provide an alternative approach to examining leader-member relationship quality in a work setting. The outcome is an alternative model adapted from sports coaching that may more accurately represent and measure the leader-member relationship taking into account both dyadic partners emotions, cognitions and behaviours.

Overall, this thesis presents a transparent and ordered approach to providing an alternative framework to assess the quality of leader-member relationships through a lens of reciprocity. A modified self-reporting tool (CART-Q-R) has been created to measure the quality of leader-member relationships in a workplace setting. This thesis is the first body of research to suggest and demonstrate that Interdependence Theory can fit the conceptualisation of assessing leader-member relationship quality and highlights the appropriateness and practicability of the modified 4Cs model and the CART-Q-R as a mechanism to evaluate the dyadic partners simultaneously. The modified 4Cs model and the CART-Q-R may offer more significant psychosocial insights than the previous Leader-Member Exchange Theory (LMX), which has been pre-

eminent in leadership and organisational psychology literature. Psychological constructs have been precisely conceptualised, established and anchored to allow for the specific nature of the leader-member relationship.

Conclusion

This thesis claims that to better understand workplace relationships and their dyadic nature, the concept of reciprocity needs to be included to encapsulate the leaders and members' emotions, cognitions and behaviours, as they are critical factors in representing the social exchanges of the leader-member relationship in the workplace. The findings provide a foundation for researchers to build on and potentially validate the CART-Q-R's appropriateness using quantitative methodologies in a range of other industries and organisational types.

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Glossary

3Cs	Closeness, Commitment and Complementarity model
3+1Cs (4Cs)	Closeness, Commitment, Complementarity and Co-orientation model
ALS	Average Leadership Style
CAR	Coach-Athlete Relationship
CART-Q	Coach-Athlete Relationship Questionnaire
CART-Q-R	Coach-Athlete Relationship Questionnaire (Revised)
CFA	Confirmatory Factor Analysis
CL	Comparison Level
CL-Alt	Comparison Level of Alternatives
CTT	Classical Test Theory
Dyad	A pair of individuals in an interpersonal situation
Dyadic Partners	The two individuals involved in an interpersonal relationship
EFA	Exploratory Factor Analysis

FIRO-B	Fundamental Interpersonal Relations Orientation- Behaviour
GrCART-Q	Greek version of the Coach-Athlete Relationship Questionnaire
IL	Individualised Leadership
IRT	Item Response Theory
Leader-Member Dyad	Interpersonal relationship between leader and staff member in the workplace
LMX	Leader-Member Exchange
LMX7	Seven-item Leader-Member Exchange Questionnaire
LMX-MDM	Leader-Member Exchange Multidimensional Measure Questionnaire
PCA	Principal Component Analysis
RLT	Relationship Leadership Theory
SDT	Self Determination Theory
SET	Social Exchange Theory
VDL	Vertical Dyad Linkage

Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

14/10/21

Signature

Date

Co-Authored Works

Chapter 4 Resolving uncertainties of the factor structures of the Coach-Athlete Relationship Questionnaire (CART-Q)

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Chapter 5 Advancing Leader-Member Exchange utilising the 4Cs relationship model

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Chapter 6 Using cognitive interviewing to explore the applicability of the CART-Q to assess the Leader-Member Exchange

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humbling and made me a better scholar. A special thanks need to be made to Chris for his willingness to be involved and his calming and responsive demeanour which was very welcome. Your expertise is exceptional, and I know that there are many research articles we can work on in the future. Finally, I would like to thank Lesley for playing 'devil's advocate' with me on many occasions and bringing a sense of considered awareness to the appropriateness of my words, statements and themes throughout this piece of work.

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Ethics Approval

1. Auckland University of Technology Ethics Committee (AUTEC)

- a. Ethics Application: 19/86 Dyadic relationships in the leadership of sport organisations
- b. Ethics Application: 20/126 Dyadic Relationships in the Leadership of Sport Organisations

Chapter 1 Introduction

1.1 Background

Leadership occurs in the presence of others and typically involves a leader and a member or multiple members. Leaders and their members in the workplace are mutually and causally interconnected in a relational process of two-way influence (Epitropaki et al., 2017). Relationship-centred research in leadership has attracted considerable attention from scholars over the past four and a half decades (Day & Miscenko, 2016). It goes beyond examining leader behaviours and traits to focus on the relational process that facilitates meaningful engagement for those involved (Wong et al., 2019). Relationship-centred research is continually growing as a significant contributor to advancing leadership (Ospina & Uhl-Bien, 2012). The changing nature of the work environment has broadened the concept of relationality to consider dyadic partners, leaders and members as people rather than the position within the organisation they hold (Fletcher, 2012). There is significant research evidence to suggest that high-quality relationships influence positive outcomes, and low-quality relationships influence adverse outcomes regarding organisational performance and the psychological well-being of those involved. Research to date indicates the associations of high-quality dyadic relationships with organisational outputs include job satisfaction (Dulebohn et al., 2012; Epitropaki & Martin, 2005; Gerstner & Day, 1997; Harris et al., 2009), organisational commitment (Epitropaki & Martin, 2005), turnover intentions (Dulebohn et al., 2012; Gerstner & Day, 1997) and performance (Olsson et al., 2012; Schriesheim et al., 1999; Vidyanthi et al., 2010). Research also supports high-quality relationships as a mediator between leadership and psychological well-being, including motivation (Adie & Jowett, 2010; Olympiou et

al., 2008), satisfaction (Jowett & Nezlek, 2012; Jowett & Ntoumanis, 2003; Lorimer & Jowett, 2009), passion (Lafrenière et al., 2011; Lafrenière et al., 2008) and attachment (Davis & Jowett, 2010; Davis et al., 2013; Felton & Jowett, 2013).

Leader-Member Exchange Theory (LMX) (Dansereau et al., 1975; Graen & Cashman, 1975; Graen & Schiemann, 1978; Graen & Uhl-Bien, 1995) is the foremost relationship-centred approach to assessing the quality of dyadic relationships in a workplace setting (Erdogan & Bauer, 2014). LMX has been described as the most mature relationship-centred approach in leadership literature (Day & Miscenko, 2016; Scandura & Meuser, 2022) and one of the advanced approaches to understanding leadership in the workplace (Epitropaki et al., 2017). However, LMX has attracted criticisms for theory alignment, structure and content, levels of analysis and measures (Gottfredson et al., 2020). Completing a search on Google Scholar for articles with LMX in the title resulted in 27,000 peer-reviewed articles, 16,000 published within the past five years showing no signs of slowing. One notable contribution to the LMX literature is a seminal article written by Graen and Uhl-Bien (1995), cited 3507 times. The overwhelming volume of past and present LMX related research presents difficulties in tracking the evolution of LMX.

Another popular relationship centred framework is the 3 + 1Cs (4Cs) coach-athlete relationship model developed by Jowett and colleagues (Jowett, 2007; Jowett & Cockerill, 2003; Jowett & Meek, 2000; Jowett & Ntoumanis, 2004). The 4Cs relationship model is arguably the most creditable and prominent dyadic relationship-centred model in sport and is routinely described as an empirically and theoretically sound representation of evaluating the key constructs of the quality of coach-athlete relationships (Currie et al., 2021; Poczwardowski et al., 2020). Jowett's

model was specifically developed to investigate the nature and quality of coach-athlete relationships. However, the 4Cs model has also been shown to be appropriate for examining teacher-student relationships (López-Jiménez et al., 2017) and executive coaching in the workplace (Jowett et al., 2012). Jowett et al. (2010) state that the 4Cs model and the corresponding measure may have the potential to be applied in other diverse contexts, including the leader-member relationship in the workplace.

1.2 Statement of the Problem

Although a widely cited model, LMX has undergone significant evolutionary changes, and there has been some critique of the lack of robust definitional, conceptual and theoretical foundations (Scandura & Meuser, 2022). Recent critical reviews (Gottfredson et al., 2020; Scandura & Meuser, 2022) suggest that LMX researchers seem to be focused on examining the consequences of high-quality leader-member relationships and less concerned with the LMX Theory being technically and scientifically robust. It has also been suggested that the majority of LMX measures originate at the individual level (Gooty et al., 2012) and therefore do not measure the relationship from a dyadic approach but rather offer insight into how one individual (the leader or the member) perceives the quality of the relationship. To fully understand the formation and maintenance of relationship quality, it would appear to be fundamentally important that research gathers insights from both dyadic partners concurrently.

1.3 Statement of the Purpose

The purpose of this thesis is to investigate other potential relationship-centred approaches to assessing dyadic relationship quality in the workplace. There is now an opportunity to re-examine LMX through the lens of more advanced scientific norms, data analysis methods, and in the context of a more progressive working environment. A recent critical review (Gottfredson et al., 2020) suggested that LMX should be rebuilt from its foundations up. This thesis proposes that LMX research may benefit from exploring alternative approaches to assessing leader-member relationship quality to develop more valid constructs and measures that include both dyadic partners.

Aims and Objectives

This thesis aimed to test whether the conceptualisation of the 4Cs model of the coach-athlete relationship (Jowett, 2007), as measured by the Coach-Athlete Relationship Questionnaire (CART-Q), is an appropriate model to examine the corresponding dyad between a leader and a member in a work context. Expressly, this thesis examined if the 4Cs model of relationship content and quality can be applied in a leadership setting between a leader and a member.

The objectives of each study were to:

1. Test the CART-Q with coaches and athletes to determine its validity and reliability within the New Zealand sport context.
2. Determine if leaders and members in a workplace recognise the 4Cs as vital constructs of interpersonal relationships.

Determine the psychological constructs that represent the interpersonal connections between leaders and members in the workplace.

3. Design a questionnaire that represents the key psychological constructs of leader-member relationships to assess the content and quality of the relationship in a work setting.

Research Benefits/Significance

Dyadic relationships between coaches-athletes and leader-members have been recognised as an essential aspect of effective and successful leadership (Graen & Schiemann, 1978; Jowett & Cockerill, 2003). However, LMX research to date has primarily ignored that both dyadic partners' perspectives are essential to gain an accurate picture of the nature and quality of the dyadic relationship (Matta et al., 2015). Gaining a better understanding of the inner workings of leader-member relationships in the workplace may allow organisations to accurately identify relationship quality between dyadic partners across a team or organisation; provide insights into how relationship quality can be improved; and provide a platform for human resource development interventions to design and deliver training opportunities to improve organisational outputs, well-being, and flourishing in the workplace.

This research explored the CART-Q's potential to measure the quality of interpersonal relationships at different levels within an organisation. For example, Chief Executive Officer (CEO) - Senior Management, Senior Management - Line Manager and Line Manager - Administrator. Gaining a better understanding of leader-member relationships and these relationships' functions is imperative. The knowledge could

develop strategies that help establish and maintain productive and successful relationships and increase performance outputs and job satisfaction (Graen & Uhl-Bien, 1995) and psychological well-being (Feeney & Collins, 2015).

Chapter 2 Literature Review

2.1 Prelude

This chapter reviews relevant leadership, sports coaching and sports psychology literature, which investigates the conceptualisation and operationalisation of relationship models specific to business organisational leader-member and sport coach-athlete partnerships. This historical narrative review explores the evolution of Leader-Member Exchange and coach-athlete research from broad single-participant paradigms through to more holistic and contemporary considerations addressing the importance of tools that fully capture the interpersonal nature of the dyadic relationship.

2.2 Overview

Core activities differentiate between high-performance sport and high-performing sports. In the New Zealand context, an organisation's ability to produce medals primarily from pinnacle events, such as the Olympic and Paralympic Games, is considered a high-performance sport. By contrast, high-performing sports include more general organisational best practice activities operating in a manner more competently than one's peer group (De Waal, 2007).

Two frequently researched relationship models in coaching and leadership are the 3 + 1C's (4Cs) model proposed by (Jowett, 2007) and the Leader-Member Exchange Theory (LMX) developed by Dansereau, Graen and colleagues (Dansereau et al., 1975; Graen & Cashman, 1975; Graen & Schiemann, 1978; Graen & Uhl-Bien, 1995). Both models have undergone refinements over the past 14 to 46 years, respectively.

The appropriateness of the LMX has come into question as a valid instrument to examine different dyadic partnerships in leadership (Hwa et al., 2009). Gooty et al. (2012) concluded in their systematic review that 96 of 105 LMX articles were misaligned regarding theory and measurement. By contrast, Jowett (2009a) suggested that the 4C's model has the scope to measure the quality and content of dyadic relationships regardless of type and setting. However, the CART-Q has currently only been used to measure dyadic relationships in sport teams, specifically the coach-athlete or coach-coachee dyads.

2.3 Search Methods

Due to the sheer volume of literature related to LMX Theory alone, this narrative review narrowed its focus to literature pertaining specifically to the main foci of this thesis: namely dyadic relationships in leadership. As such keyword included:

- Coach-athlete relationships
- 3 Cs, 3 + 1Cs and 4Cs model
- CART-Q
- Dyadic relationships
- Interdependence
- Leader-Member Exchange
- LMX
- Relationship-based leadership

Cited references from seminal and popular publications in the field were sourced to guide the author throughout this process.

This review first examines and traces the history of the evolution of LMX specific to leader-member relationships. Secondly, the review considers dyadic research models; sport coaching models invested in social behaviour practices leading to the conceptualisation and operationalisation of the 3 + 1Cs (4Cs) model specific to coach-athlete relationships. Finally, the review examines future research applications.

2.4 Overview of Organisational Leadership Research

Leadership can involve the leader, the member, a group of members and the relationship between dyadic partners. Traditionally, leadership research has been heavily focused on the personality characteristics a leader may possess (e.g., traits, behaviours, and styles) and how these characteristics influence their behaviours towards their follower (member) in a working environment (Graen & Uhl-Bien, 1995). However, leadership involves many other characteristics in which it operates and is a multi-level phenomenon (Gooty et al., 2012). Yammarino et al. (2005) completed a comprehensive, qualitative, narrative review of the leadership literature investigating 17 leadership theories, models, and analysis levels. Their findings suggested that 19 of 211 empirical publications addressed the levels of analysis appropriately in the areas of theory and hypothesis construction, measurement, data analysis and inference drawing. They concluded that to build a comprehensive and integrative leadership theory, multiple levels of analysis must be incorporated in theory and hypothesis construction regardless of the approach. This review highlights the difficulties leadership theory has presented for researchers and its multiple levels of analysis which has created a high level of complexity. Thus inhibiting researchers agreement as to what leadership is, theory building, hypothesis testing and the alignment of theory and measurement analysis.

2.5 Leader-Member Exchange (LMX)

LMX has been described by many as the most prominent and impactful relationship-centred approach to leadership (Day & Miscenko, 2016; Gerstner & Day, 1997). LMX is considered a mature research area with considerable growth since its inception (Erdogan & Bauer, 2014). During its 46 year evolution, LMX has undertaken two distinctive theoretical pathways (Role Theory, then Social Exchange Theory (SET)) that have manifested over time, and somewhat confusingly, LMX is often referred to as LMX Theory by some researchers (Dienesch & Liden, 1986; Graen & Uhl-Bien, 1995). The term LMX Theory was coined by Dienesch and Liden (1986) to explain the Vertical Dyad Linkage (VDL) role-making process and highlighted the broader conceptualisation of LMX Theory as an umbrella framework. Researchers (for example, see Graen & Uhl-Bien, 1995) have accepted the term LMX Theory as an overriding theory to encapsulate the notion that the interpersonal social exchanges between leaders and team members are of varying quality, resulting in all parties' differentiated behaviours in the workplace.

LMX Theory was formerly referred to as Vertical Dyad Linkage (VDL) (Dansereau et al., 1975; Dansereau Jr et al., 1973; Graen & Cashman, 1975), Dansereau, Graen, and colleagues proposed that VDL considered leadership as existing at the dyadic level of analysis, consisting of 'the leader' and 'the member.' The VDL model was purported to be different from prior leadership approaches (Yammarino et al., 2005), such as Average Leadership Style (ASL), which previously argued that leaders demonstrated consistent behaviours towards members (Schriesheim et al., 1999). The VDL model was the first to suggest that leaders differentiate between members of the same group, as opposed to considering that leaders develop the same type of relationship

with each group member (Day & Miscenko, 2016). The VDL model also suggested that relationships occur vertically between the leader and each team member in an organisational setting, and thus the dyad is a more appropriate level of analysis than the workgroup (Dansereau et al., 1975). Grounded in Role Theory and the role-making process, VDL postulated that the extent of latitude that the leader presents to a team member in negotiating work tasks and the social exchanges influence the relationship between both parties over time. Role Theory postulated that the informal social exchanges that take place between a leader and a member could be considered as a series of role episodes that reflect the transitioning from stage-to-stage, progressively advancing the closeness of the relationship. The first is the “role-taking” stage, where the leader articulates expectations of the member, the member then affirms the leader's proposition, and the leader subsequently appraises the member's acts (Dansereau, 1995; Dansereau et al., 1975; Graen & Uhl-Bien, 1995).

Dansereau et al. (1975) define the second stage as the “role-making” stage, where the leader tests the relationship through a negotiation process, resulting in the leader classifying the relationship as either being assessed as high-quality or low-quality. Finally, the “role routinisation” stage is where a series of behavioural norms are established. As the leader and member exchange social interactions and work through the role episodes, the dyadic partners evaluate their mutual liking, trust, respect and influence.

During the development of the VDL approach, a second distinct pathway emerged from the initial LMX model (Dansereau, 1995). Dansereau referred to this pathway as Individualised Leadership (IL). IL involved different constructs and levels of analysis. Dansereau attempted to distance his approach from VDL and advocated IL as an

alternative conceptualised model by drawing attention to the need to consider the leader and member relationship as dyadic, thus addressing the need to consider leadership from multi-levels of analysis (i.e., at an individual level, a dyadic level or a group level).

LMX was based on the degree to which leaders allow their members to negotiate organisational roles; as a consequence coming to rely heavily on Social Exchange Theory (SET). Graen and Uhl-Bien (1995) sought to reconceptualise the leader-member relationship beyond the vertical dyad and, in the process, suggested SET was more suitable to appraise the workplace relationship. SET inferred that dyadic partners acted in ways that benefitted others, resulting in the expectation that this behaviour would be reciprocated due to a sense of indebtedness, an essential distinction from the vertical exchange (Bernerth et al., 2007, p. 980; Graen & Uhl-Bien, 1995). LMX Theory suggested that leaders and members experience different types of social interactions. Leaders may differentiate how they moderate their behaviours and treat their members, resulting in leaders having varying levels of relationships between the leader and each member (Dansereau et al., 1975). The interpersonal exchanges that occur between a leader and a member were categorised into two groups:

1. The "in-group" where high-quality relationships arise from significant relationships with a small number of trusted members who are considered by the leader as assistants or advisors.
2. The "out-group" contains the remaining members, with the interpersonal transactions occurring sparingly, being more formalised and based on occupational requirements (Yammarino et al., 2005, p. 898).

The "in-group", or high-quality relationships, play a vital role in the leadership process resulting in closer, more inclusive and communicative transactions between the dyadic partners (Gerstner & Day, 1997). The consequences of high-quality leader-member exchanges have been reported to increase job satisfaction (Dulebohn et al., 2012; Epitropaki & Martin, 2005; Gerstner & Day, 1997; Harris et al., 2009), organisational commitment (Epitropaki & Martin, 2005), turnover intentions (Dulebohn et al., 2012; Gerstner & Day, 1997) and performance (Olsson et al., 2012; Schriesheim et al., 1999; Vidyanthi et al., 2010).

Conversely, "out-group", or poor quality leader-member relationships, have been reported to display limited information flow and a lack of support from the leader to the member, resulting in less access to resources and members becoming less satisfied in the workplace (Graen & Uhl-Bien, 1995).

During the first 20 years of research, the definitions of the LMX Theory concepts varied considerably with minimal empirical support resulting in a variance in constructs, measures and analytical procedures not being aligned with theory (Schriesheim et al., 1999). In this regard, the theoretical content and the breadth and depth of constructs and measures have been considerably diverse. Despite this diversity, LMX research is widespread within the field of leadership (Yammarino et al., 2005) and has undergone four distinct stages of development.

Stage 1. Identified that leaders developed differentiated relationships with members.

Stage 2. Focused on the different quality of relationships the leader had with different members of a group and the decipherment of the LMX construct.

Stage 3. Moved differentiation of relationships to considering the relationship to be dyadic (i.e. a relationship is formed between two parties).

Stage 4. Considered dyads can form larger groups investigating how dyadic relationships are organised.

Graen and Cashman (1975) developed the theoretical definition of LMX and initiated the call to evolve measures. LMX is a relationship-oriented approach based on the leader's competence, interpersonal skill and trust towards the member. However, from 1975 to the 1980s, researchers suggested 29 first-order constructs and included a potential 35 second-order constructs. As researchers added constructs to the LMX Theory, much disagreement was evident as to the definition of these constructs. Therefore, disrupting the use of the LMX to be considered a well-respected, validated and reliable model that measured the quality of relationships between a leader and a member in working organisations (Schriesheim et al., 1999). Schriesheim and colleagues reviewed 82 empirical and theoretical publications during the 1990s and identified that researchers were inconsistent in defining and utilising LMX Theory. However, limited perceived agreement was observed, so consequently, the conceptualisation of LMX was comprised of its four main constructs: mutual liking, trust, respect and obligation.

2.5.1 LMX Levels of Analysis

LMX levels of analysis have been scrutinised due to the ambiguity of leadership theory and what constitutes 'leadership.' Graen and Uhl-Bien (1995) believed there was a need to expand levels of analysis beyond the leader and suggested that the member and the relationship should be included as necessary correlates of leadership. As the four constructs of mutual liking, trust, respect and obligation were ingrained in the leadership process, each construct required attention singularly and in combination. They stated that research undertaking multiple perspective approaches to leadership were critical to providing a coherent picture of what is being experienced by both dyadic partners, rather than solely through the eyes of the leader or the member.

According to Graen and Uhl-Bien (1995), up to the mid-1990s, there was an overabundance of research conducted on the leader and a paucity of research on the relationship member. Peachey et al. (2015) completed a review of forty years of leadership research in sport management. They noted that a multi-level approach to analyses is required to advance leadership research. A leader-centric domain was primarily focused on the leader, to include their traits, behaviours and perceptions to promote outcomes. A member-centric domain was primarily focused on the member and their characteristics and behaviours to promote desired outcomes. A relationship-centric approach focussed on the dyadic relationship between the leader and the member.

Graen and Uhl-Bien (1995) highlighted the need for further investigation in the area of LMX and relationship analysis. This would evaluate the reciprocity between the leader and member, how the relationship was associated with essential correlates, and how

high-quality relationships can be established and maintained. By drawing attention to the need to consider the LMX from a relationship-based entity, Graen and Uhl-Bien have advocated that LMX measures should be viewed as entities of interdependent dyadic relationships. However, according to more recent reports, most reported LMX measures originate at the individual level and rarely collect data from both parties (Gooty et al., 2012). Therefore, the research did not measure the relationship from a dyadic approach but may have offered insight into how one individual perceives the relationship's quality.

2.5.2 LMX Measures

LMX measures have attracted considerable debate over their evolution due to the scale of items, the sheer number of measures, and the divergent theoretical associations. LMX has changed over the years, and as the popularity grew, so did the number of items and variations of items (Bernerth et al., 2007). Previous investigations have used the 2-item (Dansereau et al., 1975), 4-item (Graen & Schiemann, 1978; Liden & Graen, 1980), 5-item (G. Graen, R. Liden, et al., 1982), 6-item (Schriesheim et al., 1992), 7-item (G. Graen, M. A. Novak, et al., 1982; Graen & Uhl-Bien, 1995), 8-item (Kozlowski & Doherty, 1989), 10-item (Bhal & Ansari, 1996), 11 and 12-item (Liden & Maslyn, 1998), and 14-item (Uhl-Bien & Maslyn, 2003; Wakabayashi et al., 1990) LMX scales.

The addition and subtraction of items have not been formulated in an organised nor scientific manner (Bernerth et al., 2007). Schriesheim et al. (1999) concluded that researchers had offered no justification with regards to the rationale for choosing a particular measure. Researchers did not offer scale item content and did not stipulate

the source of the measure. To add to this, Schriesheim and colleagues noted that the evolution of the LMX measures had taken place in an *ad hoc* fashion with no regard to psychometric robustness. Although LMX has been based on the premise of social exchange and reciprocity, researchers such as Dulebohn et al. (2012) and Bernerth et al. (2007) believe that LMX scales did not measure social exchange and few measure reciprocity between the leader and member. LMX measures were not developed to measure social exchanges and are heavily rooted in Role Theory (Bernerth et al., 2007).

The seven-item LMX7 is the most widely cited LMX scale (Gerstner & Day, 1997), yet no evidence had been offered in an attempt to evaluate the scale's construct validity (Liden & Maslyn, 1998; Schriesheim et al., 1992). The LMX7 consisted of the 2, 4 and 5 item measures that were initially designed to measure VDL and Role Theory, not LMX and SET (Bernerth et al., 2007). When the 2, 4 and 5 item measures were designed and developed, the VDL model constructs were postulated as mutual liking, trust, respect, and influence. These VDL constructs have been adopted into LMX Theory and measures where mutual liking, trust and respect have remained and influence has been replaced with the construct of obligation. The theoretical nuance between Role Theory and SET are distinctive. However, researchers have simultaneously intertwined Role Theory and SET within LMX Theory, resulting in the method of LMX measurement being wrongly aligned to its conceptualisation (Gottfredson et al., 2020). Measures of high psychometric quality require content validity and mechanisms to test construction before the measure is developed, rather than validating construction after the fact (Nunnally & Bernstein, 1994).

Another prominent measure to assess the quality of leader-member relationships proposed by Liden and Maslyn (1998) is the LMX-MDM (LMX-multidimensional

measure) (Gottfredson et al., 2020; Liden et al., 2015). The conceptualisation of the multi-dimensional measure of LMX was a result of 3 studies reported in Liden and Maslyn (1998). Joseph et al. (2011) suggested that the LMX-MDM has undergone rigorous psychometric development and that the scale does not suffer from the *ad hoc* approach contrasting the LMX7. Unlike other scales, including the LMX7, the content validity of the LMX-MDM has been reported in detail. This has given researchers greater confidence that the LMX-MDM captured the constructs it claims to measure. Researchers such as Joseph et al. (2011) welcomed Liden and Maslyn's attempt to use this more robust psychometric development. Research has confirmed that the LMX-MDM is more effective at capturing the essence of the constructs it purports to measure (Liden et al., 2015). The four-factor first-order structure has moved away from the constructs of mutual liking, trust, respect and obligation and suggested that the leader-member relationship was more appropriately assessed through the constructs of affect, loyalty, contribution and professional respect. The LMX-MDM construct definitions offered by Liden and Maslyn (1998) were:

- Affect: The dyad's mutual affection dyadic members have for each other based on interpersonal attraction, including friendship.
- Loyalty: The expression of public support for the dyadic partner's goals and personal character, including faithfulness and consistent behaviours.
- Contribution: The perception of the effort each dyadic member demonstrates to meet mutually agreed goals.
- Professional Respect: The perception of how much each dyadic member has built a reputation of capability in her/his work tasks.

The subsequent Confirmatory Factor Analysis conducted by Liden and Maslyn supports the four-factor first-order structure to represent the content of LMX-MDM, hence suggesting that the four constructs are unique yet interrelated aspects of LMX-MDM. Despite this attempt to progress LMX to become a more appropriate measure, there remained some limitations to the LMX-MDM. Firstly, LMX-MDM relied on Role Theory and not Social Exchange Theory to assess leader-member relationships. Liden and Maslyn noted that the LMX-MDM scale could be criticised for not attending to assessing exchanges and that the items capture psychological states of the individual's perception of their dyadic partner, such as the degree to which the leader is likeable and loyal. Secondly, the LMX-MDM construct of contribution did not meet an acceptable level of reliability and therefore required further attention.

Olsson et al. (2012) investigated the effects of LMX-MDM on leader-member creative performance with dyads from academia, commercial research and development groups. Olsson and colleagues noted that the contribution construct did not meet acceptable reliability scores confirming Liden and Maslyn's result and highlighting the concern with the construct of contribution in how it is represented in the LMX-MDM. Lastly, the constructs of affect, loyalty, and professional respect may contribute to the leader-member relationship's psychological properties. However, Liden and Maslyn (1998) did note that other dimensions such as trust, openness and honesty may also be included in the social exchanges of leader-member relationships, highlighting the need for further examination into the conceptualisation of Leader-Member Exchange.

2.5.3 LMX Practices

A high volume of LMX research has focused on the consequences of LMX rather than its antecedents (Epitropaki & Martin, 2016). A specific favoured line of inquiry has been to investigate the consequence of leader-member relationships through leaders or members perspectives to include job satisfaction (Cheung & Wu, 2012; Epitropaki & Martin, 2005; Harris et al., 2009; Mardanov et al., 2008; Venkataramani et al., 2010), job attitudes (Dulebohn et al., 2012; Epitropaki & Martin, 2016), organisation commitment (Van Vianen et al., 2011) and psychological empowerment (Harris et al., 2009; Kim & George, 2005; Schermuly & Meyer, 2016) or through an organisational perspective investigating performance (Dulebohn et al., 2012; Gerstner & Day, 1997; Liden et al., 1997; Martin et al., 2016) and organisational citizenship behaviour (Hackett et al., 2003; Ilies et al., 2007; Matta et al., 2015). Since the turn of the twenty-first century, much of the research has focused on examining the value LMX has provided to leaders, members, and organisations. However, the structure, content and processes of LMX have been overlooked (Gottfredson et al., 2020). Turning the attention of the research to the leader-member relationship has had a positive impact on the popularity of LMX in leadership research and has initiated more traditional lines of inquiry to include understanding leadership traits, behaviours and styles (Day & Miscenko, 2016).

LMX has attracted much criticism from researchers regarding the theoretical content (Schriesheim et al., 1999), levels of analysis (i.e., individual, dyadic or group level) and measurement (Gooty et al., 2012). Gooty and colleagues completed a comprehensive review of leader-member exchange investigating the use and misuse of levels of analysis to include 162 multi-level empirical LMX and VDL publications between 1972

and 2012. Their findings indicated that it is not apparent exactly what LMX is and if LMX resides at an individual or dyad level. Careful consideration should be given to defining LMX with clarity, determining the construct validity of the concept, clarifying how the concept will be measured, and creating a link between theoretical to construct validity through observation (Jowett, 2009b). Gooty noted that the term LMX had been interpreted in several ways, causing a disservice to the domain in which it was intended. For the concept to be genuinely dyadic, researchers cannot adopt a single-participant paradigm for data collection, highlighting that relationships are more fully understood when data is gathered from both parties. Gooty and colleagues found that only 32% of publications aligned theory with the operationalisation of constructs at an individual, dyad and group level, 50% of all studies aligned levels of analysis of hypotheses and measures, and 67% of studies analysed data at a different level of analysis than what the theoretical development stated or implied. Although progress has been made to indicate closer alignment between theory and hypotheses (Gooty et al., 2012), there is still much debate about a full definition of LMX. Researchers such as Gottfredson et al. (2020) go as far as to say that LMX has significant limitations in conceptualisation and operationalisation, leading to the need for future research to examine the development of new and valid constructs and measures of leader-member relationships.

2.6 Overview of Coach-Athlete Relationship Research

Participation in organised sport rarely takes place in isolation and, as such, is an ideal environment to study relationship interdependence of dyadic relationships. These relationships include, for example, coach-athlete, coach-parent, athlete-parent, athlete-athlete and athlete-coach. The coach-athlete relationship, in particular, plays

an essential element in the success of the coaching process, where dyadic partners form close relationships with a high degree of interdependence (Jowett, 2009b).

Earlier research examining the dyadic interpersonal relationships between coaches and athletes used the sports leadership model framework, particularly the Mediation model (Smoll & Smith, 1989) and the Multi-Dimensional model (Chelladurai, 1978).

These two models relied on single-participant paradigms to measure interpersonal relationships and seemed to ignore the extent to which dyadic partners influence each other and, consequently, performance outcomes, which is fundamental to the coaching and leadership process (Jowett, 2005). An interpersonal relationship implies mutual interrelations between two members, so both members (dyadic partners)

should be considered when attempting to understand the relationship and its influence on performance (Berscheid, 1999; Poczwardowski et al., 2002). The coach-athlete relationship is entrenched in the dynamic and complex interactions where both relationship members rely on each other during difficult times and are mutually bound as members of a dyadic relationship. Jowett (2005) determined that this relationship is based upon the interpersonal constructs of closeness, commitment and

complementarity (3Cs) of coaches and athletes' emotions, cognitions and behaviours,

subsequently adding co-orientation as a fourth construct to the model (3 + 1Cs model).

Her model highlighted the degree to which the coaches and athletes' perceptions are interconnected (Rhind & Jowett, 2010a) and the need to capture the dyadic nature of the relationship between the two parties (Jowett, 2006; Poczwardowski et al., 2006).

The conceptualisation and operationalisation of Jowett's theoretical framework

(Jowett, 2003a; Jowett & Cockerill, 2003; Jowett & Meek, 2000; Jowett & Ntoumanis, 2004) has acknowledged the significance of this dyadic relationship over the past 15

years.

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years, and there has been considerable progression with regards to the validity of assessing the coach-athlete relationship (Balduck & Jowett, 2010).

2.7 Sport Leadership Models in Coaching

Early research (pre-2000) examining coach-athlete relationships tended towards investigating leadership in sport, coach leadership and behaviour.

Four major sport leadership models have been recognised as investigating social behaviour within coach-athlete relationships. They include:

1. Mediation model of leadership (Smoll & Smith, 1989).
2. Normative model of decision styles in coaching (Chelladurai & Haggerty, 1978).
3. Multidimensional model (Chelladurai, 1978; Chelladurai et al., 1988; Chelladurai & Saleh, 1980).
4. Compatibility model (Carron & Bennett, 1977).

The first three models are not reciprocal in that they focus solely on what the coach should do and offer little guidance as to which behaviour might benefit a team or a subset of players (Woolliams, 2015). They are intrinsically personality-driven and centred on leadership styles and dispositions. Chelladurai and colleagues have examined coach and athlete perceptions of leadership behaviours (Chelladurai et al., 1988) but did not go as far as to consider both parties emotions, cognitions and behaviours in the process. The research drawing upon these models was formative for assessing coach behaviours and promoting reflective practices but did not address the reciprocal nature of coach-athlete relationships.

The compatibility model considered relationship theory as being significant when investigating dyadic interactions between coaches and athletes. Carron and Bennett (1977) postulated that a focus on the coaches' personality traits, attitudes, and values alone were a significant failing in investigating the coach-athlete relationship as it considers the athlete as a non-participant. Adopting the theory of Fundamental Interpersonal Relations Orientation-Behaviour (FIRO-B) as proposed by Schutz (1958) and its accompanying FIRO-B scale, Carron and Bennett found that inclusion, as opposed to control and affection, was the critical determinant in discerning compatible coach-athlete dyads. Horne and Carron (1985) examined the efficacy of the FIRO-B and determined that it was too generalised to assess the coach and athlete's compatibility adequately. They suggested that the measure had three potential limitations. The FIRO-B was not specific enough to acknowledge the dyadic relationship as it refers to coaches in general and not the athlete's coach. It does not attend to the specific sport-related environment, and finally, the athlete's perceptions are not taken into consideration to accurately probe the coach's behaviour.

Hinde (1997) argued that social behaviour models evolved from these early sport leadership theories do not accurately measure the complexities of social relationships, as they neglect to acknowledge the cognitive and affective properties of the dyadic members.

2.8 The Call for Dyadic Thinking

Wylleman (2000) constructed a conceptual model to determine the characteristics that make up a coach-athlete relationship. Founded on Interpersonal Theory, as

championed by Kiesler (1983), Wylleman proposed that the relationship be comprised of three elements:

1. Acceptance-rejection – the positive and negative attitudes the dyadic partners adopt in their relationship.
2. Dominance-submission – embracing a stronger or weaker stance towards each other.
3. Social-emotional – the relational and emotional attitude toward each other.

While this model goes some way toward explaining the nature of the coach-athlete relationship, it has been suggested that the model is limited in the theoretical detail of when, how and why behaviours occur (Philippe et al., 2011).

Less than satisfied with single-participant research paradigms, Poczwardowski et al. (2002) adopted a phenomenological approach to investigate coaching practice and coach-athlete relationships. The study was conducted with a group of NCAA Division 1 Collegiate gymnasts and their coaches over four months. The results identified that coaching practice encompassed a series of dyadic interconnections between the athlete and coach and that this dyadic relationship was responsible for shaping the coaching environment. Notable themes of 'task,' 'interpretation,' 'meaning,' and 'negotiation' were identified, and Poczwardowski et al. suggested that these influenced the dyadic partners' interpersonal interactions. The complex, multifaceted nature of the coaching process stressed the dyadic relations' individualistic and contextual uniqueness. These findings raised pertinent questions about how the coaching process is influenced by the dyadic partners' dynamic social exchanges. Therefore, models that neglect the interpersonal interactions between the athlete and

coach may undermine the accuracy of effective coaching processes. So, the key to unlocking a better understanding of coach-athlete relationships needed to consider the coach and athletes' social exchanges.

In summary, Wylleman (2000) and Poczwadowski et al. (2002) championed the call for dyadic thinking and have made efforts to conceptualise the coach-athlete relationship. However, no subsequent research has been conducted to apply either of their models further.

2.9 Interdependence Theory

Interdependence Theory is a classical theory of social psychology (Thibaut & Kelley, 1959; Van Lange & Rusbult, 2011) and describes the importance of the structure for understanding the intrapersonal and interpersonal processes (Kelley et al., 2003).

Interdependence Theory explains how dyadic partners influence others' interactions while considering interpersonal characteristics, contextual, nuanced motives and social norms (Rusbult & Van Lange, 2003). The theory regards the relationship of dyadic partners as crucial as the individuals themselves. It sets out to provide a discernable analysis of the social exchanges of dyadic partners in which the type of relationship resides. Thibaut and Kelley (1959) were the first to conceptualise Interdependence Theory. They were inspired by Game Theory, Decision Theory and Social Exchange Theory to investigate social exchanges in dyadic relationships in more depth. Their research enabled them to identify Interdependence and Move Theory themes to consider an evaluation process that individuals would reflect on and compare the positive and negative consequences of being engaged in a dyadic relationship. Nearly twenty years after Thibaut and Kelley initially conceptualised their Interdependence

Theory, they articulated that with new analysis (Kelley & Thibaut, 1978), Interdependence Theory met the standards of a theory that would pass stringent testing of scientific rigour (Van Lange & Rusbult, 2011). Interdependence Theory has inspired researchers for approximately fifty years. It has evolved to consider that dyadic partners affect each other's outcomes through a process of their emotions, cognitions, and behaviours being both mutually and causally interconnected (Kelley et al., 2003). The extent to which an individual's outcomes are affected by their dyadic partner is a core tenet of the theory, and there are six critical dimensions that can be considered building blocks of interdependence structure.

- Level of dependence describes how the dyadic partners' actions are affected by an individual's outcomes.
- Mutuality of dependence describes the degree to which dyadic partners are equally dependent on one another.
- Basis of dependence describes how dyadic partners influence one another.
- Covariation of interests describes the degree to which the dyadic partners' outcomes coexist.
- Temporal structure describes the degree to which prior social exchanges influence future outcomes, situations and behaviours.
- Information availability describes the degree to which the dyadic partners possess specified or unspecified information regarding the situation.

These structural dimensions influence the dyadic partners' behavioural options to attend to a specific set of social exchanges (Eby & Robertson, 2020).

Each dyadic partner assesses the value of the relationship as a series of “rewards” (positives) and “costs” (negatives) associated with that relationship (Jowett & Nezlek, 2012). Rewards are determined as positive characteristics associated with happiness, pleasure and satisfaction; costs are the negative characteristics, such as anxiety, conflict and distress. This process of assessing one’s relationship is determined by two intrinsic benchmarks: comparison level (CL) and comparison level of alternatives (CL-alt). CL is the standard against which the individual gauges the desirability of being involved in the relationship, and CL-alt is the benchmark an individual uses in deciding to remain or leave the relationship (Jowett & Nezlek, 2012; Thibaut & Kelley, 2007). Some individuals may consider remaining in low-quality relationships if they believe the comparison between CL and CL-alt is not significant enough to act upon. This suggested that dyadic partners continually evaluate their relationship, comparing the outcomes of the “rewards” and “costs” of that relationship. Hence, dyadic partners use the benchmarks of rewards and costs to decide whether to continue or terminate the relationship.

However, Kelley et al. (2003) contend that Interdependence Theory is not an economically grounded theory of self-interest. Therefore, it is suggested that although individuals are in this continuous cycle of evaluation, self-interest is not the only motivating factor for dyadic partners to remain in the relationship. Kelley and colleagues state that the terms “rewards” and “costs” were derived to describe patterns of corresponding interactions and noted that dyadic partners often forsake short-term self-interest for other motives to consider their dyadic partners' emotions, cognitions and behaviours. Kelley and Thibaut’s interdependence analysis encompassed the formal analysis of discernable properties of a situation; a

conceptualisation of psychological process to determine what people make of their dyadic situation, behaviour and social exchanges.

Rusbult and Van Lange (2003) stated that Interdependence Theory offered an interpersonal reality of exchanges. Thus, the theory offers a comprehensive base from which to investigate close relationships, social comparisons, conflict and cooperation, trust and distrust, performance and motivation, attribution and self-presentation, emotions and behaviours (Rusbult & Van Lange, 2003; Rusbult & Van Lange, 2008). Over the years, many researchers were inspired by Interdependence Theory as a more intricate theory to investigate dyadic relationships. Jowett and colleagues (Jowett, 2003a; Jowett & Cockerill, 2003; Jowett & Meek, 2000; Jowett & Ntoumanis, 2004) recognised that coaches and athletes are inherently motivated to form high-quality relationships to succeed. Hence, high levels of interdependence materialises. Jowett acknowledged that the value Interdependence Theory provided her with was the ability to conceptualise a coach-athlete relationship model that could encapsulate the unique social interplay between coaches and athletes. Jowett suggested that the relationship can be defined as; "the situation in which coaches' and athletes' emotions, cognitions and behaviours are mutually and causally interconnected" (Jowett & Ntoumanis, 2004, p. 245).

2.10 Contemporary Advancement of Coach-Athlete Research-

Conceptualisation of the 3 Cs Model

Jowett (2007) extended the work by Kelley et al. (1983) using general social psychological practices to conceptualise the 3Cs model through the operationalised

relationship constructs of closeness (Berscheid et al., 1989), co-orientation (Newcomb, 1953) and complementarity (Kiesler, 1997).

- Closeness represented the feeling of being emotionally close with one another in the coach-athlete relationship. Jowett suggested that the feelings of being liked, cared for, valued, and having mutual trust had a positive effect on the coaches and athletes' intrapersonal and interpersonal factors.
- Co-orientation "represented the perspectives the relational partners' share (common goals, values, and beliefs) which are developed as a result of open communication" (Jowett & Ntoumanis, 2004, p. 246).
- Complementarity reflected the cooperative interactions of coaches and athletes' responsiveness and affiliation. Jowett and Ntoumanis (2004) suggested that complementary roles, tasks, and support were found to play a vital role in the relationship because this enabled both parties to concentrate their efforts towards accomplishing shared goals.

Jowett and colleagues facilitated a series of qualitative studies to determine the quality of the coach-athlete relationship using the 3Cs model (Jowett, 2001, 2003a; Jowett & Cockerill, 2003; Jowett & Meek, 2000). The researchers initially investigated the definition of the unique interpersonal relationship as a circumstance in which coaches and athletes' emotions, cognitions, and behaviours are reciprocally and causally interconnected. This process provided a platform from which a model has been developed to represent the dyadic coach-athlete relationship (Jowett, 2009b) and acknowledged the primary psychological constructs of the relationship and their interconnections (Jowett & Ntoumanis, 2004).

The first qualitative study conducted by Jowett and Meek (2000) examined the interpersonal athletic relationship of four married coach-athlete relationships. The purpose was to scrutinise the applicability of closeness, co-orientation, and complementarity to understand a specific dyadic relationship type. The coaches were male, and the athletes were Greek national track and field athletes. In-depth interviews consisted of 85 open-ended questions, which were analysed for thematic content. The results demonstrated the existence of the 3 Cs as independent but interrelated constructs that holistically could be viewed as an integrated conceptual model that provided a means to appraise the quality of the coach-athlete relationships.

The second qualitative study conducted by Jowett and Cockerill (2003) used the 3 Cs model to determine the nature and significance of dyadic relationships between 12 Olympic medalists and their respective coaches. The athletes and coaches were asked five open-ended questions, and the data were content analysed. The results indicated that the emotions of closeness, cognitions of co-orientation, and behaviours of complementarity were appropriate constructs to investigate the nature and significance of the coach-athlete relationship. The study recognised that at an elite level, dyadic relationships could be a significant factor in contributing to athlete development and that the coaching process does not need to be authoritarian in nature and performance-focused.

In the third study, Jowett (2003b) examined a single dyad experiencing interpersonal conflict employing the 3 Cs model. The coach and athlete dyad was considered typical in nature, as it consisted of a male coach and a female athlete that competed at a national and international level in an individual sport. Jowett's findings supported her

two previous studies suggesting that the 3 Cs are interrelated. However, it further suggested that interrelations could be represented positively and negatively. Jowett stated that "positive associations included the relational aspects of closeness, co-orientation, and complementarity, whereas negative associations included relational aspects of lack of closeness, lack of co-orientation and non-complementarity" (p. 456). This provided evidence that conflict can be caused when dyadic partners do not meet each other's basic needs and wants.

These three qualitative studies indicated that the 3 Cs interpersonal constructs address the coaches and athletes' emotions, cognitions, and behaviours, respectively (Jowett, 2003a; Jowett & Cockerill, 2003; Jowett & Meek, 2000).

Subsequently, several studies have adopted the 3 C's model to explore the coach-athlete relationship quality. Philippe and Seiler (2006) adopted the 3 Cs model as perceived by Swiss national swimmers preparing for the 2004 Olympic games. The research used semi-structured interviews consisting of 57 open-ended questions. The results revealed that the athletes believed that positive actions were the currency for repaying the coach for the investment made toward the dyadic relationship and that the athletes believed that maintaining their relationship with their coach was of great importance. Philippe and Seiler stated that the 3 Cs model was a viable framework to assess the quality of coach-athlete relationships. Trzaskoma-Bicsérdy et al. (2007) adopted very similar protocols to investigate the perspectives and experiences of 15 elite Hungarian coaches and athletes. They found that coaches and athletes displayed more similarities than differences when comparing the dyadic relationships between sports-specific environments. Both of these qualitative studies confirmed the

appropriateness of the 3 Cs framework to gain a better understanding of the coach-athlete relationship.

The ability of the 3 Cs model to provide a useful framework for the research of the coach-athlete relationship had therefore been acknowledged and provided vital information to better understand the influence of the dyadic relationship on coach and athlete performance.

2.10.1 Coach-Athlete Relationship Measure-Development of the CART-Q

The development of the CART-Q has legitimised the ability for the coaches and athletes' self-(directed) perceptions to be measured to appraise the nature of the dyadic relationship.

Jowett and Ntoumanis (2004) developed and validated a self-reporting tool to measure the coach-athlete relationship. They evaluated the content, criterion, construct validity, and internal reliability of the Coach-Athlete Relationship Questionnaire (CART-Q). Principal Component Analysis (PCA) demonstrated that the constructs of closeness and complementarity were evidenced in representing emotional and behavioural determinants of the coach-athlete relationship. However, the construct of co-orientation was not an acceptable component of the 3Cs model. The initial operational definition utilised by Jowett and colleagues was not appropriate, and the Rusbult and Buunk (1993) definition of co-orientation better represented the dyadic partners' perceived levels of shared agreement. This was reinforced by PCA, highlighting that the content more truly reflected the interpersonal construct of commitment. Jowett and colleagues had initially discerned commitment as a property of closeness and not as a stand-alone construct. Subsequently two 11 item CART-Q's were produced, one for

coaches and the other for athletes. In the second study Confirmatory Factor Analysis (CFA) confirmed that the three interpersonal constructs of closeness, commitment and complementarity should be considered independent and represented as a three-factor first-order model.

To address the need to be mindful of the cultural nuance of psychological assessments, Jowett and Ntoumanis (2004) examined the nature of Greek coach-athlete relationships to develop and validate the Greek Coach-Athlete Relationship Questionnaire (GrCART-Q). CFA results indicated that commitment better demonstrates the dyadic partner's cognitions towards accommodative behaviours and favourable evaluations (Jowett & Ntoumanis, 2004, p. 109). Co-orientation was deemed not to be a viable construct and duly removed. The construct of commitment was added as a new interpersonal construct, and the psychometric properties of closeness, commitment, and complementarity are reflected in the 13 item GrCART-Q. The results suggested that the GrCART-Q was a valid and reliable tool by which to measure the nature of coach-athlete relationships in Greece.

Jowett and colleagues had demonstrated the 3Cs model could be used as a conceptual framework to measure the psychometric properties of closeness (emotions), commitment (cognitions) and complementarity (behaviours) and that the CART-Q is a valid and reliable tool in which to measure the nature of the coach-athlete relationship.

2.10.2 Advancing Dyadic Thinking Through the 3 + 1Cs Relationship Model

Jowett (2005) identified co-orientation as a fourth construct to extend the original 3Cs to the 3 + 1Cs (4Cs) model. This construct accentuated the extent to which the coaches

and athletes' perceptions were interconnected (Rhind & Jowett, 2010a), thus addressing the importance of capturing the reciprocal nature of the dyadic relationship (Jowett, 2006; Poczwardowski et al., 2006). Co-orientation asserted that coaches and athletes were capable of perceiving their relationship from two different perspectives. The interpersonal perspective method proposed by Laing et al. (1966) posited that individuals could adopt perceptual orientations or perspectives of how they view relationships. The interpersonal perspective method allowed for the evaluation of co-orientation by comparing the dyadic partners' direct perspective and meta-perspective views; hence this addressed the need to investigate two-person relationships with reciprocity at the heart of the analysis. Laing and colleagues developed the framework to analyse relationships through a dyadic lens. Kenny and Acitelli (2001) advanced the concept by developing a methodological model to measure similarity and empathetic accuracy within dyadic relationships. The model made it possible to simultaneously investigate the similarity and bias of perception of both dyadic partners. Jowett adopted the model proposed by Kenny and Acitelli (2001) to operationally assess the level of similarity (agreement) and empathetic accuracy (understanding) between dyadic partners. Kenny and Acitelli's model suggested that individuals utilised two perceptions to assess their relationship with their dyadic partner. The direct perspective is where one individual self-reflected on their own emotions and cognitions toward their dyadic partner, and the meta-perspective reflected the individual's capacity to perceive the relationship through the dyadic partner's point of view. The dyadic partners evaluated their relationship by reflecting on their own internal emotions and cognitions and making assumptions about how their member perceived the relationship. An athlete's direct perspective would be "I respect my coach", and their meta-perspective would be "My coach respects me". Reciprocally,

the direct perspective would be "I respect my athlete" for the coach, and their meta-perspective would be "My athlete respects me". This process would be repeated for each item of the questionnaire, and both the athlete and the coach have the opportunity to assess their relationship, which can be correlated to measure three dimensions associated with co-orientation: (a) actual similarity, (b) assumed similarity, and (c) empathetic accuracy. Actual similarity is disclosed by comparing the athlete's direct perspective question (in this case, "I respect my coach") with the coaches' direct perspective question (e.g., "I respect my athlete). The athlete's assumed similarity is disclosed when a comparison is facilitated between the athlete's direct perspective and the athletes' meta-perspective questions (e.g., "I respect my coach" versus "My coach trusts me"). A coach's assumed similarity would follow the same process and would be a comparison between "I respect my athlete" and "My athlete respects me". Lastly, the athletes' empathetic accuracy is disclosed by comparing the athlete's meta-perspective ("My coach respects me") to the coach's direct perspective ("I respect my athlete"). Interdependently, the coach's empathetic accuracy is disclosed by comparing their meta-perspective question (e.g., "My athlete respects me") with the athlete's direct perception (e.g., "I respect my coach").

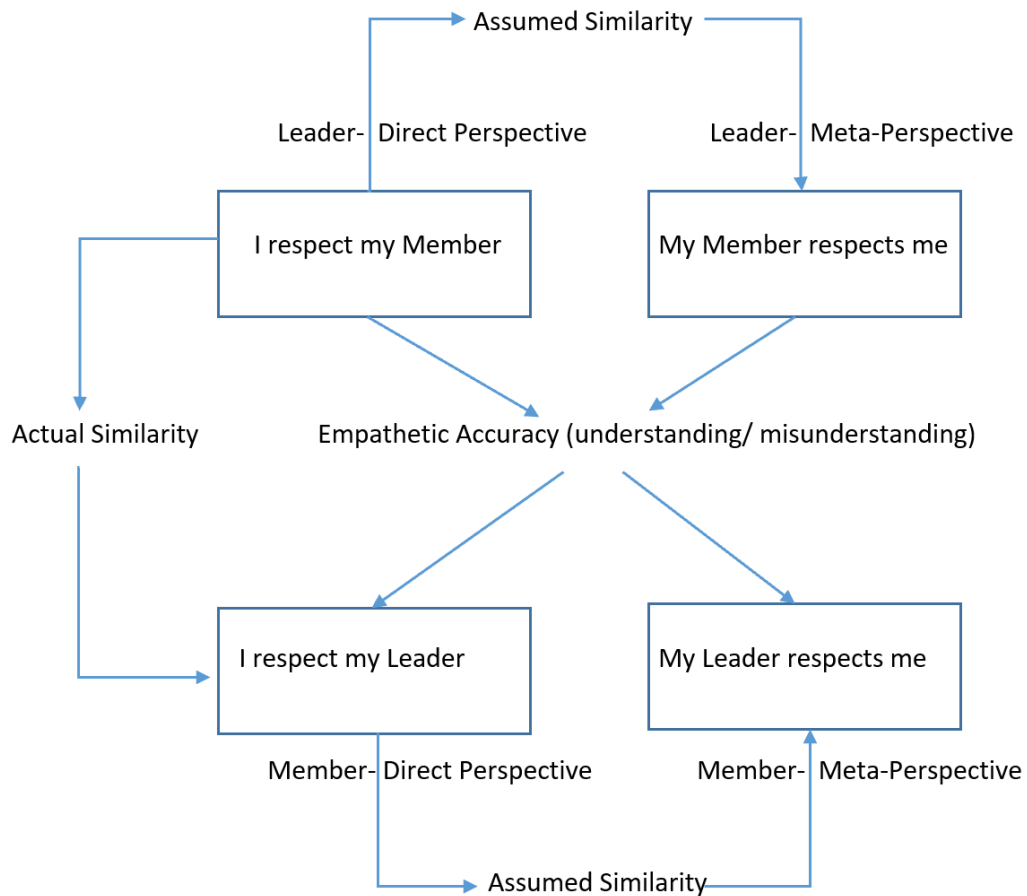
Social exchanges provide a mechanism for individuals to assess their relationship and understanding with their dyadic partner. Understanding others is an essential aspect of relationships, and similarity binds dyadic partners together with shared views (Jowett, 2007). Actual similarity validates attitudes towards each other and galvanises understanding, leading to positive emotions resulting in close/high-quality relationships. Dyadic partners who demonstrate disagreement in actual similarity, experience misunderstanding and changeability, leading to increased negative

emotions, such as anxiety and confusion, resulting in low-quality relationships (Montoya et al., 2008). Assumed similarity was the extent to which people judge their dyadic partner's emotions, cognitions and behaviours to be consistent with how they judge themselves. Similarity has been shown to lead to empathetic accuracy. Empathetic accuracy, actual similarity and assumed similarity coevolve within the dyadic relationship and could expose previously undisclosed interpersonal/social exchanges to assess the content and quality of leader-member relationships.

The additional construct of co-orientation, therefore, addressed the dyadic nature of the athlete-coach relationship. Figure 1 provides an operational schematic of how the social exchanges between the dyadic partners' direct perspective and meta-perspective are interconnected to determine actual similarity, assumed similarity, and empathetic accuracy (i.e., understanding/misunderstanding).

Figure 1:

Adapted representation of Kenny and Acitellis' (2001) model of accuracy and bias perception of the partner in close relationships to assess similarity and empathetic accuracy analysis.



Employing Kenny and Acitellis' model allowed researchers to consider both parties in the analysis of the dyadic relationship and the measurement of co-orientation for each item within a questionnaire. Jowett's 4Cs relationship model successfully defined the quality of the coach-athlete relationship and suggested a structured process by delineating the four interpersonal and interrelated constructs of emotional closeness, cognitive commitment, complementarity behaviours, and co-orientation (Jowett, 2006b). A direct-perspective version of the 11-item CART-Q (Jowett & Ntoumanis, 2004) and a corresponding 11-item meta-perspective version were subsequently

developed to capture the dyadic relationship between coaches and athletes, with reciprocity being a core tenet of the model.

2.10.1 Validity and Reliability of the CART-Q

As a triggered response to the growing interest in coach-athlete relationship research and the development of the CART-Q's direct and meta-perspective versions, Jowett (2009b) adopted a nomological network approach to constitute the validity of the questionnaires. The studies examined the psychometric constructs, the interrelationship between the 3Cs, and the associated variable outcomes of depth, support, and conflict as a result of being a dyadic member within a coach-athlete relationship. CFA results established that the 3Cs are separate yet interrelated properties and supported previous studies' findings to validate the legitimacy of the direct and meta-perspective versions of the CART-Q. An 18 item Quality Relationship Inventory (QRI: Pierce et al., 1997) was employed to authenticate the 3Cs model's appropriateness and associated variable outcomes highlighting the positive and negative characteristics of the coach-athlete relationship. Jowett demonstrated that the model could predict outcome variables of support, depth and conflict in a meaningful manner and suggested that the utilisation of the direct and meta-perspective versions of the CART-Q appropriately measured the quality of coach-athlete relationships.

Another study completed by Jowett (2009a) examined the factor structure and criterion-related validity of the CART-Q meta-perspective version. To this point, the 11-item direct-perspective version provided researchers with a unilateral outlook on co-orientation. Specifically, the coaches and athletes assumed similarity and empathetic

understanding. CFA supported the multi-dimensional model for meta-closeness, meta-commitment, and meta-complementarity as separate constructs yet interrelated.

Further evidence of the validity of the meta-perspective version supported the opinion that the 22-item CART-Q captured the quality of the coach-athlete relationship through the dyadic partner's emotions (closeness), cognitions (commitment) and behaviours (complementarity), which are reciprocally connected yet interdependent.

2.11 General Discussion

As highlighted in the literature, there was a significant difference in researchers' confidence levels concerning the conceptualisation and operationalisation of the LMX and the 4Cs relationship model. Both relationship-centred models had set out to establish mechanisms to focus on the quality of dyadic relationships and agree that high-quality relationships were essential to dyadic partners' goals, success, and performance. Although LMX is a widely researched approach to understanding leadership (Yamminaro et al., 2005), much criticism has emerged around the levels of analysis, in theory, hypothesis development, construct usage and measurement (Gooty et al., 2012). The evolution of LMX would appear to have been ambiguous, lacking scientific rigour, and does not have the same breadth and depth of psychometric constructs as the CART-Q. The LMX questionnaire does not genuinely reflect both parties' direct and meta-perspectives of the relationship. The measures are primarily facilitated for one person within the leader-member relationship to complete and are, therefore, non-dyadic, non-reciprocal, and may not adequately measure the relationship's quality.

By contrast to LMX, Jowett and colleagues have successfully defined, conceptualised, and operationalised the 4Cs model. The model and measures have been rigorously tested in a multitude of diverse sports environments. The CART-Q is more comprehensive with regards to the breadth and depth of the interpersonal constructs, and dyadic partners provide responses that require direct and meta-perspective examination. The agreement and disagreement between the parties' responses measure the relationship's empathetic accuracy, resulting in a better understanding of the relationship's dyadic partners' emotions, cognitions, and behaviours.

2.12 Advancing Research

Leader-Member Exchange (LMX) Theory has been described as the most influential relationship-centred model in leadership (Erdogan & Bauer, 2014) and one of the dominant approaches to understanding organisational leadership (Epitropaki et al., 2017). Nevertheless, a growing body of research has highlighted that LMX Theory alignment, structure, constructs and measures are vulnerable to criticism (Dulebohn et al., 2012; Gooty et al., 2012; Gottfredson et al., 2020; Schriesheim et al., 2001; Yammarino et al., 2005). As such, LMX research would benefit from exploring alternative approaches to assessing leader-member relationship quality that might develop more valid constructs and measures.

The 4Cs relationship model and measures (the direct and meta-perspective CART-Q) have been extensively validated in assessing coach-athlete relationship quality. They may provide a foundation to re-examine leader-member relationship quality using a process to consider dyadic partners perspectives simultaneously. Researchers assert that future "research should attempt to investigate a new, more effective global

measure of the leader-member exchange relationship quality” (Schriesheim et al., 2011, p. 889). LMX has evolved to have a greater focus on the relationship between the leader and the member than initially anticipated. As theory alignment of the LMX is somewhat questionable, advancing leader-member relationship knowledge may be better served to consider Interdependence Theory rather than Social Exchange Theory.

Future research investigating the appropriateness of the CART-Q in the New Zealand context is warranted. Woolliams (2015) implemented the CART-Q with New Zealand representative female football players and their respective coaches to investigate agreement and disagreement between the dyadic partners. However, they did not go as far as to validate the reliability of the questionnaire in the New Zealand context. An exploration into the potential of the CART-Q to measure the quality of interpersonal relationships at all levels within an organisation, for example, Chief Executive Officer (CEO) - Senior Management, Senior Management - Line Manager, Line Manager-Administrator and Coach-Athlete are needed. Gaining an improved understanding of leader-member dyadic relationships and these relationships' functions is imperative to ensure that all social exchanges are fully captured. The knowledge could develop strategies that help establish and maintain productive and successful relationships and increase performance outputs and job satisfaction (Graen & Uhl-Bien, 1995) and psychological well-being (Feeney & Collins, 2015). If the CART-Q or a modified version is appropriate within leadership, this will promote a higher level of knowledge and understanding relevant to the significance of the leaders and members' psychosocial development and performance.

Current leadership knowledge will benefit from an increased volume of research addressing the social dynamics and dyadic interpersonal connections within the

leader-member relationship. More research will augment the model's value proposition to governments, sports governing bodies, national sport organisations, members, and, more importantly, leaders to promote relational leadership practices.

Sport organisations and businesses are continually looking for mechanisms to improve performance. Although each industry adopts practices from the other, there is little research to substantiate the contextual applicability and appropriateness of adopting research from other disciplines.

Future research could identify shared interpersonal constructs from within and between the two domains (i.e., coach-athlete and leader-member relationships), high-performing sports, national sport organisations, and businesses may be provided insight into what constitutes quality relationships in contextually productive, high performing environments. Authenticating the appropriateness of a valid and reliable tool to measure productive relationships may lead to novel strategies to improve the dyadic relationships, performance, and personal welfare. At the same time, it may genuinely reflect the quality of the dyadic relationship in high-performing leadership.

Chapter 3 Methodology and Methods

3.1 Introduction

A researcher's ontology, epistemology, and methodological positioning provide an insight into how the author views and makes sense of the world. The author's position offers a roadmap for explaining how research is conceptualised and operationalised. The roadmap rests on a foundation of reasoning that guides research as a base and formalised structure (Fox, 2008). The author's ontological stance of this thesis sets out the beliefs about the nature of reality, particularly social research regarding relational leadership and the dyadic nature of the leader-member relationship.

3.2 Author's Position

The author of this thesis is a post-positivist researcher asserting that reality is subjective and socially constructed and advocates methodological pluralism (i.e. the utilisation of qualitative and quantitative methods facilitated either sequentially or concurrently). In this view, the technique facilitated in a particular study should be selected based on the research question being examined. Mixing qualitative and quantitative methods throughout this thesis enhanced the interpretations of the data to maximise the appropriateness and utility of a psychometric questionnaire to better understand leader-member relationships in the workplace.

Post-positivism draws directly from modernist principles and is a contemporary version of positivism (Ryan, 2006). By adopting an epistemological stance of post-positivism, theory and practice are interwoven and cannot be separated. The author's motivations and experiences are central to attending to the above (Fox, 2008; Ryan, 2006). In doing so, the author of this thesis is cognisant that self and knowledge are also interconnected. Nevertheless, continual self-reflection offers an opportunity to learn

from and within the process of discovering knowledge and requires the ability to dissect and question one's assumptions.

It should not be surprising to the reader that a doctoral thesis that examines interpersonal connections between leaders and members recognises that human connection is pivotal in completing research among others and learning alongside the participants and academic supervisors. The dichotomy of being passionate about facilitating this series of studies yet remaining unbiased is not lost on the author. This thesis extends a master's thesis, "Examining the nature of interpersonal coach-athlete dyads between New Zealand national representative female football players and national head coaches." Both degrees came about through the author's passion and life experiences of representing New Zealand as an athlete and then a coach in judo and target shooting. The dyadic relationship between a coach and athlete(s) was anecdotally identified as being of high and low quality, resulting in positive and negative life experiences, respectively. Then while working in national sport organisations in middle and senior management positions, the author once again observed that while being supervised and supervising others, high-quality relationships resulted in positive experiences, and low-quality relationships resulted in negative experiences. These experiences have guided the author to question the content and quality of dyadic relationships in leadership. The neutrality of exploring meaning for a researcher holding modernist assumptions recognises that s/he performs inquiry from the outside. Although not entirely independent of the process, holding oneself accountable for ensuring the researcher's biases are continually questioned throughout the studies is pivotal to being as objective as possible.

The individual's reality distinguishes between one's internal self and the environment. The interpersonal connections between the leader and member are dyadic and can also be made up of a leader and a group of members being mutually and causally interconnected; thus, each shares responsibility for the constructed relationship. Uhl-Bien (2006) describes post-positivist relational leadership researchers as having an interest in linking relational constructs, operationalised through variables, and coordinating causal relationships into models that assess the quality of the leadership relationship.

3.3 Mixed Methods

In adopting a post-positivist position, the author of this thesis holds a pragmatic outlook on research. Thus, the author acknowledges the value of combining different types of quantitative and qualitative research methodologies. Utilising a mixed methods approach throughout this thesis has captured data that would be lost by adopting mono-methodological studies.

Mixed methods research has been described as utilising quantitative and qualitative techniques together in a series of related studies (Bishop, 2015). The co-existence of quantitative and qualitative methods has long been passionately debated in academia. Some believe that quantitative and qualitative methodologies are incompatible, with researchers such as Miles and Huberman (1994) questioning whether the research methods should be mixed and for what purpose. Rossman and Wilson (1985) referred to three perspectives when using quantitative and qualitative methods in a single study: purist, situational and pragmatic researchers. Firstly, purist researchers concentrate on the differences between the two approaches rather than the similarities between quantitative and qualitative philosophies. Purists believe that the

two methodologies are mutually incompatible due to the ontological and epistemological assumptions of how knowledge is determined and champion a mono-methodological position. Secondly, situationist researchers postulate that both methods have value; however, contextual nuance or stage of the research dictates the situation when one would use either method. Finally, pragmatist researchers believe that the integration of processes is acceptable and guided by the research question and realises that quantitative and qualitative methodologies have both strengths and weaknesses.

Acknowledging the value of both quantitative and qualitative methodologies allows the researcher to learn new skill sets and provide greater data breadth and depth throughout the research process. This, therefore, provides a more holistic approach to a better understanding of the dyadic phenomena. Ashkanasy et al. (2012) noted that mixed methods might be advantageous for extending current knowledge and exposing previously undiscovered dimensions in the dyadic relationship between leaders and members in the study of leadership. Researchers use qualitative or quantitative research to inform the other when facilitating mixed methods. Therefore qualitative and quantitative research is conducted concurrently or sequentially. Researchers such as Morse and Niehaus (2009) believe that mixed methods studies generally emphasise either the quantitative or qualitative component of the studies to have a higher value or importance. However, the series of studies in this thesis align with the ideas of Creswell and Clark (2017), who suggest that qualitative and quantitative research can have equal weighting. A study investigating the combination of methodologies conducted by Östlund et al. (2011) suggests that mixed methods studies can demonstrate triangulation adding to the scientific rigour of the research. This thesis

contends that quantitative analysis facilitated in Study One (a pilot study) informs the researcher how the qualitative components can best be utilised. The qualitative methods and analysis (i.e., Study Two and Three) complement the quantitative piece, and the qualitative studies complement the quantitative research. Thus, in this thesis, the quantitative research was conducted, and then two qualitative research studies were performed sequentially.

3.4 Study Design

This thesis examines whether the 4Cs model of relationship quality and content can be applied to leadership in sporting organisations. As leadership is an inherently dynamic and complex phenomenon, so is the author's ontological, epistemological, and methodological positioning. One's research philosophy must add to the whole of parts to answer important questions to advance robust and rigorous theories, models, and methods to examine leadership's relational constructs.

Two potential approaches were considered during the initial thesis design (Pathway A and B). The approach chosen depended on the outcome of Study One, a pilot study. If the pilot study results found that the CART-Q was not a valid and reliable tool to measure the quality of coach-athlete relationships in New Zealand, then the study was to default to Pathway B. However, the results from Study One determined that the CART-Q questionnaire was a valid and reliable measure of coach-athlete relationship quality in New Zealand. Therefore, Pathway A was chosen as an appropriate thesis design.

Pathway A

This thesis aimed to test whether the conceptualisation of the 4Cs model of the coach-athlete relationship (Jowett, 2007), as measured by the Coach-Athlete Relationship Questionnaire (CART-Q), is an appropriate model to examine the corresponding dyad between a leader and a member in a work context. Expressly, this thesis examined if the 4Cs model of relationship content and quality can be applied in a leadership setting between a leader and a member.

Study One: To determine the appropriateness of the CART-Q in understanding the quality of the coach-athlete relationship within the New Zealand sport context.

Method: Quantitative Research

Research Question: Is the CART-Q a valid and reliable tool to measure the quality of coach-athlete relationships in New Zealand sport?

Data Collection: Via questionnaire using a sample size to model parameter ratio of 10:1 of coaches and athletes.

Data Analysis: Descriptive analysis, CFA, Rasch analysis, convergent and discriminant validity, goodness-to-fit indexes utilising Hu & Bentler (1999) two index presentation strategy for cut-off values.

Study Two: To determine whether the 4Cs relationship model (Jowett, 2007) is an appropriate framework for understanding leadership relationships within New Zealand sport organisations and if the CART-Q can effectively evaluate the core dimensions of leader-member relationships.

Method: Qualitative Research

Research Question: Is the 4Cs relationship model a valid framework to evaluate the quality of leader-member relationships in NZ sport leadership?

Data Collection: Via semi-structured interviews of ten to twelve leaders and members.

Data Analysis: Content analysis using deductive and induction content analysis was facilitated to determine common themes, new dimensions, and if closeness, commitment, complementarity, and co-orientation are identified as vital constructs of the leader-member relationship.

Study Three: To design a new questionnaire to measure the content and quality of the leader-member relationship based on the findings from Study Two and to qualitatively examine the content validity of the CART-Q-R (the new questionnaire) utilising cognitive interviewing techniques.

Method: Qualitative Research

Research Question: What dimensions appropriately measure the 4Cs in the leader-member relationship?

Data Collection: Via semi-structured interviews and focus groups of ten to twelve leaders and members.

Data Analysis: Comprehension and understanding of the participants were observed through the examination of the retrieval from memory of relevant information, decision processes and response processes. Verbal probing was facilitated to aid the above when necessary. At the point where the participants acknowledged understanding of each question and were able to provide contextual specifics of the concerned item, it was deemed that the question item was valid.

Pathway B		
To determine what shared psychological, interpersonal constructs between high-performance coaches and athletes can be identified in New Zealand.		
<p>Study One: To determine the appropriateness of the CART-Q in understanding the quality of the coach-athlete relationship within the New Zealand sporting context.</p> <p>Method: Quantitative Research</p> <p>Research Question: Is the CART-Q, a valid and reliable tool to measure the quality of coach-athlete relationships in New Zealand sport?</p> <p>Data Collection: Via questionnaire using a sample size to model parameter ratio of 10:1 of coaches and athletes.</p> <p>Data Analysis: Descriptive analysis, CFA, Rasch analysis, convergent and discriminant validity, goodness-to-fit indexes utilising Hu & Bentler's (1999) two index presentation strategy for cut-off values.</p>	<p>Study Two: To determine the shared psychological, interpersonal constructs between high-performance coaches and athletes in NZ and modify the CART-Q to be valid and reliable for the NZ context.</p> <p>Method: Multi-Methods Research</p> <p>Part One (Qualitative Research)</p> <p>Research Question: Are there shared psychological, interpersonal constructs between New Zealand high-performance coaches and athletes?</p> <p>Data Collection: Via semi-structured interviews of ten to twelve high-performance coaches and athletes.</p> <p>Data Analysis: Thematic analysis as suggested by Braun and Clarke (2006), to determine if the constructs of closeness, commitment, complementarity and co-orientation are considered vital constructs.</p> <p>Part Two (Quantitative Research)</p> <p>Research Question: What modifications need to be made to the CART-Q for the instrument to be valid and reliable in the NZ context?</p> <p>An expert panel consisting of academics, coaches and athletes will be formed to consider the results of Study Two, Part One and to recommend the appropriate modifications required to the CART-Q.</p> <p>Data Collection: Via the modified CART-Q questionnaire using a sample ratio to model parameters of 10:1 with coaches and athletes.</p> <p>Data Analysis: Descriptive analysis, CFA, Rasch analysis, convergent and discriminant validity, goodness-to-fit indexes utilising Hu & Bentler's (1999) two index presentation strategy for cut-off values.</p>	<p>Study Three: To determine whether the 4Cs relationship model (Jowett, 2007) is an appropriate framework to evaluate the core dimensions of the leader-member exchange and confirm the validity and reliability of the modified CART-Q.</p> <p>Method: Multi-Methods Research</p> <p>Part One (Qualitative Research)</p> <p>Research Question: Is the 4Cs relationship model a valid framework to evaluate the quality of leader-member relationships in NZ sport leadership?</p> <p>Data Collection: Via semi-structured interviews of ten to twelve leaders and members.</p> <p>Data Analysis: Thematic analysis, as suggested by Braun and Clarke (2006), to determine if the constructs of closeness, commitment, complementarity and co-orientation are considered vital constructs.</p> <p>Part Two (Quantitative Research)</p> <p>Research Question: Is the modified CART-Q a valid and reliable tool to determine agreement and disagreement between leader and members in NZ sport leadership?</p> <p>Data Collection: Via questionnaire using a sample ratio to model parameters of 10:1 with leader and members.</p> <p>Data Analysis: Descriptive analysis, CFA, Rasch analysis, convergent and discriminant validity, goodness-to-fit indexes utilising Hu & Bentler's (1999) two index presentation strategy for cut-off values.</p>

The three studies have been designed to:

1. Validate the CART-Q with coaches and athletes to determine its appropriateness within the New Zealand sport context. (Study One)
2. Determine if leaders and members in a workplace setting recognise the 3 + 1Cs as vital constructs of interpersonal relationships. (Study Two)
3. Design and implement the CART-Q (or a modified version) with leaders and members to determine its appropriateness. (Study Three)

3.4.1 Methods Overview

Detail about the specific methods adopted in each study are presented in each study chapter but are also briefly summarised here.

3.4.1.1 Study One (Pilot Study)

Study one aimed to determine the CART-Q's appropriateness in understanding the coach-athlete relationship's quality within the New Zealand sport context.

- Method: Quantitative research (Classical Test Theory and Item Response Theory)
- Research Question: Is the CART-Q a valid and reliable tool to measure the quality of dyadic relationships in a New Zealand sport setting?

Study one was the progression of previous research by the author, which examined the nature of interpersonal coach-athlete dyads between New Zealand national representative female football players and coaches (Woolliams, 2015).

Previous to this, there had been no validation of the CART-Q in the New Zealand sport coach-athlete relationship context. The CART-Q measures the direct and meta-perspectives of the participant's perceptions of the state of their relationship with their dyadic partner by determining each individual's Assumed Similarity, Actual Similarity, and Empathetic Accuracy. A ratio sample size to model parameters between 10:1 was adopted, as suggested by Kline (1998). A sample of 251 athletes that have played for New Zealand at an international level in football and futsal and their respective national coaches were sought. The convenience sample was obtainable due to the professional occupation of the author of this study. Study One focused on the factorial validity of the CART-Q's direct and meta-perspective versions employing Classical Test Theory and Item Response Theory.

- Data Collection: Via questionnaire using a sample of 251 participants.
- Data Analysis:
 - Descriptive analysis techniques to include means, standard deviation, kurtosis, and skewness was measured using SPSS 23.0 and AMOS 22.0 software.
 - Factorial validity of the CART-Q was tested utilising Confirmatory Factor Analysis (CFA) using AMOS v.22.0 and LISREL v.8.80 (Jöreskog & Sörbom, 1993) to analyse the hypothesised models.
 - Rasch Analysis RUMM 2030 (Andrich et al., 2009).

3.4.1.2 Study Two

Study two aimed to determine whether the 3 + 1Cs (4Cs) model (Jowett, 2007) of dyadic relationships is an appropriate framework for understanding leadership

relationships within a New Zealand sports leadership setting and if the CART-Q can effectively evaluate the core dimensions of leader-member relationships.

- Method: Qualitative Research (semi-structured interviews)
- Research Question: Is the 3 + 1Cs relationship model a valid framework to evaluate the quality of dyadic leader-member relationships in a New Zealand sports leadership setting?
- Data Collection: Obtained via semi-structured interviews from ten leaders and members from within a National Sport Organisation.
- Data Analysis: Content analysis using deductive and induction content analysis was facilitated to determine common themes, new dimensions, and if closeness, commitment, complementarity, and co-orientation are identified as vital constructs of the leader-member relationship.

3.4.1.3 Study Three

The aim of study three was to design a questionnaire (the CART-Q-R) to measure the content and quality of the leader-member relationship based on the findings from Study Two and qualitatively examine the content validity of the CART-Q-R utilising cognitive interviewing techniques.

- Method: Qualitative Research (cognitive interviewing)
- Research Question: What dimensions appropriately measure the 3 + 1 Cs in the leader-member relationship?

- Data Collection: Obtained via cognitive interviewing techniques from one leader and seven associated members representing seven leader-member relationships.
- Data Analysis: Comprehension and understanding of the participants were observed, through the examination of the retrieval from memory of relevant information, decision processes and response processes. Verbal probing was facilitated to aid the above when necessary. The wording of an item was established when the participants acknowledged understanding of each question during the cognitive interviewing process and were able to provide contextual specifics of the concerned item; it was deemed that the question item was valid.

3.5 Summary

In adopting a post-positivist epistemological and ontological position, the author of this thesis holds a pragmatic outlook on research, asserting that utilising qualitative and quantitative components provides a rich tapestry of data for interpretation. In this instance, quantitative data validated the reliability of a psychometric tool before qualitative research was facilitated to conceptualise the constructs of interest, identify and describe the behaviours that underline the constructs and develop the initial reconceptualised psychometric tool.

In this case, this thesis aimed to test whether the conceptualisation of the 4Cs model of the coach-athlete relationship (Jowett, 2007), as measured by the Coach-Athlete Relationship Questionnaire (CART-Q), is an appropriate model for a corresponding dyad between a leader and a member in a work context. Specifically, this thesis

examines whether the 4Cs model of relationship quality and content can be applied to leadership in sporting organisations. As leadership is an inherently dynamic and complex phenomenon, so is the author's ontological, epistemological, and methodological positioning. One's research philosophy must add to the whole of parts to answer important questions to advance robust and rigorous theories, models, and methods to examine leadership's relational constructs.

Chapter 4 (Study One) Resolving uncertainties of the factor structures of the Coach-Athlete Relationship Questionnaire (CART-Q)

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4.1 Prelude

Chapter Two of this thesis highlighted the criticisms of LMX Theory and that researchers have called for alternative approaches to assessing leader-member relationship quality (Gottfredson et al., 2020). The 4Cs model and Coach-Athlete Relationship Questionnaire (CART-Q) have been identified as a potential framework to assess coach-athlete relationship quality taking into account the dyadic partners perspectives simultaneously. However, the psychometric properties of the instrument still remain unclear. Therefore, there is a need to validate the questionnaire in its original form and in the New Zealand context before it can be considered appropriate for assessing leader-member relationships in a work setting. The purpose of this study was to resolve uncertainty about a suitable factor solution by applying previously used analytical methods and psychometric methods appropriate for this type of response scale, namely asymptotic distribution-free confirmatory factor analysis (CFA) Rasch analysis. The findings demonstrated that CFA with maximum likelihood and diagonally-weighted least squares estimation methods supported the factorial validity of the three-factor first-order model of both CART-Q versions. A unidimensional solution was also tenable. Rasch analysis determined that the unidimensional model possessed higher reliability than individual subscales and also provided improved coverage of participants' scores, thus minimising ceiling effects. Research designs requiring precise coach-athlete relationship assessment may prefer the unidimensional model due to its superior psychometric properties. The subscale scores can still be interpreted with adequate validity and reliability when more detailed profile scores are required.

4.2 Keywords

3+1Cs, Psychological properties, New Zealand, Rasch analysis, High-Performance Sport

4.3 What is already known about the topic

- The coach-athlete relationship is essential to enhancing performance and psychosocial well-being.
- The 3+1Cs model and Coach-Athlete Relationship Questionnaire (CART-Q) represents the most popular approach to understanding coach-athlete relationships.
- Previous studies investigating the CAR factorial validity have identified the 3+1Cs model as a multidimensional structure with universal applicability across cultures.

4.4 What this study adds

- This is the first study to perform CTT and IRT to minimise the likelihood of psychometric findings materialising as an artefact of using a particular analytical tool.
- Contrary to previous research, the results of this study suggest that a unidimensional structure obtained greater robustness in increased reliability, item coverage and reduced ceiling effects than the multidimensionality of the model.
- These results suggest that a unidimensional factor solution is a more appropriate representation of the model than previously reported and provides researchers with confidence in the psychometric properties of the questionnaires.

4.5 Introduction

Sport is a contextually rich environment to study relationship interdependence, as many dyadic relationships are formed (Jowett & Ntoumanis, 2004). The coach-athlete relationship (CAR) is deemed pivotal in the success of the coaching process, where both parties form close relationships with a high degree of interdependence (Jowett, 2009b; Jowett & Shanmugam, 2016). Exploratory research examining social interconnections between coaches and athletes have traditionally involved sports leadership models heavily focused on single-participant paradigms and the behaviour and personality traits of coaches. The past 20 years have seen rapid advances in CAR research, using a dyadic lens to gain a better understanding of the mutual interrelations of both individuals.

Kelley et al.'s (1983a) interpersonal relationship research provided a framework for Jowett (Jowett & Cockerill, 2003; Jowett & Meek, 2000) to conceptualise the quality of the CAR as a situation in which coaches' and athletes' interpersonal emotions, cognitions and behaviours are mutually and causally interconnected. The CAR is entrenched in a series of changeable and multifaceted interactions where both members rely on each other during stressful situations and are connected members of a dyadic relationship. Jowett and Ntoumanis (2004) acknowledged that a tool was required to reflect the CAR psychometric properties. The CART-Q development and validation process included a systemised set of procedures to involve item generation and analysis with a panel of experts, followed by a series of Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) on first-order and higher-order structured models (Jowett, 2007). EFA was used to postulate the structure of the model, then supported using CFA. CFA verified the three constructs of Closeness,

Commitment and Complementarity of coaches' and athletes' emotions, cognitions and behaviours which were observable and could be represented as a three-factor first-order model to represent the CAR multidimensional nature. Subsequent qualitative studies (Jowett & Frost, 2007; Trzaskoma-Bicsérdy et al., 2007) confirmed that this 3Cs model was appropriate. The model highlighted the extent to which the coaches and athletes perceptions are interconnected (Rhind & Jowett, 2010a), emphasising the need to capture the dyadic nature of the two-person relationship (Jowett, 2006b; Poczwardowski et al., 2006).

3Cs model constructs are defined as:

1. Closeness: the feeling of being emotionally close with one another, reflected in the feelings of being liked, cared and valued, and that mutual trust had a positive effect on the coaches' and athletes' intrapersonal and interpersonal factors.
2. Commitment: a cognitive attachment and long-term orientation toward each other.
3. Complementarity: roles, tasks, and support, reflecting the co-operative interactions of coaches' and athletes' responsiveness and affiliation.

Co-orientation is the fourth construct to advance the model to 3+1Cs (Jowett, 2005). It accentuated the extent to which coaches' and athletes' perceptions were interconnected, emphasising the importance of capturing the reciprocal nature of the dyadic relationship. Co-orientation suggested that coaches and athletes could perceive their relationship from two perspectives; the direct-perspective (e.g. I trust my coach/

athlete), and the meta-perspective (e.g., My coach/athlete trusts me). Co-orientation assesses three dimensions of the CAR:

1. Actual similarity of coaches' and athletes' direct perspectives (i.e., the comparison of the coaches' and athletes' direct perspectives).
2. Assumed similarity (i.e., comparison of athletes' direct perspectives with their meta-perspective and comparing coaches' direct perspectives with their meta-perspective).
3. Empathetic understanding (i.e., the comparison of athletes' direct perspective with the coaches' meta-perspective or coaches' direct perspective with the athletes' meta-perspective) (Jowett, 2006; Jowett, 2009a).

Co-orientation allowed for analysis to determine the level of agreement and disagreement between the dyadic partners, i.e., understanding the dyadic nature of the CAR (Woolliams, 2015). CAR is measured using the CART-Q (Jowett, 2009b; Jowett & Ntoumanis, 2004) involving both direct perspective and meta-perspective versions and has been cross-culturally validated (Baldock & Jowett, 2010; Yang & Jowett, 2012, 2013).

CART-Q psychometric qualities were previously assessed using Classical Test Theory (CTT) and CFA. Previous validation studies (Jowett & Ntoumanis, 2004), utilising structural equation modelling (SEM), determined that the three-factor first-order model is an appropriate tool to examine the quality of CAR. Findings supported the multidimensional nature of the relationship, underpinned by the dyadic member's interpersonal emotions, cognitions and behaviour being mutually and causally bound. Figure 2 represents the 3Cs model of the direct perspective, and Figure 3 represents

the 3Cs model for the meta-perspective employing CFA practices. This study proposes that while CTT has advanced SEM, more sensitive approaches, such as Rasch analysis, need to be considered as suitable for ordinal Likert-scale data and provide detailed information about item performance.

Rasch analysis is a probabilistic model and is effective in determining the psychometric robustness of questionnaires (Lundgren & Tennant, 2011). Rasch (1960) demonstrated that the probability of an endorsement made by a person directed at a given item is a logistic function of the difference between the item parameter and the person parameter. A significant advantage of Rasch analysis over CTT is that it distinguishes between the items' level of difficulty (the item parameter) on the latent construct and the person's ability or propensity to endorse the item (the person parameter). The item parameters and person parameters are measured on the same scale (logits) and linearly represented demonstrating the standard error variance specific to item and person ability and difficulty (Schumacker & Smith, 2007). The Rasch model was initially developed to address dichotomous data and has been advanced through the development of the Partial Credit Model (Masters, 1982) and the Rating Scale Model (Andrich, 1978) to consider polytomous scored items. A fundamental consideration of both models is that they assume there will be variability evident in the distance between thresholds, yet the Rating Scale expects the variance to be equal across all items (Alagumalai et al., 2005). This advancement is pivotal, as polytomous Rasch analysis attends to Likert-style questionnaires allowing the model to determine whether the data in sequential categories reflects the increased property of the construct (Andrich, 1998). As the CART-Q adopts a Likert-scale ranging from 1 to 7, a

person may have specific difficulty levels endorsing a particular response due to the hierarchical nature of the rating system (Kersten & Kayes, 2011).

This study utilised a systematic analysis path to complete a thorough and iterative psychometric examination of the 3+1Cs model and associated CART-Q to reduce the likelihood that results are an artefact of using a particular computational analysis tool. Unlike previous research on this topic, Rasch analysis was utilised post-traditional CFA methods to determine the validity and reliability of the direct perspective and meta-perspective versions of the CART-Q. The aim was to resolve uncertainty about a suitable factor solution through applying previously used analytical methods, psychometric methods that are appropriate for this type of response scale, i.e., asymptotic distribution-free CFA and Rasch analysis.

Figure 2:

3Cs direct -perspective three-factor first-order factor model

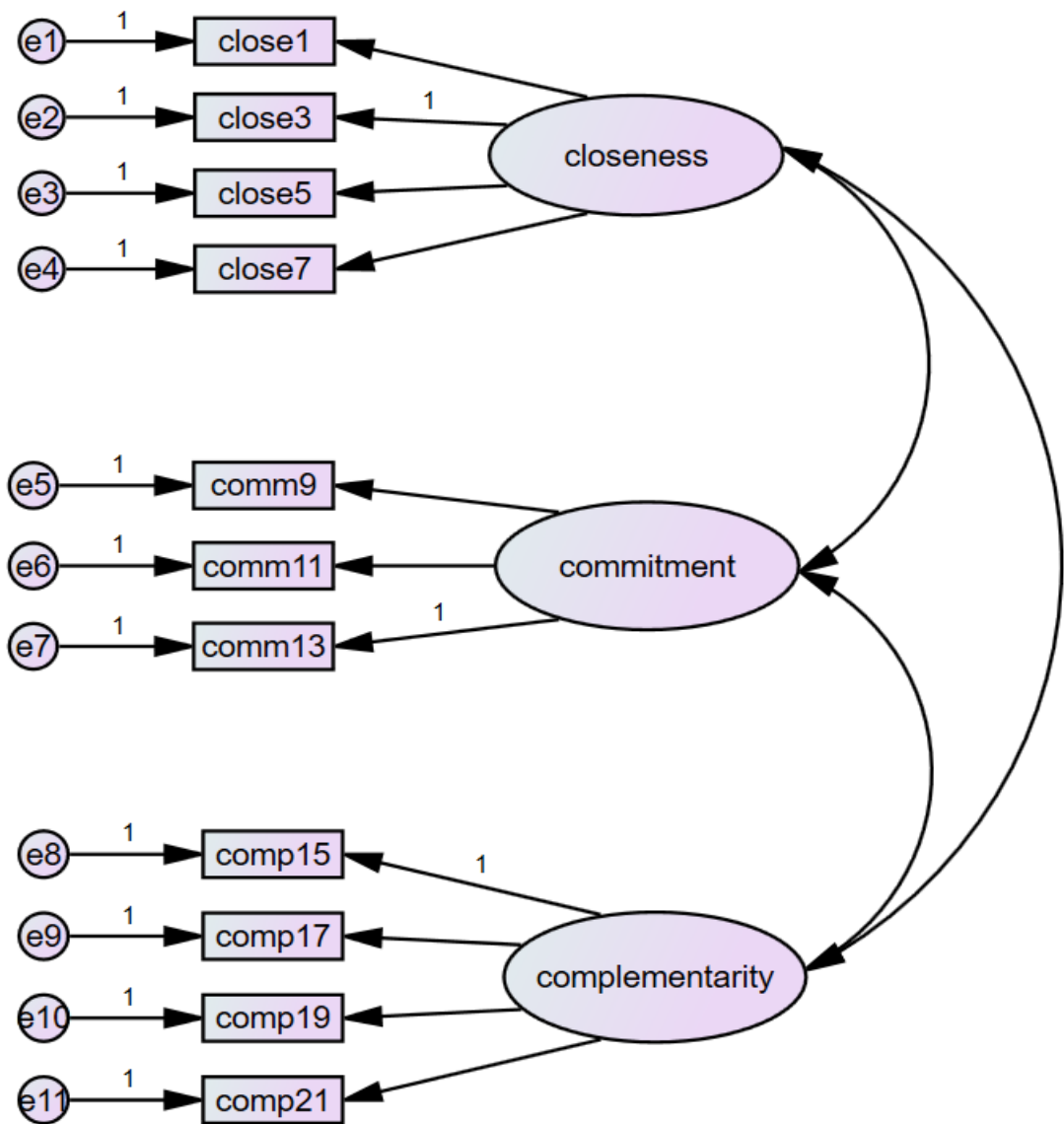
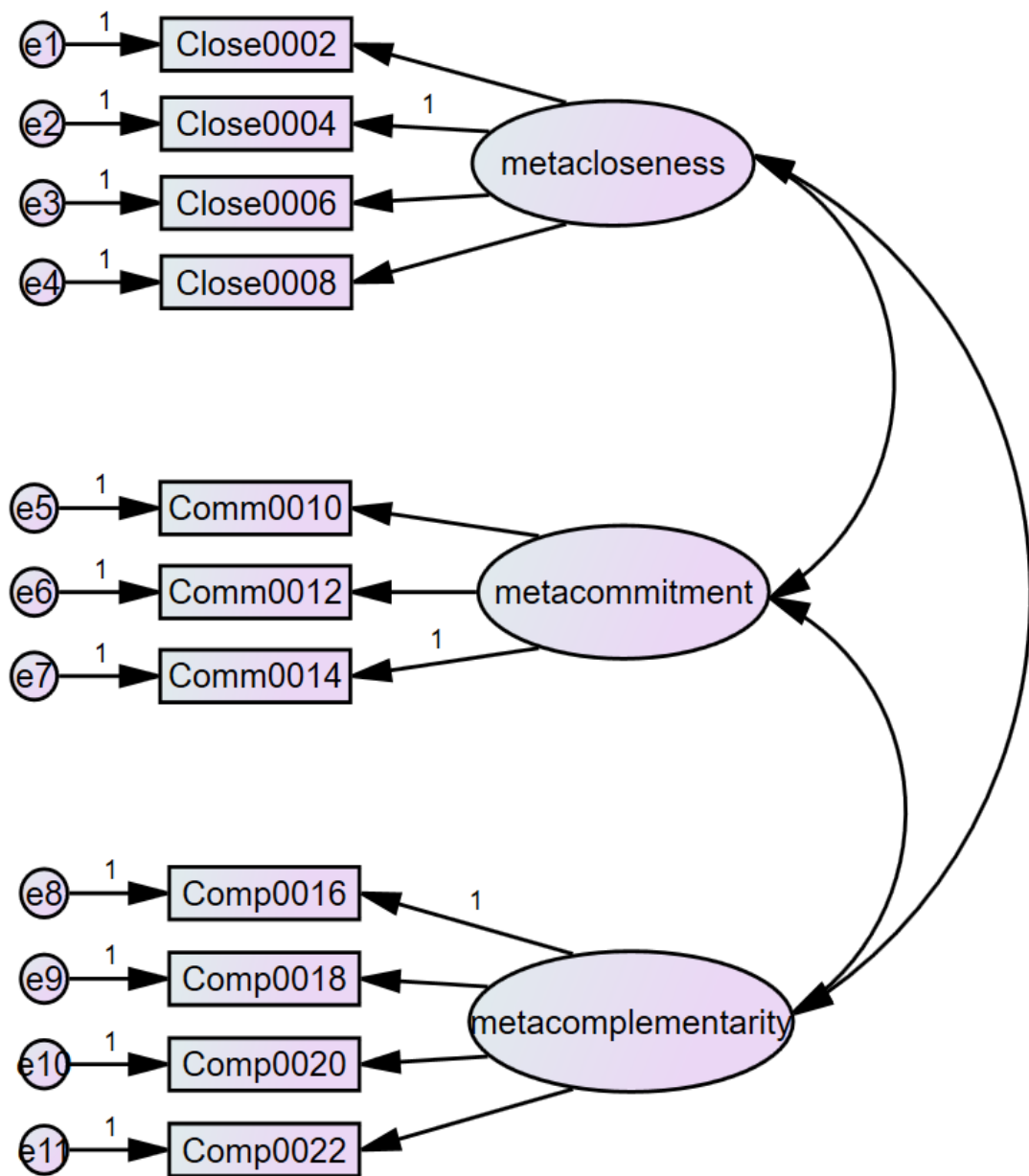


Figure 3:

3Cs meta-perspective three-factor first-order factor model



4.6 Method

4.6.1 Participants

A sample of 251 national New Zealand football and futsal players and national coaches (U20 men's, U20 women's, senior men's, and senior women's) participated in this study (51.4% male and 48.6% female). All data was de-identified.

4.6.2 Instrumentation

The CART-Q direct and meta-perspective versions were used. Each 11-item questionnaire (Jowett, 2009b; Jowett & Ntoumanis, 2004) assessed the CAR for the constructs of direct-Closeness (4 items), direct-Commitment (3 items) and direct-Complementarity (4 items), and meta-Closeness (4 items), meta-Commitment (3 items) and meta-Complementarity (4 items). Items were measured on a 7-point Likert-scale ranging from 1 (*“Strongly Disagree”*) to 7 (*“Strongly Agree”*).

4.6.3 Procedure

The primary researcher met the participants to discuss the study's aims and logistics, its voluntary nature, confidentiality and anonymity with individual athletes and coaches at training sessions. The information sheet and CART-Q were left with the consenting participants. The athletes and coaches were asked to place the questionnaires in an unmarked envelope and return them to a collection box at a pre-determined venue convenient to the participants. The research study obtained approval from the authors' institutional ethics committee.

4.6.4 Data Analysis

Descriptive analyses were conducted using SPSS 25.0. Consistent with previous research (Balduck & Jowett, 2010; Balduck et al., 2011), the software package AMOS was utilised in this study for the CFA. A model comparison strategy, as suggested by MacCallum (1995), was adopted to test the CFA of the direct and meta-perspective 11-item CART-Qs. A widely accepted strategy to evaluate factorial validity of the CART-Q is to test comparative models to contribute further evidence to support a hypothesised model (Balduck & Jowett, 2010; Jowett, 2009a; Jowett & Ntoumanis, 2004; Yang & Jowett, 2010, 2013).

Three competing models (M1, M2 and M3) were compared to identify a structure that appropriately captured the CAR constructs for the direct perspective CART-Q, and three competing models (M4, M5 and M6) were compared for the meta-perspective:

1. M1 represented the original direct perspective three-factor first-order model as postulated by Jowett and Ntoumanis (2004).
2. M2 comprised of the direct perspective three-factor first-order model with minor modifications introduced to address the misspecification issues of ill-fit of two latent traits.
3. M3 represented a single-factor solution in which the 3Cs were considered as a stand-alone unidimensional construct.
4. M4 comprised of the original meta-perspective three-factor first-order model, as postulated by Jowett (2007), representing the constructs of meta-Closeness, meta-Commitment and meta-Complementarity.

5. M5 utilised a three-factor first-order model with minimal modifications to attend to variances outlined from modification indices.
6. M6 represented a single-factor solution in which the 3Cs were grouped as a unidimensional construct with meta-Closeness, meta-Commitment and meta-Complementarity considered as a stand-alone construct.

The sample size to free parameter ratios ranged from 8.7:1 to 11.4:1, with an average of 10:1 meeting the recommended 10:1 ratio (Bentler, 1995).

A series of goodness-of-fit indices were considered to evaluate the adequacy of model fit: scaled chi-square (χ^2) statistic, Standardised Root Mean Square Residual (SRMR), Comparative Fit Index (CFI), Root-Mean-Square Error of Approximation (RMSEA), Tucker-Lewis Index (TLI), Akaike Information Criterion (AIC), and Expected Cross-Validation Index (ECVI). Chi-square difference tests were carried out to compare competing models. CFI and TLI values of 0.90 are acceptable (Dragan & Topolšek, 2014), with 0.95 to 1.00 values indicating close to exact fit. A SRMR value of <0.05 is acceptable, yet Hu and Bentler (1999) suggested a revised criterion of <0.08, and RMSEA values from 0.08 are considered to be an acceptable cut-off value with 0.06 or higher indicating close to exact fit. As there are no identified satisfactory values for the AIC or the ECVI estimates, the lowest values, the most parsimonious, were considered to indicate a better fit when comparing the competing models. This strategy aligns with previous research protocols in testing the validity of CART-Qs (Ahmad, 2014; Balduck & Jowett, 2010). Upon determining the model fit to the data, convergent and discriminant validity of the direct and meta-perspective CART-Qs were then examined.

To enable direct comparison of the present results with those of previous studies

(Balduck & Jowett, 2010; Balduck et al., 2011; Jowett & Ntoumanis, 2004; Yang & Jowett, 2010), CFA was conducted using maximum likelihood estimation with the software package AMOS v.22. Since the data is ordinal, due to the questionnaire adopting a Likert scale, CFA was also conducted using an asymptotic distribution-free method, which is deemed to be the appropriate approach for this type of data (Flora & Curran, 2004). Using the software package LISREL v.8.80 (Jöreskog & Sörbom, 1993), polychoric correlations were used with a diagonally weighted least squares method of estimation.

Rasch analysis was conducted using the software package RUMM2030 (Andrich, Sheridan, & Luo, 2009). Likelihood-ratio tests supported ($\chi^2(29)=50.64, p<0.01$, and $\chi^2(29)=66.26, p<0.01$, for the direct and meta-versions, respectively) the appropriateness of adopting the Partial-Credit Model. An iterative process was facilitated following the guidance of the sequential steps recommended by Siegert et al. (2010) until Rasch analysis expectations were met. Individual item fit residuals should be nonsignificant and within a range of -2.50 to +2.50. Local dependency of items was examined by inspected residual correlation matrices.

Rasch analysis distinguishes between local trait dependency due to the presence of multidimensionality and local response dependency, which can occur when the response to an item is influenced by the response to another item, such as a method effect (Lundgren & Tennant, 2011). The type of dependency can be investigated by locally dependent items into subtests. If the resulting solution is unidimensional, subtests can be said to have successfully resolved local response dependency (Medvedev et al., 2018) and there is no evidence of local trait dependency.

4.7 Results

4.7.1 Descriptive Statistics and Reliability Analysis

Table 1 shows the means, standard deviation, skewness and kurtosis scores of the CART-Q 11-item direct and 11-item meta-perspective versions. Negative univariate skewness scores were observed for all items except item 6 for both the direct perspective (item 6 - *"I am close to my athlete/coach"*) and meta-perspective versions (item 6 - *"My coach/athlete is close to me"*) indicating mostly positive relationship perceptions and meta-perceptions. The measures of Mardia's multivariate kurtosis coefficients were high (67.40 and 51.59) for M2 and M5, respectively, thus rejecting the hypothesis of multivariate normality. Therefore, the robust maximum likelihood estimation method was utilised as this method offers moderately accurate standard errors when data shows multivariate non-normality (Bentler, 1995).

Table 1:**Descriptive statistics for the 11-item direct perspective and meta-perspective CART-Qs.**

Item	Direct Perspective	M	SD	Skewness	Kurtosis
1	I like my athlete/coach	5.70	0.97	-0.58	0.13
2	I trust my athlete/coach	5.72	1.09	-0.78	0.33
3	I respect my athlete/coach	6.05	0.97	-1.14	1.70
4	I appreciate the sacrifices my athlete/coach has experienced to improve his/her performance	5.69	1.10	-0.62	-0.17
5	I am committed to my athlete/coach	5.70	1.10	-0.66	-0.07
6	I am close to my athlete/coach	4.42	1.23	0.01	-0.03
7	I think my coaching/playing career is promising with my athlete/coach	5.13	1.24	-0.05	-0.03
8	I am at ease with my athlete/coach	5.38	1.20	-0.70	0.30
9	I am responsive to my athlete/coach efforts	5.63	1.01	-0.40	-0.49
10	I am ready to do my best	6.11	0.89	-0.86	0.48
11	I adopt a friendly stance	5.97	0.82	-0.69	1.32

Item	Meta-Perspective	M	SD	Skewness	Kurtosis
1	My athlete/coach likes me	5.23	1.04	-0.09	-0.17
2	My athlete/coach trusts me	5.33	1.05	-0.53	-0.05
3	My athlete/coach respects me	5.64	1.06	-0.90	0.96
4	My athlete/coach appreciates the sacrifices I have experienced to improve performance	5.10	1.18	-0.21	-0.07
5	My athlete/coach is committed to me	5.30	1.07	-0.09	-0.58
6	My athlete/coach is close to me	4.20	1.16	0.20	0.33
7	My athlete/coach believes that his/her career is promising with me	5.06	1.05	-0.36	0.24
8	My athlete/coach is at ease with me	5.17	1.13	-0.33	-0.05
9	My athlete/coach is responsive to my efforts	5.24	1.14	-0.34	-0.27
10	My athlete/coach is ready to do his/ her best	6.05	0.91	-0.88	0.56
11	My athlete/coach adopts a friendly stance	5.80	1.01	-1.03	1.40

4.7.2 Model Evaluation via Confirmatory Factor Analysis

Fit indices (Table 2) demonstrate that M1, the original direct perspective version and M4, the original meta-perspective version of the CART-Qs, do not meet the minimum recommended standard cut-off criteria (Bentler (1995); Hu and Bentler (1999)).

Examination of modification misspecification through modification indices (MI) was used to identify specific areas of ill-fit for potential respecification. This indicated that the covariance between item 1 (*"I like my athlete/coach"*) of the construct of Closeness, and item 6 (*"I am close to my athlete/coach"*) of Commitment, and to a lesser extent, item 5 (*"I am committed to my athlete/coach"*) of Commitment and item 10 (*"I am ready to do my best"*) of Complementarity, were areas for improvement. As the error covariance between the items is not unique compared to previous studies (Balduck et al., 2011) and considered substantive, respecification between the latent traits was necessary, resulting in M2 (direct version) and M5 (meta-version). The respecified models with a correlated error between items 1 and 6 and items 5 and 10 were used in further analyses as M2 and M5 improved.

Table 2:

Fit indices for the alternative three-factor higher-order and single-factor models for the direct and meta-items using AMOS and LISREL (n=251).

Model	df	χ^2	χ^2/df	CFI	TLI	SRMR	RMSEA (90% confidence interval)	AIC	ECVI
AMOS									
Direct Perspective									
M1 3 Factor 1 st Order Original	41	277.82	6.78	0.89	0.84	0.06	0.14-0.17	327.83	1.31
M2 3 Factor 1 st Order Modified	37	165.18	4.46	0.93	0.90	0.05	0.10-0.14	223.18	0.89
M3 Single-Factor Solution	44	293.86	6.68	0.87	0.84	0.07	0.14-0.17	337.86	1.35
Meta-Perspective									
M4 3 Factor 1 st Order Original	41	241.74	5.90	0.89	0.86	0.06	0.12-0.16	291.74	1.17
M5 3 Factor 1 st Order Modified	37	173.01	4.68	0.93	0.89	0.05	0.10-0.14	231.01	0.92
M6 Single-Factor Solution	44	257.74	5.86	0.89	0.86	0.07	0.12-0.16	301.74	1.20
LISREL									
Direct Perspective									
M1 3 Factor 1 st Order Original	41	168.96	4.12	0.98		0.07	0.09-0.13	218.96	0.88
M2 3 Factor 1 st Order Modified	40	132.50	3.30	0.98		0.06	0.08-0.11	184.25	0.74
M3 Single-Factor Solution	44	169.68	3.86	0.98		0.07	0.09-0.12	213.68	0.86
Meta-Perspective									
M4 3 Factor 1 st Order Original	41	180.11	4.39	0.97		0.06	0.10-0.13	230.11	0.92
M5 3 Factor 1 st Order Modified	38	132.80	3.49	0.98		0.06	0.82-0.12	188.80	0.76
M6 Single-Factor Solution	44	181.21	4.19	0.97		0.07	0.10-0.13	225.21	0.90

Note. df = Degrees of Freedom, χ^2 = Chi-square, χ^2/df = Chi-square divided by Degrees of Freedom, CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, SRMR = Standardised Root Mean Square Residual, RMSEA = Root Mean Square Approximation of Error, AIC = Akaike Information criterion, ECVI = Expected Cross Validation Index.

Using AMOS, M1 and M3 of the direct perspective did not fit the data to an acceptable level as they had high corrected χ^2/df ratios, low CFI, TLI and high RMSEA values. The asymptotic distribution-free fit from LISREL produced better fit indices when compared to AMOS; however, the findings demonstrated that M1 and M3 did not fit the data as

well as M2. A comparison of the three direct models demonstrated that M2 had a superior fit. Chi-square difference tests between M1 and M2, and M2 and M3 added evidence to the superior fit of M2. AIC and ECVI values showed that M2 was more parsimonious than M1 and M3. RMSEA values were elevated and above the cut-off value of 0.060 for all models.

The same process was replicated for the meta-perspective CART-Q and displayed similar results. M5 demonstrated a superior fit over M4 and M6, due to M4 and M6 having higher corrected χ^2/df ratios, lower CFI, TFI and higher RMSEA values. Chi-square difference tests between M4 and M5, and M5 and M6, added evidence to M5 having greater levels of superiority. M5 values for AIC and ECVI were lower than M4 and M6 demonstrating better fit.

4.7.3 Convergent and Discriminant Validity

Convergent validity of the best-fitting models (M2 for the direct perspective; M5 for the meta-perspective) examined whether each item had substantial loading to the hypothesised factors. All factor loadings for the direct perspective were moderate to high ranging from .53 (item 6 "*I am close to my athlete/coach*") to .89 (item 3 "*I respect my athlete/coach*"). The factor loadings for the meta-perspective version ranged from .59 (item 10 "*My athlete/coach is ready to do their best*") to .86 (item 3 "*My athlete/coach respects me*"). Additionally, convergent validity was determined from the variance estimate squared multiple correlation coefficient (R^2). All the items recorded satisfactory R^2 , but only one item for Commitment recorded a value that was less than .50. Item 6 recorded an R^2 =.28 suggesting a misfit, however, it was retained to attend to the completeness of the scale.

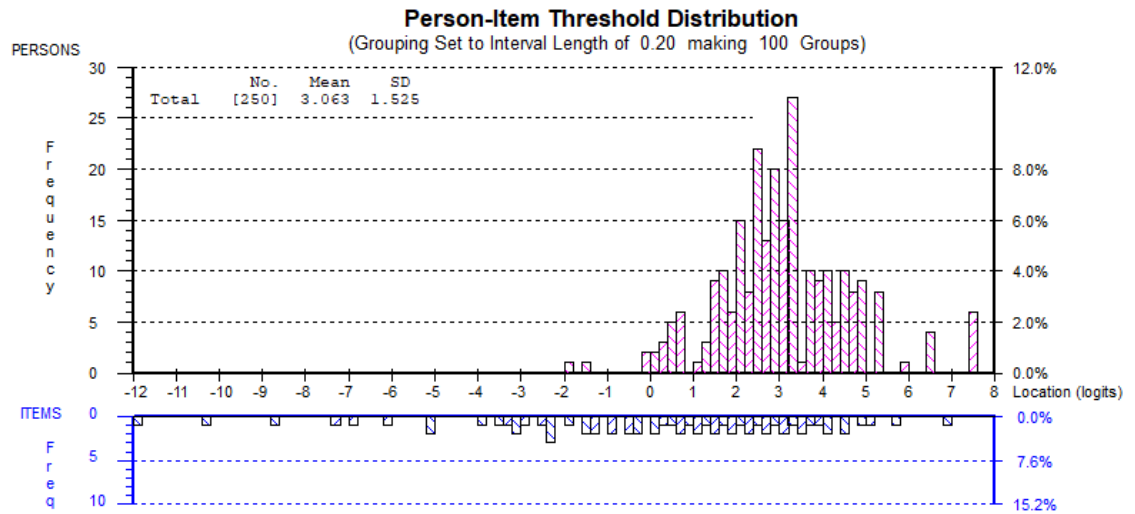
Discriminant validity refers to the magnitude to which the 3Cs exhibit uniqueness (Li & Harmer, 1996) and was tested utilising Pearson's correlation coefficient. Strong associations were identified between the 3Cs of both the direct and meta-perspective versions. M2 analysis showed relationships in direct-Closeness and direct-Complementarity ($r=0.92$), direct-Closeness and direct-Commitment ($r=0.92$) and direct-Commitment and direct-Complementarity ($r=0.85$). M5 analysis showed relationships in meta-Closeness and meta-Complementarity ($r=0.92$), meta-Closeness and meta-Commitment ($r=0.93$), and meta-Commitment and meta-Complementarity ($r=0.93$). The results suggest that the 3Cs can be perfectly correlated and considered unidimensional, therefore questioning the appropriateness of the three-factor first-order model.

4.7.4 Model Evaluation via Rasch Analysis

Rasch analysis was conducted to provide additional information about the CART-Q psychometric properties, to explore the extent the scale may be treated as a single-factor model where Closeness, Commitment, and Complementarity are described as item clusters with shared variance due to local response dependency. A model was tested where these sub-scale items were entered as subtests. The first iteration of this model already provided an adequate fit ($\chi^2(15) = 12.14, p > .05$). Person Separation Index (PSI), a measure of internal consistency reliability, was excellent (0.90) thus permitting reliable measurement within participants. Item coverage was adequate, as approximately 2% of the participants were not captured by the scale (Figure 3). However, scores were negatively skewed, with the mean score located at 3.06 on the logit scale.

Figure 4:

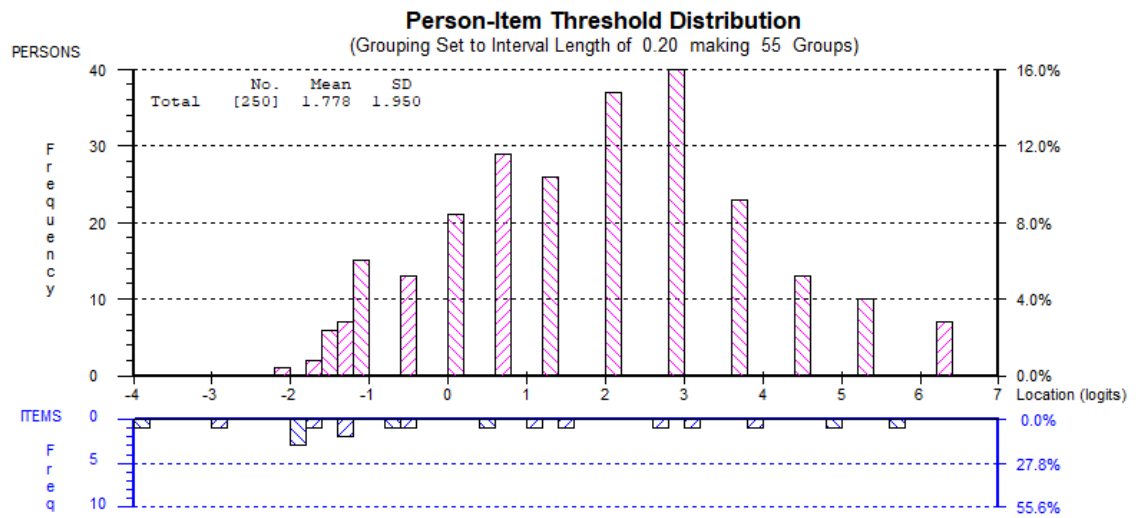
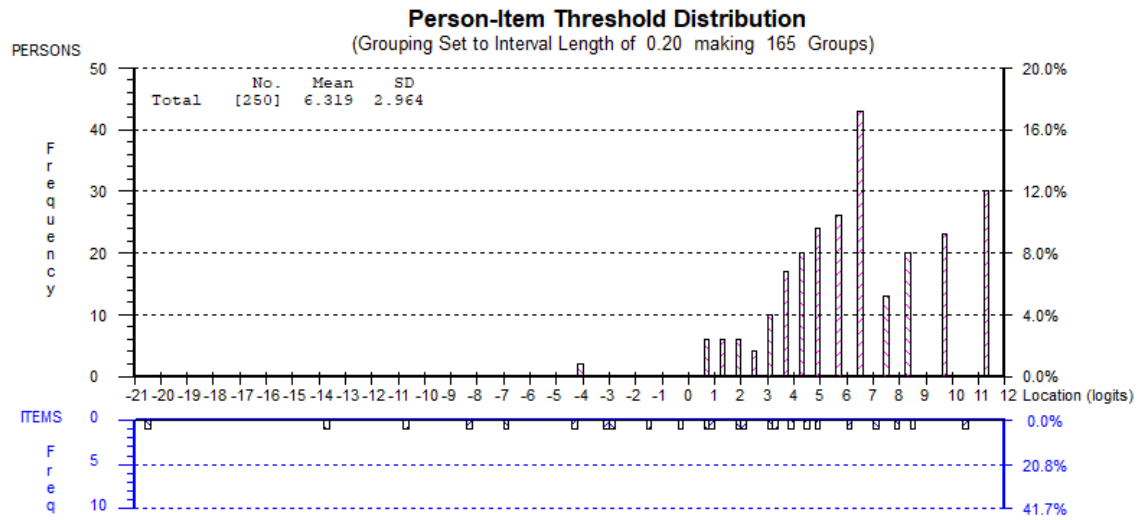
Person-item threshold distribution for the CART-Q when constructs were entered as subtests for the direct perspective data.

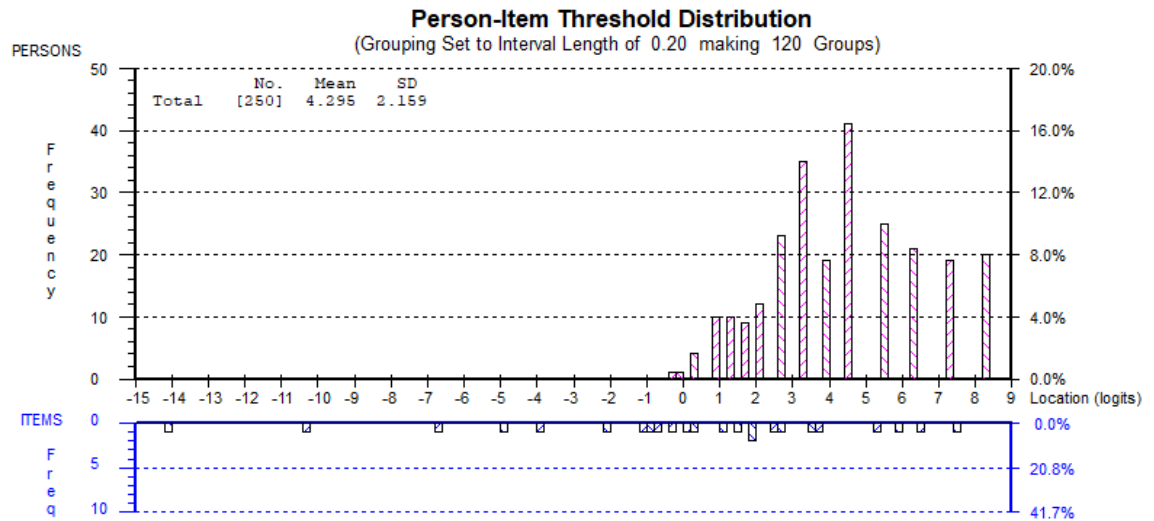


Fitting the Rasch model to the individual scale items only resulted in nonsignificant, thus adequate fits for all three constructs. Skewness was extreme for Closeness and Complementarity (Figure 4). In both cases, over 5% of the participants' traits could not be assessed by the items, which presents inadequate coverage.

Figure 5:

Person-item threshold distribution for the CART-Q when analyses were conducted separately for each construct using the direct perspective. The top panel shows results for Closeness, the middle panel, Commitment, and bottom panel, Complementarity.





PSI for Closeness, Commitment, and Complementarity was 0.87, 0.82, and 0.82, respectively. While these values were lower than for the single-factor model, they still indicated an adequate fit.

Overall, the results indicated that both the single-factor model, as well as individual construct scores, can be used with sufficiently robust psychometric properties. Given the issues with ceiling effects and item coverage for Closeness and Complementarity, the single-factor model appears preferable, with increased reliability. The same findings were noted for the meta-perspective.

4.8 Discussion

The purpose of this study was to examine the psychometric properties of the CART-Q, utilising a systematic analysis path as a mechanism to resolve previous uncertainty about a suitable factor solution. The validity and reliability of the CART-Q direct and meta-perspective versions were examined, with national football and futsal coaches and athletes in the New Zealand context.

Previous studies investigating the factorial validity of the CAR have identified the 3Cs (Jowett, 2003a; Jowett & Cockerill, 2003; Jowett & Meek, 2000) and 3+1Cs (Jowett, 2007) models as multidimensional structures. CFA has previously been adopted as a preferred method of data analysis and although researchers have identified covariances between the errors of commonly identified items across subscales, the three-factor first-order and high-order structures have been reported as universal applicability across cultures (Ahmad, 2014; Yang & Jowett, 2010, 2012).

The methodological procedures used in this study to examine the factorial validity and reliability of the direct and meta-perspective versions of the CART-Q have replicated most procedures with previous studies. CFA was initially utilised using AMOS, followed by a model comparison strategy. However, to minimise the likelihood of psychometric findings materialising as an artefact of using a particular analytic tool, LISREL and Rasch analysis were then adopted. The rationale for utilising Rasch analysis was to advance the psychometric properties of the 3+1Cs model and CART-Q as it has unique advantages over CFA to determine the validity, reliability and item difficulty of self-reporting tools that adopt a Likert-scale. This is the first study to perform CTT and IRT, highlighting the contribution to scientific knowledge to examine the psychometric properties of the CART-Q.

The analysis indicated that the three-factor first-order structure demonstrated adequate fit. Nevertheless, issues with ceiling effects and item coverage for the constructs Closeness and Complementarity were observed. Contradicting previous findings, a unidimensional structure obtained greater robustness than the multidimensionality of the model. Therefore, a unidimensional factor solution may be a more appropriate representation of the model than previously reported and

provides researchers with confidence in the CART-Q psychometric properties, as earlier discrepancies have been resolved through the adoption of Rasch analysis.

The CART-Q direct and meta-perspective versions adequately measure the quality of the CAR. This study supports previous findings with a strong positive correlation between the constructs of Closeness, Commitment, and Complementarity, with notable error covariances evident concerning item 1 (*"I like my athlete/coach"*) and item 6 (*"I am close to my athlete/coach"*) to traverse the constructs of Closeness and Commitment. While investigating the fundamental differences in how athletes from individual and team sports viewed the nature of their relationship with their coach, Rhind et al. (2012) established that the 3Cs correlate more strongly in team sports than individual sports. This is due to team-athletes being more inter-related than individual-athletes. Secondly, Balduck et al. (2011) identified items 1 and 6 to be problematic due to error covariances in a sample of Belgian athletes. Balduck et al. postulated that the connection between the two items might have been due to the participants interpreting the questions as being similar in meaning, suggesting the participants had difficulty discerning the difference between the 'emotions of being close' and the 'cognitions of being close'. Cultural nuance was rationalised as a potential reason for this misinterpretation; however, it appears that this finding may not be not unique to the Belgian cultural context as it was also found in our New Zealand sample.

Rather than cultural nuances, we suggest the environmental factors in which the coaching process takes place to be a plausible explanation for the finding that error variances of items 1 and 6 are correlated. Athletes in team sports need to be personally and instrumentally interdependent. In team sports, athletes have less opportunity to interact with their coach having to compete with other athletes for

face-to-face interpersonal transactions, and coaches are challenged with dividing their time equally to interact with the athletes personally (Woolliams, 2015). A typical New Zealand national football team would travel with a squad of 23 athletes to FIFA sanctioned events with approximately two to four opportunities to tour per annum. A typical New Zealand national futsal team would travel with a squad of 14 athletes to FIFA sanctioned events with one to two opportunities per annum. The lack of events to assemble athletes is problematic, limiting the opportunity for coaches and athletes to communicate face-to-face. The scarcity of opportunities for the athletes and coaches to communicate supports previous research conducted by Rhind et al. (2012) who determined athletes from individual sports reported being closer and more committed to their coach than those athletes in team sports.

Nevertheless, no significant differences were identified concerning Complementarity, noting that both individual and team athletes feel, think and behave similarly with regards to being responsive, friendly and ready to do their best. Individual sport athletes reported higher levels of coach trust, respect and appreciation for them as athletes than team athletes. This lack of opportunity for coaches and athletes to communicate one-to-one and face-to-face may be a contributing factor for athletes and coaches in team sports to experience a delayed onset of establishing close relationships, as it takes longer for the dyadic members to navigate and develop their emotions and cognitions towards their dyadic partner. Potential strategies to minimise this delayed onset of establishing close relationships and misunderstanding between the emotions and cognitions of being close could be overcome through the implementation of structured education programmes (Bennie & O'Connor, 2012). Athletes and coaches would benefit from having more in-depth knowledge of the

differences between feelings and thoughts and the positive benefits of establishing high-quality relationships using the 3+1Cs as a best-practice model. This could lead to a greater awareness of the importance of the CAR, how to better navigate the development of high-quality relationships, and that increased levels of one-to-one communication are an essential factor.

The results exhibited a ceiling effect in the way in which the maximum score of 7 (Strongly Agree) on the Likert-scale was represented in the data. Further research to investigate adopting a scale of 1-10 rather than 1-7 may reduce the probability of a ceiling effect. Caution should be applied to this line of thinking as it will direct the participants into not having a neutral midpoint (4- neutral midpoint) as one can choose on a scale of 1-7. A scale of 1-10 will direct the participants to express either a negative or positive opinion.

4.9 Limitations

The following limitations need to be acknowledged. Firstly, the sample size used in this study was a limitation to analyse data using CFA. Even though the sample size per free parameters ratio was met, small sample size affects Chi-square statistics and RMSEA tends to over-reject true population models (Hu & Bentler, 1999) which is evident in existing CART-Q research (Balduck & Jowett, 2010; Jowett & Ntoumanis, 2004).

Secondly, the sample may not allow for generalisability of the results due to the specific environmental context in which the coach-athlete relationships reside. Thirdly, it is worth noting that the coaches' voice has not been given equal standing to the athletes as the national football and futsal teams require a squad of athletes and fewer coaches. Finally, further research is recommended, using Rasch analysis to examine

the 3+1Cs model with a more comprehensive, diverse range of high-performing national teams and individual sports. This would increase the precision of the validity and reliability of both CART-Q versions to be incorporated into the CAR literature. Additionally, future research investigating how participants interpret the questions is required. There may be the need for a guide to be produced with an explanation of the questions for the participants to gain a better understanding of the meaning of each question to decrease the possibility of any misinterpretation.

4.10 Conclusion

In sum, the findings suggested that although the three-factor first-order structure demonstrated adequate fit, concerns with ceiling effects and item coverage for the constructs Closeness and Complementarity were observed. Based on the findings of this study, it is evident that a unidimensional structure obtained greater robustness than the multidimensionality of the model. Rasch analysis has highlighted that a unidimensional factor solution may be a more appropriate representation of the model than previously reported and provides researchers with confidence in the CART-Q psychometric properties.

Chapter 5 (Study Two) Advancing Leader-Member Exchange utilising the 4Cs relationship model

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5.1 Prelude

Chapter 4 determined the validity and reliability of the CART-Q direct and meta-perspective versions acceptable in their original form to assess coaches and athletes' relationship quality. The findings suggested that the structure and content demonstrated adequate fit. Although, concerns with ceiling effects and item coverage for the constructs of closeness and complementarity were observed. Leader-Member Exchange (LMX) Theory and associated self-reporting tools have attracted much scrutiny regarding theory alignment, content and analysis levels. The aim of Chapter 5 drew upon the perspective of ten participants from an organisational setting to explore the structure and content that underpin leader-member relationships in the twenty-first century.

Moreover, to better understand dyadic relationships between leaders and members and offer an alternative approach and in-depth analysis of the social exchanges that occur between the dyadic partners. The findings suggested that the LMX structure was limited, and a modified 4Cs model consists of nineteen dimensions. Mutual Liking and Obligation may no longer be appropriate for considering leader-member relationships, and additional dimensions of Integrity, Honesty, Openness and Leading/Following by Example can be viewed as essential dimensions. The 4Cs relationship model with newly identified items may provide an alternative approach to consider leader-member relationship quality. It offers greater breadth and depth of psychological constructs and more appropriately captures the reciprocal nature of the social exchange between a leader and member. Overall, the findings can provide a framework for dyadic partners to increase knowledge and understanding of the

leaders and members' psychosocial development and performance through a dyadic lens.

5.2 Introduction

Leadership is an inherently challenging and dynamic phenomenon that cannot occur in the absence of others and is therefore useful for studying relationship interdependence. Workplace relationships between leaders and members undergo a relational process of influence (Epitropaki et al., 2017), whereby both parties (dyadic partners) initiate interpersonal connections to pursue shared organisational and personal goals. The onset of relationship-centred theories led to the development of the Leader-Member Exchange (LMX) Theory, which has been described as the most influential relationship-centred model in leadership (Erdogan & Bauer, 2014) and one of the dominant approaches to understanding organisational leadership (Epitropaki et al., 2017). LMX has been described as a theory (Day & Miscenko, 2016; Dienesch & Liden, 1986; Graen & Uhl-Bien, 1995), a model (Dienesch & Liden, 1986; Gooty & Yammarino, 2016), and it has been commonly used as an acronym to describe the quality and differential interpersonal exchanges between leaders and members (Gottfredson et al., 2020).

Even though LMX has grown to attract considerable scholarly attention over the past 46 years, very few studies have examined the psychological constructs of the leader-member relationships through a lens of reciprocity (Gooty et al., 2012; Matta et al., 2015). Therefore, we look to advance the LMX utilising the 4Cs relationship model to better understand dyadic relationships between a leader and a member in a workplace setting (Woolliams, Spencer, et al., 2021).

Relationships have been an essential focus of recent leadership literature (Epitropaki et al., 2017; Scandura & Meuser, 2022). As a seminal scholar in this domain, Uhl-Bien (2006) developed Relationship Leadership Theory (RLT) to conceptualise a framework to examine the broad range of relationship-focused literature. The terms 'relational leadership' and 'relationship-centred' have become popular in the pursuit of studying leadership (Ospina & Uhl-Bien, 2012). However, little appears to be known about how relationships form and evolve in the workplace (Uhl-Bien, 2006). Uhl-Bien noted that 'relational leadership' and 'relationship-centred' approaches viewed leadership as a social process; however, the two perspectives attract opposing yet complementary ontologies. 'Relational leadership' lends itself to qualitative constructionism that assumes that social reality sits in the context of relationships. The concept 'relationship-centred' lends itself to quantitative positivist/post-positivist ontologies, which can be referred to as *entity* perspective, as they centre on individuals and their intention, behaviours and evaluative perceptions of dyadic partners (Uhl-Bien, 2006).

The LMX Theory of leadership fits within Uhl-Bien's 'relationship-centred' approach and has been described as the archetypal approach to consider the relationship's dyadic constructs (Dinh et al., 2014). However, most of the leading research has been leader-centric or member-centric (Gottfredson et al., 2020) in its approach, having neglected the reciprocal nature of the dyadic relationship. Reciprocity acknowledges that the relationship between leaders and members is not a top-down or bottom-up approach but a process whereby both parties play an equal and active role (Martin et al., 2010). A dyadic relationship is an interpersonal relationship formed between two individuals and is foundational to interpersonal connections and relations (Kenny et al.,

2006). To genuinely understand leader-member relationships in a work setting, reciprocity is required to capture both parties perspectives.

LMX postulates that the leaders differentiate between their relationship quality (high or low) with members of the same group rather than considering that leaders develop the same quality of relationship with each group member. High-quality LMX relationships play a vital role in the leadership process and involve close relationships with a high degree of interdependence and reciprocity between the two parties.

Gerstner and Day (1997) noted that high-quality relationships are often associated with increased satisfaction and effectiveness, resulting in closer, more inclusive and communicative bonds.

By contrast, non-effective relationships occur with low-quality LMX (Erdogan & Bauer, 2014). These relationships have been reported to result in limited communication between the dyadic partners and interpersonal connections, whereby members receive less access to their leaders, fewer resources, and become less satisfied with their workplace relationship (Graen & Uhl-Bien, 1995). The similarities and differences between the dyadic partners' perceived interpersonal dynamics could directly associate with partner performance, satisfaction, and the partner's development and welfare (Cogliser et al., 2009; Epitropaki & Martin, 2005; Jowett & Nezelek, 2012). LMX scholars have termed these in-group and out-group categories to differentiate high and low-quality dyadic relationships (Dansereau et al., 1975). Again this is from one person's perspective, not a reciprocal perspective.

Effective relationships play a vital role in leadership, where parties form close relationships with a high degree of interdependence (Jowett et al., 2012). Historically,

researchers have tended to rely on single-participant paradigms to measure individuals' subjective reactions to social interactions (Jowett, 2006b). Whereas the relationship-based approach considers that dyadic partners affect each other's outcomes through a process in which their emotions, cognitions, and behaviours are mutually and causally interconnected (Kelley et al., 2003). Through her work predominantly examining the coach-athlete relationship in a sporting setting, Jowett has highlighted the extent to which dyadic partners influence each other, and their performance outcomes are fundamental in both the coach and leadership process. As Jowett proposed, it is essential to measure both parties' emotions, cognitions and behaviours to determine how they are causally interconnected (Jowett, 2007).

This study explores the potential for the 4Cs relationship model to offer an alternative approach and in-depth analysis of the social exchanges between leaders and members to better understand dyadic relationships in a workplace setting. To be specific, LMX has for some time attracted much debate for lacking theory alignment, structure, and an appropriate measure to assess the quality of relationships between dyadic partners (Gooty et al., 2012; Schriesheim et al., 1999; Yammarino et al., 2005). This study focuses on how dyadism and reciprocity may advance the LMX model to consider how leaders and members are both essential actors in the relationship. To do this, we must first understand how LMX has evolved and the opportunities this presents. This study applies the concepts of Jowett and colleagues 4Cs relationship model to explore the dyadic relationships between a leader and a member in a workplace setting in order to advance the theoretical basis of leader-member exchanges.

It is pertinent to provide a brief history of the evolution of LMX. LMX was initially referred to as Vertical Dyad Linkage (VDL) (Dansereau et al., 1975) and grounded in

Role Theory to address the degree to which leaders allow their members to negotiate organisational roles through accepting or rejecting role tasks. Early theoretical developments between 1974 and 1995 have been critiqued as being somewhat *ad hoc* in their approach as scholars offered little to no explanation concerning the theoretical definition of the LMX construct, characterising its dimensionality and utilising rudimentary validation measures (Gooty et al., 2012; Schriesheim et al., 1999). Researchers such as Graen and Uhl-Bien (1995) sought to reconceptualise the interpersonal relationship between a leader and a member beyond a vertical dyad. This work suggested Social Exchange Theory (SET) was more appropriate to consider that dyadic partners act in ways that benefit others, resulting in an expectation that these acts will be reciprocated due to a sense of indebtedness (Graen & Uhl-Bien, 1995). LMX emerged from VDL, and although inconsistency was apparent during this evolution, some agreement was observed that through this redevelopment, the LMX model most likely comprised the four constructs of mutual liking, trust, respect, and obligation (Graen & Scandura, 1987; Graen & Uhl-Bien, 1995; Martin et al., 2010). The model has undergone many iterations, resulting in what has been claimed by Gottfredson et al. (2020) to be an unstable foundation for future research, causing definitional concerns, variance in psychological constructs, measures and analytical procedures that have not aligned to theory (Schriesheim et al., 1999).

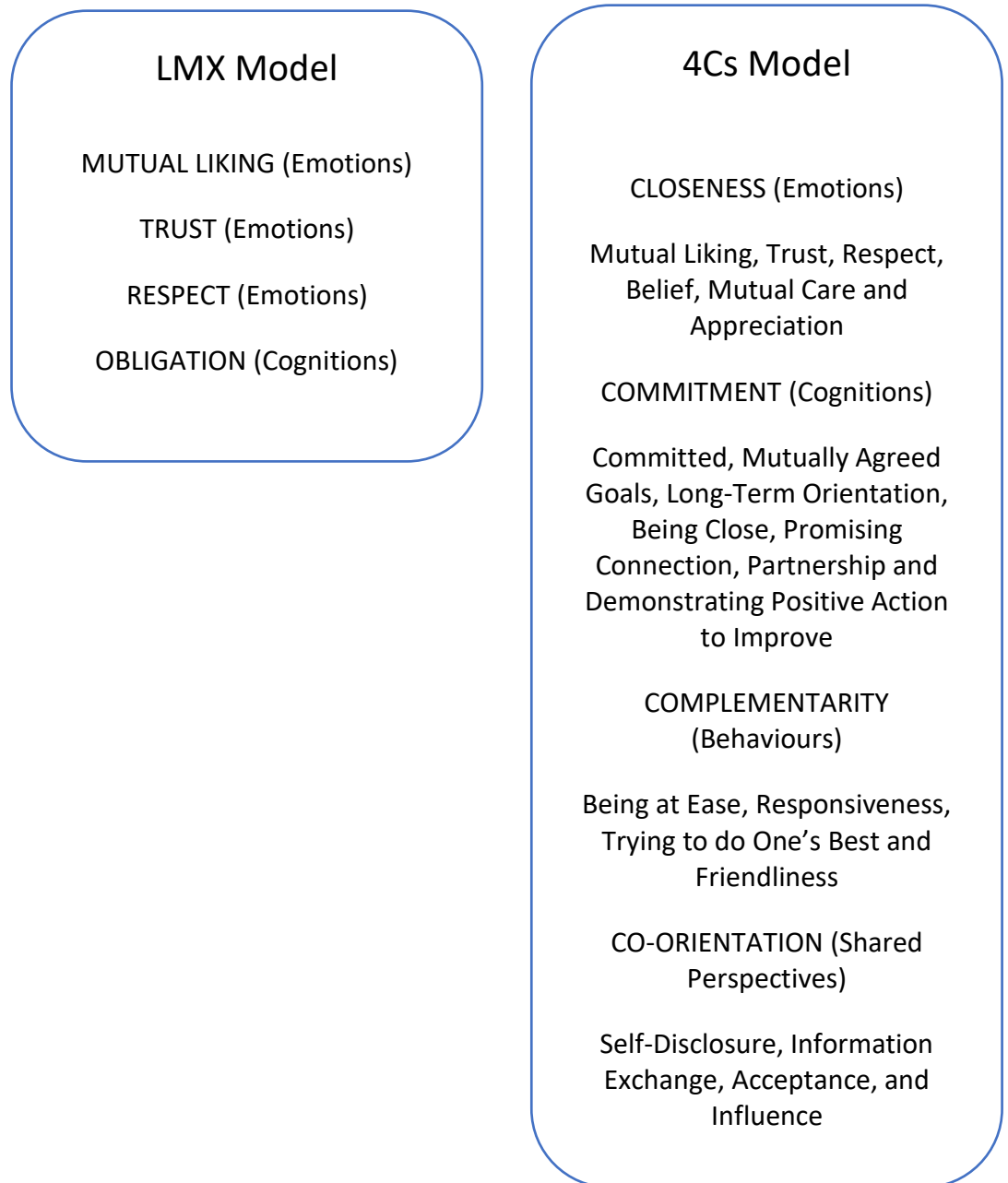
Nonetheless, the increased popularity of LMX research has resulted in scholars contributing more attention to the leader-member relationship's consequences than considering LMX's antecedents (Erdogan & Bauer, 2014). Although LMX has highlighted the importance of dyadic relationships in the workplace and potential outcomes, we contend the model may be less served by SET as a theoretical

framework. It has been claimed that LMX may no longer meet the necessities for current workplace expectations and values and that a sense of indebtedness between dyadic partners is no longer relevant in this day and age (Chernyak-Hai & Rabenu, 2018). A more accordant approach may be to consider Interdependence Theory that postulates that dyadic partners affect each other's outcomes through a process of their emotions, cognitions and behaviours, being mutually and causally interconnected (Kelley et al., 2003). The dyadic partners gauge their relationship's quality as a series of positive and negative consequences of their interactions. They are in a continuous cycle of comparing outcomes and using benchmarks to evaluate whether to continue or terminate the relationship (Jowett & Nezlek, 2012; Thibaut & Kelley, 2007).

One such dyadic model to adopt interdependence theory is the 3 + 1Cs (4Cs) coach-athlete relationship model proposed by Jowett (2007). Acknowledging that Jowett's model was developed specifically for a different context, the leader-member relationship shares many leadership acts and expectations of performance outcomes as the coach and athlete relationship itself. An argument has been made that the 4Cs model encapsulates dyadic relationships' quality and content, regardless of type or setting (Jowett, 2009a). Jowett and colleagues extended the work completed by Kelley et al. (1983) and identified that the interpersonal constructs of closeness, commitment and complementarity (3Cs) address the dyadic partners' emotions, cognitions and behaviours (Jowett, 2006a). Jowett (2005) subsequently recognised co-orientation as the fourth construct (4Cs model), which highlights the extent to which the dyadic partners' perceptions are interconnected (Rhind & Jowett, 2010a), thereby addressing the importance of capturing the dyadic nature of the two-person relationship (Jowett,

2006; Poczwardowski et al., 2006). A comparison of the LMX model and 4Cs model constructs is presented in Figure 6.

Figure 6:
LMX model and 4Cs model constructs.



As previously mentioned, LMX constructs consist of mutual liking, trust and respect, which are sub-constructs of closeness and purports some of the emotional aspects of

dyadic relationships. Jowett and Ntoumanis (2004) also identified belief, mutual care and appreciation under the closeness construct.

Graen and Uhl-Bien (1995) identified obligation as the fourth construct of LMX, and this may be represented as the 4Cs construct of commitment to address the cognition aspects of the dyadic partners. Commitment also has been identified to include mutually agreed goals, long term orientation, demonstrating affirmative action to improve, aspirations, and the belief one has a close relationship with their dyadic partner. Complementarity may be an area for consideration for LMX as it has shown to include being at ease with one another, responsiveness, doing one's best and adopting a friendly stance.

Another construct not considered in LMX modelling but, in essence, is the heart of the 4Cs model and reciprocity is co-orientation, the final construct of the model. Co-orientation identifies that dyadic partners are capable of perceiving their relationship from two perspectives. The direct perspective – how an individual feels, thinks and behaves towards their dyadic partner (e.g., I trust my dyadic partner) and a meta-perspective – how individuals perceive their dyadic partner feels, thinks and behaves toward them (e.g., My dyadic partner trusts me). There are three dimensions associated with co-orientation that offer researchers considerable insight into addressing the dyadic relationships:

1. The Actual Similarity of both parties direct and meta-perspective (i.e., comparison of both dyadic partner's direct perspectives).
2. Assumed Similarity (i.e., comparison of an individual's direct perspective and their meta-perspective).

3. Empathetic Accuracy/Understanding (i.e., comparison of an individual's meta-perspective with their partners direct perspective).

Co-orientation, therefore, offers in-depth knowledge of how both parties perceive their relationship by illustrating if the dyadic partners are 'on the same page' as each other, thus representing the inner workings of reciprocity. The LMX Theory and popular psychological measures do not provide a process for both dyadic partners to assess relationship quality to consider actual similarity, assumed similarity and empathetic accuracy.

LMX has been used in a business setting, and the 4Cs model has evolved from a sport coaching setting, resulting in both models being developed in their disciplinary silos. Although both models have emanated from social psychology literature, the models share no commonalities in dyadic theory, and the quality and content of the psychological constructs are vastly different. Uhl-Bien (2006) argues that LMX has provided a mechanism to inform the leader-member relationship's importance, but LMX has stalled its evolution. Thus, it has been proposed (Uhl-Bien, 2006) that LMX requires more examination into the relationship's psychosocial aspects to advance the theory and move beyond the current knowledge of LMX. This study argues that LMX does not have the same breadth and depth of psychometric constructs as the 4Cs model and follows a single-participant paradigm methodology whereby one party answers the questionnaire. LMX questionnaires do not genuinely reflect both parties' direct and meta-perspectives of the relationship and are, non-dyadic, so therefore do not address the reciprocal nature of the leader-member relationship.

By contrast to the LMX, the 4Cs model seemingly offers more to the breadth and depth of the interpersonal constructs; dyadic partners answer questions that require direct

and meta-perspective examination. The agreement and disagreement between the parties' answers can measure the actual similarity, assumed similarity, and empathic accuracy, resulting in a better understanding of the relationship's dyadic partners' emotions, cognitions and behaviours. If the 4Cs model is appropriate within organisational leadership, this will promote a higher level of knowledge and understanding relevant to the significance of the leaders' and members' psychosocial development and performance through a dyadic lens.

The purpose of this study was to explore the structure and content of the 4Cs relationship model to better understand dyadic relationships between a leader and a member in a workplace setting. This study proposes that more contemporary and sensitive approaches to theory alignment, data analysis and model development will advance the scope and accuracy of LMX. Thus, research needs to investigate a new, alternative approach to consider leader-member exchange relationship quality and acknowledge that the shared perceptions of leaders and members are both essential actors in the relationship process.

5.3 Method

This study utilises qualitative methodology, facilitating semi-structured interviews adopting deductive and inductive content analysis. The LMX model and the 4Cs model were used to examine existing knowledge while allowing for previously uncovered knowledge to present itself.

5.4 Participants

Twenty-six employees of a national sport organisation were invited to participate in the study. National sport organisations administer all aspects of their sport to provide the community with high-quality sporting experiences by growing the game domestically, winning worldwide, delivering world-class events, and strengthening the business. A total of 10 of the 26 employees invited agreed to participate in this study, consisting of males ($n = 7$) and females ($n = 3$) representing eight leader-member dyads. Inclusion criteria were a minimum length of any dyadic relationship of twelve months.

5.5 Instrumentation

An interview schedule was developed that was modified from that utilised in a previous study conducted by Jowett and Cockerill (2003) to examine a dyadic relationship's psychological constructs. The interview schedule consisted of five open-ended questions to establish their leader-member relationship's nature, the interviewer using a conversational approach. The semi-structured interviews comprised a general introduction, a process of building rapport with the participants, and probing when more detail was needed. The questions included, (1) What are the main features that characterise your relationship with your supervisor/member relationship? (2) In what ways do you think that your relationships with your supervisor/member have contributed to your success? (3) Can you think of a workplace supervisor/member relationship that you have experienced where you felt that the relationship was ineffective and why? (4) How would you describe the ideal supervisor/member relationship? (5) How would you describe your relationship

against this ideal? The interviews were brought to a conclusion with two additional questions (a) "Are you satisfied with your relationship with your dyadic partner?" and (b) "Do you think that your dyadic partner is satisfied with your relationship?" Drawing upon previous work by Jowett, the questions aimed to ascertain the breadth and depth to which closeness, commitment, complementarity and co-orientation were encountered in the leader-member relationship.

5.6 Procedure

The research study obtained approval from the authors' institutional ethics committee. Following ethical approval, information letters were sent to prospective participants. The information email included background information on the study, participation requirements, rights of all participants and a consent form. Video conference interviews were conducted to comply with New Zealand government lockdown requirements during the 2020 COVID-19 pandemic. All electronic-taped interviews were transcribed verbatim. An alpha-numeric system was utilised to protect the participant's confidentiality.

5.7 Data Analysis

This study draws upon the LMX model and the 4Cs model structure and content and adopts a qualitative approach to explore the composition of closeness, commitment, complementarity, and co-orientation within the leader-member relationship. Deductive content analysis was considered appropriate as it is a top-down process that considers an existing framework and theoretically rooted constructs (Pandey, 2019) to guide researchers and provide the opportunity to explore new dimensions of the phenomena that the theory did not initially consider.

The primary researcher of this study compiled the *a priori* matrix consisting of first-order and second-order categories under the 4Cs constructs as identified in previous studies (Jowett, 2005; Jowett & Cockerill, 2003; Jowett & Meek, 2000; Jowett & Ntoumanis, 2004; Jowett & Shanmugam, 2016; Woolliams, 2015; Woolliams, Spencer, et al., 2021). A total of 525 meaningful, raw data units were identified from words, phrases, sentences, or paragraphs. The primary and secondary researchers facilitated Inter-coder agreement and consistency of interpretation to manage the face validity between the identified raw data themes and the 4Cs. The inter-coder agreement was achieved with an accuracy of 78.5%. Where the data was considered to not fit within each *priori* category, in the first instance, the data was classified as "new dimensions" for analysis. Frequency analysis was used to determine the percentage of raw data themes within each *priori* category (i.e., closeness, commitment, complementarity and co-orientation). The raw data units within the 'new dimensions' category were then inductively analysed to determine if the new potential dimensions were standalone constructs or fit within the affective, cognitive, behavioural aspects of the leader-member relationship. No new constructs were established, and all-new dimensions could be classified under one of the 4Cs. An independent psychologist reviewed the initial classifications to affirm the raw data units were appropriately classified. As the study examined both positive and negative facets of the 4Cs, the study reported 84.8% as positive responses and 15.2% as negative responses.

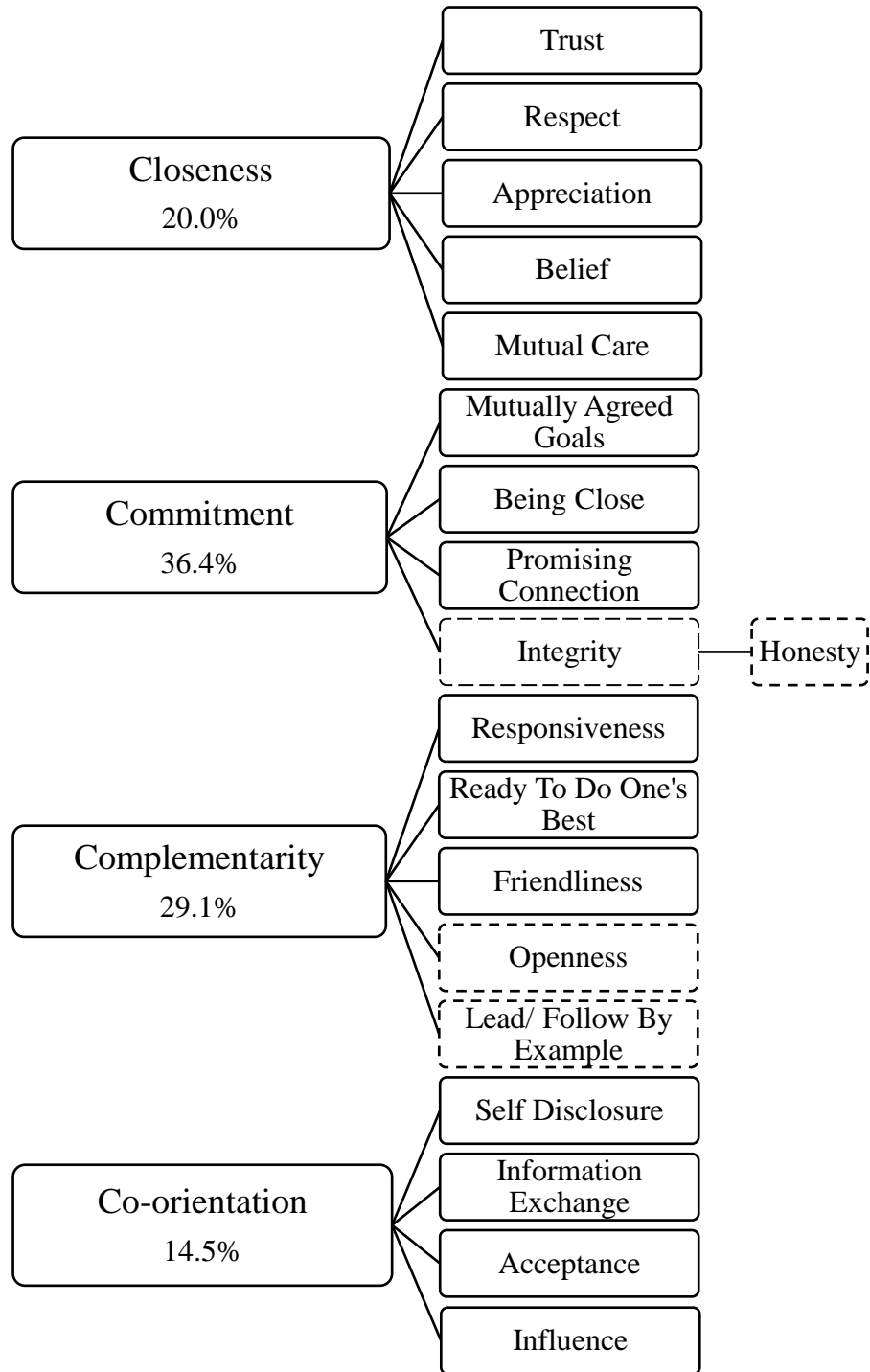
5.8 Results

This study aimed to re-examine the LMX underpinning theory and structure to better understand dyadic relationships between leaders and members in a workplace setting. The study re-examined the content and quality of LMX utilising interdependence

theory and suggests the original 4Cs relationship model as a more accurate representation of the psychological constructs observed between a leader and a member in a workplace setting. The LMX dimensions of trust and respect, were both evident in the data. However, the LMX constructs of mutual liking and obligation were not identified as significant aspects of high-quality leader-member relationships in the workplace. In addition to the original 4Cs model, the new dimensions of integrity, honesty, openness, and lead/follow by example were considered essential to high-quality leader-member relationships. A summary of the deductive content analysis is presented in Figure 7.

Figure 7:

Structure of the Leader-Member Relationship utilising the 4Cs model.



5.8.1 Closeness

Closeness reflects the relationship's affective nature and the extent to which the dyadic partners are emotionally connected. The construct of affective closeness and associated dimensions are represented as essential ingredients of the leader-member relationship and represented 105 or 20.0% of the 525 raw data units. The dimensions of trust and respect represented 17.0% and 23.1%, respectively, of the data, which contributed to closeness. All the participants ($n=10$) asserted that trust and respect were essential building blocks of high-quality leader-member relationships. A member described their relationship's main features by stating, "It is respectful with high levels of trust." Another said, "I think it comes down to respect...My leader is grounded in people and treats others with respect. So, when he leads by example, I want to follow by example." When asked to reflect on a time where a leader-member relationship was ineffective, a member stated, "When there is a lack of openness and honesty, it causes distrust, and you certainly don't respect those that are supposed to be leading the governance of the organisation itself, so it must be hard to feel valued." Belief, mutual care, and appreciation were also observable. Appreciation was noted as being strongly associated with the effort the dyadic partners display towards improving performance and general support. The dimension of mutual liking, which is considered an essential aspect of the LMX model and the original 4Cs model, was not identified as a significant dimension in this study, representing 1.0% of the total raw data units.

5.8.2 Commitment

Commitment reflects the relationship's cognitive aspects and the dyadic partner's thoughts of attachment and willingness to maintain the relationship. Commitment

represented 36.4% of the total raw data units. The dimensions of mutually agreed goals, long-term orientation, being close, promising connection and partnership were observed, yet no participant referred to the cognitions of being obligated to their dyadic partner within LMX. Integrity was identified as a new dimension that is a critical aspect of commitment. While much debate has taken place regarding an appropriate definition, the authors of this study believe that integrity can be considered as an individual being committed to action (Palanski & Yammarino, 2007), authentically presenting oneself, speaking the truth, and taking responsibility for one's feelings and behaviours. A member noted, "Integrity underpins a lot of what we do," and stated, "They (the leader) are a really good person with strong core values and integrity." Honesty was highlighted as a new dimension representing 6.3% or 33 of the total 525 raw data units. Barnard (2011) postulated honesty as an interrelated yet distinctive competency of integrity and has been described as a virtue of an individual displaying integrity values. The negative aspect of dishonesty was referenced by a leader when asked to reflect on a relationship of low quality. The leader stated, "He would pay lip service to me and somewhat to the organisation, then he would go off and do whatever he wanted."

5.8.3 Complementarity

Complementarity represents the dyadic partner's co-operative actions towards each other to establish and maintain high-quality relationships. The data analysis highlighted that complementary behaviour accounted for 29.1% of the total raw data units. Openness was identified as a previously unobserved dimension of the leader-member relationship and the 4Cs framework. Openness can be defined as having open communication lines to provide a psychologically safe environment for dyadic partners

to have the freedom and ability to discuss their feelings. When asked what the main characteristics of their leader-member relationship were, a participant stated: "To me, its openness and honesty." Another stated that, "Transparency is the number one for me. One thing that is a real strength of my boss, in particular, is the kind of no surprises approach. I guess you would say an openness. That whole kind of openness and transparency." Further supporting openness, a member stated, "We need to have the space to say if we are not meeting our goals and things we need to achieve." They went on to state, "You need to have the space to be able to talk about things that could be issues and that are bothering you. If you don't have that in a relationship, then it's not a good relationship." Previous studies investigating the antecedents of high-quality relationships have found openness to be an integral aspect of high-quality relationships (Bennie & O'Connor, 2012; Jowett & Carpenter, 2015; Jowett & Shanmugam, 2016; Liden & Maslyn, 1998; Rhind & Jowett, 2010b).

Another newly identified dimension that was considered essential to high-quality leader-member relationships was for dyadic partners to lead and follow by example. When describing the attributes of their leader, a member stated, "My boss walks the walk and talks the talk," demonstrating the positive behaviours leaders display, which in turn influence their dyadic partners to reflect on the appropriateness of how one should act in the workplace (Qiu et al., 2018). The autonomy gifted to the member, along with the confidence displayed by the leader in the member's ability to perform their duties, was highlighted by one member who stated, "He understands what we are going through from a work perspective... he's very understanding... he's very much around empowering you to actually say we have put you in this role so go ahead and

lead." The member expressed that this resulted in her feeling valued, being more creative, providing the space to grow, and developing trust with her leader.

5.8.4 Co-orientation

Co-orientation captures the individuals direct and meta-perspective of the relationship and attends to the reciprocity of dyadic relationships. The direct perspective is how an individual feels, thinks and behaves towards their dyadic partner; a meta-perspective is how an individual perceives their dyadic partner feels, thinks and behaves toward them. The construct of co-orientation accounted for 14.5% of the total raw data units. Self-disclosure, information exchange, acceptance and influence were notable dimensions and provided the dyadic partners with the information to refer to and make assumptions of the relationship's quality. Self-disclosure was highlighted through the participant's acknowledgement of knowing and understanding their dyadic partner in greater depth, thereby offering an opportunity to better meet their dyadic partner's needs. One participant stated, "I think you need to have a good relationship with people by having some insight into their personal life. I think it's nice to know people for people. It's knowing what makes them tick. If you have an inkling of what's going on in their lives, then you know how to help them, and you can give them the space that they need and the support they need." Another went on to say, "My boss is a big people person, he takes a lot of time to get to know us and spend a lot of time with each of us as well, he gives a lot of time in that regard. It is amazing. I know that it's real empathy there because he does know who we are."

The degree to which the leaders and the members expressed a significant, high-quality leader-member relationship was articulated by one participant that stated, "Words we

bound around hold true, which are mutual respect, trust, transparency, honesty, a willingness to have courageous conversations. That openness, having a genuine concern for the other person and integrity." This statement sums up the affective, cognitive and behavioural constructs of closeness, commitment, and complementarity, highlighting the 4Cs model's appropriateness to better represent the quality of LMX. Co-orientation has been exhibited by the participants articulating the need to communicate, share knowledge and have a shared understanding of each other.

5.9 Discussion

LMX has been vulnerable to criticism due to its theoretical underpinnings and the way it has evolved to focus more heavily on the relationship between the leader and the member than initially anticipated (Erdogan & Bauer, 2014). Nevertheless, this offers researchers an opportunity to investigate theoretical alignment and seek ways that elicit a better connection between conceptual framing and practice. LMX has been described as the foremost dyadic approach to leadership (Erdogan & Bauer, 2014). However, much dissonance has emerged regarding theoretical content (Schriesheim et al., 1999), levels of analysis (i.e., individual, dyadic or group level) and measurements (Bernerth et al., 2007; Gooty et al., 2012) theory alignment. Thus, this study aimed to examine if the dyadic 4Cs relationship model offered an alternative approach to capture the psychological constructs between a leader and a workplace member to assess relationship quality.

5.9.1 Relational Structure and Content

The key to unlocking the full potential of LMX at a dyadic level is to consider the 4Cs theory, structure, and content as a base to set a foundation for advancing a model to

represent the leader-member exchange. To date, LMX Theory has relied on fewer psychological constructs than that of the original 4Cs model, and thus LMX may be considered incomplete. This study's findings uncovered the psychological constructs of closeness, commitment, complementarity, and co-orientation have the facility to encompass the content and quality of the relational characteristics of LMX in greater depth. The analysis of data demonstrated that trust and respect are integral dimensions of LMX. Nevertheless, trust and respect are two of sixteen additional dimensions equally important to leader-member relationships. The original dimension of obligation, as postulated within the LMX model, is no longer fit for purpose in modern workplace relationships. The dimension of mutual liking was not considered essential, resulting in both dimensions being removed from the new 4Cs model for LMX. While investigating liking and respect between leaders and members in the workplace, Baryła (2014) determined that liking comes from a place of self-interest, and respect is more prevalent than liking as it is socially shared between the dyadic partners in a workplace setting. A possible explanation for the participants not to articulate mutual liking as an essential dimension of the leader-member relationship may be due to a lack of self-interest rather than the individual not liking their dyadic partner. It is important to note that the dimensions of being at ease and co-operation from the construct of complementarity were also removed from Jowett's (2007) original 4Cs model due to the lack of evidence provided in this study. Integrity was added to the cognitive construct of commitment and openness, and lead/follow by example, were added to complementarity's behavioural construct. Qiu et al. (2018) observed that leading by example significantly influences dyadic partners to demonstrate high co-operation levels; thus, this study's participants may have considered leading/following by example as being interrelated with co-operative acts.

It is also worth noting that throughout the study, the participants used integrity, honesty, openness, and transparency interchangeably, demonstrating the dimensions' influence on each other.

5.9.2 Theory Alignment

Firstly, it is worth noting that researchers have intertwined both VDL theory and SET throughout the evolution of LMX without fully offering an explanation for what theoretical reasoning governs them (Schriesheim et al., 1999). SET posits that dyadic partners act in ways that benefit others, resulting in an expectation that these acts will be reciprocated due to a sense of indebtedness. Chernyak-Hai and Rabenu (2018) investigated the appropriateness of SET to determine if it was fit for purpose for current workplace conditions. They concluded that although leaders and members negotiate workplace relationships due to the specific roles, the nature of changing workplace relationships has led to SET requiring reconceptualisation. We suggest that Interdependence Theory offers LMX a mechanism to better consider interpersonal analysis and reciprocity. Interdependence theory considers that emotions, cognitions, and behaviours mutually and causally interconnect dyadic partners and thus attends to the dyadic nature of relationships. Understanding human behaviour frequently rests on the content and quality of interpersonal connections between dyadic partners. The operationalisation of reciprocity has been constrained because researchers, up until recently, lacked conceptual and statistical tools (Liden et al., 2016). However, the utility of Interdependence Theory offers a humanistic approach to advancing the predictions about the connections between the dyadic partners and situations (Rusbult & Van Lange, 2008). Martin et al. (2010) assert that Interdependence Theory has an

important part to play in the advancement of LMX through extending the notion of social exchange to include leaders and members emotions, cognitions and behaviours.

5.10 Limitations

The present findings include limitations that require consideration. The first limitation is the sample size. Although the sample size is small and may not allow for generalisability of the results, the findings yielded clear themes supporting the 4Cs model, suggesting that the model encapsulates the content and quality of dyadic relationships regardless of type or setting. The second limitation is that all interviews were facilitated by utilising video conferencing. Video conferencing provided convenience, accessibility, and time-saving with no travel requirements to participate in the study. The advancement in technology has allowed researchers to geographically cast the qualitative interviewing net further, resulting in two participants engaging in the study while residing in different cities throughout New Zealand. At times the internet connection was interrupted, and one interview was continued utilising the telephone to ensure no information was lost. The study took place during the 2020 COVID-19 pandemic, with the New Zealand Government enforcing lockdown proceedings for the country's citizens to be physically distanced, not allowing the traditional face-to-face interviewing. Third, further research should consider investigating other industries with more extensive and more diverse samples of participants. Finally, another exciting direction of research is to examine the construct validity of the newly suggested model to allow researchers to consider a potential self-reporting tool to measure the quality of dyadic LMX relationships.

5.11 Conclusion

In sum, this study aimed to scrutinise the content and quality of leader-member relationships utilising Interdependence Theory and suggest the original 4Cs relationship model as a more accurate representation of the psychological constructs between a leader and a member in a workplace setting. Based on the findings, the newly suggested 4Cs model and Interdependence Theory has the facility to capture the content and quality of the leader-member relationship in a workplace setting. The findings expose the relational connectedness of the dyadic partners utilising closeness, commitment, complementarity, and co-orientation. Moreover, it was found that the dimensions of integrity, honesty, openness and leading by example are essential ingredients of commitment and complementarity. By contrast, the dimensions of mutual liking, being at ease, and cooperation were either less essential or interrelated to the nineteen suggested dimensions required to capture the leader-member relationship's psychological constructs. Overall, our findings can provide a framework for dyadic partners to increase knowledge and understanding of the leaders' and members' psychosocial development and performance through a dyadic lens.

Chapter 6 (Study Three) Using cognitive interviewing to explore the applicability of the CART-Q to assess the Leader-Member Exchange

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6.1 Prelude

Chapter 5 established that the key to unlocking the full potential of LMX at a dyadic level is to consider the 4Cs theory, structure, and content as a base to set a foundation for advancing a model to represent the leader-member exchange. To date, LMX Theory has relied on fewer psychological constructs than that of the original 4Cs model. Mutual Liking, Trust, Respect and Obligation may not be comprehensive enough to measure the quality of leader-member relationships in modern times, and thus LMX may be considered incomplete. This study's findings uncovered that the psychological constructs of closeness, commitment, complementarity, and co-orientation have the facility to encompass the content and quality of the relational characteristics of LMX in greater depth. The more in-depth 4Cs model with additional dimensions of Integrity, Honesty, Openness and Leading/Following by Example can be viewed as essential dimensions in leader-member relationships. The findings from Chapter 5 demonstrated that the 4Cs model captures the social exchanges' reciprocal nature between a leader and a member through the psychological constructs of closeness, commitment, complementarity and co-orientation. The purpose of Chapter 6 aimed to explore if a modified CART-Q (the CART-Q-R) could be utilised as an appropriate and comprehensive self-reporting tool to assess leader-member relationship quality. Utilising Cognitive Interviewing, the findings demonstrated that the face validity of the CART-Q-R was confirmed. This study advances LMX Theory to consider that the leader and member are mutually and causally interconnected through their emotions, cognitions and behaviours.

6.2 Introduction

A workplace setting is a rich environment in which to study interpersonal relationships, and an effective dyadic relationship between leaders (supervisors) and their team members can benefit all parties' psychosocial and performance outcomes. Studies have found that high-quality leader-member relationships can increase satisfaction, motivation, passion, enhanced performance and positive contribution to overall organisational effectiveness (i.e., organisation behavioural citizenship) (Vidyarthi et al., 2010).

Leader-Member Exchange (LMX) Theory is a pervading relationship-centred approach to leadership (Erdogan & Liden, 2002; Uhl-Bien, 2006). It has been argued that high-quality leader-member relationships demonstrate that leaders are more engaged and communicative with some members than others in their team (Erdogan & Bauer, 2014), and therefore it has been postulated that these social exchanges can result in varying levels of mutual liking, trust, respect and obligation (Graen & Uhl-Bien, 1995). The acceptance of LMX Theory has increased over the years to be cited as the most influential and impactful relationship-centred model in the leadership literature (Day & Miscenko, 2016). LMX can be considered a theory (Dienesch & Liden, 1986; Graen & Uhl-Bien, 1995), a model (Dienesch & Liden, 1986; Gooty & Yammarino, 2016) and somewhat confusingly, the acronym is also used to describe the social exchanges between leaders and members (Liden et al., 2016). Additionally, many of the theory's measures have been named LMX. This varied use of the term LMX and the problematic evolution of the phenomena have resulted in disparity across studies on how best to describe LMX. Gottfredson et al. (2020) examined 42 articles from 2014 in five popular journals (The Leadership Quarterly, Journal of Applied Psychology, Journal of

Organizational Behavior, Personnel Psychology, Journal of Management) to determine how researchers define LMX. The results demonstrated that there was extensive variability in how LMX is defined. The appropriateness of the LMX has come into question as a valid framework to examine different dyadic partnerships in leadership (Hwa et al., 2009). A systematic review of multi-level construct usage and measurement in the LMX conducted by Gooty et al. (2012) concluded that 96 of 105 LMX articles were misaligned regarding theory and measurement. Gooty et al. (2012) suggested the blanket LMX term in theory building means different things to different researchers. Secondly, dyadic relationships are best studied through a lens of reciprocity and not a leader-centric or follow-centric perspective as commonly facilitated. For clarity, we will use the following terminology. We will refer to the LMX Theory/model as LMX. To describe the interpersonal connections between leaders and members, we will refer to this as social exchanges, and the leader-member relationship may be referred to as dyadic partners. A critical feature of LMX is that researchers believe that it is central to understanding leader effects on members (Graen & Uhl-Bien, 1995). We can assert that, initially, LMX was innovative for its time in that it was the first to consider the leader-member relationship as pivotal to effective leadership.

According to Schriesheim et al. (1999), the evolution process of LMX has been somewhat disordered and less than transparent. Gooty and Yammarino (2016) believe that it is unfortunate that not much has changed in the 46-year evolution of LMX. The definitions of the LMX concepts varied considerably with minimal empirical support, resulting in variance in constructs, measures and analytical procedures not being aligned with theory (Schriesheim et al., 1999). Erdogan and Bauer (2014) noted that

the evolution of LMX has been more concerned with the consequences of the leader-member relationship and less about the antecedents, and LMX's theoretical landscape was heavily grounded in one particular theory, Role Theory, before diverging into another theory, Social Exchange Theory (SET). Without a stable base of sound research practices, including reporting best practices, it is unwise to rely on theory, structure and measures that may not reflect what it is researching.

This presents researchers with the opportunity to propose an alternative approach to examine the leader-member relationship to investigate new and potentially more sensitive measures to align the appropriate theory with a self-reporting tool that genuinely addresses both dyadic partners' needs. We contend that consideration must be given to acknowledge that leaders and members are mutually and causally interconnected through their emotions, cognitions and behaviours, thus allowing for a measure of reciprocity, which appears to be lacking in LMX (Gottfredson et al., 2020; Olsson et al., 2012).

LMX Theory was formerly referred to as Vertical Dyad Linkage (VDL) (Dansereau et al., 1975; Graen & Cashman, 1975). Dansereau, Graen, and colleagues proposed VDL to consider leadership as existing at the dyadic level of analysis, consisting of 'the leader' and 'the member.' The VDL model was the first to suggest that leaders treat team members differently rather than considering that leaders develop the same type of relationship with each team member. The VDL model was focused on the role-making process and consisted of mutual liking, trust, respect and influence.

VDL morphed into now what is considered LMX Theory and drew upon SET. SET inferred that dyadic partners acted in ways that benefited others, resulting in the

expectation that this behaviour would be reciprocated due to indebtedness (Graen & Uhl-Bien, 1995), an essential distinction from the vertical exchange (Bernerth et al., 2007). Although the theories sitting behind VDL and LMX are role-theory and SET, researchers (for example, Graen and Uhl-Bien (1995)) have chosen to include the VDL constructs of mutual liking, trust and respect and swapped out the construct of influence for the construct of obligation in an attempt to better represent the nature of leadership. The conceptual overlap between the constructs from VDL and LMX was suggested by Graen and Uhl-Bien (1995), resulting in LMX constructs to include mutual liking, trust, respect and obligation. In this regard, the theoretical content was considerably diverse, the breadth and depth of the construct are nearly identical, and Role Theory and SET have been used simultaneously and interchangeably (Bernerth et al., 2007).

Given that a construct needs to be measured based on the construct's conceptualisation, it is not surprising that the measures associated with LMX have followed a similar pattern of divergent development. Measures have used scales ranging from the two-item (Dansereau et al., 1975), four-item (Graen & Schiemann, 1978; Liden & Graen, 1980), five-item (G. B. Graen et al., 1982), six-item (Schriesheim et al., 1992), seven-item (G. Graen, M. A. Novak, et al., 1982; Graen & Uhl-Bien, 1995), eight-item (Kozlowski & Doherty, 1989), ten-item (Bhal & Ansari, 1996), 11 and 12-item (Liden & Maslyn, 1998), and 14-item (Uhl-Bien & Maslyn, 2003; Wakabayashi et al., 1990) LMX Theory scales.

The most frequently used seven-item measure, commonly referred to as the LMX7, comprises the 2, 4, and 5 item measures that were initially designed to measure VDL and Role Theory and not LMX and SET (Bernerth et al., 2007; Dulebohn et al., 2012).

The LMX7 contains questions designed explicitly for VDL measures. Therefore, the conceptualisation of the LMX7 was heavily rooted in VDL role-making and not aligned to the theoretical underpinnings of LMX (i.e. social exchange). Traditionally the different measures were designed for one member of the dyadic pairing to assess the relationship. Graen and Uhl-Bien (1995) attempted to revise and improve the LMX7 (SLMX7) to include both dyadic members in the process whereby both members complete a self-reporting tool specific to their role (i.e. a leader version and a member version). This attempt to attend to the relationship's dyadic nature and reciprocity was a step in the right direction. However, it is limited in that the questionnaires' structure and content were not fit for purpose, as previously mentioned. The LMX7 and the SMLX7 primarily measure VDL role-making (Bernerth et al., 2007; Schriesheim et al., 1999). If the LMX7 or the SLMX7 was conceptualised based on social exchange, mirroring the leader's version's questions to the member's version could have measured both parties' direct perspectives allowing for a measure of actual similarity to be determined.

Another popular measure postulated by Liden and Maslyn (1998) is the LMX-MDM. The LMX-MDM did not suffer from the same theoretical concerns as the LMX7 versions, and it has been reported that the LMX-MDM scale underwent rigorous construct development (Joseph et al., 2011) employing critical incident interviews and content validation using an expert panel. The LMX-MDM purportedly measured the four constructs of affect, loyalty, contribution and respect. The four constructs were supported by Confirmatory Factor Analysis (CFA). To investigate the effects of LMX on leader-member creativity, Olsson et al. (2012) utilised the LMX-MDM and reported reliability using Cronbach's Alpha as 0.78-0.86. However, when investigating the

individual constructs' reliability, affect ranged from 0.81-0.84, loyalty from 0.69-0.77, contribution from 0.45-0.77 and respect from 0.88-0.91. A limitation of this study and a potential reason for the significant variance in the contribution scores could be that the participants' sample consisted of a mixture of academic leader-member relationships and commercial leader-member relationships. The academic leader-member relationship between supervisors and PhD candidates is a crucial dyadic relationship; however, caution must be applied when sampling participants from an environment that the measure was not initially intended for without specific research. The disparity in the contribution scores were significant and therefore required further investigation. The constructs of affect, loyalty, contribution, and respect capture some of LMX, yet the original architects of LMX-MDM report that other dimensions such as trust, openness and honesty may also be included (Liden & Maslyn, 1998).

Over the past decade, researchers have attempted to complete more in-depth data analysis using CFA. However, it is worth noting that data reporting LMX measures for validity and reliability has traditionally been sparse, and the most prevalent accepted reporting practices seems to be to state coefficient α reliabilities (Gottfredson et al., 2020). Internal consistency is an essential statistical measurement to ensure that reliability testing of items provides a quantitative measurement of how well the measure performs in a contextual specific population. Nonetheless, reliability is a moot point if the measure does not assess what it claims to measure. Hence the content validity of LMX cannot be overlooked. Measures of high psychometric quality require content validity and mechanisms to test construction before the measure is developed rather than validating construction after the fact (Nunnally & Bernstein, 1994).

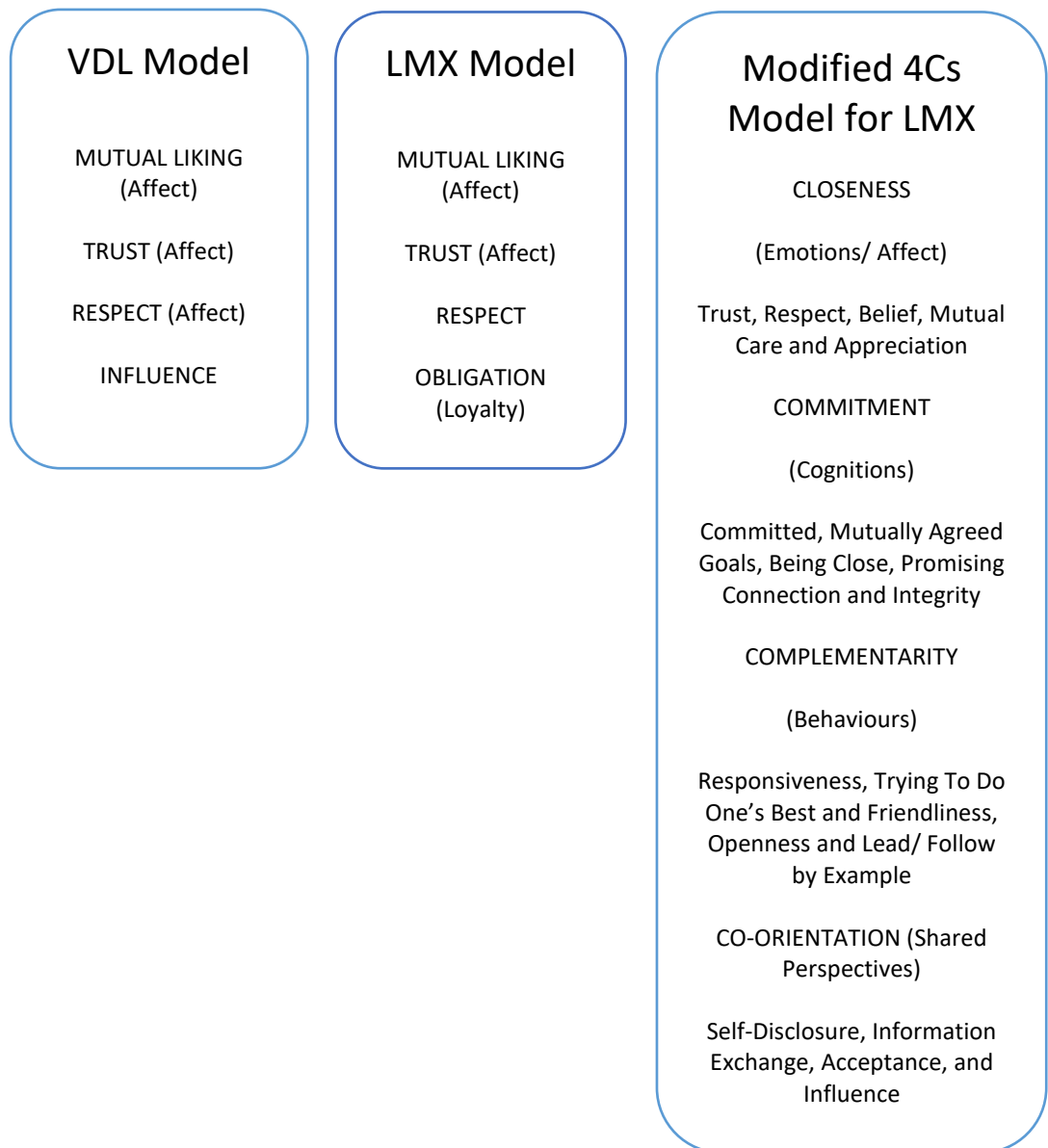
LMX has limitations regarding theory alignment, structure, and an appropriate measure to assess the quality of relationships between dyadic partners (Gooty et al., 2012; Schriesheim et al., 1999; Yammarino et al., 2005). Therefore, it is worth exploring if other close relationship models are appropriate to examine leader-member relationship quality in the workplace. In the sport context, Jowett (2007) has developed an instrument drawing upon interdependence theory that has successfully assessed the nature of relationships between dyadic partners. The Coach-Athlete Relationship Questionnaire (CART-Q) assesses the relationship's quality by using the interpersonal constructs of closeness, commitment, and complementarity to address the dyadic partners' emotions, cognitions and behaviours. Simultaneously, co-orientation exposes the extent to which dyadic partners are interconnected, therefore, exposing reciprocity. Jowett claims that the 4Cs model is universal no matter the type of relationship or setting (Jowett et al., 2010), and the model has been utilised to investigate two-person relationships in sport, executive coaching (Jowett et al., 2012) and teaching (Ada et al., 2021).

Woolliams, Walters, et al. (2021) examined if LMX required adjustment, in theory and structure, to attend to workplace relationships' dyadic nature between leaders and members. Specifically, their research aimed to test whether the 4Cs relationship model's unidimensional conceptualisation, based on interdependence theory, was a more accurate representation of the psychological constructs observed between a leader and a member in a workplace setting. The findings suggested that interdependence theory offered an alternative approach to consider interpersonal analysis and reciprocity of leader-member relationships. It considered that emotions, cognitions, and behaviours mutually and causally interconnect dyadic partners and

thus attend to the dyadic nature of relationships. Woolliams and colleagues suggest that investigating the leader-member relationship's quality utilising a modified version of Jowett's (2007) 4Cs relationship model, allows for greater insight into modern-day leader-member exchanges. According to Graen and Uhl-Bien (1995), leaders that form high-quality relationships with their members can be characterised through the dimensions of liking, trust, respect and obligation. However, the 4Cs model for leader-member relationships has shown to be more sensitive and comprehensive, demonstrating that mutual liking and obligation was not considered essential, and the 4Cs included an additional sixteen dimensions to trust and respect. Figure 8 shows the constructs of VDL, LMX and the modified 4Cs model for LMX.

Figure 8:

The constructs and dimensions of VDL, LMX and the modified 4Cs model for LMX, as suggested by Woolliams, Walters, et al. (2021).



As LMX scales omit to address reciprocity in any great detail (Bernerth et al., 2007), the 4Cs model and the CART-Q provides researchers with the opportunity to examine the dyadic relationship between a leader and member through a lens of reciprocity. We believe that reciprocity is theoretically underpinned by Interdependence Theory, which focuses on between-person processes, such as behaviour and interconnections, and within-person processes such as affect (emotion) and cognition (Van Lange &

Rusbult, 2011, p. 251). Reciprocity can be acknowledged and assessed through the fourth construct of the 4Cs model: co-orientation. Laing et al. (1966) posited that individuals could adopt perceptual orientations or perspectives of how they view relationships. There are two perceptions people use to assess their relationship with their dyadic partner. The direct perspective is where one self-reflects on their own emotions and cognitions toward their dyadic partner, and the meta-perspective reflects the individual's capacity to perceive the relationship through the dyadic partner's point of view. The leader and the member assess the relationship by reflecting on their own internal emotions and cognitions and making assumptions about how their member perceives the relationship. Therefore, a member's direct perspective would be "I trust my leader," and their meta-perspective would be "My leader trusts me." Reciprocally, for the leader, the direct perspective would be "I trust my member," and their meta-perspective would be "My member trusts me." This process would be replicated for each question of a given questionnaire, and both the leader and the member have the opportunity to assess their relationship, which can be compared to measure three specific dimensions correlated to co-orientation: (a) actual similarity, (b) assumed similarity and (c) empathetic accuracy. Actual similarity is exhibited by comparing the member's direct perspective question (in this case, "I trust my leader") with the leader's direct perspective question (e.g., "I trust my member"). The member's assumed similarity is exhibited when a comparison is made between the member's direct perspective and meta-perspective questions (e.g., "I trust my leader" versus "My leader trusts me"). A leader's meta-perspective would follow the same process and would be a comparison between "I trust my member" and "My member trusts me." Lastly, the member's empathetic accuracy is determined by comparing the member's meta-perspective ("My leader trusts me") to the leader's

direct perspective ("I trust my member"). Interdependently, the leader's empathetic accuracy is exhibited by comparing the leader's meta-perspective question (e.g., "My member trusts me") with the member's direct perception (e.g., "I trust my leader").

Social exchanges provide a mechanism for individuals to assess their relationship and understanding with their dyadic partner. Understanding others is an essential aspect of relationships, and similarity binds dyadic partners together with shared views (Jowett, 2007). Actual similarity validates attitudes towards each other, and galvanises understanding, leading to positive emotions resulting in close/ high-quality relationships. Dyadic partners who demonstrate disagreement in actual similarity experience misunderstanding and changeability, leading to increased negative emotions like anxiety and confusion, resulting in low-quality relationships (Montoya et al., 2008). Assumed similarity is the extent to which people judge their dyadic partner's emotions, cognitions and behaviours to be consistent with how they judge themselves. Similarity has been shown to effect empathetic accuracy.

Empathetic accuracy, actual similarity and assumed similarity coevolve within the dyadic relationship and could expose previously undisclosed interpersonal/social exchanges to assess the content and quality of leader-member relationships.

Relationship research has shown that dyadic relationships can be assessed by capturing both dyadic partners' emotions, cognitions, and behaviours to represent the constructs of closeness, commitment, complementarity and co-orientation (Jowett, 2007; Woolliams, Walters, et al., 2021). The dyadic partners' direct and meta-perspective offers an opportunity to assess actual similarity, assumed similarity, and empathetic accuracy in assessing the leader-member relationship's quality.

More research is needed to examine the constructs involved to better understand the relationship between a leader and a member from a reciprocity perspective. In an attempt to do so, Woolliams, Walters, et al. (2021) examined if the dyadic coach-athlete relationship 4Cs model offered a more accurate representation of the psychological constructs observed between a leader and a workplace member. Their results revealed a modified 4Cs model more appropriately captures the psychological construct's reciprocal nature of the leader-member relationship. Thus, allowing researchers to examine if a revised version of Jowett's original CART-Q (Jowett, 2007; Jowett & Ntoumanis, 2004) (the 4Cs associated self-reporting tool) can assess the leader-member relationship's quality and content.

This current study aimed at developing a revised CART-Q questionnaire that applies to the leader-member relationship in the workplace that should assess the content and quality of the relationship through the dyadic partners affects (closeness), cognitions (commitment), behaviours (complementarity) and reciprocity (co-orientation). This study's objective was to validate the structure of a revised version of the CART-Q utilising cognitive interviewing (CI). We have named the questionnaire the CART-Q-R to acknowledge the seminal work conducted by Jowett and colleagues.

Cognitive interviewing (CI) has been a valuable tool for developing self-reporting survey items (Willis, 1999). CI is an acceptable method of obtaining data as it provides a purposeful mechanism to observe the process of the thoughts produced from the participant considering the questions of a self-reporting tool and the verbal reports made during the interview (Beatty & Willis, 2007). As a technique, CI was employed to apply qualitative research methods to determine the participant's comprehension of items within a questionnaire, initially referred to as Cognitive Aspects of Survey

Methodology (Beatty & Willis, 2007). CI has gained popularity as a qualitative method within social sciences. This methodology allows for a small sample of participants to complete the questionnaire while thinking-aloud (Willis, 1999). Simultaneously, the interviewer interjects with planned probes to understand the participant's comprehension of the questions, the participant's retrieval of information pertinent to the questions, and their motivation to apply their decision making and response processes (Collins, 2014; Tourangeau, 1984). CI creates opportunities for researchers to test questionnaires on the desired sample rather than rely on an expert panel to agree to a proposed list of generated items collectively. This presents researchers' opportunity to observe the participants' cognitive processing concerns during interviews, variabilities in question response processes, and patterns across interviews (Peterson et al., 2017). The benefit of this is it offers to identify issues of validity. The process can determine if there is a misalignment between respondent interpretation and the intended meaning. The content validity is therefore evidenced, as respondents are asked to provide feedback on the satisfactoriness of content coverage. When completed early in scale development, CI enables the developer to identify and correct issues in understanding and content coverage before resources have been devoted to more extensive validity testing.

This current study utilises cognitive interviewing techniques to address the need to advance the psychosocial constructs of leader-member relationships evidenced in earlier research conducted by Woolliams, Walters, et al. (2021). This study aimed to develop and validate a self-reporting tool's structure to assess leader-member relationships' content and quality through a reciprocal perspective. Moreover, this

study examines if the CART-Q-R is an appropriate self-reporting tool to assess the nature of the leader-member relationship in the workplace.

6.3 Method

This study utilises qualitative methodology, facilitating semi-structured interviews adopting deductive and inductive content analysis. The LMX model and the 4Cs model were used to examine existing knowledge while allowing for previously uncovered knowledge to present itself.

6.4 Participants

Administrative employees of a national sport organisation (NSO) were selected, and with their consent, participated in the study. NSO's administer all aspects of the sport to provide the community with high-quality sporting experiences by growing the game domestically, winning worldwide, delivering world-class events, and strengthening the business. A total of 8 employees elected to participate in this study, consisting of males ($n = 6$) and females ($n = 2$) representing seven leader-member dyads. The average length of any dyadic relationship was 2.6 years.

6.5 Instrumentation

A 24-item revised Coach-Athlete Relationship Questionnaire (CART-Q-R) was comprised from the results derived from Chapter 5 (Study Two) of this thesis. This draft version was utilised in this study. As a result of study two of this thesis, the original CART-Q and the proposed modified version is titled the CART-Q-R. The CART-Q-R is an adaptation of the CART-Q and shares 16 of 24 items contained in the CART-Q,

excluding items of mutual liking, being at ease and co-operation, while new items of integrity, role modelling and openness were evidenced as essential dimensions to the leader-member relationship. An initial pool of 24 items (Table 3) was generated based on Jowett's 4Cs model, CART-Q and a qualitative study completed by Woolliams and colleagues (Woolliams, Walters, et al., 2021). Six items reflected the closeness construct, eight reflected commitment, and ten items reflected complementarity.

Table 3:

The 24-item Coach-Athlete Relationship Questionnaire (CART-Q-R), member's version, as derived from a qualitative study.

Items
Affect – Closeness
1. I trust my supervisor
2. My supervisor trusts me
3. I respect my supervisor
4. My supervisor respects me
5. I appreciate the sacrifices my supervisor demonstrates to improve performance
6. My supervisor appreciates the sacrifices I have made to improve performance
Cognition – Commitment
7. I have high levels of integrity
8. My supervisor has high levels of integrity
9. I am committed to my supervisor
10. My supervisor is committed to me
11. I am close to my supervisor
12. My supervisor is close to me
13. I think my career is promising with my supervisor
14. My supervisor believes that his/her career is promising with me
Behaviour – Complementarity
15. I follow by example
16. My supervisor leads by example
17. I am responsive to my supervisor's efforts
18. My supervisor is responsive to my efforts
19. I am ready to do my best
20. My supervisor is ready to do his/her best
21. I adopt a friendly stance
22. My supervisor adopts a friendly stance
23. I initiate open conversations with my supervisor
24. My supervisor initiates open conversations with me

6.6 Procedure

The research study obtained approval from the authors' institutional ethics committee.

Following ethical approval, information letters were sent to prospective participants.

The information email included background information on the study, the requirements of those participating, and the rights of all participants. An alphanumeric system was utilised to protect the participant's confidentiality. Video conference cognitive interviews (CI) were conducted and electronically recorded. All electronic-taped interviews were verbatim. The researcher provided the participants with an electronic version of the CART-Q-R during the interview process. The primary researcher was trained and experienced in several interviewing modalities; however, this is the first experience implementing CI techniques. Two secondary researchers reviewed the interviews' transcripts and analysed the data independently to test the process's inter-rater reliability. The results from the three researchers were compared to determine inter-rater agreement. All researchers identified the participant's concerns and agreed that saturation was evident from participants five, six, seven and eight. Saturation is when the participants demonstrate no difficulty or hesitation regarding comprehension, recall, judgement or response when answering the questions within the questionnaire. 'Think-aloud' and 'verbal' probes' were considered two accepted operational means to conduct the cognitive interviews. The think-aloud technique allows the participants to complete the self-reporting tool while verbally reporting everything they think word-for-word in real-time. Verbal probing, the second technique, allows researchers to question critical targeted observations for specific information. An example of verbal probing was to ask the participant why they hesitated when attempting to answer a particular question and what was going through their minds when considering the question's meaning. The two techniques have been shown to be useful in identifying uncertainties in clarifying question meaning in self-reporting tools (Beatty & Willis, 2007). One round of eight interviews took place, and saturation was observed in the final four interviews.

6.7 Data Analysis

In analysing the data, we organised the issues into four categories to capture the cognitive operations to include (a) comprehension – to determine the participants understanding of what is being asked from the question, (b) recall – to retrieve relevant information to support thinking, (c) judgement – to ensure a judgement can be made regarding the item or what is being asked, and (d) response – to ensure that a response is possible (Tourangeau, 1984). If a participant had concerns answering a question within the CART-Q-R, a code relating to the four categories were assigned to the question in concern. In real-time, during the interview, the primary researcher would probe the participants to offer more reasoning for the lack of understanding, inability to recall information, hesitance, or inability to make judgments and time taken to respond to answer any given question. If more than two participants had difficulty on the same item, the participant and the primary researcher revised it during the interview. The item would be revised and subject to retesting. In every case, the revisions included word changes. As a result of resolving the wording, the final four consecutive interviews did not show cause for concern regarding comprehension, recall, judgement or response, demonstrating saturation.

6.8 Results

Data were analysed to determine the participants thought processes and associated behaviours and evidence of understanding of the 24 items of the CART-Q-R questionnaire. The inter-rater agreement between the primary researcher and two secondary researchers was achieved with an accuracy of 78.5%.

Participant One

- Questions one, two, three and four were answered without difficulty within the construct of affect/closeness.
- Questions five and six were cause for concern. The participant stated that the dyadic partner's appreciation was high and reciprocated;
 - the word "sacrifices" confused. The participant felt that appreciation is more linked to the effort demonstrated by the dyadic partner in the workplace, followed by the time the dyadic partner makes available to attend to the participants' needs.
- The wording of questions five and six were discussed and changed to reflect the appreciation of effort rather than appreciation of sacrifices for further potential interviews.
- Questions seven, eight, nine and ten were answered with confidence and without hesitation.
- Question 11, the participant stated: "Close, that is an interesting word." The participant verbalised their cognitions of closeness and explained how this is operationalised between them and their dyadic partner.
- Question 13, "I think my career is promising with my supervisor," was difficult for the participant. The participant referred to their age and stated, "I think that instead of promising, value would be better, okay, because really at my age it is not really a promising career is it, but we do add value to each other."
- The behavioural constructs of complementarity and associated questions 15 through to 24 offered no areas of concern.

Participant Two

- Questions one, two, three and four were answered without hesitation.

- Questions five and six once again caused difficulty for the participant in making sense of the word "sacrifices." When asked, "My staff member appreciates the sacrifices I make to improve performance", the participant articulated, "Hmmm...effort and time, yes, but I don't know if sacrifice is right."
- Questions seven through to twelve were answered with confidence.
- Question 13, "I think my career is promising with my staff member," the participant asked, "What do you mean by that." The participant went on to say, "Do my staff make me better at my job? And do I make them better in their job? Yes, that's an outcome."
- Question 15, "I lead by example" was answered concisely.
- Question 16, "My staff member follows by example." The participant stated that the question was confusing and stated, "I want them to lead by example as well, but they might not use that language and I think by leading/following by example, we are good role models for each other."
- The behavioural constructs of complementarity, questions 17 through to 24, were answered confidently.

As a result of participants one and two having concerns with questions five, six, 13 and 14, the wording was changed to reflect the participants' thoughts but captured the following interviews' initial dimensions. Appreciating sacrifices was substituted for appreciating effort, and a promising career was substituted for "I make my supervisor/ staff member better in their job" and "My staff member/supervisor makes me better at my job."

Participant Three

- Showed no concerns with questions 1-14 covering the constructs of closeness and commitment. Hence by changing the wording in questions five and six, 13 and 14 were answered, demonstrating a clear comprehension of the intended meaning.
- Question 15, "I follow by example" was again a challenge for the participant to answer. The participant verbalised that they try to be the best they can be in their role and follow instructions, but the term 'following by example' was an issue thus needed attention for further interviews. Participant three stated that role modelling was, in their mind, be a more appropriate consideration term than their ability to follow by example. They went on to say that they could follow instructions, but this was not the intent of the initial question.

Participant Four

- Questions one through to eight were answered with ease.
- Question 9, "I am committed to my supervisor" caused the participant to ask for an interpretation of the question. The researcher provided the intended meaning of working towards mutually agreed goals and driving the same values and outcomes, resulting in the participant answering the question. The remaining questions covering the construct of commitment were answered with confidence.
- Question 15, "I follow by example" required attention. The participant stated, "I think it has a connotation to me that it sounds like I just follow people," and went on to say, "I am a good role model." The participant then answered the question once they settled on the item being modified to consider herself a role model rather than leading/following by example.

- Questions 16 through to 24 were answered explicitly in quick succession.

Participant Five

- No concerns understanding, recalling, making decisions, and assessing questions one through to ten.
- The participant asked for clarification for question 11, "I am close to my supervisor" and if the intention was to consider the "tightness" of a close relationship.
- The participant moved on to consider the remaining questions, of which no difficulties were verbalised or observed.

Participants Six, Seven and Eight

- Completed the questionnaire with no signs of difficulty and completed the process in an average of fifteen minutes. The lack of concerns (i.e., in comprehension, recall, judgement and responses) was observed from participants five, six, seven and eight, evidenced saturation resulting in no more required interviews. Table 4 shows the final CART-Q-R as established from the CI process.

Table 4:

The 24-item Relationship Questionnaire (CART-Q-R), member's version, as derived from cognitive interviewing.

Items
Affect – Closeness
1. I trust my supervisor
2. My supervisor trusts me
3. I respect my supervisor
4. My supervisor respects me
5. I appreciate the sacrifices effort my supervisor demonstrates to improve performance
6. My supervisor appreciates the sacrifices effort I have made to improve performance
Cognition – Commitment
7. I have high levels of integrity
8. My supervisor has high levels of integrity
9. I am committed to my supervisor
10. My supervisor is committed to me
11. I am close to my supervisor
12. My supervisor is close to me
13. I think my career is promising with my supervisor helps me be better at my job
14. My supervisor believes that his/her career is promising with me I help them be better at their job
Behaviour – Complementarity
15. I follow by example I am a model employee
16. My supervisor leads by example is a good role model
17. I am responsive to my supervisor's efforts
18. My supervisor is responsive to my efforts
19. I am ready to do my best
20. My supervisor is ready to do his/ her best
21. I adopt a friendly stance
22. My supervisor adopts a friendly stance
23. I initiate open conversations with my supervisor
24. My supervisor initiates open conversations with me

6.9 Discussion

The LMX has been considered critical to advancing leadership research, yet there is still much debate regarding LMX's most popular measures' validity. The development of contemporary and more sensitive data analysis techniques and model development offers researchers an opportunity to investigate LMX in this millennium. Thus, this study aimed to develop and validate a self-reporting tool's structure to assess the content and quality of leader-member relationships through a reciprocal perspective. Jowett et al. (2010) argue that the 4Cs model of closeness, commitment, complementarity, and co-orientation encapsulates the content and quality of interpersonal relationships irrespective of type. This study's findings determined that the four constructs' relational dimensions of closeness, commitment, complementarity and co-orientation are evident in the leader-member relationship, and the CART-Q-R effectively measures the 4Cs.

CI methodology offers a means to cognitively pre-test the performance of generated items to affirm that the participant has understood the intended meaning. Therefore, CI evaluates and improves self-reporting tools by highlighting flaws in the structure and wording of the questions that may go unnoticed until the questionnaires' psychometric properties are quantitatively tested utilising such modalities as CFA or Rasch analysis. The modalities mentioned above may identify potential concerns in any given question; however, they may not explain the concerns. Hence, CI can offer another layer of validity and assurance to the process development of self-reporting tools. A cognitive interviewing framework, suggested by Willis (2004), proved useful in pre-testing the item performance and the CART-Q-R's face validity. The cognitive pre-testing highlighted concerns, with six of the 24 items included in the original item pool,

highlighting the practical effectiveness of developing self-reporting tools during the initial construction phase.

Moreover, the data analysis demonstrated that the participants understood the intent of the proposed questions in the self-reporting tool and responded with clarity and confidence while assessing the quality of their relationship with their leader/member. The items generated in the revised CART-Q, the CART-Q-R offers researchers a potential tool to measure the reciprocity between a leader and a member. Reciprocity of the dyadic relationship can be identified, considering that individuals adopt two distinct perspectives of how they view relationships. The CART-Q-R is structured to assess the direct perspective where an individual self-reflects on their own emotions and cognitions toward their dyadic partner, and the meta-perspective reflects the individual's capacity to perceive the relationship through the dyadic partner's point of view. Combining the results from the leader and the member allows the researcher to measure actual similarity, assumed similarity and empathetic accuracy. Thus, they provide a greater breadth and depth of measures and a window into the reciprocal nature of the leader-member relationship in the workplace. The CART-Q-R differed from previous LMX measures and demonstrated that liking and obligation might not have the same bearing on the leader-member relationship as it once did.

Regarding affective closeness, mutual trust and respect are essential dimensions, noting that no participant had concerns with understanding, recalling, making a judgement or responding to these two questions. Questions three and four needed to be amended as the appreciation of the dyadic partner's effort in social exchanges was deemed more appropriate than the initial question that asked the participants to consider appreciating their sacrifices to improve performance. The items of trust,

respect and appreciation of effort help bind the dyadic partners to increase the relationship's emotional aspect of LMX. LMX measures suggest that loyalty may be an essential aspect of the leader-member relationship. However, it appears that the construct of commitment was represented by integrity, being committed to one another, having cognitions of being close and believing that the dyadic partner helps them be better at their job. Complementarity behaviour has not been considered as a foundational construct until this study. The noticeable acts of social exchanges of being a role model, being responsive to one another, the willingness to do one's best in a given situation, adopting a friendly stance and initiating open and honest conversations are evident from results.

Co-orientation is operationalised by comparing the answers of both dyadic partners direct and meta-perspective answers. The scores' convergence and divergence provide a mechanism to ascertain if the leader and member agree or disagree concerning the questions. Convergence will show where the dyadic partners are on the same page as each other. Divergence will show gaps in the direct and meta-perspective answers. Therefore, it will provide a measure to highlight differences and allow the dyadic partners to understand better where they differ in their assumptions of the quality of the relationship, allowing strategies to be formulated to minimise the gaps for future social exchanges. Co-orientation has not been considered by other measures to assess leader-member relationship quality. Therefore co-orientation offers more detail regarding the reciprocal nature of the relationship.

It was evident that the wording of self-reporting tools plays a vital role in capturing the proposed generated items' intent.

6.10 Limitations

Several limitations require consideration. Firstly, the primary researcher of this study was a skilled interviewer but not an expert in cognitive interviewing. Although the transcripts were reviewed by an expert in qualitative research and another with expertise in psychology, neuroscience and psychometrics, there may have been cues demonstrated by the participants not identified by the primary researcher, resulting in a lost opportunity to delve deeper into their understanding, recall, judgement and response. Secondly, national sport organisations in New Zealand is a contextually narrow industry. The contextual nuance of the relationship type and the environment may impact the participant's understanding of the questions. Thus, this study may not provide a sense of generalisability in the self-reporting tool to be used within other industries (e.g., academia and commerce). Lastly, the interviews were completed via video conferencing. Although the audio was electronically recorded, the physicality of not being near the participants may have impeded the social exchanges between the primary research and the participants.

6.11 Conclusion

In summary, the results provided evidence that the 4Cs and the CART-Q-R are appropriate to better measure the reciprocal nature of the leader-member relationship than LMX measures by adding a greater breadth and depth of psychosocial aspects not previously considered. The CART-Q-R, in its current form, is in a position for the self-reporting tool to be scrutinised quantitatively to assess further its validity and reliability. By measuring the reciprocity of both dyadic partners allows for an altogether more holistic approach to determine the content and quality of LMX.

This study advances LMX Theory to consider that the leader and member are mutually and causally interconnected through their emotions, cognitions and behaviours.

Chapter 7 Discussion, Limitations and Conclusion

7.1 Discussion

This series of studies investigates the complex nature of leadership using interpersonal relationships to better understand reciprocity between leader-member relationships in sporting organisations. This thesis argues that studies of relational and relationship-centred leadership processes have tended not to consider the reciprocity between leaders and members in a workplace setting, particularly the psychological constructs that act as building blocks and scaffolding to establish high-quality relationships. This thesis aimed to test whether the conceptualisation of the 4Cs model of the coach-athlete relationship (Jowett, 2007), as measured by the Coach-Athlete Relationship Questionnaire (CART-Q), is an appropriate model to examine the corresponding dyad between a leader and a member in a work context. Expressly, this thesis examined if the 4Cs model of relationship content and quality can be applied in a leadership setting between a leader and a member. In doing so, we explicitly address a call for researchers to study leadership through a relational lens utilising various philosophical stances and methodological approaches (e.g., see Ospina & Uhl-Bien, 2012).

LMX has attracted considerable attention, and the evolution of LMX Theory has highlighted cause for concern (Gooty & Yammarino, 2016). Firstly, theoretical associations with Role Theory and Social Exchange Theory (SET) have been adopted by researchers since its inception in the quest to better understand LMX Theory. Thus, some researchers have considered LMX as being based on the notion that leaders enable members to negotiate work tasks (Dansereau et al., 1975). Alternatively, LMX relationships develop through positive social exchanges between leaders and

members, resulting in the dyadic partners experiencing a sense of indebtedness (Graen & Uhl-Bien, 1995; Uhl-Bien & Maslyn, 2003). The theoretical content of role theory has been reported to include mutual liking, trust, respect, and influence (Dansereau et al., 1975). The theoretical content of SET has also been reported as mutual liking, trust, respect, and obligation (Graen & Uhl-Bien, 1995). While Role Theory and SET have consistently been used homogeneously, the two conceptualisations are not the same (Bernerth et al., 2007).

Secondly, when a construct is measured, it is based on the conceptualisation of the construct. Thus, it is not surprising that the LMX Theory measures have followed a similar pattern of divergent development. The two most popular self-reporting tools to better understand LMX Theory are the LMX-7 and the LMX-MDM (Bernerth et al., 2008; Dulebohn et al., 2012; Gottfredson et al., 2020). The LMX-7 has been criticised for not aligning with the appropriate theoretical underpinning (Gerstner & Day, 1997). There is a lack of evidence that the self-reporting tool has undergone psychometric testing to assess its validity (Bernerth et al., 2007; Schriesheim et al., 1999). The LMX-MDM appears to have undergone more appropriate psychometric testing (Dulebohn et al., 2012). However, Liden and Maslyn (1998), the originators of the LMX-MDM, have aligned the self-reporting tool with Role Theory and not SET. They believe the measured constructs are affect, loyalty, contribution, and respect. Moreover, Liden and Maslyn claim that other dimensions such as trust, openness, and honesty may also be included to capture LMX more completely.

Lastly, the level of analysis is also a critical aspect requiring further examination.

Researchers have questioned whether the level of analysis is appropriately located at the individual, dyad, or group levels (Gooty et al., 2012). Traditionally, most measures

were designed for one member of the leader-member relationship to complete the self-reporting tool. The different measures have been either leader-centric or follower-centric but rarely dyadic. Researchers have primarily neglected the reciprocal nature of the dyadic relationship (Gottfredson et al., 2020; Uhl-Bien, 2006). It is proposed that assessing the quality of a relationship needs to involve both dyadic partners more fully to capture relational understanding (Matta et al., 2015).

The key to unlocking the more significant potential of LMX at a dyadic level may be to consider an alternative approach drawing upon interdependence theory, a modified 4Cs relationship model and a revised CART-Q. The author of this thesis argues that to attend to the diversity of the theoretical landscape, scarcity of up-to-date psychological constructs and misaligned self-reporting tools, an alternative approach is more appropriate to investigate than a suggestion to 'throw the baby out with the bathwater.' The research design allows for new, contemporary, previously unobserved factors to emerge and be added to the existent body of research.

The thesis comprised of three major research studies;

Study One

To test the CART-Q with coaches and athletes to determine the validity and reliability of the self-reporting tool within the New Zealand sport context.

Study Two

To determine whether the 4Cs model (Jowett, 2007) of dyadic relationships is an appropriate framework for understanding leadership relationships within

New Zealand sporting organisations and if the CART-Q can effectively evaluate the core dimensions of leader-member relationships.

Study Three

To design a revised questionnaire to measure the leader-member relationship content and quality based on Study Two findings. Also, to qualitatively pilot the examination of the CART-Q-R (the adapted questionnaire) face validity utilising cognitive interviewing techniques.

7.1.1 Statement of Principal Findings

Firstly, the findings of the studies demonstrated evidence to suggest that the CART-Q in its original form is a valid and reliable psychometric tool to assess relationship quality between coaches and athletes in the New Zealand context. Secondly, the 4Cs model is an effective and appropriate alternative model to consider the dyadic nature of LMX. Lastly, it was found that the CART-Q-R offers the potential to measure the organisational leaders' and members' emotions, cognitions, and behaviours to encapsulate the following dimensions.

7.1.2 Study One

Study one aimed to investigate the CART-Q to determine its validity and reliability within the New Zealand sport context with coaches and athletes. A quantitative methodology was deemed appropriate, and Classical Test Theory and Rasch analysis were facilitated. The reason for this is that previous research studies had utilised Confirmatory Factor Analysis (CFA) as the method of choice. Therefore in the first

instance, we completed the analysis utilising the same techniques to align with other studies (Balduck et al., 2011; Jowett & Ntoumanis, 2004; Yang & Jowett, 2010, 2013). Previous studies utilised different computational products to facilitate analysis, with EQS and AMOS being the two most favoured software packages. AMOS was facilitated in the first instance to directly compare the present results with previous studies. However, as the self-reporting tool uses a Likert-scale, LISREL was facilitated after that to attend to ordinal data. CFA with maximum likelihood and diagonally-weighted least squares estimation methods supported the factorial validity of the three-factor first-order model of both CART-Q versions, yet a unidimensional solution was also tenable. Rasch analysis determined that the unidimensional model possessed higher reliability than individual subscales and provided improved coverage of participants' scores, thus minimising ceiling effects. Rasch was able to identify which issues with ceiling effects and item coverage for the constructs of closeness and complementarity were observed.

Contrary to previous findings (e.g., Balduck & Jowett, 2010; Jowett, 2003a, 2007; Jowett & Cockerill, 2003), a unidimensional structure obtained greater robustness than the multidimensionality of the model. Therefore, a unidimensional factor solution may be a more suitable representation of the model than previously reported and provides researchers with confidence in the CART-Q psychometric properties, as earlier discrepancies have been resolved through the adoption of Rasch analysis. It has been argued that the 4Cs model and the CART-Q are culturally universal (Ahmad, 2014; Balduck et al., 2011; Contreira et al., 2019; Yang & Jowett, 2010, 2013). A noteworthy result in our study provided evidence that demonstrated the participants had difficulties understanding the difference between "I like my coach/athlete" and "I am

close to my coach/athlete." This anomaly supported a previous study completed by Balduck et al. (2011) utilising athletes from Belgium. Balduck and colleagues postulated that the connection between the two items might have been due to how the participants interpreted the wording, suggesting that the participants may have had difficulty in discerning the difference between the emotions and cognitions of being close. Cultural nuance was offered as a potential reason for this. However, it appears that this finding is not unique to the Belgium context. We agree that the dyadic partners may have difficulties understanding the wording and grasping the difference between emotions and cognitions. Although we argue another possible reason for this may be the environmental factors in which the coaching process takes place rather than cultural nuance. The New Zealand sample was from team-based sports, and the player is continually competing for face-to-face interpersonal connections with the coach/athlete; therefore, it may take longer to build a close relationship with their dyadic partner (Rhind et al., 2012). A potential strategy to combat this is to help athletes and coaches become aware that the volume of interpersonal connections is essential to establishing close relationships (Bennie & O'Connor, 2012; Rhind et al., 2012). The dyadic partners may benefit from having more in-depth knowledge of the differences between feelings and thoughts and the positive benefits of establishing high-quality relationships using the 4Cs as a best-practice model. The wording of the items "I like my coach/athlete" and "I am close to my coach/athlete" requires further research. Qualitative methodological techniques such as cognitive interviewing may offer a more comprehensive line of inquiry. The participants' comprehension, retrieval of information pertinent to the questions, and their motivation to apply their decision-making and response processes were investigated.

The findings of Study One support that the CART-Q is culturally appropriate in the New Zealand sporting context and has added evidence for the validity and reliability of the CART-Q utilising methods not previously considered.

7.1.3 Study Two

Study two investigated the structure and content of LMX in this millennium to resolve the uncertainties of LMX and offer an alternative approach to redefining the concept's theoretical content. Specifically, the study aimed to examine if LMX requires an adjustment in theory and structure to attend to the dyadic nature of workplace relationships between leaders and members. Further, it is necessary to determine if the 4Cs relationship model is a more accurate representation of the psychological constructs observed between a leader and a member in the workplace. Using a qualitative methodology adopting a modified interview schedule facilitated by Jowett and Cockerill (2003) in a previous study, semi-structured interviews were conducted with ten administrative employees from a New Zealand national sports organisation.

LMX Theory consists of four constructs, mutual liking, trust, respect and obligation. The need to re-examine the structure and content of LMX was highlighted by one of its early founders, Mary Uhl-Bein (Uhl-Bien, 2006). She believes that the theory has stagnated in development, so she proposes more examination into the relationship's psychosocial aspects required to advance the theory and move beyond the current knowledge of LMX. The analysis revealed that the core dimensions of trust and respect were observed. Nevertheless, these dimensions fit into a more appropriate and in-depth 4Cs framework, including the higher-order constructs of closeness, commitment, complementarity, and co-orientation. The constructs of mutual liking

and obligation were not evidenced as essential aspects of the leader-member relationship. It has been suggested that the construct of "liking" comes from a place of self-interest (Baryła, 2014). Thus, the participants in this study may not consider self-interest in the workplace important, as previously reported. The construct of obligation was noticeably absent from our findings. Chernyak-Hai and Rabenu (2018) believe that modern-day workplace relationships challenge LMX, and obligations may no longer meet the necessities for current workplace expectations and values. They assert that indebtedness between dyadic partners is no longer relevant in this day and age, therefore, question the appropriateness of the construct of obligation.

Moreover, this study's findings expose previously undisclosed psychological constructs of integrity, honesty, openness, and leading/following by example, which are essential dimensions of leader-member relationships. The results highlighted that the nature of the dyadic relationship between a leader and a member is more effectively observed using a modified 4Cs model. The following constructs and dimensions represent the modified 4Cs model (see Table 5).

Table 5:***Psychological constructs and dimensions represent the modified 4Cs model***

CART-Q-R Constructs	CART-Q-R Dimensions (sub-constructs)
Emotions (Affect) – Closeness	Trust Respect Appreciation of effort Belief
Cognitions – Commitment	Being committed Being close Promising connection Integrity
Behaviours – Complementarity	Responsiveness Ready to do one's best Friendliness Openness Lead/follow by example
Co-orientation	Self-disclosure Information exchange Acceptance Influence

The research findings from study two reveal that the structure and content of leader-member relationships are far more comprehensive than initially conceptualised by

researchers (Graen & Uhl-Bien, 1995). Therefore, a more extensive and appropriate measure is required to assess the quality and content of the dyadic relationship in a workplace setting.

This study suggests that more contemporary and sensitive approaches to theory alignment, data analysis and model development have advanced an alternative approach to considering LMX. There is a need for further research to investigate a new, more effective global measure of the quality of the leader-member exchange relationship.

Many questionnaires have been developed to assess the nature of the leader and team member relationship in an organisational setting (Bernerth et al., 2007; Gottfredson et al., 2020). However, several studies have challenged the psychometric robustness of these self-reporting tools (Bernerth et al., 2007; Gooty et al., 2012; Schriesheim et al., 1999; Yammarino et al., 2005). There is a need to reconsider how LMX is operationalised using a more appropriate measure that draws upon the constructs evidenced in this study. Overall, the findings can provide a framework to increase knowledge and understanding of the leaders' and members' psychosocial development and performance through a dyadic lens. A more precise direction can now be offered to enhance the reliability and validity of LMX.

7.1.4 Study Three

Study three set out to operationalise a more effective global measure of the leader-member relationship quality, a measure that considered that leaders and members are mutually and causally interconnected through their emotions, cognitions and behaviours. Similar relationship dynamics have been studied in sports (Ada et al.,

2021; Jowett, 2007; Jowett & Ntoumanis, 2004; López-Jiménez et al., 2017). This study aimed to explore the potential of a commonly used sport coach-athlete questionnaire (CART-Q) (Jowett, 2007; Jowett & Ntoumanis, 2004) as an appropriate instrument to be applied in a more general leader-member organisational setting. Specifically, another aim was to design a new questionnaire to measure the leader-member relationship content and quality based on the findings of study two and to qualitatively examine the CART-Q-R's (the new questionnaire) content validity utilising cognitive interviewing techniques.

The study pursued two objectives. The first was to develop items representing leader-member relationships utilising the 4Cs relationship model. This phase aimed to create a questionnaire that applies to the leader-member relationship in the workplace. Moreover, it was decided that the questionnaire be required to assess the content and quality of the relationship through the dyadic partner's emotions (closeness), cognitions (commitment), behaviours (complementarity) and reciprocity (co-orientation). The second objective was to validate the structure of the questionnaire utilising Cognitive Interviewing (CI).

CI was used as a valuable tool for the development of self-reporting survey items. CI was employed to apply qualitative research methods to determine the participant's comprehension of items within a questionnaire. This technique has gained popularity as a qualitative method within social sciences (Boeije & Willis, 2013). The methodology allows a small sample of participants to complete the questionnaire while thinking-aloud. Simultaneously, the interviewer interjects with anticipated probes to understand the participant's comprehension of the question, retrieval of information pertinent to the questions, and motivation to apply their decision-making and

response processes. CI allows researchers to test questionnaires on the desired sample rather than rely on an expert panel to agree to a proposed list of generated items collectively. This allows researchers to observe the participant's cognitive processing concerns during interviews, variabilities in question response processes and patterns across interviews (Willis, 1999). Testing continues until the participants no longer show any noticeable signs of a lack of comprehension, inability to retrieve information and an inability to decide or demonstrate a delayed response to a question (Willis, 2004). In this instance, participants one through four displayed concerns about six of the 24 questions. Once the wording of the questions was modified and retested, participants five through eight answered the questions without hesitation and demonstrated understanding.

Moreover, the data analysis demonstrated that the participants understood the intent of the proposed questions in the self-reporting tool and responded with clarity and confidence while assessing the quality of their relationship with their leader/member. The items generated in the revised CART-Q, the CART-Q-R, offer researchers a potential tool to measure the reciprocity between a leader and a member. Reciprocity of the dyadic relationship can be identified considering that individuals adopt two distinct perspectives of how they view relationships. The dyadic partners' direct and meta-perspectives allow for assessing Actual Similarity, Assumed Similarity, and Empathetic Accuracy.

The results provided evidence that both the modified 4Cs model and the CART-Q-R are appropriate to better measure the reciprocal nature of LMX by adding a greater breadth and depth of psychosocial aspects not previously considered. The CART-Q-R is ready as a self-reporting tool to be scrutinised quantitatively in its current form.

Measuring both dyadic partners' reciprocity allows for an altogether more holistic approach to determining the content and quality of leader-member relationships. Study three advances theory development to consider that the leader and member are mutually and causally interconnected through their emotions, cognitions, and behaviours.

7.2 Implications

This section will discuss the literature in general and its contribution to LMX, leadership and organisational leadership psychology by discussing the thesis findings and implications for theory and practice. Investigating the leader-member relationship utilising a modified 4Cs model underpinned by Interdependence Theory has not been studied before. The significance of the findings will be detailed in two contexts. First, the theoretical implications will be discussed for their contribution to a better understanding of the structure, content and process of leader-member relationship quality in the workplace. Second, the practical implications of the findings will be discussed for assessing the leader-member relationship for the organisation, the dyadic relationship and the individuals involved.

7.2.1 Theoretical Implications

Relational leadership processes have primarily overlooked the mutuality between leaders and members in a workplace setting, particularly the psychological constructs that act as building blocks to establish high-quality relationships and a mechanism to measure the dyadic relationship. The concept of dyadism is that 'it takes two to tango;' hence, both individuals need a voice in assessing dyadic relationships. This has

implications for LMX as no studies to date have evaluated the leaders and the member's direct and meta-perceptions of considering their emotions, cognitions and behaviours utilising a lens of simultaneous reciprocity. This section will discuss the literature in general and its contribution to sports leadership, organisational leadership psychology and LMX by discussing the implications of the theory.

Utilising theory and research from multi-disciplinary literature has provided new insight into relational processes in relationships between leaders and workplace members. This thesis draws on the close relationship literature and contributes new-fashioned understandings into relationship-centred leadership approaches. By addressing the evolution of LMX Theory, this thesis suggests that neither Role Theory nor SET fully attends to the dyadic and reciprocal nature of the leader-member relationship. Therefore, the author agrees with Uhl-Bien (2006) that LMX has stalled in its evolution. Graen and Uhl-Bien (1995) believe that LMX Theory evolution can be considered four distinct stages. Stage one is the realisation that dyads are formed. Stage two requires the investigation of the constructs of LMX relationships and associated outcomes. Stage three attends to the theory and exploration of dyadic relationships. Stage four moves beyond the dyad to consider the group and network levels.

A critical finding of this thesis is that LMX has done little to consider the dyadic leader-member relationship to incorporate a lens of reciprocity. The conclusion drawn from the studies within this thesis is that while researchers approach the leader-member relationship through a leader-centric or member-centric approach and not a relational-centred approach to understanding the relationship's nuances, LMX Theory will not be

in a position to move beyond stage three. Both members need to be heard to capture a fuller picture of the relationship's constructs. Therefore, it is concluded that researchers should acknowledge stage one, concentrate on establishing and validating the psychosocial constructs between leaders and members in modern times as suggested in stage two, move to stage three once stage two is thoroughly examined, and then move to stage four with caution.

Interdependence Theory has been described as a classical theory within social psychology (Van Lange & Rusbult, 2011). This thesis has adopted it as a framework to capture the social interactions between leaders and members as it details the social exchanges between the dyadic partners. It addresses the reciprocal nature of the leader-member relationship by focusing on the intra-personal processes, such as emotion and cognition and interpersonal processes, such as behaviour interconnections in dyads (Van Lange & Rusbult, 2011). According to recent reports, most LMX measures originate at the individual level (Gooty et al., 2012; Matta et al., 2015; Scandura & Meuser, 2022). They, therefore, do not measure the relationship from a dyadic approach. Although LMX Theory claims to detail the social exchanges of the relationship, it fails to acknowledge reciprocity in any detail.

Investigating the leader-member relationship utilising the 4Cs model underpinned by Interdependence Theory has not been studied before. The concept has added a new element to the leadership literature concerned with leader-member relationships in the workplace. Leadership is a complex and dynamic process and takes place in the presence of others. The constructs that represent the dyadic relationship need to more fully illustrate the social exchange inner workings between the two individuals. Thus, investigating the psychosocial constructs of the relationship from a direct and meta-

perspective from both dyadic partners could enhance leadership psychology with a new model utilising a reciprocal lens.

Researchers such as Schriesheim et al. (2011) assert that future research should investigate new, more effective measures of the quality of leader-member relationships. LMX has evolved to focus on the relationship between the leader and the member more than initially anticipated. Therefore, as theory alignment has been questioned (Gooty et al., 2012), advancing LMX may be better served to consider Interdependence Theory rather than Role Theory and SET as an alternative approach.

The findings of this set of studies have theoretical implications for examining leader-member relationships in the workplace. This thesis is the first body of research to suggest and demonstrate that Interdependence Theory fits the conceptualisation of how to assess leader-member relationship quality. The findings provide potentially a foundation for researchers to build on and validate the CART-Q-R's appropriateness using quantitative methodologies. There is little doubt from the results that the dimensionality of the leader-member relationship in the workplace is far more comprehensive than previously thought. The findings have added a complete set of emotional, cognitive, and behavioural aspects that better represent the dyadic relationship between a leader and a member. To more fully understand the leader-member relationship at a dyadic level, researchers need to consider the direct and meta-perspective of both dyadic partners simultaneously. This thesis highlights the appropriateness and practicability of the modified 4Cs model and the CART-Q-R as a mechanism to assess the dyadic partners simultaneously.

Utilising Interdependence Theory to investigate leader-member relationships allows researchers to identify situations that dyadic partners might encounter; for example, how they make sense of the relationship and processes of influencing behaviour and future social exchanges (Van Lange & Rusbult, 2011). Interdependence theory captures the leaders' and the members' emotions, cognitions, and behaviours are mutually and causally interconnected. This provides greater breadth and depth of understanding of the leader-member relationship than previously considered. A comprehensive understanding of the dyadic relationship between leaders and members will extend the knowledge of critical psychosocial phenomena, particularly in leadership, and inform our understanding of intrapersonal and interpersonal processes in the circumstances in which the type of relationship resides.

As suggested in this thesis, Interdependence Theory, the modified 4Cs relationship model, and the CART-Q-R have added a new element to the leadership literature concerned with examining leader-member relationships in the workplace. A theory sets a series of concepts and principles explaining and predicting phenomena and guiding conceptualisation and operationalisation (Doherty, 2013). If LMX Theory fails to address the essence of what LMX suggests it does, this provides an opportunity for researchers to investigate alternative approaches to more appropriately examine the quality of leader-member relationships. Setting a transparent path for what the theory sets out to achieve provides researchers with the confidence to use it in the most appropriate context. As mentioned throughout this thesis, there is a doubt about LMX, and researchers have questioned the lack of conceptual clarity. Role theory and SET have and continue to be used interchangeably to measure unsubstantiated constructs. The most common self-reporting tools may not measure what is being examined. The

constructs' representing the dyadic relationship need to fully illustrate the psychosocial constructs' inner workings between the leader and the member. LMX is considered a dyadic model and a relationship-centred approach to leadership (Uhl-Bien, 2006), yet, few studies conceptualise and operationalise the examination of leader-member quality at a dyadic level (Gooty et al., 2012; Gooty & Yammarino, 2016; Schriesheim et al., 1999; Sin et al., 2009). Gooty et al. (2012) stated that researching leader-member relationship quality at a dyadic level has not improved over the years and may have regressed in this millennium. LMX Theory has primarily overlooked the reciprocity between the leader and the member. The disordered and less than transparent evolution of theoretical diversity has resulted in researchers adopting a mix and match approach to theory alignment, measures and levels of analysis. This thesis argues that Interdependence Theory, as inspired by Game Theory and SET, considers that dyadic partners are mutually and causally interconnected through their emotions, cognitions, and behaviours (Kelley et al., 2003). This provides a stable foundation for investigating leader-member relationships.

Jowett advanced Kelley's concept to proclaim that dyadic partners consider the emotions of closeness, the cognitions of commitment, and complementary behaviours to be essential psychosocial constructs of coach-athlete (Jowett, 2007), coach-coachee (Jowett et al., 2012) and teacher-pupil relationships (López-Jiménez et al., 2017).

According to Thomas et al. (2013), close relationship research provides a far greater magnitude of exposing the intricate nature of relationships; therefore, integrating theoretical concepts that focus on interdependence may offer new insights into leader-member relationship research. Jowett adopted a methodological model to measure similarity and empathetic accuracy within dyadic relationships, as Kenny and

Acitelli (2001) suggested. The model proposed by Kenny and Acitelli (2001) provided Jowett with the opportunity to operationally assess the level of similarity (agreement) and empathetic accuracy (understanding) from both dyadic partners simultaneously. Jowett and colleagues have successfully defined, conceptualised, and operationalised the 4Cs model and the CART-Q founded on Interdependence Theory. The model and measures have been rigorously tested in a multitude of diverse sports environments. Thus, investigating the leader-member relationship's psychosocial constructs from a direct and meta-perspective from both dyadic partners could enhance leadership psychology with a new model utilising a reciprocal lens. The findings of this set of studies have theoretical implications for examining leader-member relationships in the workplace.

This thesis is the first body of research to suggest and demonstrate that Interdependence Theory fits the conceptualisation of examining leader-member relationships. Interdependence theory, a modified 4Cs model, and the proposed CART-Q-R could potentially provide an avenue for leader-member relationships to be understood from a dyadic approach that demonstrates the significance of the reciprocal nature of the relationship. The findings illustrate that although the original 4Cs have acted as a *priori* framework, dimensions have been added or subtracted to represent the leader-member relationship. Based on the results of Chapter 4 (Study One) of this thesis, the dimensions of integrity, honesty, openness and leading by example are essential components of commitment and complementarity. Mutual liking and obligation are no longer considered to be necessary as initially conceptualised by Graen and Uhl-Bien (1995). The findings provide a foundation for

researchers to build on and potentially validate the CART-Q-R's appropriateness using quantitative methodologies in various industries and organisational types.

There is little doubt that the dimensionality of the leader-member relationship in the workplace in modern times is far more comprehensive than previously thought. The findings have added a comprehensive set of emotional, cognitive, and behavioural aspects that more fully represent the leader-member relationship than previously reported in LMX, leadership and organisational psychology literature.

7.2.2 Practical Implications

The sporting and professional experiences of the researcher have acted as inspiration for completing this thesis. As an international coach and athlete, the researcher recognised that the dyadic relationship between coach and athlete was anecdotally identified as either high or low quality, resulting in positive and negative relational experiences. Then while working in national sporting organisations in middle and senior management positions, the author once again observed that while being supervised and supervising others, high-quality relationships resulted in positive experiences, and low-quality relationships resulted in adverse situations. These experiences have guided the author to question the content and quality of dyadic relationships in leadership practically and theoretically. The practical implications can be viewed from a scholarship perspective, an organisational point of view, and the individual's perspective.

The practical implications of this thesis provide researchers with three main areas of potential improvement:

1. Interdependence theory, the modified 4Cs model, and the CART-Q-R provide a framework to capture the psychological constructs of both leaders' and members' emotions, cognitions and behaviours simultaneously. This, therefore, attends to LMX criticisms of not giving true consideration to dyadism and reciprocity (Gooty et al., 2012; Gottfredson et al., 2020; Matta et al., 2015).
2. The new cognition items of integrity, role modelling and behavioural item of initiating open conversations of the CART-Q-R have been precisely established and anchored to the construct's conceptualisation.
3. Researchers can have the assurance that the CART-Q-R and its items are anchored in the construct's conceptualisation. Therefore, it will offer leadership and organisational psychology researchers more confidence in utilising this approach to measure the reciprocal nature of the leader-member relationship in a work setting.

The calls for researching LMX through a dyadic model approach have been somewhat answered by considering the findings of this thesis and the proposed conceptual framework to adopt Interdependence Theory, a modified 4Cs model and the CART-Q-R. Thus attending to the need for both dyadic partners to be involved in the process addresses a critical and empirical oversight (Matta et al., 2015). Providing the opportunity for the leader and the member to assess the quality of the relationship will provide researchers with a fuller picture of what is taking place between the dyadic partners. Simultaneous reciprocity has the potential to invite debate and broaden current knowledge about the inner workings of leader-member relationships.

The modified 4Cs conceptual framework offers a model and tools to better understand leaders' and members' emotions, cognitions, and behaviours from an organisational

perspective. Chapter Three of this thesis states that several positive outcomes are associated with high-quality leader-member relationships in the workplace. The implementation of the modified 4Cs and the CART-Q-R could be used as an organisational leadership tool to:

1. Determine the quality of specific leader-member relationships.
2. Determine the quality of leader-member relationships across a team or the organisation as a whole.
3. Be used as a training needs analysis to provide insight into where leaders and members can improve relationship quality.
4. Be used as a tool to comprehensively assess the life cycle of leader-member relationships within the workplace.
5. Provide a platform for human resource development interventions to design and deliver training opportunities to improve high-quality relationships.
6. Provide a platform for human resource development interventions to design and deliver training opportunities to improve well-being and flourishing in the workplace.

Organisations that have leaders and members engaged in high-quality relationships have reduced turnover intentions, increased performance (Bauer et al., 2006) and promotes increased commitment (Gwynne, 2014) to their dyadic relationships and the organisation (Rowold et al., 2014). Each of these outcomes comes with financial benefits to the organisation. Firstly, high-quality leader-member relationships have been shown to negatively affect staff turnover intentions. Hence the more positive the relationship quality, the members' intention to leave the organisation is less likely to

occur. If turnover intentions are reduced, the cost of recruitment, onboarding and training of new employees will be reduced for an organisation. Secondly, increased performance levels allow organisations to increase revenue and profits. Graen et al. (1982) examined the relationship between high-quality leader-member relationships and productivity. They found that productivity increased by 16.3% when relationship quality increased without a loss in craftsmanship. When training was provided that aimed to improve leader-member relationship quality, productivity also increased. Graen and colleagues (1982) believed that the participants responded in kind to the organisation by being more productive due to being part of a high-quality dyadic relationship. Dyadic partners who demonstrate high commitment levels resulting from high-quality dyadic relationships are more likely to persevere with a difficult task than let others down.

If a leader has multiple members, each dyadic relationship the leader is involved in could be compared to determine if common themes are running through their members' dyadic relationships. Comparing the data across the leader-member connections may provide a source of information to highlight the areas in which the leader may excel or improve when assessing the quality of relationships.

Uhl-Bien et al. (2000) examined the implications of Leader-Member Exchange for strategic human resources management systems, implicitly examining if high-quality leader-member relationships provide organisations with a competitive advantage through the development of social capital. Uhl-Bien and colleagues stated:

Organisations with broad bases of effective work relationships and fewer poor-quality relationships will necessarily be able to generate more social capital to produce superior products and services and more flexibly adapt to the demands of modern environments than organisations that continue to ignore the value of relationships (Uhl-Bien et al., 2000, p. 178).

The modified 4Cs relationship model and the CART-Q-R may provide a more accurate understanding and measure to assess the quality of leader-member relationships by providing a more significant number of specific and relevant items in the modern workplace. This would result in substantial benefits to organisations promoting high-quality leader-member relationships.

This thesis may provide several practical implications for those involved in leader-member relationships. Firstly, high-quality dyadic relationships play an essential building block in human flourishing, and close relationship literature highlights the importance of socially connected positive effects. Feeney and Collins (2015) suggested that individuals who experienced rewarding and supportive relationships have subjectively higher well-being and better mental health than those with low-quality connections. Individuals with low-quality relationships due to not being socially connected to others have been linked to several mental health concerns, including depression, low self-esteem and non-specific psychological distress (Lakey & Cronin, 2008). Secondly, the author of this thesis believes that individuals who have exposure to the modified 4Cs model will be more aware of the psychosocial constructs that bind dyadic partners. A greater understanding of the constructs' dimensions will better help the individual navigate the leader-member relationship. Hence, this would provide a greater awareness and education of the relationships inner workings, which will

provide the individual with more strategies to improve the quality of their dyadic relationship. A more in-depth dyadic model may provide a greater awareness of establishing and maintaining high-quality relationships in the workplace.

To date, research has failed to recognise the complete picture of what constructs constitute a high-quality leader-member relationship. Instead, unvalidated studies claim that leader-member relationship quality consists of either mutual liking, trust, respect and influence grounded in Role Theory or mutual liking, trust, respect and obligation grounded in SET are relied on. Based on the findings of this thesis, more constructs and dimensions need to be considered. Employing research methodology with combined quantitative and qualitative data analysis has allowed for the transformation of a conceptual framework that considers the participants' direct and meta-perspective to be transformed into a tangible dyadic model. The consolidation of utilising Interdependence Theory, the constructs of closeness (emotions), commitment (cognitions), complementarity (behaviours), and co-orientation in an interconnected dyadic model to understand the quality and content of the leader-member relationship is considered necessary in advancing dyadic relationships. The modified 4Cs model allows individuals to be more aware of the psychosocial makeup of their leader-member relationship, therefore, providing greater interconnection to their dyadic partners. The recipients of high-quality relationships demonstrate increased self-confidence (Jowett, 2005), self-efficacy (Bandura, 1997), motivation (Adie & Jowett, 2010), team efficacy (Jowett & Chaundy, 2004) and inspire dyadic partners to work harder to produce greater levels of productivity (Xesha et al., 2014).

7.3 Limitations

There are three main limitations throughout this thesis that need to be acknowledged:

1. Sample selection
2. Participant availability due to COVID-19 pandemic
3. Narrow context of industry

Narrow context of industry A purposive sample strategy was adopted throughout this thesis. The selection of similar participants to investigate a specific phenomenon has advantages and disadvantages compared to probability samples. Study One utilised New Zealand representative coaches and athletes. Study Two and Three used leaders and members from a national sport organisation in New Zealand. The samples share similar contextual nuances and behavioural traits within their specific environment, yet, a homogenous sample can be considered disadvantaged concerning generalisability. The lack of diversity in the sample population may provide inadequate information for considering age, ethnicity, gender and sexual orientation. Probability samples are unbiased and provide generalisability. However, they offer significant challenges to facilitate as they require greater resourcing, funds, and time (Onwuegbuzie & Collins, 2007). A purposive sample is considered appropriate when resources are limited and when there are a limited number of data sources. As in this case, a limited number of sport administrators work full-time in national sport organisations. For the purpose of this thesis, the study's objectives and research questions informed the most appropriate course of action in choosing a sample strategy, especially during the challenging times we faced due to Covid.

Together with deciding how to select the samples for the three studies, researchers adopting a mixed methods approach should also determine appropriate sample sizes for each quantitative and qualitative phase. The sample size for the quantitative and qualitative studies met acceptable sample sizes. The number of participants reported for Chapter Four (Study One) required the sample size per free parameters ratio was met. However, a small sample size affects Chi-square statistics, and RMSEA tends to over-reject true population models (Hu & Bentler, 1999), which is evident in existing CART-Q research (Balduck & Jowett, 2010; Jowett & Ntoumanis, 2004). Future quantitative studies examining the validity and reliability of the CART-Q-R would benefit from more than 240 participants and the utilisation of Rasch analysis. A significant advantage of Rasch analysis over CTT is that it distinguishes between the items' level of difficulty (the item parameter) on the latent construct and the person's ability or propensity to endorse the item (the person parameter). Additionally, polytomous Rasch analysis attends to Likert-style questionnaires allowing the model to determine whether the data in sequential categories reflects the increased property of the construct (Andrich, 1998). This would increase the precision of the validity and reliability of both CART-Q versions to be incorporated into the coach-athlete relationship literature.

The sample size of participants used in the qualitative studies in Study Two and Three met the sample size requirements for the type of methodology facilitated. However, when conducting theory-based interview studies (i.e., Study Two), Francis et al. (2010) recommend a minimum sample size of 13 participants. The initial analysis consists of 10, followed by the second round of 3 to determine if data saturation is reached. The sample size for Study Three was guided by cognitive interviewing techniques and

analysis, as suggested by Willis (1999). The notion of data saturation is when no new themes emerge from the data analysis. This was used as a guide for justification to determine sample size in Study Two and Three. Although acceptable standards were met and have set a foundation for the modified 4Cs relationship model and the CART-Q-R to be developed, more significant numbers of participants would provide more robustness to the framework.

Participant availability was the second limitation that required further attention. The 2020 COVID-19 pandemic and the New Zealand Government enforced lockdown proceedings for the country mandating physical distancing did not allow for all interviews to be conducted face-to-face. Hence the studies facilitated in Chapters 5 (Study Two) and 6 (Study Three) provided limited access to the participants.

Nevertheless, the advent of video conference services and audio recording tools provided convenience, accessibility, and time-saving with no travel requirements to participate in the study.

Lastly, this study has held a narrow focus on completing the series of studies with one national sport organisation, Hockey New Zealand. The contextual nuance of the relationship type and the environment may impact the relational perspectives of the participants. However, the sports industry in New Zealand is a multi-billion dollar industry and is considered an essential contributor to the international political and economic stage that significantly strengthens the domestic economy (Shilbury & Ferkins, 2011). Thus, many national sport organisations are established and operationalised using standard business structures and practices.

7.4 Future Research

This thesis aimed to test whether the conceptualisation of the 4Cs model of the coach-athlete relationship (Jowett, 2007), as measured by the Coach-Athlete Relationship Questionnaire (CART-Q), is an appropriate model to examine the corresponding dyad between a leader and a member in a work context. Additionally, the thesis sought to determine if the 4Cs relationship model and associated self-reporting tool (the CART-Q) more fully represent the structure, content and processes originally offered by LMX theorists when examining the quality of leader-member relationships. In some way, the study held a focus that was narrow, giving little attention to the leader-member relationship in a workplace setting outside sport.

To attend to the narrow scope of this thesis, further research should examine the structure, content and processes of high-quality leader-member relationships in a multitude of cultural settings and industry and organisational types (e.g., academia, emergency services, medicine, commerce, financial and professional services). This may shed light on the contextual nuance of leader-member relationships in different settings and types.

As highlighted in previous chapters, the 4Cs model has been modified to meet the structure and content of the leader-member relationship. An unexpected finding of the thesis is that mutual liking was not identified as an essential dimension of the leader-member relationship. However, mutual liking was exposed as a cause for concern in Studies One, Two and Three. The qualitative analysis from studies two and three revealed that mutual liking might not be an essential dimension of high-quality leader-member relationships. In study one, when investigating the factor structures of

the original CART-Q, the examination of modification misspecification through modification indices, ill-fit of item one, "I like my coach/ athlete", and item six, "I am close to my coach/ athlete" was evidenced. The error covariance between the items is not unique compared to previous studies. A study completed by Balduck et al. (2011) identified the same concern yet suggested that this finding was potentially a result of cultural nuance; however, that is highly unlikely as study one's participants were from a culturally different cohort. These findings suggest that the participants had difficulties discerning the difference between the meaning of emotional liking and giving cognitive consideration to being close to one's dyadic partner.

All coach-athlete relationship research utilising the 3Cs or 4Cs relationship model proposed by Jowett and colleagues found mutual liking is an integral dimension of emotional closeness. Mutual liking (affect) has also been consistently identified as a core dimension of developing leader-member relationships utilising Role Theory and SET throughout the evolution of LMX Theory (Dienesch & Liden, 1986). Previous research examining early social exchanges between leaders and members determined that liking one's dyadic partner was positively correlated to the perceptions of the quality of leader-member relationships (Liden et al., 1997). Dulebohn et al. (2017) recently investigated whether liking should be included as an essential dimension of LMX after noticing a decline in the inclusion of liking in research on leader-member relationships since the turn of the century. Dulebohn and colleagues believe that although there was diminished scholarly attention to liking, it should not be considered redundant when examining LMX research.

This thesis is the first body of research to comprehensively demonstrate that the dimension of mutual liking may not be as important as other dimensions when

examining the quality of leader-member relationships. It is important to note that the thesis findings do not suggest that mutual liking is not taking place between the leaders and members. Nevertheless, the participants in the qualitative studies did not articulate the need for mutual liking.

A couple of considerations require further attention before the generalisability of the results can be inferred. As discussed in Chapter 5 (Study Two), mutual liking comes from a place of self-interest (Baryła, 2014); therefore, there may be some other behaviours in the organisation or the team for self-interest not to be exposed in the leader-member relationships. Although this significant finding does not support previous studies, studies one, two, and three utilised different methodologies and cohorts to strengthen the validity of the claims made in this thesis.

Newly identified psychosocial constructs that were previously not identified within the field of LMX research, including integrity, role modelling and openness, have produced a more accurate picture of the structure and content of leader-member relationships. The author of this thesis recognises that although the studies have demonstrated contextual nuance, a modified 4Cs model and the CART-Q-R examine the leader-member relationship in greater detail than ever suggested.

Future research adopting the CART-Q-R process to determine the dyadic partners' perspectives simultaneously will offer researchers a more complete picture of what is happening within the relationship. Therefore, previous calls to question the levels of analysis at which LMX research should be considered must be attended to. This thesis claims that much work is still to be done at a dyadic level of analysis before a group level should be considered. This series of studies have gone some way to suggest an

alternative approach. However, the CART-Q-R in its current form requires further testing in many organisational contexts to establish the validity and reliability of the psychometric tool and attend to the lack of generalisability.

7.5 Conclusion

This thesis provides LMX, leadership and organisational psychology researchers with the opportunity to understand better the structure, content and processes of examining leader-member relationship quality. An attempt was made to provide an alternative approach to examine LMX relationship quality to advance leader-member relationship research. The modified 4Cs model and the CART-Q-R may more accurately represent and capture the dyadic relationship through a lens of reciprocity. Utilising a greater breadth and depth of psychological constructs than previously considered. As a result of the findings of this thesis, a new self-reporting tool has been created. It claims that dyadic relationships should include reciprocity to encapsulate the leaders' and the members' emotions, cognitions, and behaviours. These social exchanges are mutually and causally interconnected between the leaders and the members in a workplace setting.

It is evident from the research presented in Chapter Two of this thesis (Gooty & Yammarino, 2016; Gottfredson et al., 2020; Schriesheim et al., 2001) that there is some consensus among LMX researchers that the direct perspective of an individual, be it from the leader or the member, of the dyadic partnership is adequate to understand the simultaneous social exchanges between a leader and a member. This study has found that a single individual cannot offer a complete picture of the leader-member relationship and agrees with those who argue that LMX research rarely

considers both dyadic partners in the assessment process of leader-member relationship quality (Sin et al., 2009). According to reports, most LMX measures originate at the individual level (Gooty et al., 2012). Therefore do not measure the relationship from a dyadic approach but may offer insight into how one individual perceives the quality of the relationship. Hence moving the attention away from broad single-participant paradigms to more holistic and contemporary considerations addressing the importance of capturing the interpersonal nature of the dyadic relationship will help advance relationship-centred theory and our understanding of leader-member relationship quality. Researchers such as Epitropaki et al. (2017) have acknowledged that a high level of interdependence characterises the leader-member relationship and that Interdependence theory may be an appropriate approach to future LMX research.

As highlighted earlier, there is a significant difference in the confidence levels researchers have articulated about the conceptualisation and operationalisation of LMX and the 4Cs relationship model. Both relationship-centred models had set out to establish mechanisms to focus on the quality of dyadic relationships and agree that high-quality relationships are essential to dyadic partners' goals, success, and performance. Although LMX is a widely researched approach to understanding leadership (Yamminaro et al., 2005), much criticism has emerged around the levels of analysis, theory, hypothesis development, construct usage, and measurement (Gooty et al., 2012). The evolution of the LMX model would appear ambiguous, lacks scientific rigour, and does not have the same breadth and depth of psychometric constructs that the CART-Q-R may offer. The LMX questionnaires do not genuinely reflect both parties'

direct and meta-perspectives of the relationship and are, therefore, non-dyadic and may not adequately measure the complete picture of the quality of the relationship.

In contrast to LMX, as detailed in previous chapters, Jowett and colleagues have defined, conceptualised and operationalised the 4Cs model. The model and measures have been tested in various contexts, including sports coaching, executive coaching, and teaching environments. Gottfredson et al. (2020) articulate that due to the issues LMX presents in theory alignment, problems with conceptualisation, measures and levels of analysis, the best way to advance Leader-Member Exchange is to start over and go back to the drawing board. This thesis suggests that an alternative framework is a more appropriate approach to relook at LMX. As suggested in this thesis, the modified 4Cs model and the CART-Q-R attend to researchers' criticisms of the conceptualisation and operationalisation of LMX Theory. Utilising an *a priori* framework, combining quantitative and qualitative research methodology and adopting contemporary data analysis techniques have provided a precise series of constructs representing the inner workings of the interpersonal connection between leaders and members. The findings of this thesis provide a transparent and ordered approach to providing an alternative framework to assess the quality of leader-member relationships. A modified 4Cs relationship model and the associated CART-Q-R are comprehensive regarding the breadth and depth of the interpersonal constructs (see Figure 6); dyadic partners answer questions that require direct and meta-perspective examination.

The agreement and disagreement between the parties' answers can measure the actual similarity of the relationship, assumed similarity, and empathic accuracy,

resulting in a better understanding of the relationship's dyadic partners' emotions of closeness, cognitions of commitment, and complementary behaviours.

This thesis makes several theoretical contributions to LMX, leadership and organisational psychology literature. Theoretically, the research draws on the close relationship literature and provides novel insights into relationship-centred leadership approaches. The findings of the three studies of this thesis provide evidence for integrating Interdependence Theory, a modified 4Cs model, and the CART-Q-R as an alternative approach to better understand the structure, content, and process of leader-member relationships in the workplace and relationship-centred leadership literature. By drawing attention to the need to consider both parties in assessing relationship quality and the importance of reciprocity, this thesis promotes a higher level of knowledge and understanding relevant to the significance of contemporary psychosocial constructs of the leader-member relationship (see Figure 6).

Figure 6:

Leader-member relationships in the workplace utilising Interdependence Theory, a modified 4Cs relationship model and proposed CART-Q-R.

Leader-Member Relationships in the Workplace					
Role Theory		Social Exchange Theory		Interdependence Theory	
Definition: Unknown		Definition: Unknown		Definition: Leaders and members are mutually and causally connected through their emotions, cognitions and behaviours	
Constructs		Constructs		Constructs – Modified 4Cs (Closeness, Commitment, Complementarity and Co-orientation)	
Affect	Mutual Liking Trust Respect	Affect	Mutual Liking Trust Respect	Emotions	Closeness – (Trust, Respect, Appreciation, Belief and Mutual Care)
	Influence		Obligation	Cognitions	Commitment – (Being Committed, Thoughts of Closeness, Helping and Integrity)
				Behaviours	Complementarity – (Role Modelling, Being Responsive, Ready to do One's Best, Friendliness and Initiates Open Conversations)
				Perceptual Consensus	Co-orientation – (Information Exchange, Self-Disclosure, Influence and Acceptance)

Within the structure and expectations of a PhD, it is now evident that four years of study cannot invalidate the research LMX researchers have undertaken for the past 45 years. Especially a theory that has been described as the foremost dyadic approach to leadership (Erdogan & Bauer, 2014). A highly influential leadership theory (Day & Miscenko, 2016), one of the most popular lines of leadership research (Epitropaki & Martin, 2016), and the archetypal social exchange leader-follower dyadic approach (Dinh et al., 2014). LMX research has played a critical part in promoting the notion that leaders and members develop unique relationships and that the social exchanges causally and mutually connect the dyadic partners. The present study's findings lead to the conclusion that each individual's emotions, cognitions, and behaviours are critical factors in representing the social exchanges of the leader-member relationship. The CART-Q-R, in its current form, now enables researchers to quantitatively examine the content validity and reliability of the self-reporting tool with leaders and member in diverse workplace settings.

References

- Ada, E. N., Ahmad, H., Uzun, N. B., Jowett, S., & Kazak, Z. (2021). Cross-cultural adaptation of the Turkish and Kuwaiti teacher–student relationship questionnaire in physical education (TSRQ-PE Teacher Version): Testing for measurement invariance. *Sustainability*, *13*(3), 1387.
- Adie, J. W., & Jowett, S. (2010). Meta-perceptions of the coach–athlete relationship, achievement goals, and intrinsic motivation among sport participants. *Journal of Applied Social Psychology*, *40*(11), 2750-2773.
- Ahmad, H. (2014). *The coach-athlete relationship in the Middle East: Cultural considerations* https://repository.lboro.ac.uk/articles/The_coach-athlete_relationship_in_the_Middle_East_cultural_considerations/9609650
- Alagumalai, S., Curtis, D. D., & Hungi, N. (2005). *Applied Rasch measurement: A book of exemplars*. Springer.
- Andrich, D. (1978). A rating formulation for ordered response categories. *Psychometrika*, *43*(4), 561-573.
- Andrich, D. (1998). Understanding ordered category response data from the perspective of the Rasch model. *Education Research and Perspectives*, *25*(2), 25.
- Andrich, D., Sheridan, B., & Luo, G. (2009). RUMM 2030 (Beta Version for Windows) Perth. *Western Australia: RUMM Laboratory Pty Ltd*.
- Ashkanasy, N. M., Paulsen, N., & Tee, E. Y. J. (2012). Extending relational leadership theory: The role of affective process in shaping leader-follower relationships. In (pp. 335-359). Information Age Publishing.
- Baldock, A., & Jowett, S. (2010). Psychometric properties of the Belgian coach version of the coach–athlete relationship questionnaire (CART-Q). *Scandinavian Journal of Medicine & Science in Sports*, *20*(5), 779-786.
- Baldock, A., Jowett, S., & Buelens, M. (2011). Factorial and predictive validity of the Belgian (Dutch) Athlete version of the Coach-Athlete Relationship Questionnaire (CART-Q). *International Journal of Sport Psychology*, *42*(2), 204-226.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*: . W H Freeman/Times Books/ Henry Holt & Co.
- Barnard, A. (2011). The competencies of integrity. *Journal of Psychology in Africa*, *21*(2), 267-273.
- Baryła, W. (2014). Liking goes from the perceiver’s self-interest, but respect is socially shared. *Polish Psychological Bulletin*, *45*(4), 402-410.
- Bauer, T. N., Erdogan, B., Liden, R. C., & Wayne, S. J. (2006). A longitudinal study of the moderating role of extraversion: Leader-member exchange, performance, and turnover during new executive development. *Journal of Applied Psychology*, *91*(2), 298.
- Beatty, P. C., & Willis, G. B. (2007). Research synthesis: The practice of cognitive interviewing. *Public Opinion Quarterly*, *71*(2), 287-311.
- Bennie, A., & O'Connor, D. (2012). Perceptions and strategies of effective coaching leadership: A qualitative investigation of professional coaches and players. *International Journal of Sport and Health Science*, 201-222.
- Bentler, P. M. (1995). *EQS structural equations program manual* (Vol. 6). Multivariate Software Encino, CA.

- Bernerth, J. B., Armenakis, A. A., Feild, H. S., Giles, W. F., & Walker, H. J. (2007). Leader–member social exchange (LMSX): Development and validation of a scale. *Journal of Organizational Behavior, 28*(8), 979-1003.
- Bernerth, J. B., Armenakis, A. A., Feild, H. S., Giles, W. F., & Walker, H. J. (2008). The influence of personality differences between subordinates and supervisors on perceptions of LMX: An empirical investigation. *Group & Organization Management, 33*(2), 216-240.
- Berscheid, E. (1999). The greening of relationship science. *American Psychologist, 54*(4), 260.
- Berscheid, E., Snyder, M., & Omoto, A. M. (1989). The Relationship Closeness Inventory: Assessing the closeness of interpersonal relationships. *Journal of personality and Social Psychology, 57*(5), 792.
- Bhal, K. T., & Ansari, M. A. (1996). Measuring quality of interaction between leaders and members. *Journal of Applied Social Psychology, 26*(11), 945-972.
- Bishop, F. L. (2015). Using mixed methods research designs in health psychology: An illustrated discussion from a pragmatist perspective. *British Journal of Health Psychology, 20*(1), 5-20.
- Boeije, H., & Willis, G. (2013). The cognitive interviewing reporting framework (CIRF). *Methodology*.
- Carron, A. V., & Bennett, B. B. (1977). Compatibility in the Coach-Athlete Dyad. *Research Quarterly. American Alliance for Health, Physical Education and Recreation, 48*(4), 671-679. <https://doi.org/10.1080/10671315.1977.10615479>
- Chelladurai, P. (1978). *A multidimensional model of leadership* University of Waterloo]. Waterloo, Ontario.
- Chelladurai, P., & Haggerty, T. R. (1978). A normative model of decision styles in coaching. *Athletic administrator, 13*(2), 6-9.
- Chelladurai, P., Imamura, H., Yamaguchi, Y., Oinuma, Y., & Miyauchi, T. (1988). Sport leadership in a cross-national setting: The case of Japanese and Canadian university athletes. *Journal of Sport and Exercise Psychology, 10*(4), 374-389.
- Chelladurai, P., & Saleh, S. (1980). Dimensions of leader behavior in sports: Development of a leadership scale. *Journal of Sport and Exercise Psychology, 2*(1), 34-45.
- Chernyak-Hai, L., & Rabenu, E. (2018). The new era workplace relationships: Is social exchange theory still relevant? *Industrial and Organizational Psychology, 11*(3), 456-481.
- Cheung, M. F., & Wu, W.-P. (2012). Leader-member exchange and employee work outcomes in Chinese firms: the mediating role of job satisfaction. *Asia Pacific Business Review, 18*(1), 65-81.
- Cogliser, C. C., Schriesheim, C. A., Scandura, T. A., & Gardner, W. L. (2009). Balance in leader and follower perceptions of leader–member exchange: Relationships with performance and work attitudes. *The Leadership Quarterly, 20*(3), 452-465.
- Collins, D. (2014). *Cognitive interviewing practice*. Sage.
- Contreira, A. R., Andrade do Nascimento Junior, J. R., Pizzo, G. C., Siteo, S. A., Moreira, C. R., Jowett, S., & Fiorese, L. (2019). Psychometric properties of the Brazilian version of the Coach–Athlete Relationship Questionnaire for coaches. *International Journal of Sports Science & Coaching. <https://doi.org/10.1177/1747954119832715>*

- Creswell, J. W., & Clark, V. L. P. (2017). *Designing and conducting mixed methods research*. Sage publications.
- Creswell, J. W., & Plano Clark, V. L. (2011). Choosing a mixed methods design. *Designing and conducting mixed methods research, 2*, 53-106.
- Currie, C., Young, B. W., & Callary, B. (2021). Mutuality in a coached adult sport team: the masters team sport model of interdependence. *Sports Coaching Review, 1*-26.
- Dansereau, F. (1995). A dyadic approach to leadership: Creating and nurturing this approach under fire. *The Leadership Quarterly, 6*(4), 479-490.
- Dansereau, F., Graen, G., & Haga, W. J. (1975). A vertical dyad linkage approach to leadership within formal organizations: A longitudinal investigation of the role making process. *Organizational behavior and human performance, 13*(1), 46-78.
- Dansereau Jr, F., Cashman, J., & Graen, G. (1973). Instrumentality theory and equity theory as complementary approaches in predicting the relationship of leadership and turnover among managers. *Organizational Behavior and Human Performance, 10*(2), 184-200.
- Davis, L., & Jowett, S. (2010). Investigating the interpersonal dynamics between coaches and athletes based on fundamental principles of attachment. *Journal of Clinical Sport Psychology, 4*(2), 112-132.
- Davis, L., Jowett, S., & Lafrenière, M. K. (2013). An attachment theory perspective in the examination of relational processes associated with coach-athlete dyads. *Journal of Sport and Exercise Psychology, 35*(2), 156-167.
- Day, D. V., & Miscenko, D. (2016). Leader-member exchange (LMX): Construct evolution, contributions, and future prospects for advancing leadership theory.
- De Waal, A. A. (2007). The characteristics of a high performance organization. *Business Strategy Series, 8*(3), 179-185.
- Dienesch, R. M., & Liden, R. C. (1986). Leader-member exchange model of leadership: A critique and further development. *Academy of Management Review, 11*(3), 618-634.
- Dinh, J. E., Lord, R. G., Gardner, W. L., Meuser, J. D., Liden, R. C., & Hu, J. (2014). Leadership theory and research in the new millennium: Current theoretical trends and changing perspectives. *The Leadership Quarterly, 25*(1), 36-62.
- Doherty, A. (2013). Investing in sport management: The value of good theory. *Sport Management Review, 16*(1), 5-11.
- Dragan, D., & Topolšek, D. (2014). Introduction to structural equation modeling: review, methodology and practical applications. The International Conference on Logistics & Sustainable Transport,
- Dulebohn, J. H., Bommer, W. H., Liden, R. C., Brouer, R. L., & Ferris, G. R. (2012). A meta-analysis of antecedents and consequences of leader-member exchange: Integrating the past with an eye toward the future. *Journal of Management, 38*(6), 1715-1759.
- Dulebohn, J. H., Wu, D., & Liao, C. (2017). Does liking explain variance above and beyond LMX? A meta-analysis. *Human Resource Management Review, 27*(1), 149-166.
- Eby, L. T., & Robertson, M. M. (2020). The psychology of workplace mentoring relationships. *Annual Review of Organizational Psychology and Organizational Behavior, 7*, 75-100.

- Epitropaki, O., & Martin, R. (2005). From ideal to real: A longitudinal study of the role of implicit leadership theories on leader-member exchanges and employee outcomes. *Journal of Applied Psychology, 90*(4), 659.
- Epitropaki, O., & Martin, R. (2016). LMX and work attitudes: is there anything left unsaid or unexamined? In T. N. B. B. Erdogan (Ed.), *The Oxford Handbook of Leader-Member Exchange*. Oxford University Press.
<https://doi.org/10.1093/oxfordhb/9780199326174.013.4>
- Epitropaki, O., Martin, R., & Thomas, G. (2017). Relational leadership. *The Nature of Leadership, 109-137*.
- Erdogan, B., & Bauer, T. N. (2014). Leader-member exchange (LMX) theory: The relational approach to leadership. In *The Oxford Handbook of Leadership and Organizations* (pp. 407-434). Oxford University Press.
- Erdogan, B., & Liden, R. C. (2002). Social exchanges in the workplace. *Leadership, 65*, 114.
- Feeney, B. C., & Collins, N. L. (2015). A new look at social support: A theoretical perspective on thriving through relationships. *Personality and Social Psychology Review, 19*(2), 113-147.
- Felton, L., & Jowett, S. (2013). Attachment and well-being: The mediating effects of psychological needs satisfaction within the coach-athlete and parent-athlete relational contexts. *Psychology of Sport and Exercise, 14*(1), 57-65.
- Fletcher, J. K. (2012). The relational practice of leadership.
- Flora, D. B., & Curran, P. J. (2004). An empirical evaluation of alternative methods of estimation for confirmatory factor analysis with ordinal data. *Psychological Methods, 9*(4), 466.
- Fox, N. J. (2008). Postpositivism. *The SAGE encyclopedia of qualitative research methods, 2*, 659-664.
- Gerstner, C. R., & Day, D. V. (1997). Meta-analytic review of leader-member exchange theory: Correlates and construct issues. In: American Psychological Association.
- Gooty, J., Serban, A., Thomas, J., Gavin, M., & Yammarino, F. (2012). Use and misuse of levels of analysis in leadership research: An illustrative review of leader-member exchange. *The Leadership Quarterly, 23*(6), 1080-1103.
- Gooty, J., & Yammarino, F. (2016). The leader-member exchange relationship: A multisource, cross-level investigation. *Journal of Management, 42*(4), 915-935.
- Gottfredson, R. K., Wright, S. L., & Heaphy, E. D. (2020). A critique of the leader-member exchange construct: Back to square one. *The Leadership Quarterly, 31*(6), 101385.
- Graen, G., & Cashman, J. (1975). A role-making model of leadership in formal organizations: A developmental approach. *Leadership Frontiers, 143*, 165.
- Graen, G., Liden, R., & Hoel, W. (1982). Role of leadership in the employee withdrawal process. *Journal of applied psychology, 67*(6), 868.
- Graen, G., Novak, M. A., & Sommerkamp, P. (1982). The effects of leader-member exchange and job design on productivity and satisfaction: Testing a dual attachment model. *Organizational Behavior and Human Performance, 30*(1), 109-131.
- Graen, G., & Scandura, T. (1987). Toward a psychology of dyadic organizing. *Research in Organizational Behavior, 9*(175-208).
- Graen, G., & Schiemann, W. (1978). Leader-member agreement: A vertical dyad linkage approach. *Journal of Applied Psychology, 63*(2), 206.

- Graen, G., & Uhl-Bien, M. (1995). Relationship-based approach to leadership: Development of leader-member exchange (LMX) theory of leadership over 25 years: Applying a multi-level multi-domain perspective. *The Leadership Quarterly*, *6*(2), 219-247.
- Graen, G. B., Liden, R. C., & Hoel, W. (1982). Role of leadership in the employee withdrawal process. *Journal of Applied Psychology*, *67*(6), 868.
- Gwynne, J. L. (2014). *The effects of low-quality LMX dyads on subordinate perceptions of organizational justice and organizational commitment: A phenomenological investigation* [Capella University].
- Hackett, R. D., Farh, J.-L., Song, L. J., & Lapierre, L. M. (2003). LMX and organizational citizenship behavior: Examining the links within and across Western and Chinese samples. *Dealing with Diversity*, *1*, 219-231.
- Harris, K. J., Wheeler, A. R., & Kacmar, K. M. (2009). Leader-member exchange and empowerment: Direct and interactive effects on job satisfaction, turnover intentions, and performance. *The Leadership Quarterly*, *20*(3), 371-382.
- Hinde, R. A. (1997). *Relationships: A dialectical perspective*. Psychology Press.
- Horne, T., & Carron, A. V. (1985). Compatibility in coach-athlete relationships. *Journal of Sport Psychology*, *7*(2), 137-149.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1-55.
- Hwa, A. M. C., Jantani, M., & Ansari, M. A. (2009). Supervisor vs. subordinate perception on leader-member exchange quality: a Malaysian perspective. *International Journal of Business and Management*, *4*(7), 165.
- Ilies, R., Nahrgang, J. D., & Morgeson, F. P. (2007). Leader-member exchange and citizenship behaviors: A meta-analysis. *Journal of Applied Psychology*, *92*(1), 269.
- Jöreskog, K. G., & Sörbom, D. (1993). *LISREL 8: Structural equation modeling with the SIMPLIS command language*. Scientific Software International.
- Joseph, D. L., Newman, D. A., & Sin, H.-P. (2011). Leader–Member Exchange (LMX) measurement: Evidence for consensus, construct breadth, and discriminant validity. *Building Methodological Bridges. Research Methodology in Strategy and Management*, *6*, 89-135.
- Jowett, S. (2001). *The psychology of interpersonal relationships in sport: the coach-athlete relationship* [University of Exeter]. Unpublished manuscript.
- Jowett, S. (2003a). When the “Honeymoon” Is Over: A Case Study of a Coach-Athlete Dyad in Crisis. *The Sport Psychologist*, *17*(4), 444.
<https://doi.org/10.1123/tsp.17.4.444>
- Jowett, S. (2003b). When the honeymoon is over: A case study of a coach-athlete relationship in crisis. *Sport Psychologist*, *17*, 444-460.
<https://doi.org/10.1123/tsp.17.4.444>
- Jowett, S. (2005). On repairing and enhancing the coach-athlete relationship. *The psychology of coaching*, 14-26.
- Jowett, S. (2006a). Interpersonal and Structural features of Greek Coach-Athlete dyads Performing in Individual Sports. *Journal of applied sport psychology*, *18*, 69-81.
<https://doi.org/10.1080/10413200500471335>
- Jowett, S. (2006b). Interpersonal and structural features of Greek coach–athlete dyads performing in individual sports. *Journal of Applied Sport Psychology*, *18*(1), 69-81. <https://doi.org/10.1080/10413200500471335>

- Jowett, S. (2007). Interdependence analysis and the 3+ 1Cs in the coach-athlete relationship. In S. J. D. Lavalley (Ed.), *Social Psychology in Sport* (pp. 15-27). Human Kinetics.
- Jowett, S. (2009a). Factor structure and criterion-related validity of the metaperspective version of the Coach-Athlete Relationship Questionnaire (CART-Q). *Group Dynamics: Theory, Research, and Practice*, 13(3), 163.
- Jowett, S. (2009b). Validating coach-athlete relationship measures with the nomological network. *Measurement in Physical Education and Exercise Science*, 13(1), 34-51.
- Jowett, S., & Carpenter, P. (2015). The concept of rules in the coach-athlete relationship. *Sports Coaching Review*, 4(1), 1-23.
- Jowett, S., & Chaundy, V. (2004). An investigation into the impact of coach leadership and coach-athlete relationship on group cohesion. *Group Dynamics: Theory, Research, and Practice*, 8(4), 302.
- Jowett, S., & Cockerill, I. M. (2003). Olympic medallists' perspective of the athlete-coach relationship. *Psychology of Sport and Exercise*, 4(4), 313-331.
- Jowett, S., & Frost, T. (2007). Race/ethnicity in the all-male coach-athlete relationship: Black footballers' narratives. *International Journal of Sport and Exercise Psychology*, 5(3), 255-269.
- Jowett, S., Kanakoglou, K., & Passmore, J. (2012). The application of the 3+ 1Cs relationship model in executive coaching. *Consulting Psychology Journal: Practice and Research*, 64(3), 183.
- Jowett, S., & Meek, G. A. (2000). The coach-athlete relationship in married couples: An exploratory content analysis. *The Sport Psychologist*, 14(2), 157-175.
- Jowett, S., & Nezelek, J. (2012). Relationship interdependence and satisfaction with important outcomes in coach-athlete dyads. *Journal of Social and Personal Relationships*, 29(3), 287-301.
- Jowett, S., & Ntoumanis, N. (2003). The Greek coach-athlete relationship questionnaire (Gr CART-Q): Scale construction and validation. *International Journal of Sport Psychology*, 34(2), 101-124.
- Jowett, S., & Ntoumanis, N. (2004). The coach-athlete relationship questionnaire (CART-Q): Development and initial validation. *Scandinavian Journal of Medicine & Science in Sports*, 14(4), 245-257.
- Jowett, S., O'Broin, A., & Palmer, S. (2010). On understanding the role and significance of a key two-person relationship in sport and executive coaching. *Sport & Exercise Psychology Review*, 6(2), 19-30.
- Jowett, S., & Shanmugam, V. (2016). Relational coaching in sport: Its psychological underpinnings and practical effectiveness. In *Routledge international handbook of sport psychology* (pp. 471-484). Routledge/Taylor & Francis Group.
- Kelley, H. H., Berscheid, E., Christensen, A., Harvey, J. H., Huston, T. L., Levinger, G., McClintock, E., Peplau, L. A., & Peterson, D. R. (1983). Analyzing close relationships. *Close Relationships*, 20, 67.
- Kelley, H. H., Holmes, J. G., Kerr, N. L., Reis, H. T., Rusbult, C. E., & Van Lange, P. A. M. (2003). An atlas of interpersonal situations. 10.1017. CBO9780511499845.
- Kelley, H. H., & Thibaut, J. W. (1978). *Interpersonal relations: A theory of interdependence*. John Wiley & Sons.
- Kenny, D. A., & Acitelli, L. K. (2001). Accuracy and bias in the perception of the partner in a close relationship. *Journal of personality and Social Psychology*, 80(3), 439.
- Kenny, D. A., Kashy, D. A., & Cook, W. L. (2006). *Dyadic data analysis*. Guilford Press.

- Kersten, P., & Kayes, N. M. (2011). Outcome measurement and the use of Rasch analysis, a statistics-free introduction. *New Zealand Journal of Physiotherapy*, 39(2), 92-99.
- Kiesler, D. J. (1983). The 1982 interpersonal circle: A taxonomy for complementarity in human transactions. *Psychological Review*, 90(3), 185.
- Kiesler, D. J. (1997). Contemporary interpersonal theory and research: personality, psychopathology, and psychotherapy. *The Journal of psychotherapy practice and research*, 6(4), 339.
- Kim, B., & George, R. T. (2005). The relationship between leader-member exchange (LMX) and psychological empowerment: A quick casual restaurant employee correlation study. *Journal of Hospitality & Tourism Research*, 29(4), 468-483.
- Kozlowski, S. W., & Doherty, M. L. (1989). Integration of climate and leadership: Examination of a neglected issue. *Journal of Applied Psychology*, 74(4), 546.
- Lafrenière, M. K., Jowett, S., Vallerand, R. J., & Carbonneau, N. (2011). Passion for coaching and the quality of the coach–athlete relationship: The mediating role of coaching behaviors. *Psychology of Sport and Exercise*, 12(2), 144-152.
- Lafrenière, M. K., Jowett, S., Vallerand, R. J., Donahue, E. G., & Lorimer, R. (2008). Passion in sport: On the quality of the coach–athlete relationship. *Journal of Sport and Exercise Psychology*, 30(5), 541-560.
- Laing, R. D., Phillipson, H., & Lee, A. R. (1966). Interpersonal perception: a theory and a method of research.
- Lakey, B., & Cronin, A. (2008). Low social support and major depression: Research, theory and methodological issues. In I. K. S. D. D. J. A. D. (Eds.) (Ed.), *Risk Factors in Depression* (pp. 385-408). Elsevier Academic Press.
<https://doi.org/10.1016/B978-0-08-045078-0.00017-4>
- Li, F., & Harmer, P. (1996). Confirmatory factor analysis of the Group Environment Questionnaire with an intercollegiate sample. *Journal of Sport and Exercise Psychology*, 18(1), 49-63.
- Liden, R. C., Anand, S., & Vidyarthi, P. (2016). Dyadic relationships. *Annual Review of Organizational Psychology and Organizational Behavior*, 3, 139-166.
- Liden, R. C., & Graen, G. (1980). Generalizability of the vertical dyad linkage model of leadership. *Academy of Management Journal*, 23(3), 451-465.
- Liden, R. C., & Maslyn, J. M. (1998). Multidimensionality of leader-member exchange: An empirical assessment through scale development. *Journal of Management*, 24(1), 43-72.
- Liden, R. C., Sparrowe, R. T., & Wayne, S. J. (1997). Leader-member exchange theory: The past and potential for the future. *Research in Personnel and Human Resources Management*, 15, 47-120.
- Liden, R. C., Wu, J., Cao, A. X., & Wayne, S. J. (2015). Leader-member exchange measurement. *The Oxford Handbook of Leader-Member Exchange*, 29-54.
- López-Jiménez, A., Rubio, V. J., Sánchez-Iglesias, I., & Jowett, S. (2017). Validating the TDRT-Q to assess the quality of the teacher-dancer relationship. *Revista de Psicología del Deporte*, 26(2), 71-79.
- Lorimer, R., & Jowett, S. (2009). Empathic accuracy, meta-perspective, and satisfaction in the coach-athlete relationship. *Journal of Applied Sport Psychology*, 21(2), 201-212.
- Lundgren, Å. N., & Tennant, A. (2011). Past and present issues in Rasch analysis: The functional independence measure (FIM™) revisited. *Journal of Rehabilitation Medicine*, 43(10), 884-891.

- MacCallum, R. C. (1995). Model specification: Procedures, strategies, and related issues. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 16-36). Sage Publications.
- Mardanov, I. T., Heischmidt, K., & Henson, A. (2008). Leader-member exchange and job satisfaction bond and predicted employee turnover. *Journal of Leadership & Organizational Studies, 15*(2), 159-175.
- Martin, R., Epitropaki, O., Thomas, G., & Topakas, A. (2010). A review of leader-member exchange research: Future prospects and directions. In G. P. H. J. K. Ford (Ed.), *International Review of Industrial and Organizational Psychology* (Vol. 25, pp. 35-88).
- Martin, R., Guillaume, Y., Thomas, G., Lee, A., & Epitropaki, O. (2016). Leader-member exchange (LMX) and performance: A meta-analytic review. *Personnel Psychology, 69*(1), 67-121.
- Masters, G. N. (1982). A Rasch model for partial credit scoring. *Psychometrika, 47*(2), 149-174.
- Matta, F., Scott, B., Koopman, J., & Conlon, D. (2015). Does seeing "eye to eye" affect work engagement and organizational citizenship behavior? A role theory perspective on LMX agreement. *Academy of Management Journal, 58*(6), 1686-1708. <https://doi.org/10.5465/amj.2014.0106>
- Medvedev, O. N., Titkova, E. A., Siegert, R. J., Hwang, Y., & Krägeloh, C. U. (2018). Evaluating short versions of the Five Facet Mindfulness Questionnaire using Rasch analysis. *Mindfulness, 9*(5), 1411-1422.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. Sage.
- Montoya, R. M., Horton, R. S., & Kirchner, J. (2008). Is actual similarity necessary for attraction? A meta-analysis of actual and perceived similarity. *Journal of Social and Personal Relationships, 25*(6), 889-922.
- Morse, J. M., & Niehaus, L. (2009). Principles and procedures of mixed methods design. *Walnut Creek, CA: Left*.
- Newcomb, T. M. (1953). An approach to the study of communicative acts. *Psychological review, 60*(6), 393.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory*, 3rd edn. New York: McGraw-Hill.
- Olsson, L., Hemlin, S., & Pousette, A. (2012). A multi-level analysis of leader-member exchange and creative performance in research groups. *The Leadership Quarterly, 23*(3), 604-619.
- Olympiou, A., Jowett, S., & Duda, J. L. (2008). The psychological interface between the coach-created motivational climate and the coach-athlete relationship in team sports. *The Sport Psychologist, 22*(4), 423-438.
- Onwuegbuzie, A. J., & Collins, K. M. (2007). A typology of mixed methods sampling designs in social science research. *Qualitative Report, 12*(2), 281-316.
- Ospina, S., & Uhl-Bien, M. (2012). Exploring the competing bases for legitimacy in contemporary leadership studies. In *Advancing relational leadership research* (pp. 1-40). Information Age Publishing.
- Östlund, U., Kidd, L., Wengström, Y., & Rowa-Dewar, N. (2011). Combining qualitative and quantitative research within mixed method research designs: a methodological review. *International Journal of Nursing Studies, 48*(3), 369-383.

- Palanski, M. E., & Yammarino, F. J. (2007). Integrity and leadership: Clearing the conceptual confusion. *European Management Journal*, 25(3), 171-184.
- Pandey, J. (2019). Deductive approach to content analysis. In *Qualitative techniques for workplace data analysis* (pp. 145-169). IGI Global.
- Peachey, J. W., Zhou, Y., Damon, Z. J., & Burton, L. J. (2015). Forty years of leadership research in sport management: A review, synthesis, and conceptual framework. *Journal of Sport Management*, 29(5), 570-587.
- Peterson, C. H., Peterson, N. A., & Powell, K. G. (2017). Cognitive interviewing for item development: Validity evidence based on content and response processes. *Measurement and Evaluation in Counseling and Development*, 50(4), 217-223.
- Philippe, R. A., Sagar, S. S., Huguet, S., Paquet, Y., & Jowett, S. (2011). From teacher to friend: The evolving nature of the coach-athlete relationship. *International Journal of Sport Psychology*, 42(1), 1-23.
- Philippe, R. A., & Seiler, R. (2006). Closeness, co-orientation and complementarity in coach-athlete relationships: What male swimmers say about their male coaches. *Psychology of Sport and Exercise*, 7(2), 159-171.
- Pierce, G. R., Sarason, I. G., Sarason, B. R., Solky-Butzel, J. A., & Nagle, L. C. (1997). Assessing the quality of personal relationships. *Journal of Social and Personal Relationships*, 14(3), 339-356.
- Poczwadowski, A., Barott, J. E., & Jowett, S. (2006). Diversifying approaches to research on athlete-coach relationships. *Psychology of Sport and Exercise*, 7(2), 125-142.
- Poczwadowski, A., Barott, J. E., & Peregoy, J. J. (2002). The athlete and coach: Their relationship and its meaning. Methodological concerns and research progress. *International Journal of Sport Psychology*.
- Poczwadowski, A., Lamphere, B., Allen, K., Marican, R., & Haberl, P. (2020). The 5C's model of successful partnerships in elite beach volleyball dyads. *Journal of Applied Sport Psychology*, 32(5), 476-494.
- Qiu, H., Zhang, Y., Hou, G., & Wang, Z. (2018). The integrative effects of leading by example and follower traits in public goods game: A multilevel study. *Frontiers in Psychology*, 9, 1687.
- Rasch, G. (1960). *Studies in mathematical psychology: I. Probabilistic models for some intelligence and attainment tests*. Nielsen & Lydiche.
- Rhind, D., & Jowett, S. (2010a). Initial evidence for the criterion-related and structural validity of the long versions of the Coach-Athlete Relationship Questionnaire. *European Journal of Sport Science*, 10(6), 359-370.
- Rhind, D., & Jowett, S. (2010b). Relationship maintenance strategies in the coach-athlete relationship: The development of the COMPASS model. *Journal of Applied Sport Psychology*, 22(1), 106-121.
- Rhind, D., Jowett, S., & Yang, S. (2012). A comparison of athletes' perceptions of the coach-athlete relationship in team and individual sports. *Journal of Sport Behavior*, 35(4), 433-452.
- Rossmann, G. B., & Wilson, B. L. (1985). Numbers and words: Combining quantitative and qualitative methods in a single large-scale evaluation study. *Evaluation Review*, 9(5), 627-643.
- Rowold, J., Borgmann, L., & Bormann, K. (2014). Which leadership constructs are important for predicting job satisfaction, affective commitment, and perceived job performance in profit versus nonprofit organizations? *Nonprofit Management and Leadership*, 25(2), 147-164.

- Rusbult, C. E., & Buunk, B. P. (1993). Commitment processes in close relationships: An interdependence analysis. *Journal of Social and Personal Relationships, 10*(2), 175-204.
- Rusbult, C. E., & Van Lange, P. A. M. (2003). Interdependence, interaction, and relationships. *Annual review of psychology, 54*(1), 351-375.
- Rusbult, C. E., & Van Lange, P. A. M. (2008). Why we need interdependence theory. *Social and Personality Psychology Compass, 2*(5), 2049-2070.
- Ryan, A. B. (2006). Post-positivist approaches to research. *Researching and Writing your Thesis: a guide for postgraduate students, 12-26*.
- Scandura, T. A., & Meuser, J. D. (2022). Relational Dynamics of Leadership: Problems and Prospects. *Annual Review of Organizational Psychology and Organizational Behavior, 9*.
- Schermuly, C. C., & Meyer, B. (2016). Good relationships at work: The effects of leader-member exchange and team-member exchange on psychological empowerment, emotional exhaustion, and depression. *Journal of Organizational Behavior, 37*(5), 673-691.
- Schriesheim, C. A., Castro, S. L., & Cogliser, C. C. (1999). Leader-member exchange (LMX) research: A comprehensive review of theory, measurement, and data-analytic practices. *The Leadership Quarterly, 10*(1), 63-113.
- Schriesheim, C. A., Castro, S. L., Zhou, X. T., & Yammarino, F. J. (2001). The folly of theorizing "A" but testing "B": A selective level-of-analysis review of the field and a detailed leader-member exchange illustration. *The Leadership Quarterly, 12*(4), 515-551.
- Schriesheim, C. A., Neider, L. L., Scandura, T. A., & Tepper, B. J. (1992). Development and preliminary validation of a new scale (LMX-6) to measure leader-member exchange in organizations. *Educational and Psychological Measurement, 52*(1), 135-147.
- Schriesheim, C. A., Wu, J. B., & Cooper, C. D. (2011). A two-study investigation of item wording effects on leader-follower convergence in descriptions of the leader-member exchange (LMX) relationship. *The Leadership Quarterly, 22*(5), 881-892.
- Schumacker, R. E., & Smith, J. E. V. (2007). A Rasch perspective. *Educational and Psychological Measurement, 67*(3), 394-409.
- Schutz, W. C. (1958). *FIRO: A three-dimensional theory of interpersonal behavior*. Rinehart.
- Shilbury, D., & Ferkins, L. (2011). Professionalisation, sport governance and strategic capability. *Managing Leisure, 16*(2), 108-127.
- Siegert, R. J., Tennant, A., & Turner-Stokes, L. (2010). Rasch analysis of the Beck Depression Inventory-II in a neurological rehabilitation sample. *Disability and Rehabilitation, 32*(1), 8-17.
- Sin, H.-P., Nahrgang, J. D., & Morgeson, F. P. (2009). Understanding why they don't see eye to eye: An examination of leader-member exchange (LMX) agreement. *Journal of Applied Psychology, 94*(4), 1048.
- Smoll, F. L., & Smith, R. E. (1989). Leadership Behaviors in Sport: A Theoretical Model and Research Paradigm [Article]. *Journal of Applied Social Psychology, 19*(18), 1522-1551.
- <http://ezproxy.aut.ac.nz/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=sih&AN=24603899&site=eds-live>
- Thibaut, J. W., & Kelley, H. H. (1959). *The social psychology of groups*. Wiley.

- Thibaut, J. W., & Kelley, H. H. (2007). *The social psychology of groups* (4th ed.). Wiley.
- Thomas, G., Martin, R., Epitropaki, O., Guillaume, Y., & Lee, A. (2013). Social cognition in leader–follower relationships: Applying insights from relationship science to understanding relationship-based approaches to leadership. *Journal of Organizational Behavior, 34*(S1), S63-S81.
- Tourangeau, R. (1984). Cognitive sciences and survey methods. *Cognitive Aspects of Survey Methodology: Building a bridge between disciplines, 15*, 73-100.
- Trzaskoma-Bicsérdy, G., Bognár, J., Révész, L., & Géczi, G. (2007). The coach-athlete relationship in successful Hungarian individual sports. *International Journal of Sports Science & Coaching, 2*(4), 485-495.
- Uhl-Bien, M. (2006). Relational leadership theory: Exploring the social processes of leadership and organizing. *The Leadership Quarterly, 17*:6, 654-667.
<https://doi.org/10.1016/j.leaqua.2006.10.007>
- Uhl-Bien, M., Graen, G. B., & Scandura, T. A. (2000). Implications of leader-member exchange (LMX) for strategic human resource management systems: Relationships as social capital for competitive advantage. *Research in Personnel and Human Resources Management, 18*, 137-186.
- Uhl-Bien, M., & Maslyn, J. M. (2003). Reciprocity in manager-subordinate relationships: Components, configurations, and outcomes. *Journal of Management, 29*(4), 511-532.
- Van Lange, P. A., & Rusbult, C. E. (2011). Interdependence theory. *Handbook of Theories of Social Psychology, 2*, 251-272.
- Van Vianen, A. E., Shen, C. T., & Chuang, A. (2011). Person–organization and person–supervisor fits: Employee commitments in a Chinese context. *Journal of Organizational Behavior, 32*(6), 906-926.
- Venkataramani, V., Green, S. G., & Schleicher, D. J. (2010). Well-connected leaders: The impact of leaders' social network ties on LMX and members' work attitudes. *Journal of Applied Psychology, 95*(6), 1071.
- Vidyardhi, P. R., Liden, R. C., Anand, S., Erdogan, B., & Ghosh, S. (2010). Where do I stand? Examining the effects of leader-member exchange social comparison on employee work behaviors. *Journal of Applied Psychology, 95*(5), 849.
- Wakabayashi, M., Graen, G., & Uhl-Bien, M. (1990). The generalizability of the hidden investment hypothesis in leading Japanese corporations. *Human Relations, 43*(11), 1099-1116.
- Willis, G. B. (1999). *Cognitive interviewing: A “how to” guide*. Research Triangle Park, NC: Research Triangle Institute.
- Willis, G. B. (2004). *Cognitive interviewing: A tool for improving questionnaire design*. sage publications.
- Wong, H. C., Ramalu, S. S., & Chuah, F. (2019). An overview of leadership and the emerging of relational leadership. *Journal of Human Resource and Leadership, 4*(1), 32-43.
- Woolliams, D. (2015). Examining the nature of interpersonal coach- athlete dyads between New Zealand national representative female football players and national coaches. *Unpublished masters thesis, Auckland University of Technology, New Zealand*. <https://doi.org/10.13140/RG.2.1.4006.0007>
- Woolliams, D., Spencer, K., Walters, S., & Krägeloh, C. U. (2021). Resolving uncertainties of the factor structure of the Coach-Athlete Relationship Questionnaire (CART-Q). *Australian Journal of Psychology*.
<https://doi.org/10.1080/00049530.2021.1882275>

- Woolliams, D., Walters, S., Spencer, K., & Ferkins, L. (2021). *Advancing Leader-Member Exchange utilising the 4Cs relationship model "Manuscript submitted for publication"*.
- Wylleman, P. (2000). Interpersonal relationships in sport. Uncharted territory in sport psychology research. *International Journal of Sport Psychology, 21*, 555-572.
- Xesha, D., Iwu, C. G., Slabbert, A., & Nduna, J. (2014). The impact of employer-employee relationships on business growth. *Journal of Economics, 5*(3), 313-324.
- Yammarino, F. J., Dionne, S. D., Chun, J. U., & Dansereau, F. (2005). Leadership and levels of analysis: A state-of-the-science review. *The Leadership Quarterly, 16*(6), 879-919.
- Yang, S. X., & Jowett, S. (2010). An examination of the psychometric properties of the Chinese Coach-Athlete Relationship Questionnaire (CART-Q). *International Journal of Coaching Science, 4*(2), 73-89.
<https://doi.org/10.1016/j.psychsport.2011.07.010>
- Yang, S. X., & Jowett, S. (2012). Psychometric properties of the Coach–Athlete Relationship Questionnaire (CART-Q) in seven countries. *Psychology of Sport and Exercise, 13*(1), 36-43.
- Yang, S. X., & Jowett, S. (2013). The psychometric properties of the short and long versions of the Coach–Athlete Relationship Questionnaire. *Measurement in Physical Education & Exercise Science, 17*(4), 281-294.

Appendices

Appendix A: Ethics Approval



Auckland University of Technology Ethics Committee (AUTEC)

Auckland University of Technology
 D-88, Private Bag 92006, Auckland 1142, NZ
 T: +64 9 921 9999 ext. 8316
 E: ethics@aut.ac.nz
www.aut.ac.nz/researchethics

15 March 2019

Simon Walters
 Faculty of Health and Environmental Sciences

Dear Simon

Ethics Application: 19/86 **Dyadic relationships in the leadership of sport organisations**

I wish to advise you that a subcommittee of the Auckland University of Technology Ethics Committee (AUTEC) has **approved** your ethics application in stages.

This approval is for three years, expiring 14 March 2022.

This approval is for Study One, to validate the CART-Q. Full information about future stages of this research needs to be provided to and approved by AUTEC before the data collection for those stages commences.

Standard Conditions of Approval

1. A progress report is due annually on the anniversary of the approval date, using form EA2, which is available online through <http://www.aut.ac.nz/research/researchethics>.
2. A final report is due at the expiration of the approval period, or, upon completion of project, using form EA3, which is available online through <http://www.aut.ac.nz/research/researchethics>.
3. Any amendments to the project must be approved by AUTEC prior to being implemented. Amendments can be requested using the EA2 form: <http://www.aut.ac.nz/research/researchethics>.
4. Any serious or unexpected adverse events must be reported to AUTEC Secretariat as a matter of priority.
5. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTEC Secretariat as a matter of priority.

Please quote the application number and title on all future correspondence related to this project.

AUTEC grants ethical approval only. If you require management approval for access for your research from another institution or organisation then you are responsible for obtaining it. You are reminded that it is your responsibility to ensure that the spelling and grammar of documents being provided to participants or external organisations is of a high standard.

For any enquiries please contact ethics@aut.ac.nz

Yours sincerely,

Kate O'Connor
 Executive Manager
 Auckland University of Technology Ethics Committee

Cc: dwoilliams@gmail.com; Kirsten Spencer; Lesley Ferkins



Auckland University of Technology Ethics Committee (AUTEC)

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July 2020

Simon Walters
 Faculty of Health and Environmental Sciences

Dear Simon

Re Ethics Application: **20/126 Dyadic Relationships in the Leadership of Sport Organisations**

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC).

Your ethics application has been approved for three years until 2 July 2023.

Standard Conditions of Approval

1. The research is to be undertaken in accordance with the [Auckland University of Technology Code of Conduct for Research](#) and as approved by AUTEC in this application.
2. A progress report is due annually on the anniversary of the approval date, using the EA2 form.
3. A final report is due at the expiration of the approval period, or, upon completion of project, using the EA3 form.
4. Any amendments to the project must be approved by AUTEC prior to being implemented. Amendments can be requested using the EA2 form.
5. Any serious or unexpected adverse events must be reported to AUTEC Secretariat as a matter of priority.
6. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTEC Secretariat as a matter of priority.
7. It is your responsibility to ensure that the spelling and grammar of documents being provided to participants or external organisations is of a high standard and that all the dates on the documents are updated.

AUTEC grants ethical approval only. You are responsible for obtaining management approval for access for your research from any institution or organisation at which your research is being conducted and you need to meet all ethical, legal, public health, and locality obligations or requirements for the jurisdictions in which the research is being undertaken.

Please quote the application number and title on all future correspondence related to this project.

For any enquiries please contact ethics@aut.ac.nz. The forms mentioned above are available online through <http://www.aut.ac.nz/research/researchethics>

(This is a computer-generated letter for which no signature is required)

The AUTEC Secretariat
Auckland University of Technology Ethics Committee

Cc: dwoolliams@gmail.com; Kirsten Spencer; Lesley Ferkins; Chris Krageloh

Appendix B: Participation Information Sheet and Consent Form



Participant Information Sheet

▲ Date Information Sheet Produced:

April 2020

Project Title

Dyadic Relationships in the Leadership of Sport Organisations

An Invitation

You are invited to take part in a research project about your involvement in Hockey NZ and particularly your relationship with your supervisor/ staff member. This project aims to determine the structure of what makes a productive working relationship and a tool to measure its effectiveness.

I am Dwayne Woolliams, a PhD. student at AUT University and I will be undertaking this project.

Your participation in the project will involve a 30-minute interview to gain an insight into your thoughts, feelings and behaviours towards productive workplace relationships. Then you will be asked to complete a 15 minute survey as a follow up to the interview for those that wish to participate.

Your participation is entirely voluntary at all times. This means you can choose to withdraw from the study at any stage. Your involvement in this study or withdrawal from it will not cause you any harm.

It is important to note that no identifying factors will be used in the study. This means your name, and any other identities will remain anonymous at all times. Therefore Hockey New Zealand supervisors/ staff members will not be made aware of your individual thoughts/ answers.

What is the purpose of this research?

I am undertaking this research to gain a better understanding of the nature of workplace relationships between supervisors and staff member in higher-performing sports organisation in New Zealand. High-quality relationships have shown to have a direct association with performance and satisfaction, and I would like to develop an effective model and tool to measure workplace relationships.

How was I identified and why am I being invited to participate in this research?

You have been approached for this study because:

- You are have been identified as a staff member of Hockey NZ
- You are have been identified as a supervisor at Hockey NZ

What will happen in this research?

If you choose to take part in this study you will be asked to:

- Sign a consent form to say that you would like to be involved. Give this to my Research Assistant to place in an envelope for me to collect.

- For those that have consented to participate in a 30 minute interview
 - I will arrange a time to meet at a time best suited to you, at a time best suited to you
 - The interview will be recorded by a digital voice recorder.
- I will arrange to conduct the survey during a typical workday at a time best suited to you. You will also be given the opportunity to have a support person with you during the interview/ survey if you wish.
- The survey will be in either an electronic or hard copy form

What are the discomforts and risks?

Any discomfort or risk is unlikely. However, due to the nature of discussing relationships, you may be required to reflect on negative experiences.

How will these discomforts and risks be alleviated?

You don't need to answer any questions that you don't want to and are free to withdraw from the study at any time. Upon withdrawal, all the information you have provided will be removed from the study. You will have the opportunity to read your answers to your survey and change your answers. For those that participate in the interviews will have the opportunity to read the transcript of your interview and change or withdraw any comments.

Contact details for the Health, Counselling and Wellbeing Centre and Youthline will also be available if you feel you need to discuss any issues.

What are the benefits?

By taking part, your information and experiences will be used with the aim to improve workplace relationships.

1. It's important to staff performance and satisfaction
2. What constitutes a healthy dyadic relationship
3. How might the supervisors establish/ maintain healthy relationships?

How will my privacy be protected?

Only my academic supervisors and I will know your name and have access to your survey results. Any written documentation survey results, transcripts, reports, publications, presentations or study discussions you will remain anonymous. This means your name, team, and other names or locations spoken of in the study will remain unknown. Where a name is required for written purposes, I will allocate an alpha numeric coding system to ensure anonymity.

What are the costs of participating in this research?

The only cost to you as a participant is your time. You will be required to complete a survey that is estimated to take 15 minutes. For those participants that have consented to attend an interview, it is expected that this process should take approximately 30 minutes.

What opportunity do I have to consider this invitation?

You have three weeks to consider this invitation. If you would like more information before signing the consent form you are welcome to contact e on the details below.

How do I agree to participate in this research?

If you would like to take part in this study, you will need to sign the consent form attached and return to my Research Assistant at a squad training session.

Will I receive feedback on the results of this research?

If you would like to receive a summary of the findings of this research, please tick the box on the consent form. A summary of the findings will be available with 12 months of completion of the project and copies will be made available if requested.

Whom do I contact for further information about this research?**Researcher Contact Details:**

Name: Dwayne Woolliams
Email address: dwoolliams@gmail.com
Phone number: 021465836

AUT University Student Services

Department: Health, Counselling and Wellbeing
Location: WB219 or AS104
Phone: +64 (09) 921 9992 City Campus, +64 (09) 921 9998 North Shore campus

Approved by the Auckland University of Technology Ethics Committee on *type the date final ethics approval was granted*,
AUTEC Reference number *type the reference number*.



Consent Form



Project title: **Dyadic Relationships in the Leadership of Sport Organisations**

Project Supervisor: **Simon Walters**

Researcher: **Dwayne Woolliams**

- I have read and understood the information provided about this research project in the Information Sheet above.
- I have had an opportunity to ask questions and to have them answered.
- I understand that I may withdraw myself or any information that I have provided for this project at any time prior to the completion of data collection, without being disadvantaged in any way.
- If I withdraw, I understand that all relevant information, including tapes and transcripts, or parts thereof, will be destroyed.
- I agree to take part in this research.
 - I agree to take part in a 30-minute interview: Yes No
 - I agree to take part in the questionnaire/ survey
- I understand that notes will be taken during the interviews and that they will also be audio-taped and transcribed.
- I wish to receive a copy of the report from the research (please tick one): Yes No

~~Participant's~~ signature:

~~Participant's name~~:

~~Participant's~~ Contact Details (if appropriate):

.....

.....

.....

.....

Date:

Approved by the Auckland University of Technology Ethics Committee on *type the date on which the final approval was granted* AUTEC Reference number *type the AUTEC reference number*

Note: The Participant should retain a copy of this

Appendix C: Coach-Athlete Relationship Questionnaire (CART-Q)**The Coach-Athlete Relationship Questionnaire (CART-Q) meta****Athlete's version**

This questionnaire aims to measure the quality and content of the coach-athlete relationship. Please read carefully the statements below and circle the answer that indicates whether you agree or disagree. There are no right or wrong answers. Please respond to the statements as honest as possible and relevant to how you think the Head National Coach from your team or squad feels about you.

Name: _____ Length of Relationship with Coach: _____ (months)

	Strongly Disagree	Moderately	Strongly Agree				
1. I like my coach	1	2	3	4	5	6	7
2. My coach likes me	1	2	3	4	5	6	7
3. I trust my coach	1	2	3	4	5	6	7
4. My coach trusts me	1	2	3	4	5	6	7
5. I respect my coach	1	2	3	4	5	6	7
6. My coach respects me	1	2	3	4	5	6	7
7. I appreciate the sacrifices my coach has experienced to improve his/ her performance	1	2	3	4	5	6	7
8. My coach appreciates the sacrifices I have experienced to improve performance	1	2	3	4	5	6	7
9. I am committed to my coach	1	2	3	4	5	6	7
10. My coach is committed to me	1	2	3	4	5	6	7
11. I am close to my coach	1	2	3	4	5	6	7
12. My coach is close to me	1	2	3	4	5	6	7
13. I think my playing career is promising with my coach	1	2	3	4	5	6	7
14. My coach believes that his/ her football career is promising with me	1	2	3	4	5	6	7
15. I am at ease with my coach	1	2	3	4	5	6	7
16. My coach is at ease with me	1	2	3	4	5	6	7
17. I am responsive to my coach efforts	1	2	3	4	5	6	7
18. My coach is responsive to my efforts	1	2	3	4	5	6	7
19. I am ready to do my best	1	2	3	4	5	6	7
20. My coach is ready to do his/ her best	1	2	3	4	5	6	7
21. I adopt a friendly stance	1	2	3	4	5	6	7
22. My coach adopts a friendly stance	1	2	3	4	5	6	7

Appendix D: Standardised open-ended interview schedule

Standardised open-ended interview schedule.

1. What were the main features that characterised your relationship with your relationship partner? *What features reinforced your relationship with your relationship partner? (Probe)*

2. In what ways did the relationship you and your relationship partner had developed contributed to your success? *How did your relationship with your relationship partner have an impact on your performance? (Probe)*

3. Can you think of any instances where you felt that working with your relationship partner was ineffective? *Were there any moments of conflict or disagreement? (Probe)*

4. How would you describe an effective, or ideal, working relationship? *Ideally, how would you have liked your relationship with relationship partner to have been? (Probe)*

5. How do you describe your relationship in comparison with this ideal? *How was the relationship with your relationship partner different from your ideal working relationship?*

Jowett, S., & Cockerill, I. M. (2003). Olympic medallists' perspective of the athlete-coach relationship. *Psychology of sport and exercise*, 4(4), 313-331.

Appendix E: Sample of content analysis Study 2

STUDY 2 Advancing Leader-Member Exchange utilising the 4Cs relationship model

QUALITATIVE - MATRIX

Raw data themes	Number of Transactions	Percentage	Second-Order Themes	Higher-order Themes-Constructs
SLT2JM				Closeness
Like	1	2.3%	Personal Feelings	Reflects the affect bonds between dyadic members
Trust	1	2.3%	Generic feelings	
Respect	5	11.4%		
Sacrifices	2	4.5%		
Belief				
Openness SWx2 DWx2	5	11.4%		
Honesty	2	4.5%		
Mutual care SW	3	6.8%		
Appreciation	2	4.5%		
	21	47.7%		Commitment
Committed/ Mutually agreed goals	2	4.5%		Reflects the intentions of leaders and members to maintain a bond or a connection that is both close and long-term
Long term orientation	1	2.3%		
Being close	2	4.5%		
Promising connection DW	2	4.5%		
Partnership				
Demonstrating positive action to improve				
Aspiration SW	1	2.3%		
	8	18.2%		
Being at ease			Roles	Reflects coaches and athletes' behaviours that are complementary or co operative
Responsive	1	2.3%	Tasks	
Trying/ doing one's best	1	2.3%		
Friendliness	2	4.5%	Instructional support	
Co-operation	2	4.5%		
Lead/ follow by example				
Demonstrating enthusiasm			Emotional support	
Demonstrating patience	1	2.3%		
Acknowledgement	3	6.8%		
Working together DW	2	4.5%		
	12	27.3%		
Self-disclosure DW	1	2.3%	Communication	Interdependent feelings, thoughts, and behaviours and highlights the degree to which leaders and members have a common ground (i.e., they are on the same page) about the nature of their partnership
Information exchange-communication	1	2.3%	Shared knowledge	
Acceptance			Shared understanding	
Influence	1	2.3%		
	3	6.8%		
	44 comments		79.5% agreement	78.5% Avg agreement

Appendix F: Summary of Cognitive Interviewing Findings

Summary of Cognitive Interviewing Findings

Participant	Question	Needed Clarification	Alternative offered	Notes
1	4 and 5? Sacrifice	Yes	Yes time and effort	
	11 Close	Yes	No	
	13 Career is promising	No	Yes Is of 'value'	Highlighted the question as worded may not be relevant to all (in this case end of career)
2	4 and 5 Sacrifice	Yes	Effort	
	13 Promising	Yes	Yes Makes me better	So different to 1 who understood it but questioned relevance – this one struggled to understand what was meant
	16 Follows by example	Yes	Yes Role model	Understood it in context to leading by example but not following by example
3	16 Follows by example	Yes	Yes Role model	Understood it in context to leading by example but not following by example (as for P2)
4	9 Committed to	Yes	No	Had to have it explained
	15 Follow by example	Yes	No – was suggested to them? Role model	I think you led them to this role model definition? Is that ok to do that – they definitely struggled with the comprehension though of what it was which is

				consistent with others
5	11 Close to	Yes	No	Once explained by you they could answer so just comprehension again.
				The changes you made to the questions based on P1 to P4 responses work well for this P5
6	9 and 10 Integrity	Yes	No	Interpreted as personal
				Interviews much shorter which implies greater clarity for Ps?
7	24 Initiates open conversations	Yes	No	Just paused due to lack of interaction with supervisor due to Covid?
8				I can see benefit of this approach to survey design – much better than a simple pilot