Two-Dimensional Machiavellianism

Conceptualisation, Measurement, and Well-Being

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Declaration

This thesis is submitted to the Australian National University (ANU) in partial fulfillment of the Doctorate of Philosophy (PhD) in clinical psychology. The work presented in this thesis is original except as acknowledged in the text. I hereby declare that I have not submitted this material, either in full or in part, for another degree at this or any other institution. This thesis includes original papers that have been either published in peer review journals or are currently under review for publication. The ideas, development, and writing of these papers and the thesis were the principle responsibility of myself. The inclusion of co-authors reflects their input on the projects which involved providing datasets, providing guidance on study designs, and reviewing the manuscripts before submission.

Conal Monaghan

14th March 2019

> *... princes who have done great things have overcome those who have relied on their word. You must know there are two ways of contesting, the one by the law, and the other by force; the first method is proper to men, the second to beasts; but because the first is frequently not sufficient, it is necessary to have recourse to the second. Therefore it is necessary for a prince to understand how to avail himself of the beast and the man*

Machiavelli, *The Prince*, 1580, p. 141

> *The world is a vicious and brutal place. We think we're civilized. In truth, it's a cruel world and people are ruthless. They act nice to your face, but underneath they're out to kill you. Even your friends are out to get you: they want your job, they want your house, they want your money, they want your wife, and they even want your dog. Those are your friends; your enemies are even worse!*

Donald Trump, *Think Big*, 2007

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Abstract

Individuals learn to influence and manipulate others to function as part of society. Machiavellianism captures one's willingness to orchestrate the behaviour of others against their interests, rights, and well-being. Research focuses primarily on a single Machiavellianism dimension. This thesis, however, contends that Machiavellianism comprises two correlated dimensions: a views dimension that captures one's cynical and distrusting view of humanity and the world, and a tactics dimension that captures one's willingness to endorse exploitative and amoral behaviours when deemed advantageous. This thesis aimed to develop a stronger understanding of each dimension, and this required developing stronger psychometric instruments. The secondary aim was to test the presupposition of no psychopathological cost to Machiavellianism.

After an initial foray into Machiavelli and Machiavellianism in the first two chapters, Chapter 3 identifies a robust Machiavellianism factor-structure and how each dimension relates to psychopathological domains in 1478 US and 218 Australian participants. Confirmatory factor analysis demonstrated that Machiavellianism comprises two robust dimensions which could be reliably captured through a 10-item subset of the Mach-IV scale, named Two-Dimensional Mach-IV (TDM-IV). Further, Machiavellian views associated with all major psychological domains, while Machiavellian tactics related only to the externalising and thought dysfunction domains. Machiavellianism is two-dimensional, with each dimension having distinctive psychopathological implications.

The study in Chapter 4 investigates whether these two dimensions are universal, or merely measurement artefacts within Study 1. If universal, this research further aimed to develop a nomological network to better understand the nature of each dimension. International collaborators shared 15 datasets, which comprised

over 17,000 participants. The two-factor structure was reproducible and structurally equivalent across cultures, languages, types of respondent, response category length, age, and gender. Further, each dimension was situated within a different constellation of broad personality traits, developmental pathways, emotionality, and behaviour. Therefore, the two dimensions appear to be core aspects of Machiavellianism and need to be independently captured in future research.

The TDM-IV derives from the Mach-IV, inheriting many of its psychometric concerns that reduce the accuracy of its inferences, such as confusing item wording and not accounting for acquiesces appropriately. To overcome these weaknesses, Chapter 5 presents the development and validation of the Two-Dimensional Machiavellianism Scale (TDMS). The TDMS had excellent psychometric properties in six independent samples involving over 3800 participants, based on confirmatory factor analysis, longitudinal structural equation modelling, and item response theory. The scale provided invariant measurement across all samples and a test-retest sample, was internally consistent, and provided most information in the low to high average range. This study demonstrates confirmatory and discriminatory validity with existing measures of Machiavellianism, broader personality taxonomies, socio-political attitudes, psychopathy, narcissism, and morality vignettes.

Finally, Chapter 6 explicates this two-dimensional Machiavellianism construct and discusses key areas for future investigation, including latent profiles, longitudinal modelling of each dimension's development, and cross-cultural equivalence. Together, this research demonstrates that: a) Machiavellianism comprises two distinct dimensions, b) the TDMS, as a psychometrically robust measure of Machiavellianism, should replace current measures of Machiavellianism, and c) the presupposition of psychopathological immunity among *Machiavellians* is false.

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List of Common Abbreviations

ANU Australian National University

CFA Confirmatory Factor Analysis

CFI Comparative Fit Index

CTT Classical Test Theory

EFA Exploratory Factor Analysis

GVSU Grand Valley State University

IRT Item Response Theory

Mach-IV The Original Machiavellianism Scale

ML Maximum Likelihood

MMPI-2-RF Minnesota Multiphasic Personality Inventory - 2 - Restructured Form

RMSEA The Root Mean Square Error of Approximation

SEM Structural Equation Modelling

TDMS Two-Dimensional Machiavellianism Scale

TDM-IV Two-Dimensional Mach-IV

Thesis Overview and Aims

Thesis Aims

Even during his life, Machiavelli was a complicated and, in many ways, influential figure in politics and statecraft. Certainly, he has become more so in the centuries since he died. He divided his contemporaries, inspiring hate and disgust within some, while providing guidance and wisdom for others. Although he characterised human disposition intimately, what it means to be *Machiavellian* only recently entered the lexicon of psychology. Opponents condemned his morality, engrossed by the social and religious implications, while overlooking the psychological toll Machiavellianism has on the deceiver.

The personality trait of Machiavellianism (Christie & Geis, 1970) captures the philosophy of Machiavelli, his aberrant morality, and "the end justifies the means mentality". Machiavellianism captures individual variation in one's willingness to orchestrate the behaviour of others for personal gain, engage in callous exploitation, and the capacity to rationalise such behaviour (Fehr, Samsom, & Paulhus, 1992; Jones & Paulhus, 2009; Wilson, Near, & Miller, 1998). Individuals vary only in the strength of their Machiavellianism on a continuum throughout society, there is no categorical difference between those low and those high on Machiavellianism (Beller & Bosse, 2017); describing individuals as *Machiavellian* is an arbitrary distinction. Machiavellianism influences numerous areas of functioning, at both the individual and organisational levels, such as anti-sociality, leadership, morality, and organisational citizenship behaviour (Campbell et al., 2009; Gunnthorsdottir, McCabe, & Smith, 2002; Lowe & Grieve, 2015; O'Boyle, Forsyth, Banks, & McDaniel,

2012; Wilson et al., 1998). Given its involvement in these dimensions, studying Machiavellianism is an important area of investigation with real-world implications.

The overarching aim of this thesis was to identify and conceptualise the dimensional structure of Machiavellianism. Although Machiavellianism is widely studied, it lacks a common factor structure, concept, and theory (Fehr et al., 1992; Wilson, Near, & Miller, 1996). There are issues with the primary instrument used to test this relationship, the Mach-IV (Christie & Geis, 1970), in particular, troublesome psychometric properties (see Fehr et al., 1992 for review). Specific concerns relate to item wording, reliability, and factor structure. Researchers have also largely studied Machiavellianism as unidimensional, despite the growing number of studies demonstrating multidimensionality (e.g., Fehr et al., 1992; McIlwain, 2003; Panitz, 1989; Rauthmann & Will, 2011; Williams, Hazleton, & Renshaw, 1975). In previous factor-analyses, two dimensions reliably emerge regardless of technique or the final factor-solution: a *views dimension* capturing the cynical and distrusting view of humanity, and a *tactics dimension* capturing the behavioural aspects of exploiting others. This division also makes theoretical sense, differentiating the behaviour from the affective-cognitive justification for that behaviour. Nevertheless, difficulties with understanding the underlying dimensions of Machiavellianism in the literature impedes the adoption of a nuanced and complete understanding of Machiavellianism's development, emotionality, and behavioural consequences.

The secondary aim of this thesis was to identify if there is, indeed, a psychological cost to Machiavellianism. Christie and Geis (1970) theorised that those who gain and maintain power should be free of "gross" psychopathology to effectively manipulate others. They further argued that objective rationality is required to effectively exploit others as objects. However, too often powerful leaders who truly prescribe to Machiavelli's teachings are far from the epitome of mental health (Hershman & Lieb, 1994). Despite ongoing investigations, Machiavellianism's relationship to well-being (Aghababaei & Bachnio, 2015) and psychopathologies, such as depression and anxiety (Aïn, Carré, Fantini-Hauwel, Baudouin, & Besche-Richard, 2013; Austin,

Farrelly, Black, & Moore, 2007), remains unclear.

To investigate the primary aims of this thesis, the dimensional nature of Machiavellianism was derived and measured by shortening the existing Mach-IV scale (Christie & Geis, 1970) to create the Two-Dimensional Mach-IV (TDM-IV). Each dimension could then be elucidated through comparisons with important external variables, a nomological network (Cronbach & Meehl, 1955). The developing conceptualisation of the two-dimensions allowed for a new and psychometrically robust measure, named the Two-Dimensional Machiavellianism Scale (TDMS). Throughout this journey of increasing measurement accuracy and understanding into the nature of the Machiavellianism dimensions, the secondary aim of this research was consistently tested, by providing consistent evidence that there is, indeed, a psychological cost to Machiavellianism.

Thesis Aims

1. To elucidate the dimensional nature of Machiavellianism

2. To develop psychometrically sound measures of the construct, and

3. To clarify the impact that Machiavellianism has on well-being and psychopathology.

Thesis Structure

This thesis is structured to firstly provide sufficient information for readers to understand the nature of Machiavellianism and the current state of research. Then, to describe each original study conducted, before summarising the implications for ongoing research broadly. It is important to first understand who Machiavelli was and the justification for measuring individual personality variation in his name. Therefore, Chapter 1 provides a brief historical introduction of Machiavelli, his condemnation (Machiavelli was not *Machiavellian*), his philosophy on morality (known as "civic virtue"), and his impact on modern philosophical discussion. Chapter 1 then discusses how Christie and Geis (1970) capture his perspectives (along with other power theorists) into the *Machiavellianism* personality construct. The second

component of Chapter 1 is dedicated to providing the reader with a better understanding of what is known about Machiavellianism, before briefly highlighting research into well-being. Chapter 2 then critiques existing factor-analyses and the conclusions that can be drawn regarding its two-dimensional nature. This chapter finishes by reviewing the current state of Machiavellianism measurement, along with its shortcomings.

Once grounded in an understanding of Machiavellianism, the reader's attention is directed to each study conducted. First, Chapter 3 outlines the distilling of the Two-Dimensional Mach-IV (TDM-IV), a psychometrically superior instrument that differentiated the two dimensions of Machiavellianism - views and tactics. This allowed for the investigation of Machiavellianism and the major domains of psychopathology identified in clinical research (Kotov et al., 2011; Krueger & Markon, 2006). As no previous research has explicated the two dimensions before the work outlined in Chapter 3, little was known of their nature or universality. Therefore, Chapter 4 described the two-dimension's replication across 15 samples and more than 17,000 participants. Study 2 also developed a nomological network for the dimensions within broader personality traits, developmental pathways, emotionality, and behaviour.

Given psychometric issues the TDM-IV could not address, the development of the TDMS is outlined in Chapter 5, a psychometrically stronger measure of Machiavellianism and the views and tactics dimensions. The TDMS welcomes a new age of investigation into Machiavellianism for ongoing research in the field and provides the psychometric underpinning for understanding the nature of two-dimensional Machiavellianism.

Finally, Chapter 6 summarises this thesis' contribution to the literature and the implications for understanding antagonistic behaviour more broadly. The discussion highlights the conceptual advances now possible with the Dark Triad (Paulhus & Williams, 2002), particularly distinguishing Machiavellianism from psychopathy (Glenn & Sellbom, 2015; Miller, Hyatt, Maples-Keller, Carter, & Lynam, 2016). Im-

portant avenues for future research are identified and discussed, namely, the developmental pathways of each dimension, identification of latent profiles (particularly identification of the elusive "conscientious Machiavellian" archetype), developmental pathways, and cross-cultural research including TDMS translations and invariance modelling.

Dissemination

During the completion of this thesis, the developing theoretical and empirical contributions were disseminated to the wider research community. This involved publishing in internal peer reviewed journals, presenting at international conferences, and engaging in open source distribution of research and resources (Open Science Framework; OSF). This contribution is outlined below:

Published

Monaghan, C., Bizumic, B., & Sellbom, M. (2016). The role of Machiavellian views and tactics in psychopathology. *Personality and Individual Differences, 94*, 72-81. https://doi.org/10.1016/j.paid.2016.01.002. A short presentation ("Audioslide") on this paper is available at:

http://www.sciencedirect.com/science/article/pii/S0191886916300010

Monaghan, C., Bizumic, B., & Sellbom, M. (2018). Nomological network of two-dimensional Machiavellianism. *Personality and Individual Differences, 139*, 161-173. https://doi.org/10.1016/j.paid.2018.03.047. A short presentation ("Audioslide") will be available shortly at:

http://www.sciencedirect.com/science/article/pii/S0191886916300010

Under Review

Monaghan, C., Bizumic, B., Williams, T., & Sellbom, M. (2018). Two-Dimensional Machiavellianism: Conceptualisation, theory, and measurement of the views and tactics dimensions. Manuscript currently under review at the *Psychological Assessment*.

Conferences

Monaghan, C., Bizumic, B., & Sellbom, M. *The psychopathology of Machiavellian views and tactics.* Poster presented at the 16th Annual Meeting of the Society for Personality and Social Psychology (2015), California, United States, and presented at the Inaugural ANU Psychology Conference (2016), Canberra, Australia. Online version available at: https://osf.io/enwfu/.

Monaghan, C., Bizumic, B., & Sellbom, M. *A nomological network of two-dimensional Machiavellianism.* Poster presented at the Annual ANU Psychology Conference, Canberra, Australia (2017) and as a short presentation at the Australian Conference on Personality and Individual Differences, Melbourne, Australia (2017). Poster and presentation are available online: https://osf.io/rh9vp.

Monaghan, C., Bizumic, B., Sellbom, M. & Williams. T. *A new measure of two-dimensional Machiavellianism.* Poster presented at the 18th Annual Meeting of the Society for Personality and Social Psychology (2018), Atlanta, United States. Online version available at: https://osf.io/z7sgb/.

Inspired Research

This thesis and associated measures have also influenced ongoing work on two-dimensional Machiavellianism, including:

Anyan, F., Monaghan, C., Hjemdal, O., Williams, T., & Bizumic, B. Cross-cultural stability of two-dimensional Machiavellianism: Norwegian and North American perspectives. Research Currently Underway.

Lamont, A. (2017). Sociodemographic, trait, and state predictors of empathy in psychology students (Master's thesis, Australian National University).

Smith, L. (2017). The nature of the relationship between Machiavellianism and social dominance orientation with happiness (Honour's thesis, Australian National University).

Williams, T. (2019). Behavioural validation of two-dimensional Machiavellianism. Research Currently Underway.

Website

The companion website for Chapter 5 offers an open source (free) method for distributing this research, with the aim of public science communication. The website contains background information on two-dimensional Machiavellianism, the TDMS, and provides participants with estimates of the strength of their Machiavellianism. (More detailed information including current distribution is available in Appendix A.) Participants can "opt in" to allow their data to be used in the ongoing research.

This website commits to open science, with the measure, data, and psychometric information freely available (ANU ethics approval: 2015/821). Given the benefits of an open source website with the capability to collect data and provide individualised participant feedback, skeleton website code is available for researchers to build their own websites in Appendix A, on the Open Science Framework (https://osf.io/2hfm8/), and on GitHub (https://github.com/ConalMonaghan/Machiavellianism).

Chapter 1

Machiavelli and Machiavellianism

1.1   The Life and Influence of Niccolo Machiavelli

Niccolo Machiavelli (1469-1527) was an Italian diplomat and political philosopher who lived in Renaissance Florence. He wrote his influential treatise *The Prince (Il Principe)* and discourses (Machiavelli, 1532/1935) after his dismissal from the chancery and subsequent exile from Florence, under an accusation of conspiracy that was likely politically motivated. Scholars continue to debate the purpose of *The Prince*. Some advocate for a satiric commentary about the ruthlessness of Florentine rule, while others propose that Machiavelli wrote *The Prince* hoping to overturn his exile by winning the favour of the Florentine regent, Lorenzo Medici III (Fuller, 2015).

Regardless of his intent, due to the content of his work Machiavelli's name became synonymous with evil and the devil ("Old Nick"). Society's fouling of his name and reputation is likely undeserved, because Machiavelli was known to be a largely reputable civil servant and defender of the republic, and his works appear to lament the necessity of immoral actions. Simply, Machiavelli was not what has come to be labelled *Machiavellian*. Nevertheless, Pope Paul IV placed *The Prince* and *Discourses* on the *Index Librorum Prohibitorum* (list of banned books) in 1559 (Bald & Karolides, 2014). Machiavelli's works survived the church's condemnation, transformed philosophical and political thought, and eventually influenced popular culture and psychology.

The Prince and *Discourses* argue that all leaders should aim to be moral, clement, and virtuous ("the best in the man"). But, Machiavelli suggested, avoiding cruelty altogether invited one's demise and the ruin of the state through dissent, crime, and invasion. Therefore, cruelty and behaviour that would normally be characterised as unethical (referred to as taking "advantage of the beast") can be morally justifiable for preserving the state and the well-being of its people (that is, the end can justify the means). "It is therefore necessary to know well how to use both the beast and the man," Machiavelli argued (Machiavelli, 1532/1935, p. 69).

Machiavelli's manifestos further outline his views of humanity and "the masses" as weak, stupid, and simplistically driven to meet their present needs. He wrote, in *The Prince* (Machiavelli, 1532/1935), "one can say this generally of men: that they are ungrateful, fickle, pretenders and dissemblers, evaders of danger, eager for gain" (p. 66), and "if all men were good, this teaching would not be good advice, but since they are dishonest and do not keep faith with you, you in return, need not keep faith with them" (p. 70). His philosophy advocates that rational people should not keep their word or refrain from exploitation when that damages their cause.

A key contribution to moral philosophy was to modify the term prudent ("*prudenza*"). Previously, this term was grounded within classical Christian, Aristotelian, and Aquinian traditions, and had signified the inherent good of an action within a virtuous moral philosophy. Discarding this absolutist conception, Machiavelli introduced the term civic virtue, a secular and pragmatic approach to the "realities" of running the state (in opposition to the Socratic or Aristotelian "city") (see Soll, 2014). In Machiavelli's view, an act exemplified "civic virtue" (and was therefore moral) when it was for the good of the state and came with a "profession of good". This conception of civic virtue influenced ongoing philosophical discourse, aligned to arguments for maximising collective welfare (e.g., John Stuart Mills and Jeremy Bentham), and starkly ran counter to prevailing arguments for universal and inalienable moral rights (e.g., Immanuel Kant and Christian ethics).

Machiavelli's notion did not influence the Medicis (there is little evidence Lorenzo

ever read Machiavelli's "little book") but, over the centuries, other civic leaders have taken heed of his lessons on statecraft, earning him the title "the counsellor of Tyrants" among some authors (Femia, 1998). Benito Mussolini wrote an introduction to *The Prince*. It may have influenced Churchill, Cromwell, and Lenin, who reputedly took a copy into exile, influenced his confrontation with the tsarist army, and in his writing of *The State and Revolution*. Stalin allegedly kept *The Prince* on his bedside table, while Napoleon Bonaparte pointedly stated, "*The Prince* is the only book worth reading" (for a thorough explication of the influence of Machiavelli, see Fuller, 2015). In recent times, some observers claimed during the 2016 presidential campaign that Hillary Clinton displayed behaviour reminiscent of Machiavellian personality traits[1] (Visser, Book, & Volk, 2016). Machiavelli's reputation as having been effective in acquiring and maintaining power has also occasioned a recent boom in Machiavellian self-help books (e.g., Bing, 2009; Greene & Elffers, 2002; Powell, 2010; Rubin, 1997). Variously embraced and condemned, Machiavelli's manifestos and their pragmatic views on the nature of power and human nature have resonated throughout the centuries into modernity (see Soll, 2014).

1.2 Machiavellianism as a Personality Construct

Soon after *The Prince* was published, *Machiavellian / Machiavel* was used to describe duplicity, ruthlessness, cunning, and deceit. Machiavelli's teaching influenced Shakespeare's depiction of Iago from *Othello*, and Richard III's cold and calculated ruthless acquisition of the crown of England, "I can add colours to the chameleon, change shapes with Proteus for advantages, and set the murderous Machiavel to school" (III Henry VI, III.2.193). Shakespeare used Richard III's adherence to *The Prince's* Florentine statecraft to show the inevitable failure of this form of leadership (Hebert, 2015). This trend continued, with references to Machiavellian behaviour appearing in the 1800's, "Nothing could be more congenial to the character of

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[1]In this study utilising the HEXACO personality framework (Lee & Ashton, 2012), Clinton was described as being low on honesty/humility and emotionality, yet conscientious. This aligns with the Machiavellianism personality trait discussed in the section below. Tangentially, participants described Donald Trump as the quintessential narcissist, high on extraversion and low on conscientiousness, agreeableness, emotional stability, and honesty/humility.

James than this piece of Machiavellianism" (M'Crie, 1819, p. 89) and throughout the mid-1900's, "but the Machiavellian hand of Aaron Burr was at work, suavely and ruthlessly undermining the structure of Federalism" (Ferguson, 1938, p. 155).

Despite such popular uses of concepts from Machiavelli, "Machiavellianism", as a concept in psychology, was not formulated until 1970[2]. Christie and Geis established the personality construct of Machiavellianism from themes and extracts from Machiavelli's work, in conjunction with works from other influential power theorists, such as Sun Tzu and Chanakya. They defined Machiavellianism as the degree to which an individual employs cold and callous interpersonal tactics, holds cynical and misanthropic views of humanity, rejects conventional morality, and is emotionally detached (Christie & Geis, 1970). Machiavellianism simply represented a singular continuum of normal personality variation, ranging from low to high.

Interest in Machiavellianism has grown rapidly throughout psychology. Researchers have used Machiavellianism to explicate a wide range of behaviours, such as cooperation and organisational behaviour (O'Boyle et al., 2012; Zagenczyk, Restubog, Kiewitz, Kiazad, & Tang, 2014), leadership (Deluga, 2001; Visser et al., 2016), aggression and delinquency in youth (Chabrol, Van Leeuwen, Rodgers, & Séjourné, 2009; Kerig & Stellwagen, 2010; Marsee & Frick, 2007), calculated duplicity (Jones & Paulhus, 2017), and even social evolutionary processes (Wilson et al., 1996). (A respectable grasp on this literature can be gained from the noted reviews by Vleeming, 1979, Fehr et al., 1992, and more recently by Jones & Paulhus, 2009.)

The growth in interest can be seen in the increase in journal articles that include Machiavellianism in their abstract, reaching over 2,500 on the PsychINFO database by March 2018 (Figure 1.1). References sharply increased in the early 2000s, heavily influenced by the coining of the *Dark Triad* of personality (Paulhus & Williams, 2002; which is discussed, along with its criticisms, in Section 1.2.2, p. 13), and the recent academic fascination with "dark personalities" (e.g., Jonason, Li, & Buss, 2010). Similar interest has grown within evolutionary fields (e.g., Jonason, Li, &

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[2]Published in 1970, their book, *Studies in Machiavellianism*, encapsulated a decade of research and experiments into the construct (e.g., Christie & Geis, 1968) with a host of collaborators.
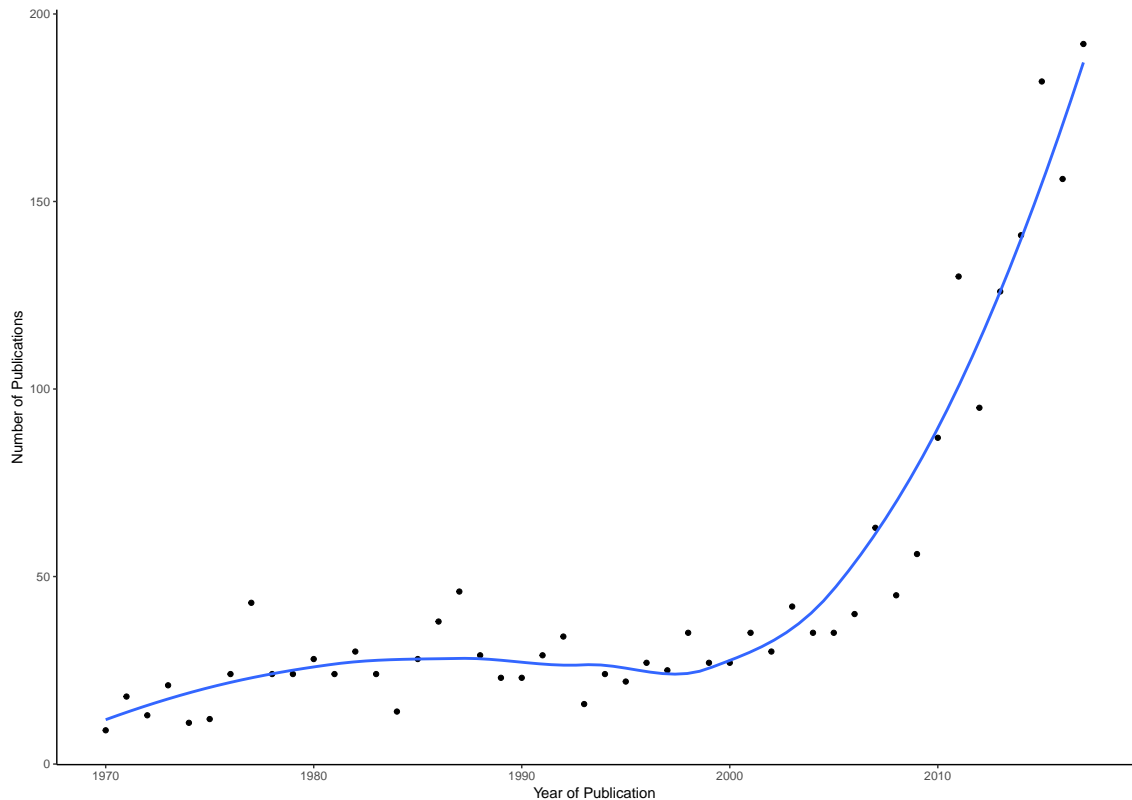
Figure 1.1. Growth in publications referencing Machiavellianism from the PsychINFO database. This search only included the term "Machiavellianism" in the abstract and works published between 1970 and 2017. There were an additional 50 articles published in the period January to beginning of March 2018 (not included in this figure) suggesting this growth pattern is likely to continue.

Buss, 2010; Jonason, Li, Webster, & Schmitt, 2009; Jones & Paulhus, 2009), with the aim of establishing a stronger theoretical basis for Machiavellianism[3]. Conceptual and methodological research offered in this thesis is, therefore, timely and will affect the ongoing theorising and empiricism in this field.

1.2.1 Overview of the Machiavellianism Research

Machiavelli (1532/1935) articulates clearly that it is best to be "*merciful, faithful, humane, frank and religious*" (p. 63), because this is the most advantageous way

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[3]Evolutionary ecological theory suggests that increasing social complexity drives evolutionary pressures for the selection of intelligence. *Homo Sapiens* who were capable of manipulating others, both for cooperation or exploitation, would gain reproductive advantage - gaining "Machiavellian intelligence" (Whiten & Byrne, 1997; Wilson et al., 1998).

Researchers in evolutionary psychology are currently focused on the mating behaviours of individuals with Dark Triad traits, such as higher rates of short-term mating and success (Jonason et al., 2009) and mate poaching (Jonason et al., 2010; Jonason et al., 2009).

to be seen. However, he emphasised that one should never rely on these behaviours or one's own ideologies when it is detrimental to them. Machiavellianism represents one's willingness to engage in whatever behaviour is the most beneficial for achieving their goals (the agentic pursuit of individual over collective goals). This behaviour is, obviously, to the best of their ability, as choosing the best strategy to achieve one's goals in all situations would require superhuman intelligence to foresee all possible options and consequences (akin to a chess grand master; Wilson et al., 1996).

Christie and Geis (1970), along with a range of colleagues, identified four personality factors characteristic of individuals who acquire and maintain power, which underlie Machiavellianism:

1. A relative lack of affect in interpersonal relationships to allow manipulation of others as objects, as opposed to empathising with them,

2. a moral ideology of utilitarianism / instrumentalism over a more conventional view of conventional libertarian ethics,

3. a focus on short-term tactics for achieving goals over long-term ideological goals (low ideological commitment), and

4. a lack of gross psychopathology, so that emotional needs are not distorting one's perceptions. Christie and Geis (1970) emphasised that manipulators are not free of mental health concerns but would need to be within the normal range.

Whereas Chapter 2 will cover the growing evidence for dimensionality (Fehr et al., 1992), the focus here is on the unidimensional perspective which embodies each of the four factors above, given that it is the basis for the majority of this research. Machiavellianism is a relatively stable personality trait, sitting in the middle of the state-trait continuum. Machiavellianism develops in response to one's environment over time, becoming increasingly stable with the accumulation of experience. Although low conscientiousness and agreeableness will predispose one to

Machiavellianism, there is no specific genetic "Machiavellianism" genes. Therefore, one's Machiavellianism retains enough plasticity to change over time in response to new information (1 year stability estimates around $r = .75$; Quednow et al., 2017).

Taxometric analysis (Meehl, 1995; Ruscio, Haslam, & Ruscio, 2006), an amalgamation of techniques for identifying whether the latent trait is dimensional or comprises taxa, demonstrated that the Machiavellianism latent trait is dimensional (Beller & Bosse, 2017). Early usage of the term "Machiavellians" and "high-Machs" to describe individuals high on Machiavellianism (especially by Christie & Geis, 1970), may have misled readers into thinking that "Machiavellians" exist as a qualitatively separate group (taxon). However, dividing the latent trait into these categorical labels is arbitrary and not based on real divisions along the latent trait. Therefore, everyone can find themselves on a dimension from very low to very high in Machiavellianism.

Men have consistently higher levels of Machiavellianism than women (Austin et al., 2007; Brewer, Abell, & Lyons, 2013; Jones & Paulhus, 2009). Gender differences are likely influenced by psychometric issues with current measurement, differences in the manifestation of the construct (Jones & Paulhus, 2009; Wilson et al., 1996), and differences in gender norms and society's acceptance of aggressive behaviours (Eagly & Steffen, 1986). Research into Machiavellianism tends to treat gender as random error, rarely modelling this bias when calculating parameter estimates.

The section below reviews evidence on each of the primary aspects of the Machiavellianism continuum. Figure 1.2 displays each of these domains in the order they will be discussed. The rest of this chapter will review the literature pertaining to Machiavellianism's location within existing and widely accepted personality frameworks, similar antagonistic personality traits (psychopathy, narcissism), and hypotheses regarding its aetiology. This section concludes by expounding the limited understanding of the relationship between Machiavellianism and well-being.

Strength of Machiavellianism

Low

- Does not exploit others, even to personal detriment
- Respects the liberty of others
- Pro-socially orientated
- Anthropic and cooperative
- Trusting of others
- Potentially overly positive / naïve world-view
- Higher in agreeableness, honesty-humility, conscientiousness, and emotional stability

High

- More willing to exploit others to achieve one's goals
- Strategic and callous use of interpersonal manipulation
- Cooperation is not prosocial, simply aligned to the optimum strategy
- Values goals attainment and utilitarian values over individual welfare
- Cynical and distrusting view of humanity
- Lower in agreeableness, honesty-humility, conscientiousness, and emotional stability

Figure 1.2. The unidimensional Machiavellianism latent trait with descriptors for each pole

Amoral behaviour.[4] Machiavellianism reliably predicts willingness to employ calculated, callous, and duplicitous manipulative tactics (Christie & Geis, 1970). Individuals higher in Machiavellianism, when compared to those lower in Machiavellianism, employ more and a greater variety of manipulative behaviours (Austin et al., 2007; Geis, Christie, & Nelson, 1970; Rauthmann, 2012b; Sakalaki, Richardson, & Thepaut, 2007). Although the vast majority of behavioural research is still based on survey methodology, similar findings are consistently found in daily diary studies (Kashy & DePaulo, 1996), organisational / natural, and laboratory experiments (Chabrol et al., 2009; Christie & Geis, 1970; Harrell & Hartnagel, 1976; Zagenczyk et al., 2014). Machiavellianism also predicts support for ingratiation, persuasion, intimidation, betrayal (Rauthmann, 2013), and duplicity (Jones & Paulhus, 2017). Children's willingness to manipulate their peers also correlates to their Machiavellianism (Braginsky, 1970a).

Differentiating from similar constructs, Machiavellianism predicts strategic exploitation, with careful discrimination of when to act anti-socially (Bogart, Geis, Levy, & Zimbardo, 1970; Cooper & Peterson, 1980; Harrell & Hartnagel, 1976; Shultz, 1993). This also includes adjusting behaviour based on the perceived re-

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[4]The term amoral is used here specifically, despite the term immoral being used largely in the literature. Immoral implies directly against moral standards (evil, wicked), while amoral suggests unconcerned / unconnected with moral standards. Machiavellianism is concerned with the latter, as will be discussed.

ward versus the likelihood and punishment of being caught (Bogart et al., 1970; Geis, 1970; Geis & Moon, 1981; Harrell & Hartnagel, 1976; Jones & Paulhus, 2017). Therefore, Machiavellian duplicity involves self-monitoring and impression management (Bolino & Turnley, 2003; Fehr et al., 1992; Leone & Corte, 1994).

Machiavellian strategy includes cooperating with others. This should not be confused with pro-social cooperation, which associates negatively with Machiavellianism (Paal & Bereczkei, 2007). Machiavellianism associates with cooperation only when it is more personally beneficial than the alternatives (Geis, 1970; Gunnthorsdottir et al., 2002). Geis (1970) found that those high in Machiavellianism entered into more alliances than those low in Machiavellianism. However, they were more willing to break or defect from the alliance to better performing groups when it was more beneficial to them (Geis, 1970; Gunnthorsdottir et al., 2002).

Given this behaviour, researchers have elegantly summarised Machiavellian behaviour as *homines economici* (rational economic agent) (Gunnthorsdottir et al., 2002; Sakalaki et al., 2007). *Homines economici* calmly and logically select optimal strategies to achieve their goals, detached from social norms or affect (Exline, Thibaut, Hickey, & Gumpert, 1970). Gunnthorsdottir et al., (2002) and Salaki et al., (2007) argue that those higher on Machiavellianism receive less reward from engaging in cooperative behaviour and reciprocity that follows social norms. As those higher in Machiavellianism are less concerned with social approval and judge others in a negative light, they are more able to select the strategy that best serves their individual goals and be economically opportunistic to increase their likelihood of success.

Given the freedom to engage in whatever behaviour best achieves their goals, Machiavellianism predicts success in a range of interpersonal situations, such as game scenarios, and more successfully lying to and manipulating peers (Braginsky, 1970a; Christie, 1970c; Jones & Paulhus, 2009; Vleeming, 1979). Individuals higher in Machiavellianism tend to display more behaviours typical of trust (e.g., maintaining more eye-contact), appear more persuasive (for review see Vleeming, 1979), tell more

plausible lies (Exline et al., 1970), and are judged as being more truthful when lying (DePaulo & Rosenthal, 1979; Geis & Moon, 1981; Riggio, Salinas, & Tucker, 1988). The same pattern of increased ability to manipulate is also seen in Machiavellian children, with children higher in Machiavellianism more capable at convincing peers to eat a distasteful quinine cracker than children lower in Machiavellianism (Christie, 1970c).

Machiavellianism and intelligence domains. There is no evidence for the belief that individuals higher in Machiavellianism are able to effectively manipulate others because of their heightened intelligence (Christie, 1970a; Christie & Geis, 1968; Paulhus & Williams, 2002; Wilson et al., 1998), advanced theory of mind, and superior emotional intelligence (EI) (Jones & Paulhus, 2009; Loftus & Glenwick, 2001). In fact, Machiavellianism tends to associate with lower levels of EI across a range of test modalities such as self-report, performance based questionnaires (Ali, Amorim, & Chamorro-Premuzic, 2009; Austin et al., 2007; Jones & Paulhus, 2009; Pilch, 2008), reading emotions from manikins' faces (Ali et al., 2009), and deciphering emotional information from vignette tasks (Paal & Bereczkei, 2007).

It seems contrary to expectations that those higher in Machiavellianism have poor EI, alexithymia (unconnected to one's own emotions), and empathy deficits (Wastell & Booth, 2003). Knowledge of others' emotional states appears necessary to exploit them, *prima facie*, for "to manipulate, one needs to know something of the material one is working with" (McIlwain, 2003). McIlwain (2003) suggested that individuals higher in Machiavellianism understand humans' general weaknesses, drives, and capacity to be exploited. Therefore, vigilance of another's moment-by-moment idiosyncrasies is not necessary. Intra and Inter EI and empathy will impede their capacity to make cold and manipulative decisions. A cynical world-view and external locus of control (McHoskey, Worzel, & Szyarto, 1998; McIlwain, 2011; Mudrack, 1990) may also justify antisocial behaviour (discussed below). Additionally, increased manipulation proficiency could be the product of practice effects, because increased usage of exploitation should, on average, increase proficiency.

Bereczkei and colleagues (e.g., Bereczkei, 2015; Bereczkei, Birkas, & Kerekes, 2010; Bereczkei, Deak, Papp, Perlaki, & Orsi, 2013; Czibor, & Bereczkei, 2012; Czibor, Vincze, & Bereczkei, 2014) also argued that there might be specific neural correlates and cognitive devices associated with Machiavellianism. Building upon the strong evidence for Machiavellianism relating to lower EI, their research suggests Machiavellianism is, instead, associated with a flexible focus on long-term strategy, adjusting behaviour based on the situation, the likelihood of future engagement, and the likelihood of punishment (Bereczkei, 2015). Interestingly, this flexibility might also set Machiavellianism apart from psychopathy, given the latter appears to be inflexibly associated with dysfunctional impulsivity, heightened sensitivity to short-term rewards, and emotionally driven aggression.

Given the importance of Machiavellian flexibility to meet the demands of the current situation, Machiavellianism associates with increased activity in brain regions such as: the anterior cingulate cortex (involved in monitoring social connection and conflict), left anterior orbitofrontal cortex (implicated in goal-direction and punishment sensitivity), right insula cortex (increased experiences of unpleasant affect), middle occipital gyrus and superior frontal gyrus (involved in inhibition and attentional control), and inferior frontal gyrus (stimulated during reward expectancy and social monitoring). Although this research is still in its infancy, exposure to adverse and competitive social environments might result in neurological changes attuned to flexible and calculated social monitoring and manipulation (Bereczkei, 2015).

Distrusting view of others. Research also supports those higher in Machiavellianism having increased distrust and cynical view of others. Rauthmann (2013) argued that this cynicism might be the core feature of Machiavellianism, which drives and justifies the use of interpersonal exploitation. Machiavellianism associates with hypervigilance to being incriminated, suspicion of experimental manipulations, and greater resistance to, and suspicion of, others' attempts to involve them in unethical acts (Bogart et al., 1970; Exline et al., 1970; Geis & Moon, 1981). Individuals higher in Machiavellianism also perceive confederates and poten-

tial partners in behavioural experiments as less trusting (Harrell & Hartnagel, 1976).
When rating peers in such experiments, Machiavellianism correlates with being less
nurturing, gregarious, open, and intelligent (Rauthmann, 2012a).

Sakalaki et al., (2007) further found that Machiavellians endorsed statements
such as "in economic matters people usually don't trust others", and "in economic
relationships, usually one uses the other for his or her own satisfaction" significantly
more than an alternative, trusting statement. Despite this scepticism, Machiavel-
lianism appears only to predict hypervigilance and distrust, and not increased ef-
ficacy at detecting deceit in others (DePaulo & Rosenthal, 1979; Geis & Moon,
1981; Kraut & Price, 1976; Zuckerman, DePaulo, & Rosenthal, 1981). Interestingly,
work by Rauthmann (2012a) suggests Machiavellian misanthropy relates to human-
ity globally, in the sense that those higher in Machiavellianism also see themselves
as corrupt.

1.2.2   Relation to Personality Constructs

Broad personality constructs. The Five Factor model (FFM) (Digman,
1996; Goldberg, 1999; McCrae & Costa, 1996) is the most widely accepted and
studied taxonomy of personality and has been instrumental in the study of indi-
vidual differences. Under the FFM, all human personality can be differentiated
across five relatively stable, universal, and biologically based traits (DeYoung et al.,
2010; McCrae et al., 2000; McCrae & Costa Jr., 1997). While Machiavellianism
appears unrelated to extraversion and openness to experience, it reliably correlates
negatively with conscientiousness (characterised by being orderly, delaying gratifica-
tion, and being goal directed) and with agreeableness (compassionate, friendly, and
cooperation) (see Furnham, Richards, Rangel, & Jones, 2014 for review).

The negative association with agreeableness is expected, given it is a feature
of antagonistic personality traits (antisocial, self-interested). However, the associ-
ation with conscientiousness is somewhat troublesome, because it is closely aligned
with impulse control (Hampson, 2012), against the Machiavellian archetype of being
cold and calculated. This relationship is conceptually aligned to more disinhibited

personality traits, such as psychopathy (Patrick, Fowles, & Krueger, 2009), and suggests there is divergence between the measurement and conceptualisation of Machiavellianism.

Machiavellianism has been linked to moderate levels of neuroticism, the converse of emotional stability. These links are inconsistent, with some studies finding small but non-significant positive relationships (Jonason, Li, & Teicher, 2010; Lee & Ashton, 2005; Paulhus & Williams, 2002; Rauthmann, 2013) and others finding significant positive relationships (Ashton, Lee, & Son, 2000; Austin et al., 2007; Jakobwitz & Egan, 2006; Jonason & Webster, 2010; Ramanaiah, Byravan, & Detwiler, 1994; Rauthmann, 2012b; Stead, Cynthia, Alexandra, & Kate, 2012; Vernon, Villani, Vickers, & Harris, 2008). A positive relationship is also seen in children (Muris, Meesters, & Timmermans, 2013). When only considering the Mach-IV scale (the primary measure of Machiavellianism), positive correlations with neuroticism are consistent (see data presented by Furnham et al., 2014).

A sixth factor, honesty-humility, can be partitioned from variance in agreeableness (the HEXACO model; Lee & Ashton, 2012). This additional trait aligns closely with Machiavellianism, because it represents fairness and sincerity. Honesty-humility has stronger correlations than the FFM traits, often around -.40 (Ashton et al., 2000; Lee & Ashton, 2005). Book, Visser, and Volk (2015) demonstrated that honesty-humility is the best way to represent the three overlapping aversive personality traits coined the *Dark Triad*.

The Dark Triad. Paulhus and Williams (2002) coined the term Dark Triad to represent three associated antagonistic personality traits: Machiavellianism, psychopathy (representing enduring antisocial behaviour, disinhibition, "meanness", and empathy deficits), and narcissism (self-absorption, dominance, and egocentricity). Correlations between the traits average between .34 and .58, strongest between psychopathy and Machiavellianism ranging from .45 to .70 (Muris, Merckelbach, Otgaar, & Meijer, 2017). Interest in the Dark Triad is increasing exponentially, being cited over 350 times by 2013 (Furnham, Richards, & Paulhus, 2013) and over 770 by May

2018 (PsychINFO database).

Debate surrounds the higher-order structure between each trait, in particular whether each are unique components within the higher-order antagonism personality construct (Book et al., 2015), or whether psychopathy encompasses narcissism and Machiavellianism (Glenn & Sellbom, 2015; Lilienfeld & Andrews, 1996). Psychopathy is a broad personality construct that comprises key features of the other two traits: grandiosity, pathological lying, and callousness. Considerable Dark Triad research, therefore, loses core features of all three traits (see Glenn & Sellbom, 2015; Sleep, Lynam, Hyatt, & Miller, 2017) by only estimating unique contributions to the outcome of interest. Similarly, reducing all three traits to a singular value is conceptually troublesome and might represent psychopathy grossly, while removing variance associated with Machiavellian views (Glenn & Sellbom, 2015).

We need to pay particular attention to whether Machiavellianism is subsumed within psychopathy, or potentially represents a less impulsive manifestation of non-clinical or secondary psychopathy (Glenn & Sellbom, 2015; McHoskey et al., 1998; Miller et al., 2016). Machiavellianism demarcates (at least conceptually) from psychopathy because it captures cold, logical, and pragmatic manipulation, and not the disinhibited predatory behaviour that is archetypal of psychopathy.[5] Psychopathy also appears to have a stronger genetic basis, while Machiavellianism is largely learnt through environmental experiences (Campbell et al., 2009; Vernon et al., 2008; Veselka, Schermer, & Vernon, 2011). Machiavellianism represents learning the world is unjust and that exploitative behaviours can be moral to thrive and survive (i.e., an external loci of control; Mudrack, 1990). Therefore, although psychopathy and Machiavellianism are phenotypically similar, agentic striving for self-beneficial goals at the expense of others, their underlying motivations are distinct.

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[5]Given the broad multi-dimensional nature of psychopathy (Patrick, 2005; Patrick, Fowles, & Krueger, 2009), research does highlight that impulsivity may not be quintessential to psychopathy (Poythress & Hall, 2011).

Secondary psychopathy is also hypothesised to be environmentally, and not genetically, based (Patrick, 2005). We cannot test the difference here, given that the referenced genetic studies (Campbell et al., 2009; Vernon et al., 2008) utilise the Self-Report Psychopathy Scale-III, a measure of subclinical psychopathy (Paulhus, Neumann, & Hare, 2009), which did not divide between primary and secondary psychopathy.

Glenn and Sellbom (2015) identified cynicism as a potential unique feature of Machiavellianism, because cynicism is absent from the psychopathy literature and, in their analysis, was not captured by the Dark Triad latent trait. However, the prevailing unidimensional conceptualisation and measure of Machiavellianism are incapable of clearly differentiating these two constructs (Miller et al., 2016). This thesis will finally provide empirical support for the cynical dimension of Machiavellianism, Machiavellian views, as a key point of differentiation between the two traits.

1.2.3 Aetiology of Machiavellianism

Machiavellianism largely develops in reaction to one's environment. Life experiences influence trust in others and acceptable modes of behaviour. Genetics influences Machiavellianism through broader biologically based and cross-culturally stable personality traits (DeYoung et al., 2010; McCrae & Costa Jr., 1997). Agreeableness, emotional stability and conscientiousness account for approximately 25% of the variation in Machiavellianism (Vernon et al., 2008). While sub-clinical psychopathy and Machiavellianism correlate moderately (Furnham & Richards, 2013), psychopathy appears strongly influenced by genetic factors that are not uniquely implicated in the development of Machiavellianism (Vernon et al., 2008). Further, twin studies demonstrate minimal heritability through shared genetic factors, with the majority of variance attributable to shared, and non-shared environments (Campbell et al., 2009; Vernon et al., 2008).

A constellation of environmental experiences influences the development of Machiavellianism. Difficult early or later life experiences, such as abuse, neglect, trauma, and family discord (Láng & Abell, 2018; Láng & Birkás, 2014; Láng & Lénárd, 2015; McIlwain, 2011), likely facilitate cynical world-views, interpersonal distrust, and insecure attachment. These experiences result in core world-views or schemas, such as emotional deprivation and mistrust/abuse (Láng, 2015). Attachment figures may model and reinforce antisocial and objectifying behaviour (Braginsky, 1970b; Kraut & Price, 1976), particularly likely if the child is achieving favourable outcomes. Evidence implicates the role of modelling from family mem-

bers (Guterman, 1970; Kraut & Price, 1976; Ojha, 2007) and external attachment figures (Touhey, 1973). It is not yet possible to identify the process by which Machiavellianism develops based on retrospective correlational analyses, however there is some evidence that the behavioural components arise in response to a cynical world-view (Hunter, Gerbing, & Boster, 1982).

1.2.4   Machiavellianism, Psychopathology, and Well-being

The "cool syndrome" associated with Machiavellianism suggests manipulating others with psychopathological impunity. This presupposition is disputed in Chapter 3 that provides evidence to the contrary, therefore only a brief review is offered here. Christie and Geis (1970) made formal statements regarding the nature of those who can gain and maintain power. They argued that "the absence of gross psychopathology" is important in being able to effectively exploit others. Psychopathology would inhibit rational thought. They reported correlations between the Mach-V scale and anxiety, depression, and emotional adjustment (Christie & Geis, 1970; Skinner, 1982). Despite their findings, inconsistent findings arise between Machiavellianism and higher levels of depression, psychiatric and social symptomatology (Stead et al., 2012), and lower levels of subjective well-being and life satisfaction (Aghababaei & Bachnio, 2015; Rehman, Nabi, & Shahnawaz, 2018). Researchers have also suggested Machiavellianism's association with alexithymia facilitates anhedonia, depression, and anxiety (Aïn et al., 2013; Austin et al., 2007).

Humans are social creatures. Engaging in solidarity with others, seeing peers as sources of social support, and being seen favourably by others, are important to one's subjective well-being (Siedlecki, Salthouse, Oishi, & Jeswani, 2014). As the strength of one's Machiavellianism increases, one is less trusting of others, more likely to see them as objects, rather than for social connections, and a perceived threat. Hypervigilance to threat is also an axiom of anxiety (LeDoux, 2014). In response, peers become less willing to develop close social connections unless their manipulativeness can be directed against a third-party for their benefit (Wilson et al., 1998). Peers will not accept a friend manipulating them for long unless there is

some added benefit. Consequently, Machiavellianism associates with higher levels of self-reported social exclusion, alienation, and rejection (Stead et al., 2012).

Evidence of increased social rejection and exclusion among individuals higher in Machiavellianism can even be seen in children (Repacholi, Slaughter, Pritchard, & Gibbs, 2003). In adults, Machiavellianism associates with increased rejection from peers, more frequent and unemotionally discarded romantic relationships (Jonason, Li, & Buss, 2010), and feeling less connected and intimate with romantic partners (Ali & Chamorro-Premuzic, 2010; Jonason, Li, & Czarna, 2013). Social deficits likely impact Machiavellians' lower self-reported life satisfaction (Ali & Chamorro-Premuzic, 2010) and adult friendship quality (Abell, Lyons, & Brewer, 2014). Therefore, Machiavellian anti-sociality associates with a lifetime of peer rejection.

Each of the major domains discussed above - personality, Dark Triad, and aetiology - influences well-being. Machiavellianism (when using the Mach-IV) associates with neuroticism (opposite of trait emotional stability). Neuroticism is a general risk factor for a wide range of mental health concerns, such as anxiety, depression, and psychosis (Kotov et al., 2011; Ormel et al., 2013). The other two Dark Triad traits have clinical counterparts, with long histories as diagnoses (or specifiers), and associated with antagonism, externalising psychopathology, criminality / delinquency, and impulsivity (American Psychiatric Association, 2013; Chabrol et al., 2009; Patrick, 2005). Finally, the associated maladaptive early or later life experiences, attachment difficulties, and schema development (see Láng & Abell, 2018; Láng & Birkás, 2014; Láng & Lénárd, 2015; McIlwain, 2011) strongly influence the development of psychopathology throughout the lifespan (Cicchetti & Toth, 1995). Overall, there are strong arguments as to why Machiavellianism should relate to lower levels of subjective well-being and increased psychopathology.

The following chapter will address issues with current psychometric measurement that obscure credible relationships between Machiavellianism and negative psychosocial factors.

Chapter 2

Current State of Measurement and Evidence for Dimensionality

Measurement is only as precise as the instruments available. In understanding individual differences in psychological science, measurement largely comprises questionnaires. These can range from short scales of even a single item (such as asking about one's gender) to large scale clinical test batteries, such as the Minnesota Multiphasic Personality Inventory-2 (Hathaway & McKinley, 1982) and its more recent restructured-form (Ben-Porath & Tellegen, 2008), spanning 567 and 338 items respectively. The psychometric quality of such scales relies on their capacity to yield accurate and consistent estimates (lower error of estimates / higher reliability) of a construct based upon a conceptuality respectable definition (construct validity; Cronbach & Meehl, 1955). Accurate measurement often requires subscales to capture important mechanisms, which can aggregate to the higher-order construct, or be completely independent. Especially when a single measure dominates understanding of any construct and is limited to the picture that measure can paint.

Chapter 2 will cover the instruments used to paint current understanding of Machiavellianism. The most widely used measure, the Mach-IV (Christie & Geis, 1970), and dominant composite measures, such as the Dirty Dozen measure of the Dark Triad (Jonason & Webster, 2010), largely conceptualise Machiavellianism as

a singular construct. Others, especially newer organisational measures (e.g., Dahling, Whitaker, & Levy, 2009), have much stronger, multidimensional, psychometric properties. However, these measures are limited in terms of their capacity to capture the conceptual aspects of Machiavellianism covered in Chapter 1. Overall, Chapter 2 will demonstrate that, although there have been many, and quite valiant, attempts to measure Machiavellianism accurately, the field needs a psychometrically sound multidimensional instrument to capture the views and tactics dimensions. Only then can an accurate understanding of Machiavellianism, psychopathology, and well-being be developed.

2.1   The Original "Mach" Scales

To capture the Machiavellianism personality construct, Christie and Geis (1970) developed and validated two scales, known as the Mach-IV (Likert scale available in Appendix B) and the Mach-V (forced-choice scale with three options). When developing the scales, Christie and Geis (1970) shortened the larger item pool in three phases (labelled the Mach-I, Mach-II, and Mach-III), with the Mach-IV representing the first viable measure. These two scales have been extensively employed throughout the psychological literature, with their psychometric properties receiving mixed reviews, being both endorsed (e.g., Furnham et al., 2013; Jones & Paulhus, 2009; Wrightsman, 1991) and criticised (e.g., Calvete & Corral, 2000; Dahling et al., 2009; Hunter et al., 1982; Kessler et al., 2010; Vleeming, 1984).

The Mach-IV is a Likert style self-report scale comprising 20 items selected from an initial item pool of 71 (named the Mach-II, with the items at each step along the scale construction process receiving the next "Mach" numeration). To identify individuals who are attracted and thrive in positions of power, the researchers (Christie, 1970d; Christie & Geis, 1968) developed an initial item pool that captured the teachings of Machiavelli and other influential power theorists, such as Sun Tzu and Chanakya. The researchers chose items to represent the three key themes identified in the works of Machiavelli and several other influential power theorists: 1) the advocacy of manipulation, deceit, and exploitation in interpersonal relations

(interpersonal tactics), 2) an unflattering view of humans as being weak, simplistic, and easily exploited by more rational individuals (cynicism), and 3) the absence of adherence to conventional abstract morality (morality). The final 20 items (10 protrait, 10 contrait) best discriminated between high and low respondents on the overall item pool of 1196 university students (Christie, 1970b).

The Mach-V consists of the same 20 items as the Mach-IV but utilising a forced-choice response style (three alternatives). Response options consist of the Mach-IV item, and non-Machiavellianism item matched for social desirability, and an unre-lated buffer item that disguises the nature of the scale and forces a choice between the two other items. By changing the response scheme of the scale, Christie and Geis were able to reduce the correlations between the estimate of Machiavellianism (Mach-V) and both the Edwards (Edwards, 1957) and the Crowne-Marlow (Crowne & Marlowe, 1960) social desirability scales, from troublesome to insignificant levels (Christie & Geis, 1968).

Soon after the Mach-V's inception, its usage in research steadily declined, des-pite its initial promise. Researchers hesitated to use the measure because of its psychometric shortcomings (such as reliability) and due to issues with its forced-choice format (Dahling et al., 2009; Fehr et al., 1992; Kraut & Price, 1976; Ray, 1983; Vleeming, 1979; Williams et al., 1975; Zook, 1985). Furthermore, research-ers have raised concerns that the pattern of associations with external measures indicates that the two forms may be measuring different constructs (Fehr et al., 1992).

Given the issues with the Mach-V, the Mach-IV has been adopted as the "gold standard" of measuring Machiavellianism (Fehr et al., 1992; Guterman, 1970; Jones & Paulhus, 2009; Ramanaiah et al., 1994; Wrightsman, 1991); it had been utilised by more than 2,000 studies by 2009, nearly 40 years after its original publication (Jones & Paulhus, 2009). This popularity led to the translation of the Mach-IV into a variety of languages, such as German (Rauthmann, 2013), Korean (Ashton et al., 2000), Arabic (Starr, 1975), French (Aïn et al., 2013), Spanish (Calvete & Corral,

2000), Dutch (Vleeming, 1984), and a Chinese language (Oksenberg, 1971).

Regardless of the psychometric issues surrounding the Mach-IV (discussed in the next section), it has proven to be an effective measure of Machiavellianism. Homogeneous with the original conceptualisation of the Machiavellian, individuals who score high on the Mach-IV, when compared to those who scored low, consistently manipulate and deceive more (Geis et al., 1970; Sakalaki et al., 2007), are more manipulative, persuasive, and plausible liars (Christie, 1970c; DePaulo & Rosenthal, 1979; Vleeming, 1979), and selfishly play the dominant strategy in game experiments (Gunnthorsdottir et al., 2002; Sakalaki et al., 2007). Mach-IV also predicts increased self-reports of the usage of manipulative tactics, such as emotional manipulation, persuasion, self-disclosure, and betrayal (Austin et al., 2007; Rauthmann, 2013). The Mach-IV can be considered a meaningful predictor of Machiavellian behaviour.

2.1.1   Psychometric Concerns

The Mach-IV has a range of critical methodological concerns. Scale items have been criticised for being too vague, lacking adequate content coverage, being double barrelled (Dahling et al., 2009), and lacking a clear theoretical and nomological framework (Rauthmann, 2013; Wilson et al., 1996). Item Response Theory (IRT) analyses also suggest that the majority of the Mach-IV are unnecessary "noise" items (discriminating respondents on the latent trait poorly; Rauthmann, 2013). The issues that exist with the Mach-IV have led some researchers to doubt the scale's ability to accurately measure Machiavellianism (Panitz, 1989; Rauthmann, 2013). Below is a brief discussion of the major psychometric concerns with the Mach-IV, recent attempts to develop better instruments, the factor-analytic investigations into the Mach-IV factor structure of Machiavellianism, and the bifactor structure that arises reliably throughout these studies the underlying framework on which the subsequent investigation of this thesis is built.

Internal consistency estimates for the Mach-IV (i.e. the degree to which the pattern of correlations among the items suggest they measure the same thing) are variable and often troublesome (Fehr et al., 1992). Highlighting the extent of this

issue, the mean internal consistency (Cronbach's α) of 19 studies published between 1984 and 2012 was .70[1] (ranging from .51 to .82, $SD = .08$). As the mean estimate is at the lower bound of what is considered acceptable for research (DeVellis, 2011), the large standard deviation indicates that the Mach-IVs internal consistency is often considerably lower than what would be considered acceptable, often resulting in its exclusion from studies (e.g., Vrij & Holland, 1998). Further, an average alpha of .70 is low when considering the scale is 20 items in length (alpha estimates tends to artificially inflate as scale length increases). This variability in alpha estimates also suggests inconsistent response patterns among items. Substantial sex differences in reliability estimates have also been found (see Kraut & Price, 1976; Vleeming, 1979), reaching as low as .39 in female samples, with females samples generally being less reliable than male samples (Oksenberg, 1971; Vleeming, 1979). The poor reliability is especially pronounced when using the Machiavellian subscales (Aïn et al., 2013; Calvete & Corral, 2000), with the morality subscale often removed from research. Estimates of Mach-IV's temporal stability are strong when considering the variation in internal consistency. Estimates of temporal stability have been reported for two weeks ($r = .73$; Meyer, 1992), six weeks ($r = .76$; Zook, 1985; Zook & Sipps, 1986), and at nine months ($r = .63$; Gunnthorsdottir et al., 2002). During the construction of the scale, Christie (1970b) noted that the internal consistency of the measures could be easily increased by including more items and increasing homogeneity of item content. However, Christie reported prioritising items that discriminated between high and low Mach-IV scorers over increased internal consistency.

It seems almost a maxim that those who employ Machiavellian duplicity and cunning deceit also manage their social impression. Therefore, completely reducing measurement error introduced by socially desirable responding might be impossible, and efforts should instead aim to select items that minimise this bias. These is-

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[1]The papers sampled were: Ali et al. (2009); Ashton et al. (2000); Austin et al. (2007); Chabrol et al. (2009); Esperger & Bereczkei (2012); Gurtman (1992); Jakobwitz & Egan (2006); Jonason, Li, & Buss (2010); Jonason, Li, & Teicher (2010); Jonason et al. (2009); Jonason & Webster (2010); Jones & Paulhus (2011); Lee & Ashton (2005); Paulhus & Williams (2002); Rauthmann (2012); Stead et al. (2012); and Vleeming (1984).

sues facilitated the development of the Mach-V, to address social desirability issues. While validating the Mach-IV, Christie (1970a) found that the measure has medium to large (Cohen, 1988) correlations (r = -.35 to -.45) with a measure of social desirability (Edwards social desirability scale). Numerous studies report similar associations (r = -.15 to -.50; Vleeming, 1984; Watson, Milliron, & Morris, 1995; Zook, 1985; Zook & Sipps, 1986), which is consistent with associations between Machiavellianism and higher levels of self-monitoring (Calvete & Corral, 2000).

Interestingly, the relationship between Machiavellianism and social desirability appears to vary between genders. Budner (as cited in Christie, 1970b) found that females (r = -.75) have higher levels of socially desirable responses on the Mach-IV than males (r = -.35). Zook and Sipps (1986) also found sex differences in social desirability associations (although much smaller), -.10 for men and -.25 for females. For males, especially young boys, being Machiavellian may increase one's social status, and thus manipulative tendencies are more socially desirable (Kerig & Sink, 2011). These correlations as a whole suggest that, especially for females, social norms restrict one's willingness to endorse Machiavellian items (Christie, 1970a), introducing measurement error.

2.2   Other Measures of Machiavellianism

Although alternative measures have been suggested, these also have psychometric or conceptual issues that diminish their utility for the overall aims of this thesis. A brief discussion of these measures is provided.

2.2.1   Mach-IV/V Variations

A host of other measures of Machiavellianism have been developed through modification of the Mach scales. Although these measures strengthen investigations into Machiavellianism, they inherit the issues with item content and unidimensionality, which were raised in the previous section. Several researchers simply shortened the Mach-IV (Ray, 1983) or the Mach-V (Guterman, 1970), included items from the Mach-II (Christie, 1970b) (the item pool for the Mach-IV; e.g., Kline & Cooper, 1983), or modified item content - for example to remove sex biased language (Hunter

et al., 1982; Zook & Sipps, 1986). Allsopp, Eysenck, and Eysenck (1991) reworded the standard Mach items to be self-referent, and added several items to capture Machiavellian behaviours, such as ruthlessness and power-seeking.

The Kiddy Mach scale (Nachamie, 1970) specifically assessed Machiavellian tendencies among young children (as cited in Christie, 1970c, p. 326). The Kiddie Mach contains the same items and anticipated factor structure as the Mach-IV, with alterations in wording for children. Similar psychometric issues surrounding the Kiddie Mach, and internal consistency estimates around .50 (Christie, 1970c; Kraut & Price, 1976) have led to its psychometrics being deemed "adequate at best" (Slaughter, 2011).

The Mach* (Rauthmann, 2013) comprises the five strongest performing Mach-IV items based on IRT, a powerful technique which is increasingly being employed in the field of psychological research (Reise, Ainsworth, & Haviland, 2005; Reise & Waller, 2009) and in Chapter 5 of this thesis. Rauthmann (2013) argued that the core of Machiavellianism is likely a misanthropic and cynical view of human nature, as these items provided the most information about the Machiavellianism latent trait. The correlations between the Mach* and the Mach-IV were strong (disattenuated correlation = .84), as they were with an emotional manipulation scale ($r = .62$), and the German Machiavellianism Scale ($r = .72$). This scale also replicates much of the Mach-IV's associations with external scales (convergent validity estimates), such as with agreeableness and conscientiousness (Rauthmann, 2013).

2.2.2 Dark Triad Composite Measures

Jonason and Webster (2010) developed a 28-item Dark Triad measure that was eventually shortened to only twelve items, the Dirty Dozen. This measure is gaining wide spread use and popularity (Furnham & Richards, 2013; Muris et al., 2017). The Machiavellian facet is internally consistent in their original studies (α ranged from .72 to .77), and only contains items pertaining to exploitative and duplicitous tactics. As discussed previously (Section 1.2.2, p.13), ongoing debate surrounds

whether these traits are truly independent enough to warrant all three being used in a single investigation (Glenn & Sellbom, 2015; Lilienfeld & Andrews, 1996). The practice of partialing out unique variance from each trait removes essential variance from each trait, while taking the mean of the Dirty Dozen to create a "core" Dark Trait likely results in a crude measure of antagonism or psychopathy (Glenn & Sellbom, 2015; Muris et al., 2017; Sleep et al., 2017).

As will be reiterated throughout this thesis, there are strong arguments for cynicism to be a key feature of Machiavellianism and an important point of differentiation from the other Dark Triad traits. The Dirty Dozen measure has no items to capture Machiavellian cynicism. (Interestingly, there was one cynicism item which was integrated into the psychopathy facet.) The Dirty Dozen measure has been further criticised for having poor associations with the primary measures of each Dark Triad trait, for having subscales that correlate more strongly with the Dirty Dozen's other subscales than with their own primary measure, and for its Machiavellianism subscale correlating with short-term / impulsive behaviours, which is inconsistent with Machiavellianism's strategic nature (Jonason Webster, 2010; Rauthmann, 2013; Jones Paulhus, 2009).

Overcoming many of the concerns with the Dirty Dozen measure, Jones and Paulhus (2013) developed the Short Dark Triad (SD3) measure across four studies. Initial exploratory factor analysis and subsequent confirmatory factor analysis supported a three-factor structure for the scale's 27 items. The Machiavellianism subscale comprises items that closely align with Christie and Geis's (1970) original conceptualisation: protection of reputation, cynicism, coalition building, and planning. Initial research also suggests strong correlations between self and informant ratings ($r = .42$), and strong correlations with the Mach-IV ($r = .68$; disattenuated $= .82$). The SD3 correlates relatively evenly with both the Mach-IV's Tactics ($r = .55$) and Views ($r = .52$) subscales, suggesting a good representation of both core dimensions. This measure appears to be a good step forward in composite measures and the measurement of Machiavellianism.

2.2.3 New Measures

Several measures have arisen since the mid-1970's in Germany that have only recently been applied in literature in English (Rauthmann, 2012b). These include the Machiavellian Attitudes Scale (Ulbrich-Herrmann, 2008), the Swiss/German Machiavellianism and conservatism scale (Cloetta, 1983), and the German Machiavellian Scale (GMS) (Henning, 1983; Henning & Six, 1977). The GMS has been more recently validated (Rauthmann, 2012b), with evidence for a three-factor solution for males and a two-factor solution for females. In support of its construct validity, the GMS correlates with psychopathy and emotional manipulation.

Three measures have arisen to specifically measure organisational Machiavellianism, but are yet to be widely adopted in the psychological literature. The Machiavellianism scale (Mach-B) is a seven-item behavioural measure (Aziz, May, & Crotts, 2002), and the Machiavellian Personality Scale (MPS) (Dahling et al., 2009; Talmácsi, Orosz, Birkás, Bereczkei, 2013 and Organisational Machiavellianism Scale (OMS) (Kessler et al., 2010) are multidimensional measures. The development of the MPS (Dahling et al., 2009) was guided by four key themes extracted from the Machiavellian literature: distrust of others, desire for status, desire for control, and amoral manipulation. Confirmatory Factor Analysis (CFA) supported the hierarchical 4-factor structure, and each subscale was internally consistent enough for research purposes (α = .70 - .82). The OMS (Kessler et al., 2010) consists of 18 items, divided into three subscales: maintaining power (α = .67), management practices (α = .72), and manipulativeness (α = .76). This measure has been used to explain a growing variety of organisational behaviours. However, the factor structure and item content are specifically workplace orientated, for example "If I show any weakness at work, other people will take advantage of it", and the scales do not control for acquiescence by including protrait and contrait items.

Several scales are currently under development that have not been published outside conference presentations. The development of two German scales, the General Machiavellianism scale and the Machiavellian intelligence scale, resulted from

extended critiques of the current measures (Rauthmann, 2012b, 2013; Rauthmann & Will, 2011). The results of initial factor-analysis suggest a three-factor solution, labelled Machiavellian: influence ($\alpha = .88$), strategy ($\alpha = .75$), and reputation ($\alpha = .69$). Jones and Paulhus (2009) also reported their development of a measure to assess strategic / non-impulsive Machiavellianism. Given their unpublished status, these measures are not available to address the concerns raised regarding the Mach-IV, or to capture the evidence for bidimensionality discussed below.

2.3   The Bi-Dimensional Structure of Machiavellianism

While most researchers have focused on Machiavellianism as unidimensional, evidence for its multidimensionality is growing (e.g., Fehr et al., 1992; McIlwain, 2003; Panitz, 1989; Rauthmann & Will, 2011; Williams et al., 1975). Christie and Geis (1970) originally conceptualised Machiavellianism as a unidimensional construct, only later hypothesising three underlying lower level dimensions (views, tactics, and morality) that subsequent factor-analyses could not support. Treating Machiavellianism as multidimensional may clarify issues with estimates of reliability, and with inconsistent and troublesome findings in the literature.

Issues with the factor structure are not surprising, given Mach-IV items were chosen using criterion validity, without a clear theoretical or empirical basis for their factor structure. This selection process resulted in the morality dimension containing only two items, worded in the Machiavellian direction (protrait). These two items are also difficult to differentiate conceptually from the other two dimensions, given amorality (morality subscale item: "All in all, it is better to be humble and honest than to be important and dishonest") is an important component of duplicitous tactics (tactics subscale item: "Honesty is the best policy in all cases")[2]. As a result, the morality subscale is the most problematic in factor-analyses and is often dropped from studies, given unacceptable estimates of internal consistency. Therefore, although amorality is an important component of Machiavellianism, it is

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[2]In fact, this is demonstrated empirically in Chapter 3, where factor-analysis suggested the psychometrically strongest morality subscale item (item 9) loaded onto the tactics subscale. As a result, this item was adopted into the tactics subscale.

subsumed within the other two dimensions.

The amalgamation of scale and structural deficits gives rise to numerous factorial solutions, ranging from two (Fehr et al., 1992; Kline & Cooper, 1984) to eight-factors (Panitz, 1989), and everywhere in between (Ahmed & Stewart, 1981; Calvete & Corral, 2000; Christie & Lehmann, 1970; Hunter et al., 1982; Kuo & Marsella, 1977; Vleeming, 1984; Williams et al., 1975). Although issues with factor structures are exacerbated by variations in factor-analytic procedures, Panitz (1989) conducted the same factor-analytic procedure on two independent samples, each providing different factor solutions. It is clear why Pantiz (1989), along with other researchers, questioned the capacity of the Mach-IV to capture the Machiavellianism construct (Hunter et al., 1982; Kline & Cooper, 1984; Panitz, 1989; Williams et al., 1975).

The strongest evidence is for a two-factor solution, differentiating Machiavellian views from tactics in both adult and child samples (Fehr et al., 1992; McIlwain, 2003). Given their basis in previous theory and research, and that they are directly tested in the next chapter, only a brief introduction is offered here. A views factor (capturing thoughts about people or society) and a tactics factor (capturing calculated and exploitative behaviour) arise regardless of the factoring technique, sample composition (e.g., Calvete & Corral, 2000; Fehr et al., 1992; Kline & Cooper, 1984), or even different measures of Machiavellianism (Dahling et al., 2009; Miller, 2015). For example, the MPS (Dahling et al., 2009) distrust of others and amoral manipulation subscales had the strongest loadings on the high-order Machiavellianism construct (when compared to desire for status or desire for control subscales). In a thorough review of factor-analytic studies (and a subsequent study of their own), Fehr and colleagues (1992) reported that "analyses of the Mach scales (especially the Mach-IV) consistently support a distinction between the tactics and views factors ... like Christie and Lehmann, I conclude that the structure simplifies to the two robust factors - tactics and views" (p. 107) and recommended that, given variations in the pattern of responses, "one should obtain separate scores for each of the components" (p. 108).

When more than two factors are proposed, these often reflect manifestations of the Machiavellian views and tactics. For example, Christie and Geis's (1970) original factor-analysis suggested three factors: negative views about society, views about the goodness of man, and interpersonal manipulation. Recently, Andrew, Cooke, and Muncer (2008) used CFA to demonstrate a four-factor solution: negative interpersonal tactics, positive interpersonal tactics, cynical view of human nature, and positive view of human nature. Their solution exemplifies the approach taken often by researchers, breaking contrait and protrait components of the views and tactics dimension into separate parts. This approach is troublesome, given one cannot endorse items in these factors independently (that is, one cannot score highly on both positive and negative views of human nature). For example, answering *Strongly Agree* to both "it is hard to get ahead without cutting corners here and there" and "most people who get ahead in the world lead clean, moral lives". Positive and negative views of humanity cannot exist as separate constructs using Mach-IV items, and instead need to be treated as different poles of the same underlying dimension. Therefore, it is likely that the direction of the item wording, protrait vs. contrait, is confounding results (Fehr et al., 1992). A psychometrically stronger approach is to model protrait and contrait items as additional method factors, using a bifactor approach (Maul, 2013; Molina, Rodrigo, Losilla, & Vives, 2014).

The views and tactics dimensions also make theoretical sense, demarcating the behaviour from the affective-cognitive rationale for that behaviour. Taking a multi-dimensional approach is beneficial to ongoing research, given each dimension relates uniquely to attitudes and behaviours. For example, Aïn et al. (2013) showed that Machiavellian views primarily predicted depression, a difficulty experiencing pleasure (anhedonia), and deficits in cognitive empathy, whereas tactics predicted trait anxiety, deficits in affective empathy, and difficulties describing feelings. Birkás, Csathó, Gács, and Bereczkei (2015) found that tactics tended to predict reward sensitivity and a preference for short-term rewards, despite negative longer-term consequences. Dividing Machiavellianism into affective-cognitive and behavioural

dimensions allows for a more sophisticated approach, and one that has been adopted in similar areas of inquiry, such as psychopathy and narcissism (Dickinson & Pincus, 2003; Patrick et al., 2009; Paulhus, Neumann, & Hare, 2009; Pincus et al., 2009). For example, Hunter et al. (1982) argued that treating Machiavellianism as unidimensional masks true correlations and hides causal pathways. To this end, they suggested that Machiavellian views may give rise to Machiavellian tactics[3].

A final consideration, which will be further discussed in Chapter 6, is how views and tactics combine to create the higher-order Machiavellianism construct. Whether Machiavellianism is simply the sum of the views and tactics dimensions, or whether one needs to be high on both views and tactics to be considered *Machiavellian*. Overall, demarcating views from tactics would allow for a better understanding of the processes and factors involved in Machiavellianism and antagonistic behaviour broadly, by asking questions not possible with the current unidimensional measures. The next three chapters cultivate a better understanding of each dimension, given the little research into them individually, explicating their nature and definition, along with their causes and consequences.

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[3]It is important to note here that a key component of Hunter et al's (1982) thesis was that the second-order Machiavellianism latent trait was not-necessary, and that it should be dropped from ongoing research because it "convolutes" research in this domain.

Further, their analysis of causation involved path modelling, which re-arranges the correlation matrix between variables. Although this models causality, it provides only weak evidence given cross-sectional analysis.

Chapter 3

The Role of Machiavellian Views and Tactics in Psychopathology

Chapter 3 describes the first empirical investigation into two-dimensional Machiavellianism, creating the foundation for the later investigations in this thesis. Outlined in the previous chapter, substantial research suggests Machiavellianism comprises two dimensions, namely Machiavellian views and Machiavellian tactics (see Fehr, 1992 for review). Despite this, little factor-analytical work has been conducted, and few studies have utilised a two dimensional approach. This is likely due to the lack of a robust and well-validated factor-structure. To address the limitations of the Mach-IV (Christie & Geis, 1970), Chapter 3 employs a combination of factor-analytic approaches to identify a strong two-factor structure from 10 Mach-IV items. This reduced measure was named the Two-Dimensional Mach-IV (TDM-IV).

To address inconsistent evidence in the field, this chapter then utilises the TDM-IV and structural equation modelling (SEM) to demonstrate clear associations between Machiavellianism and psychopathological latent domains: Depression, Fear, Anxiety, Impulsivity, Externalising psychopathology and thought dysfunction.

3.1　Abstract

Machiavellianism represents a tendency to manipulate and exploit others in a social world perceived to be hostile. Research has been inconsistent regarding psychopathology associated with this aspect of personality. This has been partially due to focusing on Machiavellianism as a unidimensional, as opposed to multi-dimensional, construct. Thus, this study aimed to investigate associations between Machiavellianism and psychopathology from a multidimensional perspective. The participants were 1478 US undergraduates aged between 18 and 53 years ($M = 19.55$, $SD = 3.22$; 39% male) and 218 Australian undergraduates aged between 17 and 60 ($M = 20.09$, $SD = 4.56$; 33% male). To address psychometric issues in the Mach-IV scale, item analysis and confirmatory factor analyses were used to derive its multidimensional structure. Structural equation modelling tested unique associations of Machiavellian views and tactics with six psychopathological constructs: depression, fear, anxiety, impulsivity, externalising psychopathology, and thought dysfunction. Results from the US and Australian samples suggest that Machiavellianism is best viewed as a two-dimensional construct consisting of views and tactics. Furthermore, the US study showed that Machiavellian views uniquely predicted all areas of psychopathology, whereas tactics predicted only externalising domains. These findings demonstrate the multidimensional nature of Machiavellianism and highlight its distinctive psychopathological implications.

3.2 Introduction

Machiavellianism captures a tendency to exploit, deceive, and distrust others (Christie & Geis, 1970). Christie and Geis (1970) reasoned that Machiavellians must be free of gross psychopathology to manipulate others effectively. Several studies, however, have not supported this hypothesis (e.g. Aïn, Carre, Fantini-Hauwel, Baudouin, & Besche-Richard, 2013, McHoskey, 2001). Research has largely overlooked the psychopathology concomitant with Machiavellianism by treating the construct as unitary despite evidence of multidimensionality (Fehr, Samsom, & Paulhus, 1992; Rauthmann & Will, 2011). As a result, a unitary approach may have lacked the nuances required to identify the complex nature of relationships between dimensions of Machiavellianism and psychopathology. We incorporate a psychometrically sound multidimensional adaptation of the Mach-IV, the most commonly employed measure of Machiavellianism, to understand the relationship between Machiavellianism and psychopathology. In doing so, we elucidate the psychopathology associated with perpetrating exploitative behaviours and holding a cynical view of others.

3.2.1 Machiavellianism and Psychopathology

Niccolo Machiavelli (1469-1527) was an Italian diplomat and political philosopher. His treatise *The Prince* and *Discourses* argued that cruelty and exploitation are valid tools for achieving one's goals because human nature is to lie and deceive. He further argued that one should never employ these tactics for their own sake as the end must justify the means (Machiavelli, 1532/1935). Christie and Geis (1970) conceptualised the personality construct of Machiavellianism based on themes and extracts from Machiavelli's work that were consistent with the teachings of influential power theorists, such as Sun Tzu and Chanakya. Machiavellianism is a continuum of normal personality variation, with studies most consistently placing it in the domain of low Agreeableness and Conscientiousness across a range of measures (Furnham, Richards, Rangel, & Jones, 2014). Individuals who are higher in Machiavellianism tend to engage in interpersonal exploitation (tactics component), hold a cynical view of human nature (views component), and lack the conventional

morality that would condemn their actions (morality component).

Christie and Geis (1970) developed the Mach-IV to capture individuals' Machiavellian dispositions. The Mach-IV is a 20-item scale that consists of statements from Machiavelli's work along with statements theorised to capture the same construct. During scale construction, items were selected to capture the breadth of the construct while discriminating between participants high and low in Machiavellianism. The final measure tapped the three proposed components of Machiavellianism: tactics (e.g., "It is wise to flatter important people"), views (e.g., "Most men are brave" - reverse-scored), and morality (e.g., "All in all, it is better to be humble and honest than important and dishonest" - reverse-scored). The Mach-IV has become the gold-standard in measuring Machiavellianism, and most studies on the construct have used the Mach-IV (all items are in Appendix B).

Individuals high in Machiavellianism behave opportunistically and exploitatively (e.g. Austin, Farrelly, Black, & Moore, 2007, Christie & Geis, 1970; Sakalaki, Richardson, & Thepaut, 2007). Consequently, their ability and willingness to manipulate others translates often into outperforming peers when interpersonal manipulation is advantageous (Christie & Geis, 1970; DePaulo & Rosenthal, 1979; Geis & Moon, 1981; Jones & Paulhus, 2009). This advantage occurs in situations that are unstructured enough for manipulation to be possible, as opposed to fully structured and unalterable environments where those high in Machiavellianism tend to perform worse than those low on Machiavellianism (Shultz, 1993). Yet, Machiavellianism involves interpersonal manipulation for achieving one's goals, regardless of whether this is exploitation or cooperation. Hence, Machiavellians will cooperate with others if it is in their own self-interest, but congruent with the words of Machiavelli (Machiavelli, 1532/1935), they will readily break from these alliances when defecting is the better strategy (Gunnthorsdottir, McCabe, & Smith, 2002; Sakalaki et al., 2007).

The original work on Machiavellianism (Christie & Geis, 1970) has inspired interest in the construct with over 550 citations, according to Google Scholar, by

the middle of 2015; this includes over 200 citations since 2010. There has also been considerable interest in organisational Machiavellianism (e.g., Dahling, Whitaker, & Levy, 2009; cited over 130 times by mid-2015) and Machiavellianism has a central place, alongside narcissism and psychopathy, within the influential Dark Triad of personality (Paulhus & Williams, 2002; cited over 885 times by mid-2015). To provide a robust foundation for the ongoing research on Machiavellianism, it is important to investigate the original assumptions that it was constructed upon, such as the absence of psychopathology among Machiavellians.

Christie and Geis (1970) postulated that Machiavellians must be free of gross psychopathology to manipulate others successfully. These researchers' initial invest-igation into this relationship did not support their a priori assumption, as Machiavel-lianism (measured by the Mach-IV) correlated significantly with anxiety. When the Mach-V (their forced choice version of the Mach-IV; Christie & Geis, 1970) was used to account for socially desirable responding in two later studies, associations with social and emotional adjustment, anxiety, depression, and neuroticism were weak to non-existent (Christie & Geis, 1970; Skinner, 1982). However, the validity of the Mach-V has been disputed in the literature because it has serious psychometric problems, such as poor reliability, often producing low correlations with the Mach-IV, and may not appropriately adjust for socially desirable responding (e.g. Fehr et al., 1992; Kraut & Price, 1976; Williams, Hazleton, & Renshaw, 1975).

Despite contradictions in the literature, there are arguments for why Machiavel-lianism would relate to key domains of psychopathology, namely internalising psy-chopathology, externalising psychopathology, and thought dysfunction. Elevations in neuroticism underlie major components of internalising psychopathology (Bar-low, Sauer-Zavala, Carl, Bullis, & Ellard, 2014), the spectrum of disorder aligned with fear and distress (Clark & Watson, 2006; Krueger & Markon, 2006). The moderate associations between the Mach-IV and neuroticism (e.g. Jakobwitz & Egan, 2006; Rauthmann, 2012b; Stead, Cynthia, Alexandra, & Kate, 2012, Vernon, Villani, Vickers, & Harris, 2008) suggest that Machiavellians have a propensity to

experience negative emotions and stress. McHoskey (2001) found that borderline personality disorder, a disorder marked by emotional instability, was the personality disorder with the strongest unique association with Machiavellianism. Additionally, Machiavellians' deficits with emotional expression, management, and intelligence (Austin et al., 2007; Szijjarto & Bereczkei, 2014; Wastell & Booth, 2003) may affect their capacity to cope with negative emotions.

Machiavellian cynicism and peer exploitation may also result in their rejection and alienation from social networks. This is not surprising given that peers tend to perceive those high on Machiavellianism as antisocial, distant, and strongly non-nurturing (i.e., ruthless, hardhearted, and unsympathetic; Rauthmann, 2012a). Furthermore, Machiavellians' low levels of trait Agreeableness and Conscientiousness (e.g. Jakobwitz & Egan, 2006; Stead et al., 2012) may also impair relationships and reduce peers' acceptance of their antisocial behaviour. As a result, peers are less willing to enter into relationships with Machiavellians except under specific situations, such as when the Machiavellians' exploitation of a third party may benefit the peers (Wilson, Near, & Miller, 1998). Nevertheless, Machiavellianism under most circumstances facilitates alienation, higher levels of interpersonal conflict, and deficits in reliable social support.

Those predisposed to exploit and manipulate others are also likely to exemplify disorders classified as externalising, which involve directing distress outwards (Krueger & Markon, 2006). Machiavellianism is related to the externalising and delinquent behaviour constructs and to callous-unemotional traits in adolescents (Lau & Marsee, 2013; Loftus & Glenwick, 2001), and to higher rates of bullying and lower pro-victim attitudes in school-age children (Sutton & Keogh, 2000). Importantly, a Machiavellian's externalisation manifests as goal-focused social manipulation as opposed to the direct use of verbal, physical, or reactive/ impulsive aggression (Kerig & Stellwagen, 2010; Loftus & Glenwick, 2001). A Machiavellian's distrust for others and willingness to exploit manifests in elevated interpersonal antagonism and social-norms violations.

Finally, Machiavellian cynicism describes a hypervigilance to being manipulated, with the worldview that others cannot be trusted. It is therefore not surprising that Machiavellianism is associated with paranoia (Christoffersen & Stamp, 1995) and the DSM-IV-TR's odd/eccentric cluster of personality disorders (e.g., paranoid and schizotypal) in adults (McHoskey, 2001). Machiavellianism is also associated with thought problems (strange or atypical cognitions) in adolescents (Loftus & Glenwick, 2001). These findings suggest that this cynical view of humanity, overestimation of threat, and hypervigilance may, at its extreme, be delusional.

3.2.2 Multidimensional Machiavellianism

Researchers have largely studied Machiavellianism as unidimensional despite the growing number of studies demonstrating multi-dimensionality (e.g. Fehr et al., 1992; McIlwain, 2003; Panitz, 1989; Rauthmann & Will, 2011; Williams et al., 1975). Indeed, multidimensionality could explain why estimates of internal consistency for the Mach-IV, which rely on the assumption of unidimensionality, are often poor and varied (Fehr et al., 1992). Christie and Geis (1970) hypothesised a purely conceptual three-dimensional structure (views, tactics, and morality). Subsequently, a dearth of empirical support for this structure in the Mach-IV has resulted in the wider research community primarily studying Machiavellianism as a unidimensional construct rather than focusing on its potential dimensions. As a result, the number of dimensions underlying Mach-IV remains unclear. For example, researchers have identified two (Kline & Cooper, 1984), three (Christie & Geis, 1970), four (e.g. Calvete & Corral, 2000; Williams et al., 1975), five (Ahmed & Stewart, 1981), and even seven and eight (Panitz, 1989) factors within the Mach-IV. Difficulties with treating Machiavellianism as multidimensional are not surprising given the variation in factor analytic procedures used by researchers, the content overlap between Mach-IV items measuring each subscale, poor representation of the morality subscale with only two items, and substituting factor validation for criterion validity (predicting the use and approval of manipulation) during scale construction (Christie & Geis, 1970).

Without an accepted nomological network or a robust factor structure, empirical work provides the strongest evidence for a two-factor structure, that is, Machiavellian views and tactics. Supporting the conceptual distinction between these two dimensions, many factor analytic studies tend to differentiate Machiavellian views from tactics regardless of the final factor solution (e.g. Andrew, Cooke, & Muncer, 2008, Calvete & Corral, 2000; Fehr et al., 1992; Kline & Cooper, 1984). Although, Kline and Cooper (1984) explicitly identified two factors (views and tactics), Christie and Geis's (1970) own factor analysis across two samples revealed three factors: negative views about society, views about the goodness of man, and interpersonal manipulation. Further, Calvete and Corral (2000) identified four factors: positive interpersonal tactics, negative tactics, positive view of human nature, and cynical view of human nature; whereas Ahmed and Stewart (1981) identified five: tactics, tactics negative, Pollyanna syndrome, Machiavellian views, and moral ideal. Finally, Panitz's (1989) analyses identified seven unnamed factors in one sample, and eight in another. As can be seen, the kinds and names of the factors were variable across studies. Nevertheless, most factor structures seem to reflect manifestations of Machiavellian views and tactics dimensions, and therefore, ongoing research should investigate whether they are the two dimensions of Machiavellianism (see Fehr et al., 1992, for review).

The few studies that have taken a multidimensional approach identified distinct relationships of psychopathology with Machiavellian views and tactics. Aïn et al. (2013) showed that Machiavellian views primarily predicted depression, a difficulty experiencing pleasure (anhedonia), and deficits in cognitive empathy, whereas tactics predicted trait anxiety, deficits in affective empathy, and difficulties describing feelings. Birkás, Csathó, Gács, and Bereczkei (2015) found that tactics tended to predict reward sensitivity and a preference for short-term rewards despite negative longer-term consequences. Even though the division is not clear, holding Machiavellian views may primarily relate to internalising psychopathology and delusional disorders. The tactics dimension may primarily account for Machiavel-

lianism's relationship with externalising psychopathology and the conceptual overlap with psychopathy - exploitation and manipulation, deficits in affective empathy, and a focus on short-term rewards. Yet, given the unclear factor structure of the Mach-IV, an improved multidimensional approach to Mach-IV is required to elucidate the role of Machiavellian views and tactics in psychopathology.

3.2.3 The Current Study

The current study aimed to employ a multidimensional perspective to clarify the relationship between Machiavellianism and psychopathology. In doing so, we challenge the tenet that Machiavellians are free of gross psychopathology. We first aimed to employ item analysis in one sample as well as confirmatory factor analysis (CFA) across two samples to ascertain a replicable multidimensional structure of the Mach-IV. Based on the reviewed literature, the strongest evidence is in favour of differentiating Machiavellian views from tactics (e.g. Calvete & Corral, 2000; Fehr et al., 1992). As a result, it was hypothesised that Machiavellianism would best be conceptualised according to these two dimensions.

Secondly, we aimed to elucidate the relationship between the dimensions of Machiavellianism and major psychopathology constructs. Based on the findings by Aïn et al. (2013) and Birkás et al. (2015), the second hypothesis was that Machiavellian views would primarily predict internalising and thought dysfunction psychopathological constructs as these involve negative or hostile views of the world. The third hypothesis was that Machiavellian tactics would primarily predict externalising psychopathology as these tactics play a role in antisocial behaviours.

3.3 Method

3.3.1 Participants and Procedure

Sample 1. Sample 1 consisted of 1795 US undergraduates, who were recruited from a subject pool for course credit. They individually completed the study in paper-and-pencil format. In accordance with standard Minnesota Multiphasic Personality Inventory-2-Restructured Form (MMPI-2-RF) criteria (Cannot Say > 18, VRIN-r or TRIN-r > 80T, F-r > 120T, Fp-r > 100T, or L-r > 80T; Ben-Porath

& Tellegen, 2008), we removed the data from 227 participants due to excessively random, extreme, or acquiescent responding. The data from further 90 participants who completed less than 70% of the measures, 90% of items on the Mach-IV, or responded in a way that was considered to be a multivariate outlier were excluded. The final sample consisted of 1478 participants (38.55% male) with a mean age of 19.55 ($SD = 3.22$) and 89.27% reported their ethnicity as Caucasian.

Sample 2. Sample 2 consisted of 225 Australian undergraduates, who individually completed a paper-and-pencil version of the Mach-IV on two occasions at a three-month interval in a lab. We excluded the data from seven participants who did not complete 90% of the Mach-IV. The final sample consisted of 218 participants (33.49% male; $M_{age} = 20.09$, $SD = 4.56$) and 80.73% of participants described their nationality as Australian.

3.3.2   Measures

Mach-IV. The Mach-IV is a 20-item measure widely used to assess Machiavellian tendencies (Christie & Geis, 1970) (Sample 1 (S1): $\alpha = .72$; Sample 2 (S2): $\alpha_{Phase1(P1)} = .77$, $\alpha_{Phase2(P2)} = .80$). This scale consists of three subscales, Tactics (S1: $\alpha = .70$; S2: $\alpha_{P1} = .67$, $\alpha_{P2} = .72$), Views (S1: $\alpha = .61$; S2: $\alpha_{P1} = .63$, $\alpha_{P2} = .67$), and Morality (S1: $\alpha = .07$; S2: $\alpha_{P1} = .16$, $\alpha_{P2} = .16$). Each item was measured using a 7-point Likert scale from *Disagree Strongly* (3) to *Agree Strongly* (3). Example items include "Anyone who trusts anyone else is asking for trouble" and "Most people are basically good and kind" (reverse-scored) (full scale is in Appendix B).

Minnesota Multiphasic Personality Inventory-2-Restructured Form (MMPI-2-RF). The 50 scales of the MMPI-2-RF were extracted from the MMPI-2 that was administered to Sample 1. Scales of the MMPI-2-RF consist of higher-order, restructured clinical, specific problem, and validity scales comprising 338 dichotomous (true/false) items. The MMPI-2-RF has been widely validated and has a reliable hierarchical factor structure that consists of three higher-order scales (Emotional/Internalizing Dysfunction, Thought Dysfunction, and behavioural/External-

ising Dysfunction), nine Restructured Clinical Scales (RC scales), and 23 Specific Problems (SP) scales (Ben-Porath & Tellegen, 2008). The MMPI-2-RF scales also include five personality psychopathology scales (PSY-5) and nine validity scales that can be used to detect various forms of response bias.

Specific scales were selected for the study to serve as independent manifest indicators of the latent psychopathological constructs: low positive emotions (RC2) ($\alpha = .70$; average inter-item correlation (AIC) $= .12$), ideas of persecution (RC6) ($\alpha = .63$, AIC $= .09$), aberrant experiences (RC8) ($\alpha = .76$, AIC $= .15$), demoralization (RCd) ($\alpha = .90$, AIC $= .27$), multiple specific fears ($\alpha = .72$, AIC $= .22$), behaviour- restricting fears ($\alpha = .52$, AIC $= .10$), anxiety ($\alpha = .54$, AIC $= .19$), stress tension and worry ($\alpha = .66$, AIC $= .21$), aggression ($\alpha = .72$, AIC $= .22$), juvenile conduct problems ($\alpha = .58$, AIC $= .19$), substance abuse ($\alpha = .71$, AIC $= .26$), and disconstraint (PSY-5) ($\alpha = .75$, AIC $= .13$).

Beck Depression Inventory II (BDI-II). The BDI-II (Beck, Steer, Ball, & Ranieri, 1996) is a 21-item inventory that measures the cognitive and somatic symptoms of depression ($\alpha = .87$). Participants indicated their level of depressive symptomology over the last fortnight using a four-point scale with unique responses options for each question, in areas such as sleep disruption and anhedonia.

Barratt Impulsivity Scale-11 (BIS-11). The BIS-11 (Stanford et al., 2009) is a 30-item scale of impulsivity ($\alpha = .72$). Its response options range from *never/rarely* (1) to *almost always/always* (4). It contains three subscales: attentional impulsiveness (8 items; $\alpha = .69$), motor impulsiveness (11 items; $\alpha = .59$), and non-planning impulsiveness (11 items; $\alpha = .65$).

Fear Questionnaire (FQ). The FQ is a 15-item scale ($\alpha = .84$) that assesses avoidance of specific situations due to fear or other unpleasant feelings (Marks & Mathews, 1979). Participants rated their avoidance of situations such as injections, the sight of blood, and the dentist on nine-point Likert scales ranging from *would not avoid it* (0) to *always avoid it* (8).

Internal States Scale (ISS) depression. The ISS assesses the depressive and manic mood states of individuals with bipolar disorder (Bauer, Vojta, Kinosian, Altshuler, & Glick, 2000). The depression subscale ($\alpha = .76$) asks participants to indicate depressive symptoms they have felt over the last 24 hours on two visual analogue line scales ranging from *not at all/rarely* (0) to *very much so/much of the time* (10). The two items were: "Today it seems like nothing will ever work out for me" and "Today I feel depressed".

The Perceptual Aberration Scale (PAS). The PAS assesses individual's psychotic bodily perceptions (Chapman, Chapman, & Raulin, 1978) ($\alpha = .80$). Participants described their lifetime experiences of perceptual aberrations on 35 dichotomous (yes/no) items. Example items: "I sometimes have had the feeling that some parts of my body are not attached to the same person" and "I have never felt that my arms or legs have momentarily grown in size" (reverse-scored).

The Magical Ideation Scale (MIS). The MIS is a 30 dichotomous (yes/no) item measure of paranormal and delusion-like belief such as transmission of thought, ideas of reference, and extreme suspiciousness (Eckblad & Chapman, 1983) ($\alpha = .67$). Example items: "I have sometimes felt that strangers were reading my mind" and "It is not possible to harm others merely by thinking bad thoughts about them" (reverse-scored).

State-Trait Personality Inventory (STPI) trait anxiety. This scale consists of 10 items that assess a propensity towards worry and nervousness (e.g., "I feel nervous and restless") (Spielberger et al., 1979) ($\alpha = .60$). Participants were asked to rate statements on a scale from *almost never* (1) to *almost always* (4).

3.3.3 Data Analyses

Data analysis was conducted in two phases. The first phase aimed to develop a psychometrically sound multidimensional measure of Machiavellianism. We analysed the original tactics, views, and morality dimensions using CFA with maximum likelihood (ML) estimation. Next, we conducted item analysis because certain items seemed to measure different dimensions. Only items that were able to discriminate

between the subscales and correlated strongly with the full scale (Mach-IV) were kept. As described below, this analysis suggested that the morality subscale was not viable. We, therefore, used CFA to test the two-factor structure suggested by theory and item analysis in two samples, along with analyses of structural and temporal stability.

We used structural equation modelling (SEM) with ML estimation (via the Lavaan package for R; Rosseel, 2012) to control for measurement error and to allow for the assessment of latent psychopathological domains via multiple manifest indicators. Key areas of psychopathology were identified from the literature (Kotov et al., 2011; Krueger & Markon, 2006). Each domain was estimated using multiple scales widely used in research and clinical practice. The following six latent constructs were estimated using at least three manifest indicators specified a priori to the analyses:

1. Depression: MMPI-2-RF Demoralization (RCd), MMPI-2-RF low positive emotions (RC2), BDI-II, and the ISS depression subscale.

2. Fear: MMPI-2-RF multiple specific fears, MMPI-2-RF behaviour-restricting fears, and the FQ.

3. Anxiety: MMPI-2-RF anxiety, MMPI-2-RF stress/worry scale, and the STPI trait anxiety subscale.

4. Impulsivity: MMPI-2-RF disconstraint (PSY-5), and the BIS-11 - cognitive, motor, and non-planning subscales.

5. Externalising psychopathology: MMPI-2-RF Aggression, MMPI-2-RF juvenile conduct problems, and the MMPI-2-RF substance abuse scale.

6. Thought dysfunction: MIS, PAS, MMPI-2-RF aberrant experiences (RC8) scale, and MMPI 2-RF ideas of persecution (RC6) scale.

3.4   Results

3.4.1   Sample 1: Cleaning and Screening

Sample 1 substantially exceeded Jackson's (2003) conservative 20-1 ratio between cases and variables (respectively) for all planned CFA and SEM. The power of the sample to reject bad models based on Root Mean Square Error of Approximation (RMSEA = .08) and retain good models (RMSEA = .06) (MacCallum, Browne, & Sugawara, 1996) was strong for all proposed analyses ($\beta > .97$). The data were considered acceptable using standard screening and cleaning procedures, and univariate outliers ($p < .001$) were recoded at 3.29 standard deviations from the mean (see Tabachnick & Fidell, 2007). As there was less than 5% data missing from any variable at the item-level of analysis and Little's missing completely at random (MCAR) test suggested that the data were missing completely at random, data imputation was conducted using expected maximisation techniques with 50 iterations.

3.4.2   Multidimensional Subscale Development

Analysis of current structure. The original three-factor model was investigated using CFA, but it could not be estimated due to a non-positive definite matrix. This was the result of the morality subscale correlating highly with both the tactics ($r = 1.48$) and views ($r = .90$) subscales in the CFA. This suggests that the multidimensional structure of Machiavellianism was poorly specified by the original three-factor structure and could not be appropriately estimated.

Item analysis of the Mach-IV. Accordingly, we developed psychometrically sound subscales from the Mach-IV to allow a more in-depth analysis of Machiavellianism and psychopathology. This was achieved by investigating the Mach-IV using item analysis, CFA, and test-retest reliability analysis (carried out in Sample 2). First, we analysed each item from the three original Mach-IV subscales, where each subscale reflects one of the three dimensions of Machiavellianism (see the full scale, subscales, and item numbers in Appendix B).

Item analysis identified the degree to which each item represented its respective subscale and the total Machiavellianism construct. We compared corrected item-

to-subscale total correlations with the item's correlations with the other two sub-scales. Items that discriminated between the subscales should have corrected item-to-subscale correlations significantly greater than their correlations with the other Mach- IV subscales (Fishers r-to-Z). An item was considered acceptable if it could discriminate between the subscales and had strong corrected item-to-subscale and item-to-full scale total correlations. Items that did not discriminate between the subscales, did not correlate significantly with their own subscale, or total Mach-IV were considered weak and deleted. This procedure allowed us to exclude items that measured two or more dimensions of Machiavellianism (such items correlated strongly with two or more subscales), those that more strongly represent a different component than its own, and those that do not represent Machiavellianism. We reran the analysis until all weak Mach-IV items were removed.

Morality subscale. The Morality subscale performed poorly based on internal consistency ($\alpha = .07$) and correlation ($r = .04$). The two items appeared to measure two unrelated constructs. Item 19 of the Mach-IV was considered weak because it only had a small correlation with the other morality item and with the Mach-IV ($r = .15$). Although item 9 correlated weakly with the other morality item, it had a medium-large correlation with the tactics subscale ($r = .47$) and had a medium - strong corrected item-full scale correlation with the Mach-IV ($r = .43$). As a result, item 9 was included in the tactics subscale for further analysis of the remaining two subscales.

Tactics subscale. Items 3 and 15 of the Mach-IV had small corrected item-total correlations with the Mach-IV and the tactics subscale. Additionally, items 1, 2, and 16 did not discriminate tactics from views and were removed. Finally, item 12 had a stronger correlation with the Views subscale than the Tactics subscale. Accordingly, this item was included in the subsequent analysis of the views subscale. The final tactics subscale consisted of four strong items and had an acceptable internal consistency and AIC (see Table 3.1). The final tactics items discriminated well from the final views subscale, and were significantly correlated with both the

Mach-IV and the final 10-item scale (after item analysis).

Views subscale. Items 17 and 20 of the Mach-IV were considered weak due to small corrected item-total correlations with the Mach-IV and the views subscale. Item 11 failed to discriminate between the Views subscale and the final Tactics subscale and was thus deleted. The final Views subscale consisted of six strong items and had an acceptable level of internal consistency and AIC (see Table 3.1) for research purposes given the scale's length. The final views items discriminated well from the final Tactics subscale, and were significantly correlated with both the Mach-IV and the final 10-item scale.

Table 3.1

Tactics and Views Subscales Item Analyses: Final Scales and Correlations

TDM-IV Subscale	Item #	Item Content	Morality	Final Tactics	Final Views	Corrected Item-Total r		
						Subscale	Mach-IV	TDM-IV
Tactics	10	When you ask someone to do something for you, it is best to give the real reasons for wanting it rather than giving reasons which carry more weight (R)	.22***	.65***	.19***	.41***	.36***	.35***
	6	Honesty is the best policy in all cases (R)	.28***	.80***	.17***	.60***	.48***	.41***
	7	There is no excuse for lying to someone else (R)	.22***	.78***	.07***	.49***	.40***	.27***
	9	All in all, it is better to be humble and honest than to be important and dishonest (R)	.55***	.69***	.26***	.50***	.43***	.45***
Views	13	The biggest difference between most criminals and other people is that the criminals are stupid enough to get caught	.17***	.22***	.62***	.38***	.35***	.36***
	8	Generally speaking, people won't work hard unless they are forced to	.06**	.05*	.58***	.32***	.21***	.21***
	4	Most people are basically good and kind (R)	.11***	.20***	.49***	.27***	.34***	.31***
	5	It is safest to assume that all people have a vicious streak and it will come out when they are given a chance	.12***	.19***	.63***	.39***	.34***	.35***
	18	It is hard to get ahead without cutting corners here and there	.19***	.23***	.55***	.31***	.33***	.31***
	12	Anyone who completely trusts anyone else is asking for trouble	.14***	.19***	.61***	.37***	.35***	.34***

Note. $N = 1478$. R = reverse-scored. TDM-IV = Two-Dimensional Mach-IV Scale (the final 10-item scale). Final tactics and final views are the two subscales created during item analysis. Subscale represents the respective subscale, tactics above the middle line and views below the middle line. Average inter-item correlation (AIC) for the tactics and views subscales were .39 and .20 respectively. Cronbachs alphas for the tactics and views subscales were .70 and .61 respectively. Item 9 was originally in the morality subscale, and item 12 was originally in the tactics subscale.
* $p < .05$. ** $p < .10$. *** $p < .001$

CFA. We conducted CFA to determine if the two-factor structure fit the data. Two models were tested: A one-factor solution where the final 10 items loaded onto a Machiavellianism construct, and a two-factor solution where the final tactics and views items loaded onto their respective subscales. Model fit was determined by the following criteria: Standardised Root Mean Square Residual (SRMR) (Hu & Bentler, 1999) and RMSEA (Browne & Cudeck, 1993) values less than .08 and .06 respectively, a Comparative Fit Index (CFI) and a Non-Normed Fit Index (NNFI) greater than .90 (Bentler, 1992; Bentler & Bonett, 1980). The standard convention to assess the chi-squared statistic (χ^2) was de-emphasised because it is unreliable with large sample sizes (see Kline, 2011).

The one-factor model had a poor fit for the data, $\chi^2(34) = 502.17$, $p < .01$, CFI = .772, NNFI = .698, SRMR = .079, RMSEA = .097 [.089-.104], whereas the two-factor model had good fit: $\chi^2(33) = 129.67$, $p < .01$, CFI = .953, NNFI = .936, SRMR = .041, RMSEA = .045 [.037-.053] (see Figure 3.1). The correlation between the two factors was medium to large, $r = .42$, with item loadings ranging from .39 to .75, $p < .01$. In both models, the error covariance between two items (items 6 and 7) was estimated (based on a large and significant modification index) to account for the similarity in their wording ($r_{onefactor} = .44$, $r_{twofactor} = .39$). After controlling for this covariance, there were no substantial and significant modification indices within either the views or tactics dimensions. These results supported views and tactics as distinct, yet moderately related, dimensions of Machiavellianism.

The Two-Dimensional Mach-IV (TDM-IV). The final scale was called the Two-Dimensional Mach-IV (TDM-IV). Correlational analysis showed that the Mach-IV was strongly correlated with the TDM-IV ($r = .90$) and both the views ($r = .74$) and tactics ($r = .66$) subscales. Additionally, although the TDM-IV was strongly correlated to both the Views ($r = .85$) and Tactics ($r = .70$) subscales, the subscales were only moderately correlated to each other ($r = .22$). All correlations were significant at $p < .01$. The TDM-IV had an acceptable level of internal consistency given the length of the scale and the two-factor structure, $\alpha = .66$ [95%
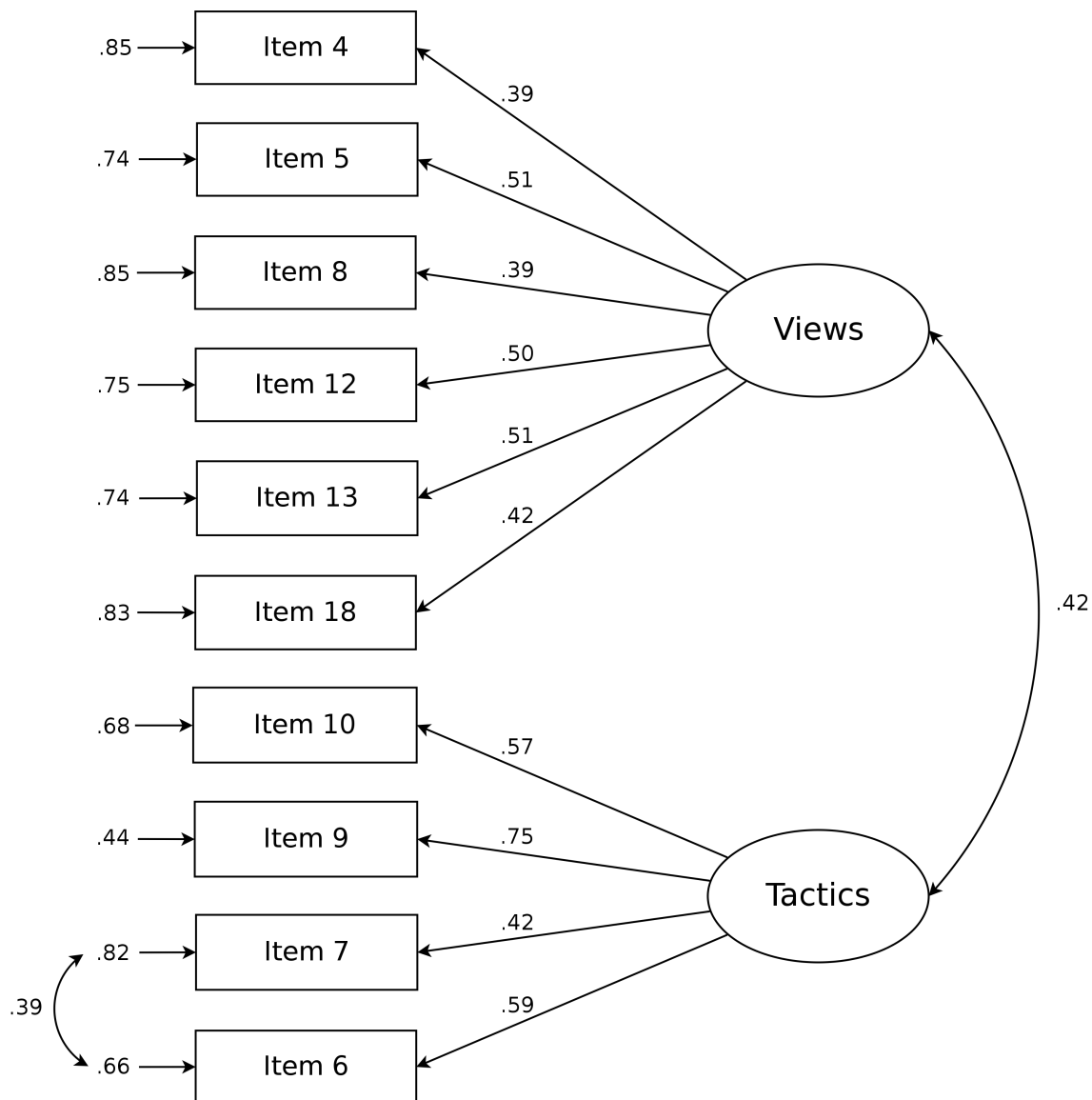
Figure 3.1. CFA model of the Two-Dimensional Mach-IV (TDM-IV) tactics and views subscales. All coefficients are standardised and significant ($p <.01$).

Confidence Interval $(CI_{.95})$ = .64, .69], AIC = 17. These findings suggested that the two scales represented Machiavellianism while capturing independent aspects of the construct.

3.4.3 Sample 2: Validation of the Structure

Temporal stability of the TDM-IV's factor structure was investigated in Sample 2. This analysis was also important because of the difficulty replicating Mach-IV factor structures in the literature (see Panitz, 1989). Data were cleaned and screened with the same protocol as in Sample 1. There was less than 5% data missing from any Mach-IV item and Little's MCAR test suggested that data was missing completely at random. Therefore, data imputation was conducted using Expected Maximisation techniques with 50 iterations.

CFA aimed to verify the TDM-IV's (α_{P1} = .69, AIC_{P1} = .19; α_{P2} = .75, AIC_{P2} = .23) two-factor structure: views (α_{P1} = .63, AIC_{P1} = .22; α_{P2} = .67, AIC_{P2} = .26) and tactics (α_{P1} = .66, AIC_{P1} = .34; α_{P2} = .72, AIC_{P2} = .39) (see Figure 3.1). The model had a good fit for the data in both the first, χ^2 (33) 57.07, p < .01, CFI = .921, NNFI = .892, SRMR = .055, RMSEA = .058 [.031, .083], and second phase, χ^2(33) = 39.96, p = .19, CFI = .980, NNFI = .973, SRMR = .048, RMSEA = .031 [.000, .061]. The correlation between views and tactics was considered large in both samples, r_{S1} = .48, p < .01; r_{S2} = .58, p < .01. As in Sample 1, the error covariance between two items (i.e., items 6 and 7) was estimated (r_{P1} = .36, r_{P2} = .26). Results suggest the TDM-IV's two-factor structure can be replicated across samples.

The temporal stability of the TDM-IV was assessed using Pearson's correlations and intra-class correlation (ICC) (3, 1) (Shrout & Fleiss, 1979) (Table 3.2). The TDM-IV along with both subscales showed strong phase one - phase two Pearson's correlations and ICCs. A longitudinal CFA model then assessed invariance over time. An unconstrained model was compared to an invariance model with the change in fit representing the construct invariance between phases (see Little, 2009). Changes in fit indices that estimated construct invariance were: ΔCFI < .01 and ΔRMSEA

$\leq .015$ (Chen, 2007). The $\Delta\chi^2$ measure was considered too sensitive for the current analysis (Little, 2009). Both the unconstrained model, CFI = .952, RMSEA = .046, and the invariance model, CFI = .944, RMSEA = .048, showed acceptable fit. The results suggested that there were equivalent factor loadings over time, ΔCFI = .008, ΔRMSEA = .002, and accordingly, the estimates of temporal stability between the latent variables for the tactics ($r = .84$) and the views ($r = .93$) subscales were very large.

Table 3.2

Interclass Correlation Coefficients and Person's Correlation's Between Phase One and Phase Two.

Scale	ICC	CI.95	*F*	*df1*	*df2*	*p*	*r*
Mach-IV	.81	[.76, .85]	9.40	217	217	<.01	.81***
TDM-IV	.77	[.71, .82]	7.66	217	217	<.01	.77***
Tactics	.67	[.59, .74]	5.14	217	217	<.01	.68***
Views	.75	[.68, .80]	6.95	217	217	<.01	.75***

Note. $N = 218$. ICC = Intra-Class Correlation. CI = Confidence interval for ICC. TDM-IV = Two-Dimensional Mach-IV Scale. ICC (3, 1) estimation was used.
* $p < .05$. ** $p < .10$. *** $p < .001$

3.4.4   Analysis of Psychopathology: Sample 1

The second and third hypotheses concerning the relationship of Machiavellianism to psychopathology were investigated in Sample 1 using SEM. SEM (ML) investigated the relative, unique influences of Machiavellian views and tactics on the six latent psychopathological constructs. To control for shared error variance among overlapping scales, the error terms between the BIS cognitive and motor subscales ($r = .23$) and between the BIS cognitive and disconstraint subscales ($r = .27$) that loaded onto impulsivity latent construct were covaried. The error terms between the MMPI-2-RF substance abuse and juvenile conduct problems scales ($r = .22$) that loaded onto externalising latent construct were also covaried. It was considered valid to minimise error variance and increase parsimony by creating item parcels because
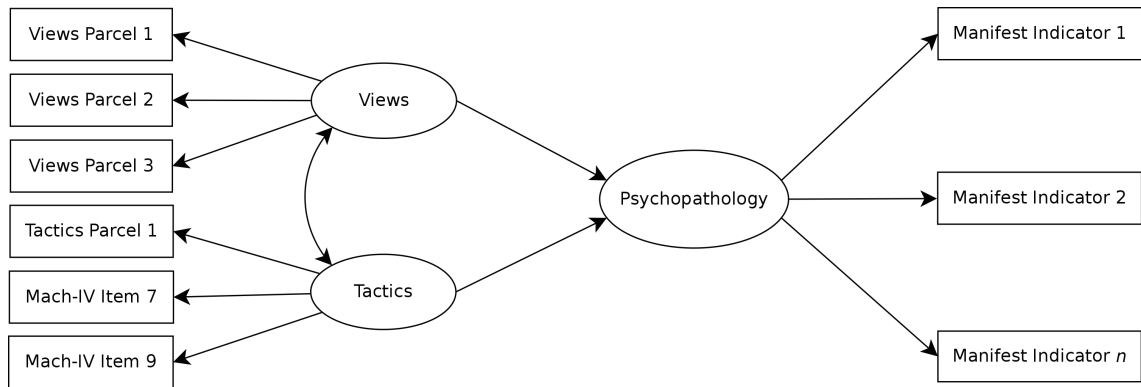
Figure 3.2. A structural equation model of Machiavellian views and tactics predicting an endogenous psychopathology construct. Ellipses represent latent factors and rectangles represent manifest indicators. $n =$ the number of manifest indicators for the psychopathology construct.

our analyses showed that the Machiavellianism subscales were unidimensional (see Hau & Marsh, 2004; Little, Cunningham, Shahar, & Widaman, 2002). Item loadings were identified using separate mono-factorial models for the views and tactics subscales. Following recommendations by Little (2009), item parcels were then created by successively averaging the items with the highest and lowest factor loadings. Although we attempted to control for acquiescence by including one protrait and one contrait item in each item parcel, three item parcels were not balanced because of the items retained during item analysis (Figure 3.2). As a minimum of three indicators are recommended for a latent factor to be appropriately identified (Little, 2009), one item parcel and two items were used to estimate the tactics construct as it consisted of four items. All measurement and structural models had good fit based on the previously outlined fit indices (see Table 3.3).

Overall, SEM results partially supported our second hypothesis that Machiavellian views would primarily predict internalising and thought dysfunction domains of psychopathology (see Table 3.4). The Views subscale significantly positively predicted all areas of psychopathology, including externalising domains (even more strongly than the Tactics subscale). As a result, the findings partially supported the third hypothesis that the Tactics subscale would primarily predict externalising psychopathology and the lower order impulsivity construct. Tactics also weakly

negatively predicted fear, suggesting that participants who espoused tactics were lower on this psychopathology domain. These findings suggest that holding Machiavellian views, even when controlling for Machiavellian tactics, predicts all areas of psychopathology. [1]

Table 3.3

Fit Indices for Measurement and Structural Models of TDM-IV and Psychopathology

Domain	χ^2	df	p	CFI	NNFI	SRMR	RMSEA	RMSEA Lower CI	RMSEA Upper CI
Depression	180.39	32	<.01	.963	.949	.041	.056	.048	.064
Fear	129.58	24	<.01	.950	.926	.043	.055	.046	.064
Anxiety	123.62	24	<.01	.958	.937	.039	.053	.044	.062
Impulsivity	166.69	30	<.01	.952	.927	.042	.056	.047	.064
Externalising	148.87	23	<.01	.950	.922	.045	.061	.052	.070
Thought Dysfunction	194.61	32	<.01	.955	.937	.043	.059	.051	.067

Note. $N = 1478$. TDM-IV = Two-Dimensional Mach-IV. Due to the number of parameters and the proposed SEM structure, the fit indices for both the measurement and structural models are equal. All models were estimated using ML.

3.5 Discussion

This study clarifies the Machiavellianism personality construct and its relationship with psychopathology. In support of the perspective that the Machiavellianism personality construct is multidimensional (e.g. Fehr et al., 1992; Rauthmann & Will, 2011), a two-factor structure fitted the data well in both the US and Australian samples. This factor structure can be captured through 10 Mach-IV items, named the Two-Dimensional Mach-IV (TDM-IV) scale. By taking a multidimensional perspective, we investigated the influence of Machiavellian views and tactics

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[1]Additional analyses were run to control for a demoralisation latent construct - a general, non-specific emotional distress (indicators: BDI-II, ISS depression scale, and the MMPI-2-RF demoralization scale). When controlling for demoralisation (excluding modified depression and anxiety constructs as their correlation with demoralization was greater than .90), these relationships were upheld. Machiavellianism, therefore, influences psychopathology above and beyond its relationship with demoralisation.

Table 3.4

Parameter Estimates for the Measurement and SEM Models Predicting Psychopathology from TDM-IV Views and Tactics

		Measurement Models						Structural Models			
Domain	Subscale	Estimate	Lower CI$_{.95}$	Upper CI$_{.95}$	p-value	Psychopathology	Subscale	Estimate	Lower CI$_{.95}$	Upper CI$_{.95}$	p-value
Depression	Tactics	.21 (.37)	.15 (.26)	.27 (.48)	< .01	Depression	Tactics	.07 (.12)	.00 (.01)	.14 (.23)	.04
	Views	.44 (.58)	.37 (.47)	.50 (.70)	< .01		Views	.42 (.95)	.34 (.74)	.49 (1.15)	< .01
Fear	Tactics	-.07 (-.67)	-.13 (-1.40)	.00 (.05)	.07	Fear	Tactics	-.16 (-1.59)	-.24 (-2.39)	-.08 (-.80)	< .01
	Views	.23 (1.71)	.14 (1.05)	.31 (2.37)	< .01		Views	.28 (3.85)	.19 (2.51)	.38 (5.20)	< .01
Anxiety	Tactics	.12 (.10)	.05 (.04)	.18 (.15)	< .01	Anxiety	Tactics	-.02 (-.01)	-.10 (-.07)	.06 (.04)	.67
	Views	.40 (.24)	.33 (.18)	.48 (.29)	< .01		Views	.41 (.42)	.32 (.32)	.49 (.53)	< .01
Impulsivity	Tactics	.36 (.77)	.29 (.60)	.43 (.93)	< .01	Impulsivity	Tactics	.22 (.48)	.13 (.31)	.30 (.64)	< .01
	Views	.48 (.76)	.41 (.60)	.55 (.92)	< .01		Views	.40 (1.18)	.32 (.89)	.48 (1.47)	< .01
Externalising	Tactics	.39 (.30)	.31 (.23)	.48 (.37)	< .01	Externalising	Tactics	.20 (.16)	.10 (.09)	.30 (.22)	< .01
	Views	.62 (.37)	.55 (.29)	.69 (.45)	< .01		Views	.55 (.55)	.47 (.43)	.63 (.68)	< .01
Thought Dysfunction	Tactics	.20 (.63)	.13 (.43)	.26 (.84)	< .01	Thought Dysfunction	Tactics	.00 (.01)	-.07 (-.20)	.07 (.22)	.93
	Views	.56 (1.39)	.51 (1.16)	.62 (1.62)	< .01		Views	.56 (2.29)	.50 (1.89)	.63 (2.69)	< .01

Note. $N = 1478$. TDM-IV = Two-Dimensional Mach-IV. Standardised correlations between views and tactics ranged from .33 to .36 and unstandardised correlations ranged from .25 to .27. Views and tactics are the new scales created for use with the TDM-IV. Estimates are standardised (unstandardised estimates are in brackets). Significance tests (p-value) are for unstandardised parameters. Figures for each model are in Appendix B. All models were estimated using ML.

on psychopathology. Both dimensions significantly predicted major psychopathologies, contradicting Christie and Geis's (1970) original assumptions.

3.5.1   Multidimensional Machiavellianism and the TDM-IV

The first hypothesis that Machiavellianism would consist of the views and tactics dimensions was supported. This study provides additional empirical support for the two-factor structure suggested as a viable candidate in the literature (see Fehr et al., 1992). Furthermore, direct testing of the original three-factor model proposed by Christie and Geis (1970) through CFA suggested that the structure was poorly specified to the extent it could not be appropriately estimated. These findings are consistent with previous research that could not replicate Christie and Geis's (1970) original factor structure (e.g. Kline & Cooper, 1984; Panitz, 1989) and researchers who found the morality subscale unfeasible (e.g., Kline & Cooper, 1984).

Item and correlational analyses suggested that a 10-item scale was sufficient to both replicate the Mach-IV and to discriminate between the Machiavellian views and tactics dimensions in both samples. CFA suggested that the two-factor structure had adequate factor loadings and fitted the data well, with moderate to high residuals. The size of the residuals is indicative of measuring the broad Machiavellianism construct using only 10 items. In fact, the cross-cultural replicability of the factor structure indicates the TDM-IV has a substantial advantage over the traditional Mach-IV. Similar item analyses were attempted, but abandoned, for the three-factor structure during the initial scale construction (Christie & Geis, 1970). This appears to be a major contributor to why the Mach-IV has an unclear factor structure and provides inconsistent findings. The test-retest analysis in Sample 2 showed that the TDM-IV was temporally consistent and the longitudinal CFA also showed that the factor structure was consistent across the three-month period.

Reducing the Mach-IV to 10 items overcame many of the scale's flaws by removing weak items and increasing discrimination between the subscales. The strong correlations with the Mach-IV also suggest that the TDM-IV retains most of the Mach-IV's criterion validity. Validity for the TDM-IV can be demonstrated by

comparing results with previous analyses of the Mach-IV. For example, Rauthmann (2013) investigated the Mach-IV items' measurement of Machiavellianism using item-response theory with the aim of deriving a shortened measure. The results suggested that five items adequately recreated the Mach-IV scale from a unidimensional perspective because many items had low probabilities of being endorsed and/or provided little information. The TDM-IV retains four of these five items, and by increasing the number of items it provides a multidimensional perspective (recommended by Rauthmann) and captures additional Mach-IV variance ($r = .90$ in our research as opposed to $r = .63$ in Rauthmann's research). Thus, the TDM-IV appears promising in its ability to explore Machiavellianism from a multidimensional perspective.

3.5.2 Machiavellian Psychopathology

The second and third hypotheses that Machiavellian views dimension would primarily predict internalising and thought dysfunction psychopathological constructs, whereas Machiavellian tactics dimension would primarily predict externalising psychopathology were partially supported. As indicated by previous studies that have investigated this relationship from a multidimensional perspective (e.g., Aïn et al., 2013; Birkás et al., 2015), each dimension predicted different areas of psychopathology. Although the division was not as clear as hypothesised, the variation in associations between the subscales and psychopathology partially explains inconsistencies and contradictions in the literature. For example, opposing correlations between each subscale and a dimension of psychopathology would cause a null correlation when using a unidimensional scale. To this end, it would be impossible to ascertain the distinct pattern of effects of holding Machiavellian views (positive) and employing Machiavellian tactics (negative) on fear with the Mach-IV.

The Machiavellian views dimension significantly predicted all domains of psychopathology, and not only internalising and thought dysfunction as hypothesised. The Views subscale was a stronger predictor of all areas of psychopathology than the Tactics subscale, including the externalising domain. Thus, holding the worldview

that human nature is dishonest and manipulative appears related to the higher-order psychopathology factor (see Caspi et al., 2014), rather than to specific dimensions of dysfunction. Therefore, although holding Machiavellian views is associated with psychopathology generally, it is likely that other factors, such as genetics and individual experiences, dictate the specific domain of psychopathology.

The third hypothesis that employing Machiavellian tactics would be the primary predictor of externalising psychopathology was partially supported, as the findings were not entirely consistent with our original theorising. Although the tactics dimension significantly predicted externalising psychopathology, Machiavellian views appeared to be, in fact, a stronger predictor. Therefore, the tactics dimension does not primarily account for the association between Machiavellian tactics and externalising psychopathology.

Regardless, the significant relationship between the tactics dimension and externalising psychopathology is consistent with previous work studying the relationship between Machiavellianism and psychopathology in children and adolescents (e.g. Lau & Marsee, 2013; Loftus & Glenwick, 2001; Stead et al., 2012). SEM demonstrated that tactics significantly predicted the externalising and impulsivity constructs, which contradicts the conceptualisation of Machiavellians as calm and calculated (Christie & Geis, 1970). Furthermore, the weak correlation between tactics and depression should be interpreted with caution. Due to the pattern of relationships, the tactics subscale appears closely related to psychopathy - manipulation in the context of impulsivity and low fear. Thus, future research should investigate whether Machiavellian tactics accounts for the conceptual overlap between Machiavellianism and psychopathy (McHoskey, Worzel, & Szyarto, 1998).

3.5.3   Limitations and Future Research

There are limitations of the current study. First, we relied on university samples that may not represent the general population. Secondly, we only employed self-report measures. Along with its standard limitations, Machiavellianism has been found to correlate with socially desirable responding (Christie & Geis, 1970), which

may bias results. Future research could strengthen these findings by employing behavioural observations or cross-validation techniques.

The association between Machiavellianism and psychopathology highlights the need to investigate the process through which this relationship forms. As personality represents a relatively stable pattern of feeling, thinking, and behaving, it should precede the development of psychopathology. However, it is also conceivable that psychopathology may facilitate the development of Machiavellian views or act to moderate the strength of these views. Future research can study variables that mediate or moderate Machiavellianism's influence on psychopathology. Given that Machiavellianism has a stronger environmental than genetic basis (see Vernon et al., 2008), it is likely that adverse life events shape the development of Machiavellianism over time. As a result, further investigations using the TDM-IV should explore the process through which Machiavellian views and tactics causally relate to state and trait psychopathology. For example, a study could investigate if Machiavellian views may predispose people to negative interactions with others, which in turn could predispose them to social rejection and, in turn, internalising psychopathology.

Importantly, the new factor structure is based on 10 items from the Mach-IV that is widely used in the assessment of Machiavellianism. By modifying this existing scale, researchers can re-analyse data from a valid multidimensional perspective. Although the TDM-IV has stable factor structure and mean stability, it was derived from the Mach-IV and thus may inherit its psychometric problems, such as variable internal consistency, unclear item wording, and response bias (Rauthmann, 2013). Additionally, the TDM-IV may incur costs due to relying on 10 items that are divided between two subscales (c.f. Miller, Smart, & Rechner, 2015) and the tactics subscale contains only contrait items. However, based on the pattern of external correlates and that the views subscale consists of both portrait and contrait items, there is sufficient empirical and theoretical grounds that the TDM-IV is measuring the views and tactics dimensions. For future and more comprehensive research on the Machiavellianism construct, a new multidimensional and balanced measure

should be created as it can provide a robust multidimensional perspective based on a nomological network that is grounded in modern conceptualisation, theory, and research (for similar arguments see Jones & Paulhus, 2009; Rauthmann & Will, 2011).

3.5.4   Conclusion

Christie and Geis argued that Machiavellians are free of gross psychopathology, but the current study contradicted this. Even if there exists a divide between their conceptualisation of Machiavellianism and the Mach-IV's ability to measure the construct, the Mach-IV was not nuanced enough to capture the construct's multidimensional structure. The TDM-IV provides this capability, showing that Machiavellianism consists of two dimensions, namely views and tactics. Therefore, an individual can strongly endorse Machiavellian tactics without necessarily holding Machiavellian views, and vice versa. We also showed that holding Machiavellian views was conducive to psychopathology, whereas employing Machiavellian tactics was, to a lesser degree, related to externalising disorders. Hence, individuals who endorse Machiavellian views are not free of gross psychopathology, but are inclined to manipulate others amidst all dimensions of psychological distress.

Chapter 4

Nomological Network of Two-Dimensional Machiavellianism

Chapter 3 provides initial evidence that Machiavellianism does indeed comprise two dimensions, each with differential roles within latent psychopathological domains. Only a handful of studies, however, have investigated the nature of each dimension or how robust the two-factor structure is (perhaps it is only a measurement artefact within Chapter 3). Given the plethora of studies utilising the Mach-IV, an opportunity presented itself to request exiting datasets and explicate the two dimensions using the TDM-IV.

In doing so, this chapter was able to utilise 15 datasets to address the following research questions:

- Are the two dimensions universal?

- Does the factor-structure differ across sample types, cultures, and genders?

- What is the nature of each dimension: developmental pathways, associations with existing personality scales, emotionality, and behavioural consequences?

4.1   Abstract

Machiavellianism captures one's cynical view of humanity and willingness to use immoral means to achieve one's goals. Although Machiavellianism consists of views and tactics dimensions, a unitary approach dominates our understanding of this construct. Therefore, we aimed to further substantiate its dimensionality and elucidate each dimension's unique characteristics. An international collaboration ($k = 15$, $N = 17{,}004$; 57.39% male; aged 11-85, $M = 26.97$) contributed datasets from Korea, Hungary, Canada, USA, and Australia. We tested a nomological network comprising associations of Machiavellianism's dimensions with demographic variables and four conceptual domains: development (trauma, family functioning, world-view), personality (Big Five, HEXACO, narcissism, psychopathy), emotionality (emotional intelligence, regulation), and behaviour (self-report, game scenarios). Meta-analytic confirmatory factor analysis supported the two-dimensional structure. Men were higher on views and tactics than women, and age did not influence Machiavellianism overall. Mean Machiavellianism varied across national cultures differently for views and tactics. Both dimensions related to adverse developmental experiences and negatively to agreeableness and honesty-humility. The views dimension related to emotionality negatively, and higher distrust and delinquency, whereas the tactics dimension related to aspects of psychopathy, and lower conscientiousness and empathy. Overall, we provide essential theoretical advancements and the foundation for future research into Machiavellianism

4.2 Introduction

Writing on the nature of prudence and modernity, Niccolo Machiavelli is (in)famous for callous and pragmatic leadership advice and repudiating traditional morality as naïve. His treatise, The Prince (Machiavelli, 1532/1935), argues that "one should wish to be both, but ... it is much safer to be feared than loved" (p. 134), and that "a prince, so long as he keeps his subjects united and loyal, ought not to mind the reproach of cruelty" (p. 133). His work on the nature of power continues to influence political thought, being both embraced and condemned (see Soll, 2014). On a continuum throughout society, individuals vary in their agreement with his ideology - their level of Machiavellianism. Machiavellianism (Christie & Geis, 1970) captures one's cynicism of humanity and willingness to embrace immoral behaviours to achieve a goal one deems worthwhile.

Machiavellianism provides important insight into a wide range of domains, such as positive and negative cooperation (Wilson, Near, & Miller, 1998, 1996), deception and lying (Geis & Moon, 1981), empathy and emotional intelligence (Austin, Farrelly, Black, & Moore, 2007; Pilch, 2008), leadership and organisational performance (Zettler & Solga, 2013), and psychopathology (Monaghan, Bizumic, & Sellbom, 2016). Machiavellianism has been adopted into the dark triad of personality (Paulhus & Williams, 2002) which is rapidly gaining popularity (as well as criticism; e.g., Glenn & Sellbom, 2015). Research, ergo our understanding, is currently founded upon a singular dimension, simply ranging from low to high.

Departing from the legacy of this approach, strong evidence demonstrates that Machiavellianism is two-dimensional. Confusion around the construct's dimensionality is not surprising given the original factor structure was a *post-hoc* hypothesis and subsequent factor analyses were largely troublesome. Christie and Geis (1970) developed the Mach-IV (the primary measure of Machiavellianism) through the deductive method, conceptualising an underlying approach to maintaining power inherent within the writings of Machiavelli. They assumed that there are three main facets of Machiavellianism: tactics, views, and morality. The final items, however,

were chosen because they best discriminated high from low scoring respondents on a singular Machiavellianism dimension.

In a review of independent factor analyses of the Mach-IV, Fehr, Samsom, and Paulhus (1992) argued that only the views and tactics dimensions emerge consistently when accounting for labelling and method factors. Their subsequent (Paulhus, 1982; as cited in Fehr et al., 1992) and independent (e.g., Andrew, Cooke, & Muncer, 2008; Calvete & Corral, 2000) factor analyses supported this conjecture. The views dimension captures a negative view of human nature, that is, the beliefs that humanity is untrustworthy and selfish. The tactics dimension captures the justification of immoral behaviour to achieve a goal. Machiavellianism exists as the higher-order aggregate of these two dimensions

Recently, Monaghan et al. (2016) derived a psychometrically stronger two-factor scale from the Mach-IV (ten-item Two-Dimensional Mach-IV; TDM-IV). Item and factor analyses investigated the Mach-IV's original three-factor structure, determining that the morality subscale was not viable, and that 10-items captured and distinguished the views and tactics dimensions. The TDM-IV had an invariant factor structure over two samples and over a three-month test-retest analysis. The TDM-IV provides the opportunity to make important theoretical advancements by elucidating the nature of Machiavellian views and tactics.

4.2.1   Nomological Network: Key Domains for Investigation

The pattern of relationships between two-dimensional Machiavellianism and key theoretical constructs explicates its construct validity, and provides insight into its nomological network (Cronbach & Meehl, 1955; Smith, 2005). Identifying robust associations within the network requires replication and meta-analysis across samples and measures. Although this process is the cornerstone of robust scientific investigation, it has been relatively neglected, and even troublesome, in modern psychological research (Cumming, 2012; Open Science Collaboration, 2015; Wagenmakers, Wetzels, Borsboom, & Van Der Maas, 2011).

Our development of a nomological network will consist of several sequential

steps. First, replication and invariance modelling across cultures, genders, and languages provides evidence that the two-factor structure is robust, a cardinal attribute given the Mach-IV's structure is notoriously difficult to replicate (e.g., Kuo & Marsella, 1977; Martinez, 1980). Then, the nature of each dimension is explicated through their relationship with key demographic factors (i.e., gender, age, and culture), and associations within conceptually important domains: development, emotionality, broader personality, and behavioural domains

Developing hypotheses about the nomological network requires augmenting the limited information on each dimension with unidimensional research. Studies have identified unique effects of each dimension on political ideology (Gold, Friedman, & Christie, 1971), borderline personality organisation (Láng, 2015a), reward sensitivity (Birkás, Csathó, Gács, & Bereczkei, 2015), development (Láng & Lénárd, 2015), empathy, and emotional intelligence (Andrew et al., 2008). Monaghan et al. (2016) demonstrated that the views dimension associated positively with all domains of psychopathology, whereas the tactics dimension associated positively with externalising and impulsivity domains, and weakly with depression domains. Extrapolating from these findings and the construct definitions, the views dimension likely associates with dysregulated emotionality, negative world-views, and distrust; whereas the tactics dimension likely associates with impulsivity, callousness, and empathy (negatively).

Research into demographic influences suggests higher levels of Machiavellianism among men than women (e.g., Austin et al., 2007; Brewer, Abell, & Lyons, 2013; Jones & Paulhus, 2009). Despite the Mach-IV being used in a variety of cultures (e.g., Calvete & Corral, 2000; Kuo & Marsella, 1977), few studies have investigated cultural variations in Machiavellianism. Starr (1975) found higher levels of Machiavellianism in Arabic, when compared to American, women. It, however, appears that variations in factor structures between cultureshinders this research (Kuo & Marsella, 1977). Age's influence on Machiavellianism remains unclear, as researchers argue that Machiavellianism increases (Sutton & Keogh, 2001; Vitell, Lumpkin,

& Rawwas, 1991), decreases (Barlett & Barlett, 2015; Mudrack, 1989; Rawwas & Singhapakdi, 1998), and has no relationship with age. Sutton and Keogh (2001) found that only Machiavellian views (dubbed "lack of faith in human nature"), and not Machiavellianism overall, increased with age.

Machiavellianism's development appears to be largely influenced by the environment, with only modest genetic inheritance (Vernon, Villani, Vickers, & Harris, 2008; Veselka, Schermer, & Vernon, 2011). Machiavellian views and tactics are likely learnt socially and reinforced through direct modelling of attachment figures (Kraut & Price, 1976) in combination with traumatic, harsh, and neglectful environments (e.g., Láng & Birkás, 2014; Láng & Lénárd, 2015; McIlwain, 2011). Substantial evidence supports lower empathy, theory of mind, and emotional intelligence among those higher on Machiavellianism (Ali, Amorim, & Chamorro-Premuzic, 2009; Austin et al., 2007), and differentially between the views and tactics dimensions (Andrew et al., 2008).

The Five-Factor Model (FFM) is the most widely endorsed model of broad personality, and along with its six-factor variation (HEXACO; Lee & Ashton, 2012) conceptualises individual variation in behaviour as the product of relatively stable, universal, and biologically based traits (DeYoung et al., 2010; McCrae et al., 2000; McCrae & Costa, 1997). Machiavellianism associates strongly - almost axiomatically - with lower levels of agreeableness and honesty-humility because these traits represent core features of the dark triad traits (Book, Visser, & Volk, 2015). Although the views dimension's fearful and distrusting worldview may account for associations between Machiavellianism and neuroticism, the tactics dimension's relationship to higher-order antagonism may explain negative associations with conscientiousness (Furnham, Richards, Rangel, & Jones, 2014; Jones & Paulhus, 2009; Vernon et al., 2008). However, the negative associations with conscientiousness and emotional stability are inconsistent with the Machiavellian archetype of being cold and calculated.

Finally, Machiavellianism consistently associates with interpersonal manipulation within behavioural experiments, because the Mach-IV was developed using this

criterion (Christie & Geis, 1970). Individuals higher in Machiavellianism engage in both positive (prosocial) and negative (manipulation) cooperation, breaking expectations of reciprocity when beneficial (Christie & Geis, 1970; Gunnthorsdottir, McCabe, & Smith, 2002; Sakalaki, Richardson, & Thepaut, 2007). It is likely that the views dimension is responsible for distrusting collaborators, whereas the tactics dimension relates to actively manipulating others for personal gain. Nevertheless, current literature in this area is largely founded upon the assumption that Machiavellianism is unidimensional.

4.2.2 The Current Study

We utilised existing data through an international collaboration to enrich our understanding of two-dimensional Machiavellianism. We first aimed to identify a robust factor structure as the base for the network. Based on previous analyses (Monaghan et al., 2016), we hypothesised that all structural analyses would support the two-dimensional factor structure of the TDM-IV (Hypothesis 1). We then aimed to establish a nomological network comprising demographics, developmental, personality, emotional, and behavioural domains. Given limited multidimensional studies, construct definitions and unidimensional research largely guided hypotheses. We made no hypotheses regarding cultural differences.

We hypothesised that men would have higher levels of Machiavellian views and tactics than women given robust associations in the literature (Jones & Paulhus, 2009) (Hypothesis 2). Next, we expected that analyses would fail to reject a null effect of age on any aspect of Machiavellianism, because the direction of effect in the literature varies (Mudrack, 1989; Vitell et al., 1991) (Hypothesis 3). The research reviewed demonstrates Machiavellianism relates to poor early life experiences (e.g., Láng & Birkás, 2014; McIlwain, 2011). We hypothesised that this would be primarily the case for the views dimension rather than the tactics dimension because the views dimension captures a cynical and untrusting beliefs about others (Hypothesis 4). Further, Machiavellianism associates with a lower capacity to manage negative emotions and with lower emotional intelligence and self-esteem (e.g., Ali et al., 2009).

We expected this association would also be primarily due to Machiavellian views, given stronger associations in the literature between internalising psychopathology and the views, when compared to the tactics, dimension (Monaghan et al., 2016) (Hypothesis 5).

We had several sub-hypotheses for the relationship of Machiavellianism with personality traits. First, we hypothesised that Machiavellianism would associate negatively with honesty-humility (Hypothesis 6a) and agreeableness (Furnham et al., 2014) (Hypothesis 6b). We further expected that neuroticism would relate to views positively because views associates with internalising psychopathology (Hypothesis 6c), and that tactics would relate negatively to conscientiousness given tactics associates with impulsivity (Monaghan et al., 2016) (Hypothesis 6d). In relation to dark triad variables, we hypothesised that psychopathy would more closely align with the tactics dimension (Hypothesis 6e), and vulnerable aspects of narcissism would align with Machiavellian views (Hypothesis 6f) given associations with impulsivity/externalising psychopathology and with internalising psychopathology, respectively.

In behavioural experiments, we hypothesised that the views dimension would facilitate distrust given its basis in misanthropy (Monaghan et al., 2016) (Hypothesis 7a). On the other hand, the tactics dimension - endorsing goal-directed duplicity/exploitation when beneficial (Christie & Geis, 1970) - would associate with engaging in the dominant behavioural strategy, reward sensitivity, and punishment insensitivity (Birkás et al., 2015) (Hypothesis 7b).

4.3   Method

4.3.1   Participants

The cumulative dataset consisted of 17,004 (57.39% male) participants aged between 11 and 85 with a mean age of 26.97 ($SD = 11.28$). Samples consisted of adolescents ($N = 135$), correctional inmates ($N = 472$), general public ($N = 12,023$), and students ($N = 4374$) from Korea, Hungary, Canada, USA, and Australia. (Table 5.1 contains detailed participant information.)

4.3.2 Procedure

In 2015, we requested data from researchers via email ($N = 40$) who recently published papers using the Mach-IV in our key conceptual domains. We attempted to contact selected researchers over the course of one year, by repeatedly emailing the primary author, and then the secondary author when the primary author did not reply (38% response rate). The data collection period was established a priori, and no additional data were collected outside this set period. All data collected within this period are reported in this article. We acquired one public domain dataset (Personality Testing, 2015). Of the 17 datasets collected, we excluded two datasets (Monaghan et al., 2015; Repacholi, Slaughter, Pritchard, & Gibbs, 2003) due to their small sample sizes ($N < 85$). As a result, we utilised 15 Mach-IV datasets published or sampled between 1994 and 2015, and calculated the TDM-IV in each dataset.

Although we utilised meta-analytical statistical techniques, we elucidated two-dimensional Machiavellianism using a multi-dataset and not a systematic meta-analytical approach. All analyses that we conducted on the datasets are reported in this article, and no analyses were removed from or included in this article due to their statistical significance. For example, no covariates were tested other than those reported. (We did, however, initially run factor analyses on all 15 datasets before analysing power, see Section 4.4.2.) We conducted the analyses after collecting all datasets, and we established criteria for excluding cases and datasets prior to conducting the analyses. Including analyses based on significance inflates Type 1 error rates and convolutes the nomological network with false positives (Simmons, Nelson, & Simonsohn, 2011).

Table 4.1

Dataset Descriptive Statistics: Authors, Year, Sample Composition, and Measurement

Author/s	Year	N	% Male	$\bar{X}_{Age}(SD)$	Age Range	Location	Sample	Mach-IV Version (Response Categories)
Ashton, Lee, & Son	2000	569	45.87	22.01 (2.19)	19-30	Chonju, South Korea	Undergraduate students	Korean (7)
Austin, Farrelly, Black, & Moore	2007i	340	32.35	21.52 (3.35)	17-41	Edinburgh, UK	Undergraduate students	English (5)
Austin, Farrelly, Black, & Moore	2007ii	182	28.02	55.23 (14.61)	20-85	Edinburgh, UK	General	English (5)
Birkás, Csathó, Gács, & Bereczkei	2015	128	55.47	22.56 (3.09)	18-33	Pécs, Hungary	Under/graduate students	Hungarian (7)
Bizumic & Fung	2016	491	27.09	22.00 (6.91)	17-74	Canberra, Australia	Undergraduate students	English (7)
Gunnthorsdottir, McCabe, & Smith	2002	259	35.45	18.77 (1.97)	17-35	Arizona, USA	Undergraduate students	English (7)
Láng	2015a	266	40.98	32.40 (5.45)	23-45	Pécs, Hungary	General	Hungarian (7)
Láng & Birkás	2014	455	36.70	17.27 (.77)	16-19	Pécs, Hungary	Secondary school students	Hungarian (7)
Lau & Marsee	2013	135	48.89	13.59 (2.19)	11-17	New Orleans, USA	Adolescent	English, Kiddie (5)
Lee & Ashton	2004	158	42.41	23.89 (7.41)	18-54	Calgary and Ontario, Canada	Undergraduate students	English (5)
Personality testing	2015	11575	65.43	29.01 (11.60)	13-78	International	Internet	English (5)
Sellbom et al.	2012	472	100	31.13 (9.51)	18-63	Michigan, USA	Correctional inmates	English (7)
Williams	1994a	552	30.25	19.02 (2.27)	17-43	Michigan, USA	Undergraduate students	English (5)
Williams	1994b	867	25.95	18.49 (1.27)	17-29	Michigan, USA	Undergraduate students	English (5)
Williams	1995	555	34.05	19.08 (2.03)	17-35	Michigan, USA	Undergraduate students	English (5)

Note. The dataset from Austin et al. (2007) was divided into the undergraduate (identified in table by i) and general (identified in the table by ii) samples used in their paper. UK = United Kingdom, USA = United States of America. Personality Testing = Data obtained from www.personality.testing.org. Dataset cited as Láng and Birkás (2014) was also used in the paper Láng and Birkás (2015). Dataset cited as Láng (2015a) was also used in the Láng and Lénárd (2015). Response categories = length of the Likert scale.

4.3.3 Measures

Machiavellianism was measured by the Two-Dimensional Mach-IV (TDM-IV; Monaghan et al., 2016), a 10-item derivative of the Mach-IV (Christie & Geis, 1970). The TDM-IV ($\alpha = .83$, $\omega_{two-factor} = .86$) consists of the internally consistent Views ($\alpha = .76$) and Tactics ($\alpha = .80$) subscales. Views ($r = .90$) and Tactics ($r = .83$) subscales correlated strongly with the full scale and correlated moderately with each other ($r = .50$; r, ω, and α are based on the total sample). One sample (Lau & Marsee, 2013) used item wording for children (Nachamie, 1970). Items asked participants how much they agreed with the presented statements on either 5-point or 7-point Likert scales from *disagree strongly* (1) to *agree strongly* (5/7). Example items: "Anyone who trusts anyone else is asking for trouble" (Views subscale) and "Most people are basically good and kind" (Tactics subscale; reverse-scored). (Items are in Appendix C and Table 3.1.)

We extracted scales from each dataset that related to our key domains of investigation, placing them into one of four nomological network domains as outlined in Table 4.3 (developmental and emotional domains) and Table 4.4 (personality and behaviour domains). (See the original papers for study designs and scale information, and Appendix C for descriptions of behavioural studies.)

4.4 Results

4.4.1 Data Cleaning and Screening

We employed a uniform cleaning and screening protocol across all datasets ($N_{rawdata} = 17,600$), based on widely accepted recommendations (e.g., Tabachnick & Fidell, 2007). Several univariate outliers ($p < .001$) were recoded at 3.29 standard deviations from the mean, and we deleted cases that were considered multivariate outliers based on Mahalanobis distances ($p < .001$) and leverage (hat) values. Data were removed from participants who responded to less than 90% of the TDM-IV (due to our modelling of item level data) or 80% of another scale's items. No variable had more than 5% missing data and were considered missing completely at random (Little, 1988). Based on these findings, data were imputed using Maximum

Likelihood (ML; 25 iterations; Tabachnick & Fidell, 2007).

4.4.2   Explication of the Nomological Network

Test of structure. Confirmatory factor analysis (CFA; ML estimation) tested Hypothesis 1 that Machiavellianism consists of two dimensions (views and tactics; based on the variance-covariance matrix). Different components of model fit were assessed through several indices. First, SRMR values should be close to .08 and RMSEA values close to .06 to represent acceptable fit (with lower values representing better fit; Hu & Bentler, 1999). Second, CFI (Bentler, 1990) and NNFI (Tucker & Lewis, 1973) values should be larger than .90 to indicate that the model is appropriately specified. Although a non-significant χ^2 is desirable (Barrett, 2007), it is rarely achieved in psychological research with large samples. We conducted CFA on samples ($k = 10$) with acceptable power ($\beta > .80$) to distinguish between our model ($df = 33$) fitting the data well (RMSEA = .050) and fitting poorly (RMSEA = .085; MacCallum, Browne, & Sugawara, 1996).

We ran the same two-dimensional model on each dataset, with each item loading onto its respective factor (items are presented in Appendix C). We replicated the original model structure (Monaghan et al., 2016) by estimating the error covariance between items 6 and 7 because of significant modification indices likely due to similar item wording - directly addressing lying vs. honesty, whereas other items assessed motives for lying. The median, standard deviation, and range of model fit estimates suggested that the TDM-IV reliably recreated the observations in all datasets (Table 4.2). The two-dimensional model fitted the data significantly better than the unidimensional alternative in all datasets. In contrast, the Mach-IV's one-factor and original three-factor structure (Christie & Geis, 1970) fitted the data poorly in all datasets. (Model fit statistics for individual datasets, and model comparisons are in Appendix C.) We proceeded to investigate Machiavellianism through the TDM-IV only, given alternative factor structures were not viable.

Two-stage meta-CFA (Cheung & Chan, 2005) investigated structure across all datasets, weighting estimates appropriately by sample size (random-effects mod-

Table 4.2

TDM-IV Model Fit Estimates Across Datasets: Medians and Ranges

	Fit Estimates						Correlations	
	χ^2	p	CFI	NNFI	SRMR	RMSEA [95% CI]	Views & Tactics	Items 6 & 7
Median	69.93	.002	.940	.918	.053	.053 [.039, .071]	.44	.42
Range	[40.05, 684.71]	[< .001, .190]	[.902, .989]	[.867, 985]	[.027, .060]	[.029, .067]	[.28, .76]	[.03, .53]

Note. Full CFA results can be found in Appendix C. All models $df = 33$. Only datasets with sufficient power ($\beta > .80$) to discriminate between well-fitting and poorly-fitting models based on RMSEA were included ($k = 10$). The correlations between items 6 and 7 represent the correlations between their error terms.

elling; weighted least squares). Stage 1 compared correlation matrices between samples, suggesting the percentage of total variance explained by the between study effect (I^2) ranged from .58 to .96 (inflated by the large sample size in the Personality Testing (2015) dataset). Stage 2 fitted the TDM-IV model to the pooled correlation matrix, suggesting the factor structure fitted the data well: $\chi^2(45, N = 17{,}004) = 2671.80$, CFI = .972, NNFI = .953, SRMR = .034, RMSEA = .011 [.001, .014].

Multigroup CFA assessed the TDM-IV's invariance across samples. An unconstrained configural model (factor structures constrained to be equivalent across samples) was compared to a metric invariance model (factor-loadings were also constrained) (Kline, 2011; Little, 2009). Minimal changes in model fit between the models, ΔCFI < .01 (Chen, 2007; Cheung & Rensvold, 2002), suggests invariance between groups/datasets. The unconstrained configural model, $\chi^2(330) = 1366.60$, CFI = .976, and the constrained invariance model, $\chi^2(402) = 1841.30$, CFI = .967, fitted the data well. Factor structure and loadings were considered invariant across the datasets, $\Delta\chi^2(72) = 474.70$, $p < .001$, ΔCFI = .009. Overall, the results supported Hypothesis 1 that the TDM-IV's factor structure was robust and equivalent across samples, permitting subsequent analyses.

Identification of demographics. We then tested Hypotheses 2-4 concerning the relationship between Machiavellianism and gender, age, and culture. Meta-analyses used random-effects modelling to allow for unconditional inference to the

wider population and account for random heterogeneity between true effect sizes
(we assumed the true effects were drawn from normal distributions). Analyses were
run using the Hunter-Schmitt method (Schmidt & Hunter, 2014) calculated by the
"psychmeta" (Dahlke & Wiernik, 2018) and "metafor" (Viechtbauer, 2010) R pack-
ages. Under this method, we individually corrected each estimate for attenuation
due to measurement error (α), which is considered artefactual variance. We then
accounted for the moderating effect of Likert scale lengths (i.e., 5-point and 7-point)
in all meta-analyses and accounted for gender as a moderator when analysing age.
(Forest plots, estimates weighted only by sample size (Barebones estimates), and
estimates without excluded datasets are in Appendix C.)

Effect of Gender.[1] We tested Hypothesis 2 that males would, on average,
score higher on Machiavellianism than females using meta-analytic techniques to
weight standardised mean differences appropriately by sample size and accounting
for positive bias ($\hat{g}$; we will denote the population estimate as δ; Hedges, 1981). We
excluded one sample (Sellbom et al., 2012) as it contained only male participants.
Results suggested a significant effect for gender with all confidence intervals exclud-
ing zero: TDM-IV, $\delta = .27$ [$CI_{95} = .13, .40$], $\hat{\tau}^2$ (residual heterogeneity) $= .015$, I^2
(heterogeneity not accounted for by sampling variance) $= 55.11\%$, Q(12) $= 22.92$,
$p = .03$; Views, $\hat{\delta} = .24$ [$CI_{95} = .07, .42$], $\hat{\tau}^2 = .039$, $I^2 = 72.01\%$, Q(12) $= 35.22$,
$p < .01$; and Tactics, $\hat{\delta} = .21$ [$CI_{95} = .07, .35$], $\hat{\tau}^2 = .012$, $I^2 = 55.64\%$, Q(12)
$= 25.72$, $p = .012$. I^2 estimates suggest that there remained a moderate amount
of unexplained variation across studies. These results suggested men report being
more Machiavellian than women, with population effect sizes ranging from .21 to
.27. We, therefore, included gender ratio as a covariate in subsequent analyses.

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[1]CFA demonstrated that the TDM-IV's factor structure fitted males, $\chi^2(33) = 874.32$, $p <$
.001, CFI $= .970$, NNFI $= .959$, SRMR $= .035$, RMSEA $= .051$ [.048, .054], and females, $\chi^2(33)$
$= 776.63$, $p < .001$, CFI $= .959$, NNFI $= .944$, SRMR $= .035$, RMSEA $= .056$ [.052, .059],
independently. Invariance models also fitted the data at configural ($\chi^2(66) = 1651.00$, CFI $= .965$,
RMSEA $= .053$), metric ($\chi^2(74) = 1764.90$, CFI $= .963$), intercepts ($\chi^2(82) = 1865.70$, CFI $=$
.961), and mean ($\chi^2(88) = 2710.30$, CFI $= .943$) levels of model constraint. Changes between
models were considered invariant between configural and metric models, $\Delta\chi^2(8) = 113.92$, $p <$
.001, ΔCFI $= .002$, and between loadings vs intercepts models, $\Delta\chi^2(2) = 844.61$, $p < .001$, ΔCFI
$= .018$.

Effect of Age. We used two approaches to test Hypothesis 3 - the influence of age. First, meta-analytic techniques estimated the correlation (observed correlation denoted by r, and population by $\hat{\rho}$ between age and Machiavellianism weighting each sample appropriately by sample size, and correcting the slight negative bias (Olkin & Pratt, 1958). We removed one dataset (Personality Testing, 2015) from the analysis of TDM-IV and views because it introduced unnecessary error through disproportionately influencing overall estimates (meta-analytic outlier based on residual estimates and Cook's distances; see Viechtbauer & Cheung, 2010).

Meta-analysis suggested age did not associate with self-reported Machiavellianism significantly, with estimates of the population correlation ranging from -.13 to -.02 with all confidence intervals including zero: TDM-IV, $\hat{\rho}$= -.02 $[CI_{95} = -.17, .13]$, $\hat{\tau}^2 = .008$, $I^2 = 66.00\%$, $Q(11) = 30.92$, $p = .001$; views, $\hat{\rho} = .05$ $[CI_{95} = -.05, .14]$, $\hat{\tau}^2 < .001$, $I^2 = 7.83\%$, $Q(11) = 15.73$, $p = .15$; tactics, $\hat{\rho} = -.13$ $[CI_{95} = -.28, .02]$, $\hat{\tau}^2 = .010$, $I^2 = 83.79\%$, $Q(12) = 115.20$, $p < .01$.

We also regressed Machiavellianism on age (controlling for gender) using all data to identify trends over a wider age range (11 to 88 years). We excluded the correctional sample (Sellbom et al., 2012) because its substantially higher Machiavellianism scores introduced error by disproportionally influenced results. We analysed datasets that used 5-point Likert, ($M_{Age} = 27.55$, $SD_{Age} = 11.34$), and 7-point Likert, ($M_{Age} = 23.68$, $SD_{Age} = 7.81$) independently. The results suggested a significant effect of age for TDM-IV$_{5-point}$ $\beta = -.12$, $SE = .00$, $t = -14.93$, $p < .001$; TDM-IV$_{7-point}$ $\beta = -.08$, $SE = .00$, $t = -3.74$, $p < .001$; Views$_{5-point}$ $\beta = -.12$, $SE = .00$, $t = -13.88$, $p < .001$; Views$_{7-point}$ $\beta = -.05$, $SE = .00$, $t = -2.15$, $p = .03$; Tactics$_{5-point}$ $\beta = -.10$, $SE = .00$, $t = -12.40$, $p < .001$; and Tactics$_{7-point}$ $\beta = -.10$, $SE = .00$, $t = -4.25$, $p < .001$. A visual inspection of regression plots found no evidence of non-linear relationships. Overall, regression results suggested Machiavellianism decreased with age.

Effect of Culture. We minimised confounding variables by investigating culture's influence in samples that used a 7-point Likert scale and students ($k = 5$,

$N = 1902$), controlling for gender. We operationalised culture as national culture, dividing samples into four national cultural groups: Korean ($N = 569$), Australian ($N = 491$), Hungarian ($N = 583$), and US ($N = 259$). ANCOVA suggested a small yet significant effect for culture, TDM-IV, $F(3,1883) = 29.06$, $p < .001$, $\eta^2_{partial}$ = .04; tactics, $F(3,1883) = 22.61$, $p < .001$, $\eta^2_{partial} = .04$; and a medium effect for views, $F(3,1883) = 70.44$, $p < .001$, $\eta^2_{partial} = .10$. (Detailed analyses are in Appendix C.) Unplanned post-hoc comparisons (1000 bootstrapped samples) suggested Hungarians had significantly higher TDM-IV scores than the other cultures. Hungarians also held the strongest Machiavellian views, significantly greater than other cultures (other cultures did not differ significantly). In contrast, Australians held the highest Machiavellian tactics scores, followed by Koreans, Hungarians, and then US participants.

Relation to conceptual domains. We then investigated associations between the scales (Tables 4.3 and 4.4) and the manifest views and tactics variables using zero-order correlations, and with their latent variables using structural equation modelling (SEM). We interpreted overall trends to minimise sample/indicator-specific random error. Given the number of analyses inflated Type I error, we focused on $p < .001$. We used semipartial correlations over SEM parameters in two samples (Birkás et al., 2015; Lau & Marsee, 2013) given insufficient power. In all SEM analyses, TDM-IV items loaded onto their respective views or tactics latent trait. Given many datasets comprised scale-level variables and not individual item scores, we estimated the endogenous latent variables using single indicator models (error = $(1-\alpha)^*SD^2_{indicator}$). All models fitted the data acceptably (Appendix C contains model fit statistics). Zero-order correlations and SEM pathways are presented in Tables 4.5 and Table 4.6 (SEM figures are in Appendix C).

Developmental and emotional. Analysis of developmental factors comprised four scales evaluating previous or current family functioning, trauma, or peer relations in adolescence, and two scales assessing world-views (Table 4.3). Machiavellianism related consistently to poor family functioning and attachment, traumatic

early life experiences, and peer conflict (Table 4.5). The views dimension showed stronger relationships with peer conflict, parental alienation, and a belief in an unjust and dangerous world, supporting Hypothesis 4. In contrast, Machiavellian tactics associated with only aspects of attachment (trust and communication) and family level communication and life satisfaction more strongly than views.

We captured emotionality on one performance and two self-report measures of emotional intelligence, two measures of empathy/callous unemotionally, two measures of self-esteem, and two measures of emotional dysregulation/management skills (Table 4.5). The Machiavellian views latent variable uniquely associated with lower self-report and performance emotional intelligences, self-esteem, and emotional dysregulation in support of Hypothesis 5. The Machiavellian tactics latent variable associated with empathy deficits more strongly than views, with weaker, yet significant, associations with Inventory of Callous-Unemotional (ICU) traits. Interestingly, the tactics dimension related positively, and the views dimension related negatively, to the Mayer-Salovey-Caruso Emotional Intelligence Test.

Personality. One HEXACO and two FFM measures assessed Machiavellianism's relation within broad personality frameworks (Table 4.4). As expected, honestly-humility and all aspects of Machiavellianism had medium - large correlations (Hypothesis 6a). Results (Table 4.6) across each FFM estimate were reasonably consistent, with significant correlations between Machiavellianism and agreeableness (negative; Hypothesis 6b), Machiavellian views with neuroticism (Hypothesis 6c) and with extraversion (negative, but inconsistent), and Machiavellian tactics with conscientiousness (negative; Hypothesis 6d).

Machiavellianism had medium - large correlations with psychopathy, with associations differing between the Levenson's Self-Report Psychopathy (LSRP) and Psychopathic Personality Inventory (PPI; Table 4.4). Machiavellian tactics showed stronger associations with PPI-II (impulsive-antisociality) and PPI-III (coldheartedness) than Machiavellian views (supporting Hypothesis 6e). Latent views and tactics dimensions did not correlate with PPI-I (fearless-dominance) significantly. LSRP

Table 4.3

Measures used in Nomological Network: Development and Emotional Style

Domain	Scale	Sub/Scale Information (Internal Consistency, α)	Data from
Development			
	Peer Conflict Scale (PCS, 20 items; 4-point Likert; Marsee, Kimonis, & Frick, 2004)	Two subscales: Overt (direct aggression, .91); relational (social manipulation, .85)	Lau and Marsee (2013)
	Family Adaptability and Cohesion Evaluation Scales IV (FACES, 5-point Likert; 62 items; Olson, 2011)	Family communication and satisfaction with family life subscales, and the cohesion, flexibility, and total ratio scores (.73 - .90, enmeshed subscale = .61)	Láng and Birkás (2014)
	Child Abuse and Trauma Scale (CATS; 38 items; 4-point Likert, Sanders & Becker-Lausen, 1995)	Total abuse / trauma and the neglect/negative home atmosphere, punishment, and sexual abuse subscales (.54 - .90)	Láng (2015a)
	Inventory of Parent and Peer Attachment (IPPA-R; 38 items; 7-point Likert; Gullone & Robinson, 2005)	Trust, communication, and alienation scales (> .75). Parent component only, average of mother and father reports were used	Láng and Birkás (2014)
	System Justification Scale (SJS; 8 items; 9-point Likert; Kay & Jost, 2003)	Belief that the current social system is fair and legitimate (.75)	Williams (1994a)
	Belief in a Dangerous world (BDWS; 12 items; 7-point Likert; Altemeyer, 1988)	Perceptions of social danger and threat (.80[1]; .83[2])	Williams 1994b[1]; 1995[2]
Emotional Style			
Emotional Intelligence			
	Bar-On EQ-i:S (51 items; Bar-On, 2002)	Self-report EI estimates. Emotional quotient (EQ; .91). Intrapersonal (.82), interpersonal (.80), adaptability (.76), stress management (.80), and general mood (.89) composite scales	Austin et al. (2007 Dataset 1)
	Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT 2.0; 141 items; Mayer, 2002)	Performance EI estimates. Overall EI (.90), experiential (.90), and strategic (.72) area scores	Austin et al. (2007 Dataset 1)
	Trait Emotional Intelligence Questionnaire-Short Form (TEIQue-SF; 30 items; Petrides & Furnham, 2009)	Self-report EI estimates. Overall EI (.89)	Austin et al. (2007 Dataset 2)
Experience and Expression			
	Emotional Empathy Scale (EES; 33 items; 4-point Likert; Mehrabian & Epstein, 1972)	Assesses emotional reactivity to other's emotions (.70)	Sellbom et al. (2012)
	Global Self-Esteem Scale (GSE; 10 items; 6-point Likert; Rosenberg, 1965)	Positive and negative feelings about one's self-worth (.90[1]; .90[2]; .90[3])	Williams (1994a[1]; 1994b[2]; 1995[3])
	Extrinsic Contingency Focus Scale (ECFS; 20 items; 5-point Likert; Williams, Schimel, Hayes, & Martens, 2010)	Measures the extent to which individuals base their self-esteem on externally defined contingencies. (.82[1]; .83[2]; .83[3])	Williams (1994a[1]; 1994b[2]; 1995[3])
	Inventory of Callous-Unemotional Traits (ICU; 24 items; Kimonis et al., 2008)	ICU total score (.78)	Lau & Marsee (2013)
	Abbreviated Dysregulation Inventory (ADI; 30 items; 4-point Likert; Mezzich, Tarter, Giancola, & Kirisci, 2001)	Emotional dysregulation (.84) subscale. The behavioural dysregulation (.83) subscale was included in the behavioural domain	Lau & Marsee (2013)

Note. Hyperscript (^{X}) indicates which dataset corresponds to the internal consistency estimates.

Table 4.4

Measures used in Nomological Network: Personality and Behaviour

Domain	Scale	Sub/Scale Information (Internal Consistency, α)	Data from
Personality			
Broad			
	Big Five Inventory (BFI; 44 items; 5-point Likert; (John & Srivastava, 1999)	Extraversion (.86[1]), agreeableness (.75[1]), conscientiousness (.80[1]), neuroticism (.85[1]), openness (.78[1]). All α exceeded .71[2]	Lee and Ashton (2005[1]), Sellbom et al. (2012[2])
	International Personality Item Pool-NEO (IPIP-NEO; 50 items; 5-point Likert; Goldberg et al., 2006)	extraversion (.891; .882), agreeableness (.83[1]; .80[2]), conscientiousness (.78[1]; .81[2]), neuroticism (.86[1]; .88[2]), openness (.77[1]; .76[2])	Austin et al. (2007 Dataset 1[1]; Dataset 2[2])
	HEXACO-PI (60 items; 5-point Likert; Lee & Ashton, 2004)	extraversion (.83), agreeableness (.76), conscientiousness (.76), neuroticism (.77), openness (.72), honesty - humility (.71)	Lee and Ashton (2005)
Narcissism			
	Hypersensitive Narcissism Scale (HSNS; 10 items; 5-point Likert; Hendin & Cheek, 1997)	Narcissism (.73)	Bizumic and Fung (2016)
	Narcissistic Personality Inventory (NPI; 40 items; dichotomous (2) and 5-point (1) Likert; Raskin & Terry, 1988)	Narcissism (.89[1]; .81[2])	Lee and Ashton (2005)[1], Sellbom et al. (2012[2])
Psychopathy			
	Levensons Self-Report Psychopathy Scale (LSRP, 26 Items; 4[34], 5[1], & 7[2] - point Likert; Levenson, Kiehl, & Fitzpatrick, 1995)	Total (.81[3]; .87[4]), primary (16 items; 88[1]; .81[2]; .81[3]; .87[4]), and secondary (10 items; .64[3]; .66[4])	Lee and Ashton (2005[1]), Ashton, Lee and Son (2000[2]), Sellbom et al. (2012[3]), Bizumic and Fung (2016[4])
	Psychopathic Personality Inventory (PPI; 4-point Likert; 187 items; Lilienfeld & Andrews, 1996)	Psychopathy (.91), and the fearless-dominance (PPI-I; .87), impulsive / antisociality (PPI-II; .92) subscales. We also included the coldheartedness (PPI-III; .75) subscale	Sellbom et al. (2012)
	Antisocial Process Screen Device (APSD, 20 items; 3-Point Likert; Frick & Hare, 2001)	Narcissism subscale (7-items; .69)	Lau and Marsee (2013)
Behaviour			
Self-Report			
	Emotional Manipulation Scale (EMS; 41 items; 5-point Likert; Austin et al., 2007)	Emotional manipulation, (.88), poor emotional skills (.66), and emotional concealment (.73) subscales	Austin et al. (2007 Dataset 2)
	Sensitivity to Punishment-Sensitivity to Reward Scale (SPSRQ; yes/no scale; 48 items; Torrubia, Avila, Moltó, & Caseras, 2001)	Sensitivity to punishment (24 items; .89) and reward 24 items; .75)	Birkás et al. (2015)
	Brief Self-Report Delinquency Scale (SRD; 19 items; Elliott, Huizinga, & Ageton, 1985)	Brief version did not include items about: sexual behaviour, nonviolent delinquency, drug use, and family history (.80)	Lau and Marsee (2013)
Behavioural Task			
	Trust Game (Berg, Dickhaut, & McCabe, 1995)	Dyads interacted to win real money ($0-$40), choosing to either reciprocate trust or utilise a defecting strategy to maximise personal gain	Gunnthorsdottir, McCabe, and Smith (2002)
	Prisoners Dilemma (Tucker, 1950, as cited in Poundstone, 1993); 10-point item from cooperate (0) to defect (10)	*Classic prisoners scenario* where best mutual outcome requires trusting other player not to play dominant strategy	Bizumic and Fung (2016)
	Iowa Gambling Task (Bechara, Damasio, Damasio, & Anderson, 1994)	Four virtual card decks, two are associated with short-term reward but long-term loss, two are associated with long-term rewards. Deck preference score used (disadvantageous decks - advantageous decks) and money made overall	Birkás et al. (2015). Only a subsample completed the task ($n = 60$)

Note. Hyperscript (^{X}) indicates which dataset corresponds to the internal consistency estimates. Estimates of internal consistency for the MSCEIT are split-half with Spearman-Brown.

Table 4.5

Developmental and Emotionality Components of the Nomological Network:

Pearson Correlations and SEM Pathways

Domain	Scale	Subscale	Machiavellianism					Dataset
			TDM-IV	Views		Tactics		
			Zero-order	Zero-order	SEM Std. Coefficient	Zero-order	SEM Std. Coefficient	
Development								
Peer	PCS	Overt	.29**	.26**	.22**†	.20*	.16*†	8
		Relational	.29***	.28**	.23**†	.19*	.17*†	8
Environment	FACES		-.18***	-.15**	-.15	-.13**	-.13	5
		Flexibility	-.14**	-.13**	-.14	-.10	-.10	5
		Cohesion	-.17***	-.14**	-.15	-.13**	-.15	5
		Family comm.	-.21***	-.14**	-.08	-.21***	-.30***	5
		Family life	-.21***	-.16**	-.14	-.18***	-.22*	5
	CATS		.23***	.18**	.16	.19**	.22	6
		Neglect	.23***	.19**	.20	.19**	.20	6
		Punishment	.17**	.12*	.06	.16**	.24*	6
		Sexual Abuse	.14*	.12*	.17	.10	.06	6
	IPPA	Trust	-.23***	-.18***	-.18*	-.19***	-.19*	5
		Communication	-.20***	-.15**	-.12	-.18***	-.22**	5
		Alienation	.20***	.18***	.22*	.12*	.08	5
World-view	Belief in just world		-.18***	-.20***	-.29**	-.05	.07	10
	Belief in a dangerous world		.08*	.19***	.28***	-.09**	-.17**	11
			.13**	.28***	.48***	-.12**	-.23**	12
Emotionality								
Intelligence	Bar-On (EQ total)		-.32***	-.34***	-.50**	-.16*	.08	3
		Intrapersonal	-.07	-.10	-.18	-.02	.08	3
		Interpersonal	-.41***	-.43***	-.67***	-.21**	.10	3
		Stress manage	-.20**	-.21**	-.34*	-.10	.06	3
		Adaptability	-.16*	-.10	.07	-.17*	-.30	3
		General mood	-.28***	-.32***	-.55**	-.11	.17	3
	MSCEIT		-.26***	-.36***	-.62***	-.04	.31*	3
		Experiential	-.20**	-.30**	-.53**	.00	.30*	3
		Strategic	-.27***	-.34***	-.62**	-.08	.23	3
	TEIQue-SF		-.27***	-.27***	-.32**	-.14*	-.08	4
Experience	EES		-.29***	-.20***	-.19*	-.26***	-.30***	9
	External Contingency Focus		.27***	.27***	.36***	.13**	.12	10
			.33***	.33***	.48***	.16***	.11*	11
			.27***	.28***	.46***	.10*	.00	12
	Global self-esteem		-.28***	-.26***	-.33	-.15***	-.12	10
			-.34***	-.32***	-.42***	-.18***	-.15**	11
			-.24***	-.22***	-.29***	-.12**	-.09	12
	ICU		.52***	.51***	.47***†	.26**	.20**†	8
	ADI	Emotional	.26**	.34***	.34***†	.04	-.03†	8
	EMS	Poor emotion skills	.12*	.16**	.27*	.02	-.05	4
		Concealment	.00	.01	.06	-.02	-.10	4

Note. Correlations are Pearson (zero-order). Std.Coefficient = Standardised pathways from structural equation modelling (SEM). SEM fit indices are in Appendix C. Datasets are: 1 = Lee and Ashton (2005); 2 = Ashton, Lee, and Son (2000), 3 = Austin et al, (2007 Dataset 1); 4 = Austin et al, (2007 Dataset 2); 5 = Láng and Birkás (2014); 6 = Láng (2015a); 7 = Birkás et al. (2015), 8 = Lau and Marsee (2013); 9 = Sellbom et al. (2012); 10 = Williams (1994a); 11 = Williams (1994b); 12 = Williams (1995); 13 = Bizumic and Fung (2016); 14 = Gunnthorsdottir, McCabe, and Smith (2002). PCS = Peer conflict scale, FACES = Family adaptability and cohesion evaluation scales IV, CATS = Childhood abuse and trauma scale, IPPA = Inventory of parent and peer attachment, EQ = emotional quotient, MSCEIT = Mayer-Salovey-Caruso emotional intelligence test, EES = Emotional empathy scale, ICU = Inventory of Callous-Unemotional traits, ADI = abbreviated dysregulation inventory, EMS = emotional manipulation inventory. Comm. = Communication. Given the number of analyses inflating type I error rates, any inferences based on $p > .001$ should be made with caution. †Estimated using semipartial correlations, as opposed to SEM parameters, given the inadequate power for SEM estimates.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 4.6

Personality and Behaviour Components of the Nomological Network:

Pearson Correlations and SEM Pathways

Domain	Scale	Subscale	Machiavellianism					
			TDM-IV	Views		Tactics		
			Zero-order	Zero-order	SEM Std. Coefficient	Zero-order	SEM Std. Coefficient	Dataset
Personality								
Broad	Big Five	Conscientiousness	-.32***	-.28***	-.36*	-.27***	.02	1
			-.21**	-.10	.10	-.26***	-.41*	3
			-.25***	-.13*	-.11	-.27***	-.33***	4
			-.31***	-.16**	-.06	-.36***	-.50***	9
		Agreeableness	-.41***	-.31***	-.19	-.40***	-.47**	1
			-.47***	-.47***	-.64***	-.27***	.00	3
			-.40***	-.34***	-.35**	-.27***	-.33***	4
			-.44***	-.29***	-.30**	-.42***	-.48***	9
		Neuroticism	.08	.10	.26	.02	-.22	1
			.16*	.22**	.52**	.02	-.27	3
			.12*	.13*	.20*	.05	.00	4
			.09	.10*	.18	.03	-.01	9
		Extraversion	-.02	-.04	-.06	-.02	-.02	1
			-.05	-.15*	-.44**	.08	.36*	3
			-.12*	-.15**	-.24**	-.02	.10	4
			-.10*	-.11*	-.14	-.04	-.04	9
		Openness	-.04	-.03	.00	-.03	-.04	1
			.09	.07	.01	.08	.08	3
			-.07	-.15	-.06	-.02	-.05	4
			-.15**	-.11*	-.07	-.13**	-.21**	9
	HEXACO	Honesty	-.54***	-.47***	-.44**	-.43***	-.39**	1
		Conscientiousness	-.29***	-.25**	-.20	-.23**	-.13	1
		Agreeableness	-.15	-.14	-.21	-.11	.02	1
		Neuroticism	.24**	.17*	.13	-.27***	-.53**	1
		Openness	-.20*	-.23**	-.39*	-.08	.16	1
		Extraversion	-.02	-.04	.00	.01	-.09	1
Psychopathy	PPI (total)		.52***	.34***	.31**	.51***	.51***	9
		F-D (PPI-I)	.04	-.01	-.06	.09*	.10	9
		I-AS (PPI-II)	.53***	.37***	.39**	.47***	.44***	9
		Cold (PPI-III)	.24***	.09	-.06	.33***	.49***	9
	LSRP		.59***	.43***	.71***	.52***	.24***	9
			.64***	.64***	.47*	.39***	.50***	13
		Primary	.67***	.63***	.62***	.47***	.33**	1
			.65***	.58***	.72***	.52***	.23**	2
			.59***	.43***	.70***	.51***	.27***	9
			.65***	.64***	.49**	.39***	.55***	13
		Secondary	.37***	.26***	.54***	.32***	.12	9
			.41***	.41***	.35*	.25***	.33***	13
APSD		Narcissism Subscale	.45***	.40***	.35***†	.29*	.24**†	8
Narcissism	HSNS		.30***	.33***	.41***	.14**	-.01	13
	NPI		.17*	.20*	.25	.05	-.02	1
			.16***	.12**	.10	.14**	.13	9
Behaviour								
Self-report	EMS	EM	.35***	.26***	.28**	.27***	.26**	4
	SPSRQ		.23**	.21*	.21*†	.11	.09†	7
		Punishment	.00	.05	.06†	-.08	-.08†	7
		Reward	.34***	.24**	.22**†	.27**	.25**†	7
	SRD		.38***	.37***	.33***†	.21*	.15†	8
	ADI	Behavioural	.15	.19*	.23**†	-.02	-.03†	8
Behaviour	Prisoner's D.		.19***	.20***	.23*	.11*	.05	13
	Iowa	Deck Selection	.22	.15	.15†	.17	.16†	7
		Money Earnt	-.32*	-.14	-13†	-.33*	-.33*†	7

Note. Correlations are zero-order (Pearson). Std.Coefficient = Standardised pathways from structural equation modelling (SEM). SEM fit indices and figures are displayed in Appendix C. Datasets are: 1 = Lee and Ashton (2005); 2 = Ashton, Lee, and Son (2000), 3 = Austin et al, (2007 Dataset 1); 4 = Austin et al, (2007 Dataset 2); 5 = Láng and Birkás (2014); 6 = Láng (2015a); 7 = Birkás et al. (2015), 8 = Lau and Marsee (2013); 9 = Sellbom et al. (2012); 10 = Williams (1994a); 11 = Williams (1994b); 12 = Williams (1995); 13 = Bizumic and Fung (2016); 14 = Gunnthorsdottir, McCabe, and Smith (2002). Results from trust game are in the Results section. PPI = Psychopathic personality inventory, PPI-I = Fearless-dominance, PPI-II =Impulsive-antisociality, PPI-III = Coldheartedness, LSRP = Levensons self-report psychopathy scale, HSNS = Hypersensitive narcissism scale, NPI = Narcissistic personality inventory, APSD = Antisocial process screening device, EMS = Emotional manipulation scale. SPSRQ = Sensitivity to punishment-Sensitivity to reward scale, SRD = Self-report delinquency, ADI = Abbreviated dysregulation inventory. Given the number of analyses inflating type I error rates, any inferences based on $p > .001$ should be made with caution. †Estimated using semipartial correlations, as opposed to SEM parameters, given the inadequate power for SEM estimates.
*$p < .05$. **$p < .01$. ***$p < .001$.

and both primary and secondary psychopathy correlated strongly with overall Machiavellianism, tending to be marginally stronger for views than tactics. Narcissism related to Machiavellian views consistently, with sporadic associations between tactics and narcissism, and Antisocial Process Screen Device estimates (supporting Hypothesis 6f).

Behaviour. We investigated behaviour using self-report measures on interpersonal exploitation and reward/punishment-sensitivity, and three behavioural studies. Self-report data suggested Machiavellianism associated with emotional manipulation and sensitivity to rewards, while appearing unrelated to sensitivity to punishment (SPSRQ; Table 4.6). The views dimension associated with delinquency and behavioural dysregulation uniquely. After removing participants who did not complete, or did not understand the task ($N = 104$), both subscales correlated significantly with defecting in the classic prisoner's dilemma, whereas only the views latent variable significantly associated with defecting in support of Hypothesis 7a.

We analysed the trust game separately for player 1 ($n = 122$) and player 2 ($n = 63$), given different decisions and information. Binary logistic regression models regressed participant's move on gender and either TDM-IV, or both views and tactics. Player 1's choice [trust (1) vs distrust (0)] did not associate significantly with TDM-IV, $r_{point-biserial} = .05$, $\chi^2(8) = 5.55$, $p = .70$, Exp(B) = 1.14, $R^2 = .01$ (Cox and Snell), or with Views ($r_{point-biserial} = .00$, $\beta = $ -.15, Exp(B) = .86, $p = .54$) and Tactics ($r_{point-biserial} = .09$, $\beta = .26$, Exp(B) = 1.30, $p = .20$) subscales in the combined model, $\chi^2(8) = 4.32$, $p = .83$, $R^2 = .02$. Similarly, Player 2's choice [reciprocate (0) or exploit (1)] did not associate significantly with TDM-IV, $r_{point-biserial} = .18$, $\chi^2(8) = 9.18$, $p = .33$, Exp(B) = 1.22, $R^2 = .07$, or with Views ($r_{point-biserial} = .23$, $\beta = .35$, Exp(B) = 1.42, $p = .31$), and Tactics ($r_{point-biserial} = .08$, $\beta = $ -.11, Exp(B) = .89, $p = .68$) subscales in the combined model, $\chi^2(8) = 3.29$, $p = .92$, $R^2 = .06$. Therefore, Machiavellianism did not associate with trust or exploitation significantly, failing to support Hypothesis 7 in this sample.

4.5 Discussion

We established a deeper understanding of Machiavellianism through the development of a nomological network. There is scarce knowledge of the views and tactics dimensions, notwithstanding arguments for a two-dimensional approach (Fehr et al., 1992; Monaghan et al., 2016). Researchers contributed data from Korea, Hungary, Canada, USA, and Australia that facilitated a thorough investigation into the demographics, development, emotionality, personality, and behaviour associated with Machiavellianism. Machiavellianism comprised two cross-culturally robust dimensions, each emerging with unique theoretical characteristics and implications within the nomological network.

A conceptual understanding of two-dimensional Machiavellianism can now be postulated. Machiavellianism is the higher-order aggregate construct - the extent to which one perceives callous interpersonal exploitation as valid and morally acceptable, because humans are untrustworthy and will act similarly if given the chance. In line with previous research, Machiavellianism appears grounded in heterogeneous maladaptive developmental environments. Reward sensitivity and low levels of trait agreeableness and honesty-humility facilitate interpersonal exploitation, distrust, and goal-focused behaviour broadly. Pattern of results supported the views dimension's definition, which includes a negative view of human nature and that others are untrustworthy and selfish. Machiavellian views tended to be primarily associated with an unjust and dangerous worldview, alienated early life experiences, emotional intelligence / management difficulties, and narcissistic dispositions. Thus, as one's Machiavellian views increase, one becomes more fearful (Monaghan et al., 2016), neurotic, and distrusting of others. Similar support was found for the tactics dimension's definition, which includes the justification of interpersonal exploitation to achieve a goal. Machiavellian tactics tended to be primarily associated with coldheartedness, antisociality, and empathy deficits, and arise from a lack of parental communication and harsh discipline, along with lower trait conscientiousness and risk sensitivity.

The proposed two-dimensional structure was robust and fitted the data well based on the medians and variances of model fit indices to account for the error of estimate. Beyond replication, meta-CFA supported the factor structure across all samples when weighted by sample size, and multigroup CFA demonstrated that the structure and factor loadings were equivalent across 10 samples spanning four countries, and in a large international sample. We implemented widely utilised but potentially liberal guidelines (Chen, 2007; Cheung & Rensvold, 2002) for supporting measurement invariance, and conclusions should be interpreted with some caution given significant χ^2 tests, and equivocal simulation research findings on CFI change (Meade, Johnson, & Braddy, 2008). Overall, we provided initial evidence that the TDM-IV is relatively stable across countries, age distributions, gender ratios, sample types, Likert scale lengths, and languages. In contrast, the Mach-IV's one and three-factor structures did not fit the data well, which is unsurprising given the Mach-IV's factor structure varies between samples even when they are matched on location, occupation, age, and gender ratio (Panitz, 1989). The Mach-IV also varies cross-culturally - even when controlling for age, gender, education, and social desirability (Kuo & Marsella, 1977). TDM-IV provided a strong foundation for subsequent analyses, capturing 90.25% of the Mach-IV's variance.

It is unsurprising that men emerged, on average, as holding stronger Machiavellian views and tactics than women - supporting Hypothesis 2 and the majority of literature (Christie & Geis, 1970; Jones & Paulhus, 2009). The same effect occurs among similar personality constructs (e.g., psychopathy; Patrick, 2005) and externalising psychopathology. Although the TDM-IV was gender (construct) invariant, gender differences could indicate divergent dominant reproductive strategies, differential item functioning, or differences in the manifestation of the construct (Jones & Paulhus, 2009; Wilson et al., 1996).

Meta-analysis found no significant effect of age on any aspect of Machiavellianism, supporting Hypothesis 3. (This is not evidence for no effect/the null, as might be obtained through the Bayesian framework or Two One-Sided Tests.) Our and

previous findings (e.g., Barlett & Barlett, 2015; Rawwas & Singhapakdi, 1998; Vitell et al., 1991) might be indicative of random measurement error surrounding a true null effect. However, several datasets (Austin et al., 2007, Dataset 2; Personality Testing, 2015; Sellbom et al., 2012) did have significant negative effects of age on Machiavellian tactics (see Appendix C). Interestingly, Machiavellian tactics, but not views, decreased with age in the correctional inmate sample (Sellbom et al., 2012). Older inmates appear less likely than younger inmates to endorse interpersonal exploitation despite similar misanthropy.

In contrast, regression suggested a significant negative trend across the entire age range, in contrast to Sutton and Keogh's (2001) positive effect for lack of faith in human nature, but somewhat aligned with Mudrack's (1989) finding for a negative effect after late 30s. When evaluating results of both meta-analysis and regression, it is likely that endorsing Machiavellian tactics decreases with age, especially when considering the meta-analytic CI only just excluded zero [-.27, -.02]. Additionally, researchers should investigate additional moderators to clarify this relationship, given the substantial heterogeneity in estimates.

Strength of Machiavellianism in students differed across national cultures. The Hungarian undergraduates were the most Machiavellian overall, equating to a difference in adjusted means of .47 [.34, .61] compared to US participants. This effect was due to substantially higher Machiavellian views among Hungarians. In contrast, Australian students endorsed Machiavellian tactics the most, with US participants the least. Little work investigates national cultural differences in Machiavellianism, outside organisational culture; thus culture is neglected in major reviews (i.e., Fehr et al., 1992; Jones & Paulhus, 2009). Our analyses are clearly limited by including only a handful of nationalities and estimating several national cultures from a single sample. Further, students are not prototypical of their national culture, nor are these samples immune from substantial heterogeneity (e.g., international students). However, we established a groundwork for future cross-cultural research and, along with gender and age, the foundation of the nomological network. Although cross-

cultural research regularly conceptualises culture at the national level, future work could identify variation between more homogenous cultural groups (such as Anglo-Australians, Latino Americans, etc.).

Overall patterns of convergent and discriminant correlations across multiple estimates (where possible) and measures provided the epistemic basis for more confident conclusions to be drawn regarding Machiavellianism's nomological network. Overall, correlations and SEM parameters were relatively consistent. Machiavellian views emerged as having the strongest association with emotionality and behaviour consistent with previous research (Monaghan et al., 2016), with similar relationships in the personality and developmental domains to the tactics subscale.

Machiavellianism appears rooted in maladaptive childhood experiences, in line with Hypothesis 4. Early experiences of inadequate and chaotic family units, peer conflict, and trauma/abuse may foster schemas and maladaptive attachment styles associated with higher levels of Machiavellianism. These may underlie beliefs that others are untrustworthy and deceitful, poor emotional regulation and detachment, and empathy deficits (Láng, 2015b; Láng & Birkás, 2014, 2015; Monaghan et al., 2016; Wastell & Booth, 2003). Early experiences may instill beliefs that trusting others is naïve and interpersonal exploitation is an adaptive defense against difficult experiences (Láng & Lénárd, 2015). Substantial variance remains unexplained given that these relationships and estimates of genetic influence (Siwy-Hudowska & Pilch, 2014; Vernon et al., 2008) are only modest. Therefore, individuals may also learn that Machiavellian behaviour is successful and normative, or experience parental role-modelling of misanthropy and exploitative behaviours (Kraut & Price, 1976; Siwy-Hudowska & Pilch, 2014).

Machiavellian views related strongly to poor emotional regulation and EI, supporting Hypothesis 5 and previous associations between Machiavellianism and internalising psychopathology (Monaghan et al., 2016). Interestingly, the tactics dimension associated with callous unemotionality (yet to a lesser extent than views did) and poorer empathy, with minimal relations to emotionality. The overall pattern

of results elucidates conceptual issues with Machiavellianism and emotionality/impulsivity. Coherent with the portrayal of a Machiavellian as cool and calm (Christie & Geis, 1970), one can endorse Machiavellian tactics with minimal emotionality, psychopathology, and dysregulation. In fact, Machiavellian tactics associated with higher performance on tasks of emotional intelligence (MSCEIT), as opposed to self-report estimates.

The location of Machiavellianism within broader personality trait constellations supported Hypothesis 6 along with the respective subhypotheses. Machiavellianism associated strongly with low agreeableness and honesty-humility, and higher levels of primary and secondary psychopathy. At the latent trait level, Machiavellian views captured the neurotic and narcissistic constructs, reflecting the emotionality domain, whereas tactics reflected the coldheartedness and impulsive-antisociality psychopathy dimensions along with lower levels of conscientiousness. This differentiation, however, was not universal throughout the datasets and analyses. Machiavellian tactics appear to be in a similar position within a nomological network of psychopathy, consistent with previous nomological investigations suggesting differentiation only within the impulsivity/risk-taking domains (Vize, Lynam, Collison, & Miller, 2016). This begs the question of whether these personality traits are shared among what we consider "psychopathy" and "Machiavellianism" (Glenn & Sellbom, 2015; Miller, Hyatt, Maples-Keller, Carter, & Lynam, 2016), particularly considering associations with manipulation and exploitation, conscientiousness, and dominance. Machiavellianism diverges from psychopathy (at least conceptually) given stronger influences from the environment as opposed to genetics (Vernon et al., 2008) and motivations in cynicism, distrust, and an "ends justify the means" mentality, as opposed to impulsivity and meanness in psychopathy.

Behavioural associates of Machiavellianism largely did not support Hypothesis 7. Both dimensions associated with emotional manipulation and reward sensitivity, and not with sensitivity to punishment. The views dimension associated with behavioural dysregulation, delinquency, and defection in the prisoner's dilemma. In

contrast, tactics associated significantly with less money earnt in the Iowa gambling task, suggesting insensitivity to emotional risk cues which resulted in favoring short-term rewards. Nonetheless, neither subscale associated with trust or exploitation in the trust game, contrary to previous experimental work (Christie & Geis, 1970). This raises conceptual issues given Machiavellian tactics axiomatically align with playing the dominant strategy, and views with distrust (Sakalaki et al., 2007; Wilson et al., 1998). Absence of effect likely resulted from the small sample sizes and associated power, given that our analytical method differed from the original paper (Gunnthorsdottir et al., 2002) - which found 72.2% of participants characterised as high in Machiavellianism exploited their partner. Ongoing work is needed to clarify this relationship by replicating these findings in larger samples, which have more power to detect effects.

4.5.1   Limitations and Conclusions

We utilised multiple datasets and meta-analytic tools to investigate the views and tactics dimensions, in contrast to conducting a meta-analysis. Systematic meta-analytic protocols are hindered by dataset sharing even among open access journals with explicit data-sharing policies (Savage & Vickers, 2009; Vanpaemel, Vermorgen, Deriemaecker, & Storms, 2015; Wicherts, Borsboom, Kats, & Molenaar, 2006). Limited data access also resulted in an over-reliance on self-reports and under-powered experimental samples for our selected analyses. We also limited our analyses given a plethora of possible investigations such as mediation and moderation, differential associations between dark triad variables, and multivariate regression-based metaanalyses (including views and tactics in the same model). We were also unable to investigate idiosyncratic findings within each dataset, such as effects of gender reported by Láng and Birkás (2015) and by Lau and Marsee (2013).

Finally, our analyses of culture utilised appropriate datasets using post-hoc methodology. Therefore, we were unable to design the study to identify factors that contribute to variations in Machiavellianism across cultures, such as current political climate, environmental and familial factors, or Hofstede's dimensions of

cultural differences. Given the variation in our current analyses, these appear important avenues for future research.

The response rate from researchers to share data (30% of contacted research teams shared data) was not surprising in light of similar requests for data-sharing. For example, Vanpaemel et al. (2015) received 38% of 394 data-sharing requests from researchers publishing in top journals. Although encouraging that research teams are sharing data, we urge researchers to more readily store data in online open source databases (Centre for Open Science, 2017). This will facilitate stronger meta-analytic studies, increasing the reliability of findings amidst current replication issues.

Despite the TDM-IV's robustness, it remains based in the Mach-IV and inherits issues with wording, reliability, potential method factor bias (within the TDM-IV subscales), and conceptualisation with many researchers suggesting the time is right for a new measure. This measure should capture two dimensions, use modern scale construction techniques, and build upon the current theory and nomological network. The current nomological network can be used to derive the theoretical basis and criterion validity expectations for such as scale.

Treating Machiavellian views and tactics as independent dimensions influences theory and assessment substantially, given their different associations, causes, and consequences. We also provide an avenue for ongoing work into the conceptual issues within the dark triad, with the dimensional approach helping to clarify issues raised in recent meta-analyses (Muris, Merckelbach, Otgaar, & Meijer, 2017). Future research should identify the nature of the interplay between each dimension and their role in the higher-order Machiavellianism construct. For example, studies should investigate whether Machiavellian views develop to rationalise one's exploitative behaviour, or whether tactics develop as a by-product of a pessimistic, fearful, and distrusting view of humanity (acting selfishly is thus normative and defensive). Overall, this study facilitates a wealth of possible future theoretical and empirical insights into Machiavellianism.

Chapter 5

Conceptualisation, Theory, and Measurement of the Views and Tactics Dimensions

Chapters 3 and 4 demonstrate clearly that Machiavellianism comprises two robust dimensions: the cynical and untrusting views dimension, and the immoral interpersonal tactics dimension. In 17 samples, the TDM-IV consistently demonstrated that Machiavellianism is best conceptualised by these two dimensions, and that each dimension is related to unique nomological networks.

This chapter consolidates the previous two chapters into a cogent theory on two-dimensional Machiavellianism. Based on this theory, it then documents the construction and validation of the 12-item Two-Dimensional Machiavellianism Scale (TDMS). The TDMS overcomes many flaws with existing measures, welcoming a new age of investigation into Machiavellianism and anti-social behaviour.

5.1 Abstract

For over 45 years, research investigating Machiavellianism has largely used the same unidimensional approach, even though empirical research demonstrates that Machiavellianism comprises two robust dimensions: views and tactics. This paper elaborates on the theory and conceptualisation behind the two dimensions. It also documents the construction and validation of the 12-item Two-Dimensional Machiavellianism Scale (TDMS), which measures the cynical and untrusting views dimension, and the immoral interpersonal tactics dimension, across six samples (N = 3886, 37.70% men) using confirmatory factor analysis (CFA) and item response theory. The two-factor structure fitted the data well based on CFA, and was invariant across samples, gender, and over a three-month period (N = 338, 59.98% men). Evidence of each subscale's construct validity was established using structural equation modelling. As expected, the Views subscale was primarily associated with misanthropy, hypersensitive narcissism, lower subjective well-being, and lower emotional stability. Whereas, the Tactics subscale primarily associated with psychopathy, lower conscientiousness, lower willingness to reciprocate, and "ends justified the means" behaviour in ethical dilemmas. The TDMS enhances practical and conceptual understanding of Machiavellianism through demarcating the underlying motivations, and addresses the need for an updated and psychometrically sound measure of Machiavellianism.

5.2 Introduction

Exploitation commonly occurs within the organisational, political, and personal spheres. In recent years, there have been numerous cases of board members in major corporations exploiting the trust of their stakeholders and the public for selfish gains (e.g., Enron; Kadlec, 2002); cases in which, politicians have "allegedly" misled their constituents by withholding conflicting interests; and cases where predatory organisations have exploited individuals in vulnerable positions to increase stock value (e.g., the 2008 financial crisis; "Crash course", 2013). History is also littered with many political leaders who achieved and maintained power through a callous and duplicitous disregard for the liberty of their citizenship (Hershman & Lieb, 1994). Among myriad factors that contribute to immoral behaviour, there has been a long-running effort to understand and measure the individual differences associated with such behaviours.

The personality construct of Machiavellianism (Christie & Geis, 1970) differentiates individuals on their belief that it is justifiable to engage in typically 'immoral' behaviour to effectively achieve their goals (Machiavellian tactics dimension). These tactics are paired with a cynical belief that humanity is inherently untrustworthy, weak, and vulnerable to exploitation (Machiavellian views dimension) (Fehr, Samsom, & Paulhus, 1992; McIlwain, 2003; Monaghan, Bizumic, & Sellbom, 2018). Previous research indicates that Machiavellianism is a relatively stable individual difference which is positively associated with unethical behaviour in social exchanges and beyond (e.g., Shafer & Simmons, 2008). Like most dimensional personality constructs, Machiavellianism is normally distributed in the general population. Consequently, "Machiavellians" do not exist as a distinct category within society (nontaxonic; Beller & Bosse, 2017).

Since the construct of Machiavellianism was introduced over 45 years ago, researchers have been forced to rely on antiquated and psychometrically unsound measures which have impeded progress toward a clearer and a more sophisticated understanding of its nature. The original and most widely utilised scale, the Mach-IV

(Christie and Geis, 1970), has troublesome psychometric properties that undermine confidence in its validity. One such issue is that estimates of internal consistency for the Mach-IV are often unacceptably poor ($\alpha < .60$) and fluctuate vastly (Fehr et al., 1992; Jones & Paulhus, 2009; Vleeming, 1979). Estimates of internal consistency are even lower in subgroups such as women and children (e.g., Kraut & Price, 1976) and concerns have frequently been raised regarding item wording. For example, items on the Mach-IV have been criticised for being vague, double-barrelled, and confrontational (e.g., Dahling, Whitaker, & Levy, 2009; Rauthmann, 2013). Item response theory (IRT) analyses also suggest that three quarters of Mach-IV items are 'noise' items that provide little information about the latent trait (flat information curves; Rauthmann, 2013). These problems raise considerable doubt as to whether the Mach-IV can accurately measure Machiavellianism.

Of central importance to the current investigation is the overwhelming reliance on unidimensional interpretations of Machiavellianism, and the lack of consensus regarding its factor structure (for review of factor studies, see Fehr, Samsom, & Paulhus, 1992). These issues impede the synthesis of research findings into a singular narrative across social, personality, evolutionary, organisational, and other psychological domains of inquiry. This lack of coherence in the literature is not surprising considering that Christie and Geis (1970) focused on criterion validity when developing the Mach-IV, and that many of the modern psychometric techniques use to assess factor structures were not yet available.

Over the years, conceptual and factor-analytic evidence has amassed in support of two robust dimensions underlying Machiavellianism, differentiating views from tactics (Ahmed & Stewart, 1981; Andrew, Cooke, & Muncer, 2008; Fehr et al., 1992; Hunter, Gerbing, & Boster, 1982; Monaghan, Bizumic, & Sellbom, 2016; Monaghan et al., 2018). The present research details the Two-Dimensional Machiavellianism Scale's (TDMS) development including evidence for its psychometric strength, reliability, and validity. We utilised classical test theory and IRT to evaluate scale properties across five samples. Thus, the TDMS addresses the concerns in

the literature regarding the assessment of Machiavellianism and in doing so, allows researchers to more fruitfully investigate the practical and theoretical implications of Machiavellianism across a broad range of intra/interpersonal and organisational contexts.

5.2.1 Machiavellianism

Past research and theory on Machiavellianism has generally assumed a unidimensional model of the construct, investigating its influence in organisational behaviours such as leadership styles, task effectiveness (Bedell, Hunter, Angie, & Vert, 2006; Deluga, 2001), and citizenship behaviour (O'Boyle, Forsyth, Banks, & McDaniel, 2012; Zagenczyk, Restubog, Kiewitz, Kiazad, & Tang, 2014). Machiavellianism has been positively linked to antisocial and delinquent behaviours such as interpersonal exploitation and antagonism (Baughman, Dearing, Giammarco, & Vernon, 2012; Chabrol, Van Leeuwen, Rodgers, & Séjourné, 2009), as well as higher levels of psychopathology and decreased levels of well-being (Jones & Paulhus, 2011; Monaghan et al., 2016).

Environmental factors primarily influence Machiavellianism's development in contrast to psychopathy's strong genetic basis (Campbell et al., 2009; Vernon, Villani, Vickers, & Harris, 2008). Thus, Machiavellianism emerges as a consequence of difficult experiences during socialization (Láng, 2015; Láng & Abell, 2018; Láng & Birkás, 2014; Láng & Lénárd, 2015), rather than from hard-wired characteristics and neurological deficits that characterise psychopathy (Patrick, 2005). Neglectful, abusive, or traumatic experiences cultivate cynical and distrusting world-views and schemas that adversely affect the development of empathy, compassion, and moral reasoning. In turn, this distrusting world-view serves to justify the exploitation of others (Hunter et al., 1982; Rauthmann, 2013). Modelling of exploitative behaviour by care-givers may not only instil but also reinforce exploitive behaviours if the individual comes to believe that the exploitation and objectification of others is acceptable or even desirable (Braginsky, 1970; Kraut & Price, 1976). The developmental interplay between views and tactics is still largely theoretical, given direct

testing has not been possible with the Mach-IV.

The use of a two-dimensional approach will clarify the relationship between Machiavellianism and traits such as psychopathy, narcissism (Paulhus & Williams, 2002), and the higher order antagonism personality construct (Krueger, Derringer, Markon, Watson, & Skodol, 2012). This dimensional refinement of this construct is important to address concerns that psychopathy encompasses Machiavellianism (Glenn & Sellbom, 2015; Miller, Hyatt, Maples-Keller, Carter, & Lynam, 2016). Machiavellian tactics do closely align with a more calculated and instrumental manifestation of psychopathy (i.e., high meanness, but lower disinhibition and boldness, from the triarchic perspective; Patrick, Fowles, & Krueger, 2009). However, Machiavellian views are unique to Machiavellianism, with minimal reference to cynicism in the psychopathy literature; indeed, cynicism is not a core facet of psychopathy in prevailing models, and remains part of the residual when psychopathy is removed from the Dark Triad composite (Glenn & Sellbom, 2015). Thus, it appears as though Machiavellianism and psychopathy differ from each other in their hereditary, motivations, and world-views (Rauthmann & Will, 2011). Further, it appears that the views, but not the tactics, dimension accounts for the overlap between Machiavellianism and vulnerable narcissism (Monaghan et al., 2018).

5.2.2   The Views and Tactics Dimensions

In light of concerns with the Mach-IV, Monaghan and colleagues (2016, 2018) demonstrated that the views and tactics dimensions are robust when using only a subset of Mach-IV items (Two-Dimensional Mach-IV; 10 items). Meta confirmatory factor analysis (meta CFA) supported the two-dimensional structure across 15 samples that varied in their national culture, language, type of respondents, Likert-scale response category length, age, and gender. The structure was also invariant between men and women, across samples, and over a three-month test-retest period. Importantly, each dimension associated differently with external variables within a nomological network, supporting their concept definitions (see Monaghan et al., 2018). These results suggest the views and tactics dimensions are universal and

core components underlying Machiavellianism. Despite this, the Two-Dimensional Mach-IV scale is not the panacea for measurement problems, because it inherits item wording issues from the Mach-IV, has lower internal consistency given only four tactics items, and is asymmetric between protrait and contrait items which does not account for acquiescent responding (Furr, 2011).

Despite little work into each dimension separately, we briefly outline the nature of Machiavellian views and tactics below, which formed the basis of our conceptualisation, theory, and scale development.

Machiavellian views. Machiavellian views capture the unflattering and pessimistic view of humanity, characterising humanity as being gullible, untrustworthy, selfish, and manipulative. As Rauthmann (2013) argues, this pessimistic view of others likely serves as the impetus and justification for individuals high in Machiavellianism to deceive and exploit others when the opportunity arises (Christie and Geis, 1970). If a person holds the view that others will seek to take advantage of them, then an effective means of thwarting their efforts is by pre-emptively manipulating the situation to serve their personal interests. Further, they are less likely to experience shame or guilt as a consequence of exploiting similarly unsympathetic individuals (McIlwain, 2003; 2011).

Supporting this conceptual definition, individuals higher on uni-dimensional Machiavellianism tend to perceive confederates as less trustworthy or remorseful (Harrell & Hartnagel, 1976; Harrel, 1980), tend to be suspicious of experimental manipulations, to be less trusting of partners in zero-sum and allocation assignment game experiments (Geis, Christie, & Nelson, 1970; Sakalaki, Richardson, & Thepaut, 2007); and to be more resistant to persuasion (Exline et al., 1970). Further, Machiavellian views predicts defection and distrusting behaviour in game scenarios (Monaghan et al., 2018). Machiavellian views are also positively related to a range of psychopathology symptoms (Monaghan et al., 2016), and viewing the world as more unjust and dangerous. Additionally, Machiavellian views associates with emotional deficits, such as a lack of empathy (Aïn, Carré, Fantini-Hauwel, Baudouin,

& Besche-Richard, 2013), detachment, and lower emotional intelligence (Austin, Farrelly, Black, & Moore, 2007; Monaghan et al., 2018).

Machiavellian tactics. Machiavellian tactics reflects an individual's willingness to use any means, irrespective of morality, to achieve one's goals. Departing from similar socially aversive and antagonistic traits, Machiavelli (1532/1935) argued that immoral behaviour should only be employed when necessary to achieve goal, rather than simply for one's own pleasure. Machiavellian tactics, therefore, encompasses goal-orientated, strategic behaviour that is detached from typical emotional responses from being prosocial (happiness, empathy) or antisocial (guilt, shame).

The tactics dimension is likely the reason individuals higher on unidimensional Machiavellianism can be exploitative and callous, but also cooperative and agreeable when these behaviours are advantageous (Geis, 1970; Gunnthorsdottir, McCabe, & Smith, 2002). For example, Machiavellianism is positively associated with forming alliances to solve problems but is also tied to increased violation of social contracts and higher levels of defection when such actions may lead to personal gain (Geis, 1970; Gunnthorsdottir et al., 2002). Thus, it is not surprising that Machiavellian tactics are strongly and negatively correlated with conscientiousness, and positively associated with thematic components of psychopathy: namely cold-heartedness, antisociality, reward sensitivity, and affective empathy deficits (Aïn et al., 2013; Birkás, Csathó, Gács, & Bereczkei, 2015; Monaghan et al., 2018). Unlike psychopathy, however, Machiavellian tactics are rationalised and non-impulsive behaviours employed to achieve specific outcomes.

Summary of two-dimensional Machiavellianism theory. Machiavellianism is a relatively stable personality construct that encompasses two dimensions: a) Machiavellian views, which is an affective-cognitive views dimension capturing a cynical, distrusting, and emotionally detached view of human nature and the world; and b) Machiavellian tactics, which is a cognitive-behavioural dimension that predicts the strategic use of any tactic, irrespective of the cost to other's rights and well-being, to achieve one's goals. The views dimension is central to Machiavellian-

ism and serves to motivate and justify Machiavellian tactics by increasing fear and mistrust of others, and by reducing the shame and guilt associated with antisocial behaviour.

Machiavellianism emerges from difficult early life experiences with only a modest genetic predisposition through lower trait agreeableness and honesty-humility (Vernon et al., 2008). Machiavellian views associates with lower trait neuroticism, experiences of mistrust and abuse, and lower empathy and emotionality. Machiavellian views also associates with lower well-being and higher psychopathology, along with distrusting, fearful, and self-protective attitudes and behaviours. In contrast, Machiavellian tactics associate with low trait conscientiousness, utilitarian moral values, and modelling of harsh or exploitative behaviour from attachment figures. The tactics dimension also relates to cold and calculated goal-orientated, and not disinhibited, behaviour. Machiavellian tactics can result in cooperative behaviour, but only when cooperation serves to benefit the individual.

5.2.3 The Current Study and Hypotheses

In recent years, here have been considerable advances in the measurement and theoretical refinement of narcissism and psychopathy. Namely, researchers have placed considerable effort into capturing the dimensionality of narcissism (Dickinson & Pincus, 2003; Hendin & Cheek, 1997; Pincus et al., 2009) and psychopathy (e.g., Patrick et al., 2009). With few exceptions (see Rauthmann, 2012; Rauthmann & Will, 2011), comparatively little work has been done to develop a strong conceptual framework of Machiavellianism. Differentiating the cognitive-behavioural from affective-cognitive aspects of Machiavellianism is central to understanding antagonistic personality constructs and their effect of social behaviour.

Researchers have introduced multidimensional measures of Machiavellianism within the field of organisational behaviour (Dahling et al., 2009; Kessler et al., 2010). Consequently, these scales include dimensional structures specifically suited to the measurement of the construct within a workplace setting. Kessler et al.'s (2010) scale includes a maintaining power and management practice dimensions,

whereas Dahling, Whitaker, & Levy's (2009) instrument includes desire for status and desire for control dimensions. Although these scales provide valuable insight into Machiavellianism within an organisational structure, they are designed specifically for this context and do not account for acquiescent responding within the subscales.

Debate also surrounds the higher order structure of the Dark Triad, that is, whether each trait represents unique components within the higher order antagonism personality construct (Book, Visser, & Volk, 2015), or whether psychopathy encompasses both narcissism and Machiavellianism (Glenn & Sellbom, 2015; Lilienfeld & Andrews, 1996). Irrespective of the latent structure of these constructs, this research has raised important concerns regarding the practice of partialing out unique variance from each trait or creating a "core" index of the Dark Triad from the overlapping variance (Glenn & Sellbom, 2015; Muris, Merckelbach, Otgaar, & Meijer, 2017; Sleep, Lynam, Hyatt, & Miller, 2017). Moreover, the shortened Dark Triad composite measure ("Dirty Dozen"; Jonason & Webster, 2010) contain items to measure Machiavellian tactics and do not assess Machiavellian views.

The Short Dark Triad measure (SD3; Jones Paulhus, 2013) offers a conceptually and psychometrically stronger measurement of Machiavellianism, with items written to capture Machiavellianism's strategic nature: protection of reputation, cynicism, coalition building, and planning. The SD3 correlates relatively evenly with both the Mach-IV's Tactics ($r = .55$) and Views ($r = .52$) subscales, suggesting a good representation of both core dimensions - yet lacking multi-dimensional capability.

In addition to establishing the psychometric properties of the TDMS, the current research establishes the validity of the Views and Tactics subscales using several contemporary methods in scale development. Following from our conceptualisation of the construct and its associated dimensions, we tested several hypotheses. We also included several exploratory variables such as socially desirable responding and social dominance orientation. Hypothesis 1: We expected Machiavellianism to correlate strongly with lower levels of agreeableness and honesty-humility given its place

within these higher order traits (Book et al., 2015; Jones & Paulhus, 2009; Muris et al., 2017). Hypothesis 2: Consistent with our theorising and the preponderance of existing evidence (e.g. Fehr et al., 1992; Jones & Paulhus, 2009), we hypothesised that Machiavellianism would be higher in males than females.

To support our theory and conceptual model, Hypothesis 3A: Machiavellian views should predict emotions related to misanthropy such as feeling disenchanted, fearful, emotionally detached, and or cynical. In accordance with past findings (Monaghan et al., 2018), Hypothesis 3B: The views dimension is expected to predict higher levels of neuroticism and narcissism, but lower levels of subjective happiness, self-esteem.

We formed hypotheses regarding the tactics subscale's validity, which we anticipated would predict the propensity to endorse and engage in goal directed behaviours, including immoral ones. Hypothesis 4A: Machiavellian tactics were expected to be positively associated with psychopathy because of the substantial overlap between the constructs. Given that Machiavellianism relates to strategic manipulation, and not impulsivity, Hypothesis 4B: The Tactics subscale will be negatively correlated with conscientiousness, and Hypotheses 4C: The Tactics subscale will be uncorrelated with dysfunctional impulsivity. Hypothesis 4D: The Tactics subscale will correlate strongly with existing measures of interpersonal exploitation. Hypothesis 4E: Machiavellian tactics will be associated with behaviours aimed at maximising utility over protecting individual rights in moral dilemma tasks.

5.3 Method

5.3.1 Participants

Sample 1A. Undergraduate students from a large Midwestern university located in the US ($N = 810$). After cleaning and screening (see Results), $N = 711$, 30.52% male; mean age = 19.29 [$SD = 2.04$], 88.11% identified as Caucasian) completed the survey online. A subset of this sample ($n = 42$) repeated the survey again after a three-month interval. These respondents were 80.95% male, aged between 19 and 32 ($M = 21.39$; $SD = 2.16$).

Sample 1B. Undergraduate students from Australia ($N = 333$) completed the survey online. After cleaning and screening, $N = 264$; 33.70% male; mean age = 19.90 [$SD = 4.70$], 63.92% identified as Anglo-Australian and 18.73% Chinese).

Sample 2. Workers from CrowdFlower completed the survey online ($N = 1185$). We requested higher quality workers over faster workers. After cleaning and screening the final sample was comprised of 842 respondents, 41.09% male, aged between 18 and 81 ($M = 37.70$, $SD = 12.82$). 46.37% were from the USA, 17.46% Canada, 15.08% England, and 9.04% from Germany. 78.74% reported their ethnicity as Caucasian and 9.50% as Asian. No other nationality was represented above 3.30%. Most of the sample spoke English as their first language (81.35%), and the sample was politically moderate ($M = 4.89$, $SD = 2.07$; scale ranged from *Left-Wing / Progressive* (1) to *Right-Wing / Conservative* (9)).

Sample 3. The general-public completed the survey online via a complementary website developed for the current scale[1]. The website was advertised through social media and academic surveying websites. Data extracted at 6 February 2018 was comprised of 500 participants. After cleaning and screening, data consisted of 370 participants, aged between 18 and 81 ($M = 18.64$, $SD = 14.88$), 60.81% male. Participants primarily identified as Caucasian (62%), with the biggest population from US (41%). Overall, participants were socially liberal ($M = 25.89$, $SD = 21.68$; single item ranging from *socially liberal* (0) to *socially conservative* (100)) and economically moderate ($M = 52.32$, $SD = 22.91$; single item ranging from *economically liberal* (0) to *economically conservative* (100)).

Sample 4. Undergraduate students from a large Midwestern university located in the US ($N = 758$) completed an online survey. After cleaning and screening, the final sample was comprised of 735 respondents, 29.12% male, aged between 16 and 45 ($M = 18.91$, $SD = 2.05$), with the majority being European-American

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[1]Website is available at: https://tinyurl.com/Machiavellianismscale which is permanently hosted on an rStudio Shiny.io server. Website includes participant information, collects and stores participant data, automatically scores and provides custom feedback on participant's Machiavellianism. Skeleton code (website template) is also available for researchers to create their own websites.

(55.78%). A subset of this sample ($n = 296$) repeated the survey again after a three-month interval. After cleaning and screening, these respondents were aged between 18 and 31 with a mean age of 18.93 ($SD = 1.36$), and 39.00% were male.

Sample 5. Undergraduate students ($N = 300$) from New Zealand completed the survey online as part of their course requirements. We removed the data from 63 participants that were classified as unconscientious or as an unlikely response style based on Minnesota Multiphasic Inventory-2-Restructured Form (Ben-Porath & Tellegen, 2008) validity scales: Cannot Say > 18, VRIN-r or TRIN-r > 80 T, F-r > 120 T, Fp-r > 100 T, or L-r > 80 T (Ben-Porath & Tellegen, 2008). The final sample comprised 237 participants, 30.94% male, aged between 17 and 32 ($M = 19.93$, $SD = 2.03$).

5.3.2 Measures

Samples 1A and 1B completed the same measures. Sample 3 only comprised data from the new scale and demographics. All scales had acceptable estimates of internal consistency for the current study. For more information regarding the measures see Table 5.1.

5.3.3 Analytical Procedure

We first developed an initial item pool that captured the views and tactics dimensions. Strongest items were identified by subjecting the item pool to expert panel review, and then by iteratively removing poorer items based on item analysis, CFA, and IRT. CFA then tested the two-factor model across samples, gender, and a test-retest sample. IRT (see Embretson & Reise, 2000; Reise & Revicki, 2014) was also used to ensure that the scale provided maximum information in the middle of the latent trait to best assess normative (not clinical) populations. Finally, the overall scale and subscales' validity was assessed through structural equation modelling (SEM).

5.3.4 Item Pool Generation and Content Analysis

In developing the TDMS, the authors reviewed common conceptualisations of the construct (e.g., Rauthmann & Will, 2011) and items from existing measures of

Table 5.1

Information on Measures Used in Each Sample

Domain	Scale (Author)	Sub / Scales information and Internal Consistency (α_{Sample})
Machiavellianism	Mach-IV (Christie & Geis, 1970)	Machiavellianism (20 items; $\alpha_{1.A} = .74$; $\alpha_{1.B} = .82$)
Machiavellianism	Two-Dimensional Mach-IV (TDM-IV; Monaghan et al., 2016, 2018)	Machiavellianism (10 items; $\alpha_{1.A} = .69$; $\alpha_{1.B} = .75$). Subscales: tactics (four items; $\alpha_{1.A} = .71$; $\alpha_{1.b} = .70$) and views (six-items $\alpha_{1.A} = .69$; $\alpha_{1.B} = .70$)
Impulsivity	Dysfunctional impulsivity scale (Dickman, 1990)	Full scale (nine items: $\alpha_{1.A} = .84$; $\alpha_{1.B} = .65$)
Socio-Political Attitudes	Social dominance orientation (SDO; Sidanius & Pratto, 2001)	Full scale (six items; $\alpha_{1.A} = .76$; $\alpha_{1.B} = .82$)
Social Desirable Responding	Two-factor balanced inventory of desirable responding (BIDR; Paulhus, 1991)	Impression management subscale (10-item subset; $\alpha_{1.A} = .61$; $\alpha_{1.B} = .65$)
Response Accuracy	Conscientious responders scale (CRS; Marjanovic, Struthers, Cribbie, & Greenglass, 2014)	Five items (internal consistency not applicable).
Response Accuracy	Response accuracy scale (Bizumic, Monaghan, & Van Rooy, unpublished manuscript)	One item (internal consistency not applicable) asking participants how closely they read the items in the survey.
Broad Personality	Ten Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann Jr., 2003)	Five, two-item subscales; conscientiousness ($SB_{1.B} = .66$; $SB_2 = .69$), agreeableness ($SB_1.B = .31$; $SB_2 = .44$), emotional stability ($SB_{1.B} = .73$; $SB_2 = .79$), extraversion ($SB_{1.B} = .83$), and openness to experience ($SB_{(1.B)} = .37$).
Happiness	Subjective happiness scale (Lyubomirsky & Lepper, 1999)	Full scale (Four items; $\alpha_{1.A} = 84$; $\alpha_{1.B} = 85$; $\alpha_2 = 87$). Rated on custom seven-point scale for each item (e.g., *Less Happy* (1) to *More Happy* (7))
Misanthropy	Faith in people or misanthropy scale (Rosenberg, 1956)	Full scale (Five items; $\alpha_2 = .65$). Rated on two dichotomous forced-choice and three agree-disagree items.
Exploitativeness	Interpersonal Exploitativeness Scale (Brunell et al., 2013)	Full scale (16-items; $\alpha_2 = .84$). Rated from *Not True for me* (1) to *Very True for me* (7).
Moral behaviour	Social dilemmas (modified from Moore, Clark, & Kane, 2008)	Four social dilemmas widely used in philosophy and game theory ($\alpha_2 = .76$), with higher scores indicating categorical over consequentialist moral views (see Appendix D for items). Rated on from *Definitely* (1) to *Never / Under no Circumstances* (6)
Reciprocity	Positive and negative reciprocity (PNR) scale (Perugini et al., 2003)	Hypothetical interpersonal exchanges: based on their beliefs concerning reciprocity (reciprocity is common and beneficial; $\alpha_2 = .66$), and willingness to engage in positive reciprocity ($\alpha_2 = .82$).
Self-esteem	Global Self-Esteem Scale (GSE; Rosenberg, 1965)	Full Scale ($\alpha_4 = .91$). Six-point Likert scales.
Broad Personality	HEXACO (Lee & Ashton, 2004)	Ten item subscales: agreeableness ($\alpha_4 = .78$), openness to experience ($\alpha_4 = .79$), conscientiousness ($\alpha_4 = .78$), neuroticism ($\alpha_4 = .80$), extraversion ($\alpha_4 = .83$), and the honesty-humility ($\alpha_4 = .77$). Five-point Likert scales.
Broad Personality	IPIP-NEO (Goldberg et al., 2006)	Five 12-item scales: agreeableness ($\alpha_5 = .82$), openness to experience ($\alpha_5 = .71$), conscientiousness ($\alpha_5 = .81$), extraversion ($\alpha_5 = .85$), and neuroticism ($\alpha_5 = .85$). Five-point Likert scales.
Psychopathy	Triarchic Psychopathy Measure (Tri-PM; Patrick, 2010)	Boldness (19 items; $\alpha_5 = .81$), disinhibition (20 items; $\alpha_5 = .80$), and meanness (19 items; $\alpha_5 = .85$) subscales. Four point scales rated from *False* (1) to *True* (4)
Psychopathy	Extended Levenson Self-Report Psychopathy Scale (ELSRP; Christian & Sellbom, 2016; Levenson, Kiehl, & Fitzpatrick, 1995)	Egocentricity (11 items; $\alpha_5 = .87$), antisocial (13 items; $\alpha_5 = .82$), and callousness (12 items; $\alpha_5 = .77$) subscales. Four point Likert scales.
Narcissism	Hypersensitive Narcissism Scale (HSNS; Hendin & Cheek, 1997)	Rated from *Very uncharacteristic or untrue, strongly disagree* (1) to *Very characteristic or true, strongly agree* (5), $\alpha_5 = .77$)
Narcissism	Narcissistic Admiration and Rivalry Questionnaire (NARQ; Back et al., 2013)	Nine items for admiration ($\alpha_5 = .86$) and nine items for rivalry ($\alpha_5 = .81$) subscales, measured on six-point Likert scales

Note. Unless otherwise specified, all scales asked respondents to rate their agreement with the presented statements on Likert scales ranging from *Disagree Strongly* (1) to *Agree Strongly* (7). Internal consistencies for the TIPI were estimated using Spearman-Brown (SB) formula because of its superior accuracy over Cronbach's alpha for two-item scales (Eisinga, te Grotenhuis, & Pelzer, 2013.)

Machiavellianism (e.g., Cloetta, 1983; Dahling et al., 2009; Henning & Six, 1977; Jonason & Webster, 2010), including the original 71 items used in the development of the Mach-IV scale (Mach-II). The authors then created a large pool of scale items (N = 120) to capture the construct Machiavellianism and balance protrait (positively-worded) and contrait (negatively-worded) items. We wrote items to cover the entire Machiavellianism construct, to vary in expected IRT difficulty parameters, and to be self-referent. Items were clear and concise, absent of colloquialism, jargon, and ambiguity. Difficult words were minimised and reading level was kept in the year five to eight range (DeVellis, 2011) based on the Flesch-Kincaid method (Kincaid, Fishburne Jr, Rogers, & Chissom, 1975).

Three personality researchers reviewed the pool of items to ensure sufficient coverage of the construct. Each researcher rated the items for fidelity to the construct definitions, and the item's clarity and conciseness as: *poor/unacceptable* (D), *needs work/fair* (C), *good/acceptable* (B), and *excellent/essential* (A). Items that received only C and D ratings were removed and items that were rated as A by all reviewers were kept. We then removed remaining items that shared content strongly with better rated items. Through this process, redundancies were removed, and the best items were retained. This reviewer protocol was then repeated with three new reviewers. The final item pool consisted of 73 items and operationalised through Likert type scales, *Disagree Strongly* (1) to *Agree Strongly* (7).

5.4 Results

5.4.1 Cleaning and Screening

Samples were cleaned and screened using standard protocols (Enders, 2010; Tabachnick & Fidell, 2007). We excluded the data from participants who did not complete 80% of each scale's items given our focus on item-level analyses. Missing data did not exceed 5% on any one variable. Data were removed from participants who did not respond correctly (correct ≤ 4) on the Conscientious Responders Scale (CRS) attention check or who reported that they did not read *most parts of* or *all questions* in the survey carefully on the Response Accuracy scale (Bizumic, Mon-

aghan, & Van Rooy, 2018). Data that were considered substantial multivariate outliers were removed based on Mahalanobis distances and leverage (hat) values because they would disproportionately influence the results. Remaining missing data were imputed using maximum likelihood (ML) techniques with 50 iterations (Tabachnick & Fidell, 2007).

5.4.2   Item Reduction in Sample 1 and Proposed Scale

Item reduction consisted of four phases in the combined Sample 1. First, we fitted a two-dimensional CFA, with each item loading onto either Machiavellian views or tactics latent traits. Items that loaded less than .40 on either factor were removed. Then we calculated monofactorial CFA and IRT (2-parameter graded response [GRM]) models for the views and tactics latent dimensions separately. Items with poor CFA factor loadings ($< .40$) or flat IRT information curves (in the -3 to 3 logit range) were removed. Third, items with content that heavily overlapped with items that had stronger CFA and IRT parameters were removed. Finally, we administered the remaining 16 items in all samples, and removed four items that failed to perform consistently. Correlations between the 16- and 12-item versions exceeded .97 for the full scale and both subscales.

The final TDMS items were evenly split between Views (6 items) and Tactics (6 items) subscales, and evenly balanced between protrait and contrait items (see Table 5.2). Both subscales had acceptable estimates of internal consistency based on ω_{total} and α (Table 5.3). The distribution of the Views subscale was close to normally distributed, whereas the Tactics subscale was positively skewed indicating that individuals were less likely, on average, to endorse tactics items (Figure 5.1). (Item frequencies, means, and item-total correlations are included in Appendix D.)

5.4.3   Confirmation and Stability of Structure

We tested four CFA models in each sample. Model 1 is a unidimensional model where all items loaded onto a common Machiavellianism latent factor; and Model 2 has a hierarchical structure, with a second-order Machiavellianism latent trait comprising views and tactics lower level latent traits (constraining their loadings on the

Table 5.2

The Two-Dimensional Machiavellianism Scale

Number	Item	Coding
The Two-Dimensional Machiavellianism Scale (TDMS)		
Views Subscale		
1	In my opinion, human nature is to be dishonest	Protrait
2	I think that most people will take advantage of others in the right situation	Protrait
3	When people do something nice for me they really have another agenda	Protrait
4	I feel that deep down people trust each other	Contrait
5	I think people would rather help each other than act selfishly	Contrait
6	I believe that most people are essentially good	Contrait
Tactics Subscale		
7	I think that it is OK to be unethical for the greater good	Protrait
8	I think that it is OK to take advantage of others to achieve an important goal	Protrait
9	It is sometimes necessary for me to mislead others to get things done	Protrait
10	I value being honest over getting ahead	Contrait
11	To me, it is never justified to deceive others	Contrait
12	To me, something is not worth doing if it requires being unethical	Contrait

Note. Protrait = Items worded in the Machiavellianism direction, contrait = items worded in the non-Machiavellianism direction.

Table 5.3

Estimates of Internal Consistency and Basic Descriptive Statistics for the TDMS

	α (95% CI)			ω_{total}	M (SD)		
Sample	Scale	Views	Tactics	Scale	Scale	Views	Tactics
1a	.82 (.79, .85)	.75 (.70, .79)	.82 (.79, .85)	.85	3.55 (.87)	3.67 (.95)	3.43 (1.43)
1b	.80 (.77, .82)	.74 (.70, .76)	.81 (.78, 83)	.83	3.14 (.73)	3.39 (.86)	2.88 (.95)
2	.84 (.82, .86)	.82 (.81, .84)	.84 (.82, 86)	.88	3.21 (.90)	3.66 (1.08)	2.77 (1.14)
3	.89 (.87, .91)	.84 (.80, .87)	.88 (.86, .90)	.91	3.95 (1.19)	3.90 (1.20)	3.49 (1.39)
4	.81 (.79, .83)	.75 (.72, .78)	.85 (.83, .87)	.85	3.18 (.81)	3.54 (.97)	2.81 (1.06)
4.2	.83 (.79, .85)	.77 (.72, .81)	.86 (.83, .88)	.87	3.22 (.82)	3.56 (.95)	2.89 (1.09)
5	.83 (.79, .86)	.79 (.75, .83)	.86 (.83, .88)	.87	2.90 (.93)	3.27 (1.09)	2.50 (1.21)

Note. 95% confidence interval around α are in parentheses, ω_{total} was calculated based the specified two-dimensional model. Sample 4.2 refers to the test-retest sample. M = mean, SD = standard deviation.
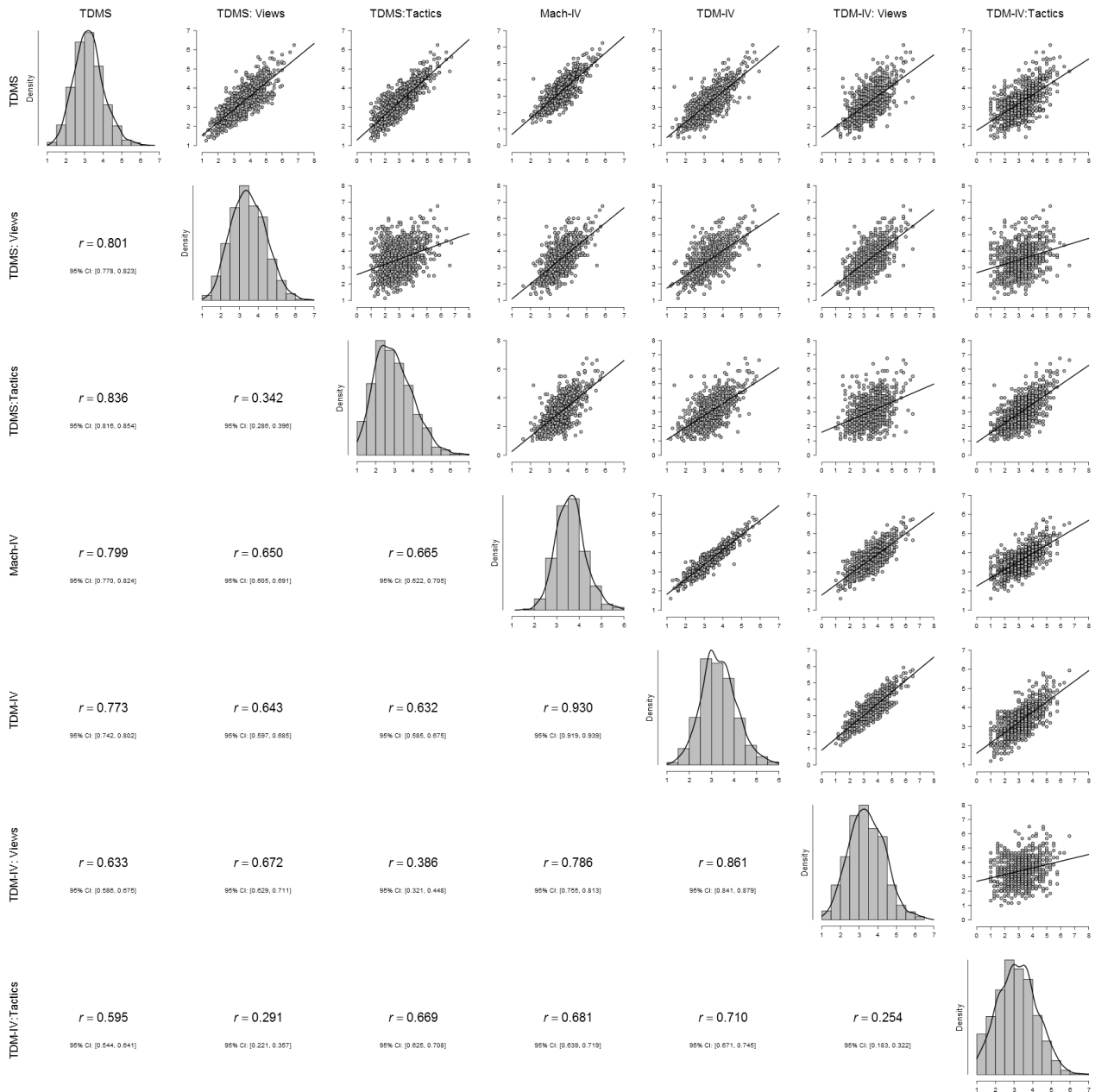
Figure 5.1. Relationship between TDMS, the Mach-IV, and TDM-IV. Distributions are on the diagonal, Pearson correlations in the lower triangle, and scatterplots in the upper triangle. Plots creating using JASP 0.8.1 (JASP Team, 2017).

second-order factor to equality). We did not include the two-factor model without the second-order Machiavellianism latent trait given that it is mathematically equivalent to Model 2. We then modelled variation in responses due to the direction of item wording (bifactor structure). Model 3 replicated Model 2, but it also included all contrait items loading onto a method factor; and Model 4 replicated Model 3, but it also included all protrait items loading onto a second method factor. Due to issues with convergence and identification, we did not estimate the weakest path between the method factors and the indicators (the path between item 3 and the protrait method factor). Power in all models was acceptable, $\beta > .80$, based on root mean square error of approximation (RMSEA; null = .05, alternative = .08) (MacCallum, Browne, & Sugawara, 1996).

Correct model specification was first evaluated through the following goodness-of-fit statistics to provide a global estimate of the reproduced observed relationships in the input matrix: Standardised root mean square residual (SRMR) values below .08 and RMSEA values close to .06 indicating an acceptable fit; comparative fit index (CFI; Bentler, 1990) below .90 indicates that the model specification could likely be improved upon. χ^2 is considered the best test of model fit (Barrett, 2007; Hayduk, 2014); however, we de-emphasised this statistic for both structural and invariance CFA given it is difficult to achieve a non-significant χ^2 in personality assessment research owing to both multiple factors causing item responses including method artefacts (Sass, Schmitt, & Marsh, 2014; Sellbom & Tellegen, 2018). Models utilised robust maximum likelihood (MLR) estimation given the tactics subscale's positive skew and Mardia's test indicated multivariate non-normality (Mardia, 1970). The one-dimensional model (Model 1) fitted the data poorly, whereas a two-dimensional model (Model 2) reproduced the data well based on incremental fit indices despite higher RMSEA estimates. Method factors (Model 3 and Model 4) significantly improved model fit based on χ^2 difference tests and RMSEA, suggesting participants responded differently to protrait and contrait items (see Table 5.4 and Figure 5.2).

Given initial evidence of model fit, we further evaluated fit and sources of strain

Table 5.4

CFA Fit Indices for Measurement Models of Machiavellianism

Sample	Model	χ^2	χ^2/df	CFI	SRMR	RMSEA	RMSEA CI
1A							
	Model 1	251.91	4.67	.743	.097	.121	.107, .137
	Model 2	102.54	1.93	.935	.058	.062	.043, .079
	Model 3	86.51	1.84	.949	.052	.058	.038, .077
	Model 4	69.71	1.70	.964	.050	.052	.030, .072
1B							
	Model 1	677.63	12.55	.667	.105	.135	.126, .144
	Model 2	227.7	4.30	.905	.046	.073	.063, .082
	Model 3	163.06	3.47	.940	.043	.061	.051, .072
	Model 4	134.29	3.28	.957	.031	.056	.045, .066
2							
	Model 1	1362.5	25.23	.601	.134	.179	.171, .187
	Model 2	365.65	6.90	.903	.055	.089	.081, .098
	Model 3	186.23	3.96	.957	.052	.063	.053, .072
	Model 4	134.76	3.29	.972	.033	.055	.045, .065
3							
	Model 1	417.71	7.74	.779	.096	.144	.131, .157
	Model 2	135.84	2.56	.950	.046	.069	.055, .084
	Model 3	115.57	2.46	.961	.039	.065	.050, .080
	Model 4	88.37	2.16	.974	.028	.056	.040, .072
4							
	Model 1	820.83	15.20	.674	.120	.149	.140, .158
	Model 2	280.88	5.30	.904	.053	.082	.072, .091
	Model 3	159.71	3.40	.953	.040	.061	.051, .071
	Model 4	137.33	3.35	.963	.036	.058	.047, .068
5							
	Model 1	384.10	7.11	.611	.149	.183	.166, .200
	Model 2	193.55	3.65	.843	.084	.117	.100, .135
	Model 3	101.58	2.16	.938	.066	.078	.057, .099
	Model 4	58.48	1.43	.981	.046	.047	.012, .072

Note. Model 1 = unidimensional model ($df = 54$). Model 2 = hierarchical structure, two first-order content factors, views and tactics, with second-order Machiavellianism factor ($df = 53$). Model 3 = Model 2, with the addition of all contrait items loading onto one method factor (bifactor structure) ($df = 47$). Model 4 = Model 3, with the addition of five protrait items loading onto a second method factor ($df = 41$). SRMR = Standardised root mean square residual, RMSEA = root mean square error of approximation, CFI = comparative fit index. Robust maximum likelihood estimation used (MLR). All χ^2 significant at $p < .01$, except for Model 4 in Sample 5. All χ^2_{diff} between models are significant at $p < .01$, with higher numbered models fitting significantly better than lower numbered models. Changing to weighted least squares with means and variance adjusted (WLSMV) estimation improved model fit in all samples and models. Factor loading ranges for Model 2 are: Sample 1 = .52 to .73, Sample 2 = .57 to .78, Sample 3 = .59 to .78, Sample 4 = .53 to .76, and Sample 5 = .57 to .77. Factor loading ranges for Model 4 are: Sample 1 = .49 to .69, Sample 2 = .57 to .75, Sample 3 = .59 to .76, Sample 4 = .43 to .79, and Sample 5 = .46 to .80.
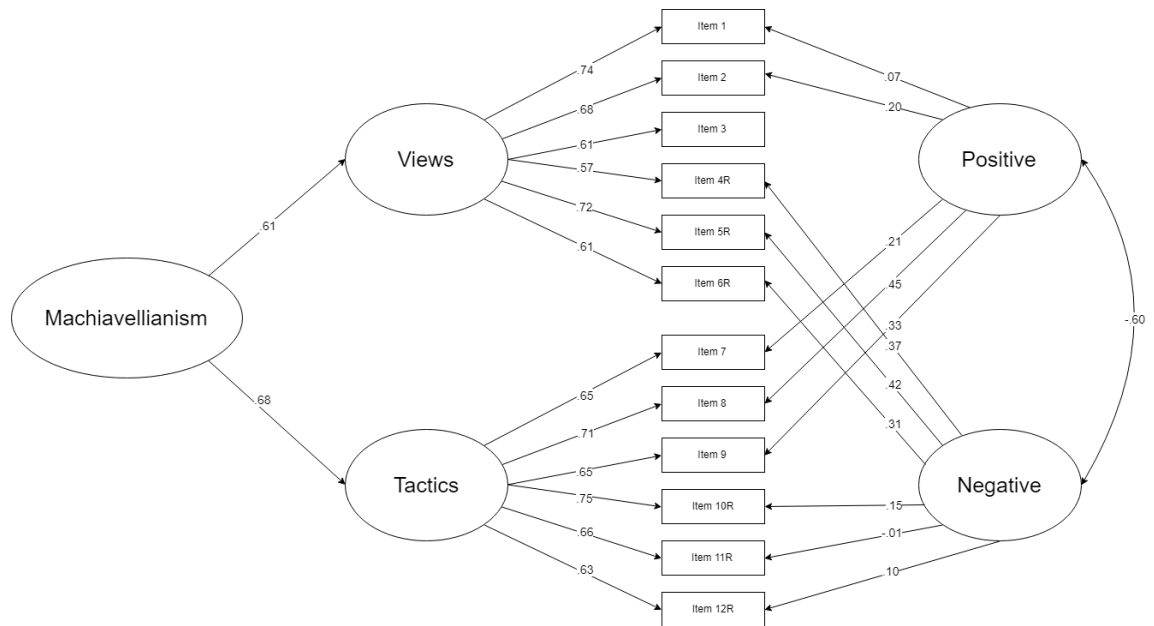
Figure 5.2. The final two-dimensional CFA model with two method factors. Displayed model is based on Sample 2 data. All paths are standardised. All paths (based on unstandardised coefficients) were significant at $p < .001$, except for the paths between the method factor and Tactics latent trait which was not significant.

through indicator loadings and standardised error (Brown, 2015). As seen in Figure 5.2, standardised loadings were acceptable, ranging between .57 and .74, which was representative of the loadings across samples. (See Table 5.4 footnote for additional loading information.) All paths between items and their respective Views and Tactics subscales were significant and standard errors were acceptable in all samples. Further, modification indices were not strong enough to warrant the addition of new paths.

We then assessed measurement invariance between samples and genders, and across time by sequentially comparing less constrained to more constrained models. We utilised Model 3 because of the identification issues with Model 4. We evaluated invariance between models in reference to liberal, ΔCFI $\leq$ .010 (Chen, 2007; Cheung & Rensvold, 2002), and more stringent, ΔCFI $\leq$ .002 (Meade, Johnson, & Braddy, 2008), criteria. First, we compared a configural invariance model (measurement model; the same factor structure) and a metric invariance model (equivalent pattern of factor loadings; the same metric). These models were considered equival-

ent between samples based on the liberal criteria, and model change estimates only just exceeded the stringent criteria between gender and test-retest. These results suggest scores on scale items can be compared because of equivalent relationships between manifest and latent variables (Table 5.5). Next, we compared an increasingly restricted scalar (constraining intercepts; the same scale) invariance model to the metric model for the analysis of gender and test-retest. Variation between these models was within our more stringent criteria, indicating that the latent means can be meaningfully compared. Finally, mean (constraining means) invariance model was substantially worse than the scalar model for gender, but invariant for test-retest (only just exceeding the stringent criteria). These findings suggest that the latent means differed between genders and were equivalent across the test-retest sample.

Table 5.5

CFA Invariance Model Summary the TDMS Across Samples and Genders

Comparison		Model Fit Indices			Change (Δ) in Model Fit		
		χ^2	df	CFI	ΔCFI	χ^2 (df)	p
Samples	Configural	910.07	277	.948	-	-	-
	Metric	1100.48	357	.939	.009	190.41 (80)	<.001
Gender	Configural	598.17	93	.958	-	-	-
	Metric	641.33	109	.955	.003	50.08 (16)	<.001
	Scalar	658.82	117	.955	.001	17.28 (8)	.025
	Means	808.97	121	.942	.012	147.10 (4)	<.001
Test-Retest	Configural	281.00	203	.974	-	-	-
	Metric	295.03	223	.976	.002	14.03 (20)	.829
	Scalar	307.15	233	.975	.001	12.12 (10)	.277
	Means	320.43	235	.972	.003	13.28 (2)	.001

Note. CFI = comparative fit index. All χ^2 model fit indices were significant at $p < .05$. Samples = comparison across samples, Gender = comparison between males and females, test-retest was over a 3-month interval. We evaluated invariance between models in reference to liberal, Δ CFI $\leq$ .010 (Chen, 2007; Cheung & Rensvold, 2002), and more stringent, Δ CFI $\leq$ .002 (Meade, Johnson, & Braddy, 2008), criteria.

A longitudinal structural model regressed views and tactics latent variables at time 2 on time 1 to demonstrate the stability of views and tactics over time and provide evidence of their nature as stable personality constructs. Power was considered acceptable, $\beta > .90$, based on RMSEA (null = .05, alternative = .08) (MacCallum et al., 1996). The model fitted the data well, χ^2 (238) = 324.044, $p < .001$, CFI = .971, SRMR = .048, RMSEA = .034 [.024, .043], and latent stability estimated at .76 for Machiavellian views and .73 for tactics. Manifest scores were also reasonably stable across time based on Pearson (r) and intraclass (ICC; 3k estimation) correlations: TDMS, ICC = .85 [CI$_{95}$ = .81, .88], $F(264, 264) = 6.66$, $p < .001$, $r = .73$, $p < .001$, for Views subscale, ICC = .82 [CI$_{95}$ = . 77, .85], $F(264, 264) = 5.49$, $p < .001$, $r = .67$, $p < .001$, and Tactics subscale, ICC = .81 [CI$_{95}$ = .76, .85], $F(264, 264) = 5.27$, p $< .001$, $r = .70$, $p < .001$.

5.4.4 Item Response Theory: Additional Psychometric Information

We ran IRT GRMs (ML estimation) for each subscale because these models are the most appropriate for Likert-style polytomous data. Models were estimated using the mirt package for R (Multidimensional Item Response Theory; Chalmers, 2012) and IRTPRO (Item Response Theory for Patient-Reported Outcomes; Cai, Du Toit, & Thissen, 2011). Thresholds (GRM equivalents of item difficulty) are parameterised by dichotomising each item response category and lower responses versus higher response categories (e.g., category 1 vs. 2, 3, 4; 1, 2 vs. 3, 4; 1, 2, 3 vs. 4), creating number of response categories minus one thresholds. We estimated the IRT models on all data collected because IRT is a large sample technique and because we established a degree of measurement invariance between the samples in the previous section.

Essential unidimensionality, the assumption that there is only one dominant factor, was satisfied based on the Scree plots and monofactorial CFAs. Local independence was acceptable for both subscales based on Yen's Q (Yen, 1984) and standardised local dependence statistics based on χ^2 (Chen & Thissen, 1997). The majority of the items in each subscale demonstrated acceptable fit between the ob-

served and modelled frequencies, based on S-χ^2, $p > .001$ (Kang & Chen, 2010). (See Appendix D for S-χ^2 estimates.) Over 99% of participants fitted the model between $-1.96 < \text{Zh} < 1.96$ (Drasgow, Levine, & Williams, 1985). RMSEA suggested the overall Views, $M2(534) = 2041.58$, $p < .001$, RMSEA $= .030$, and Tactics, $M2(534) = 2354.24$, $p = .001$, RMSEA $= .030$, IRT models fitted the data well. Although M2 was significant, it is highly sensitive to small model misfit and was de-emphasised.

Scale parameters. Overall parameter estimates were similar between Views (Figure 5.3.A) and Tactics (Figure 5.4.A) subscales, showing the subscales provided the most information centred approximately $+1$ logits in respect to θ, where standardised error is minimised. (Parameter estimates are in Appendix D.) The Tactics subscale provided more targeted information about the below average (≈ -2 logits) to above average ($\approx +3$ logits), whereas the Views subscale had flatter information curves, providing information about a wider range in respect to θ, from the well below average (≈ -3.5 logits) to well above average ($\approx +3.5$ logits) range. Items 6R ("I believe that most people are essentially good") provided the most information about the underlying views latent trait (Figure 5.3.C), whereas item 8 ("I think that it is OK to take advantage of others to achieve an important goal") provided the most information about the tactics latent trait (Figure 5.4.C). Latent trait estimates as a function of scores on the Machiavellian views (Figure 5.3.D) and Machiavellian tactics (Figure 5.4.D) are also provided. Summed scores of 8.44, 20.98, and 37.67 for Views, and 6.16, 16.44, and 37.37 for Tactics subscales represent θ estimates of -3, θ, and $+3$ logits respectively. (See Appendix D for more expected values.)

5.4.5   Estimates of Construct Validity

We investigated the external validity of the TDMS given that the robust factor structure and temporal stability indicated that views and tactics were stable and substantive factors. The Mach-IV and derivatives were the primary criterion variable, and we included a range of conceptually important measures as external indicators of validity. Pearson's correlations estimate the strength of the relationship

between two manifest variables. SEM estimated unique associations between TDMS and criterion variable's latent dimensions, thus treating each observation (item responses) as an indicator of the unobserved latent trait. Parsimony was increased though item parcelling by sequentially averaging item pairs comprising the highest and lowest factor loadings from monofactorial models (Hau & Marsh, 2004; Little, 2009; Little, Cunningham, Shahar, & Widaman, 2002). Estimates were calculated through Lavaan (Rosseel, 2012) package for R, and fit indices suggested that all models recreated the observations in the data well (see Appendix D for SEM fit indices). The results from the validity analyses are presented in Table 5.6 and Table 5.7.

TDMS validity. We investigated the ability for the TDMS to recreate Mach-IV (Christie & Geis, 1970) and TDM-IV (Monaghan et al., 2016) scores in Sample 1. The TDMS correlated strongly with both the Mach-IV ($r = .80$) and TDM-IV ($r = .77$) scales, along with respective subscales ($r = .67$ for both subscales; Figure 5.2). The TDMS captured substantial variance in agreeableness and honesty-humility personality traits, across samples and estimates (TIPI, IPIP-NEO, and HEXACO), providing support for Hypothesis 1 (see Appendix D for HEXACO facet level parameter estimates). Machiavellianism associated significantly with psychopathy and narcissism, except for NARQ admiration and TriPM boldness. Machiavellianism overall also associated with SDO and social desirable responding. Its correlations with impulsivity were generally weak, ranging from .16 to .20.

Consistent with Hypothesis 2, TDMS total and Tactics subscale estimates were higher in men, despite this effect being weak to non-significant for the Views subscale.
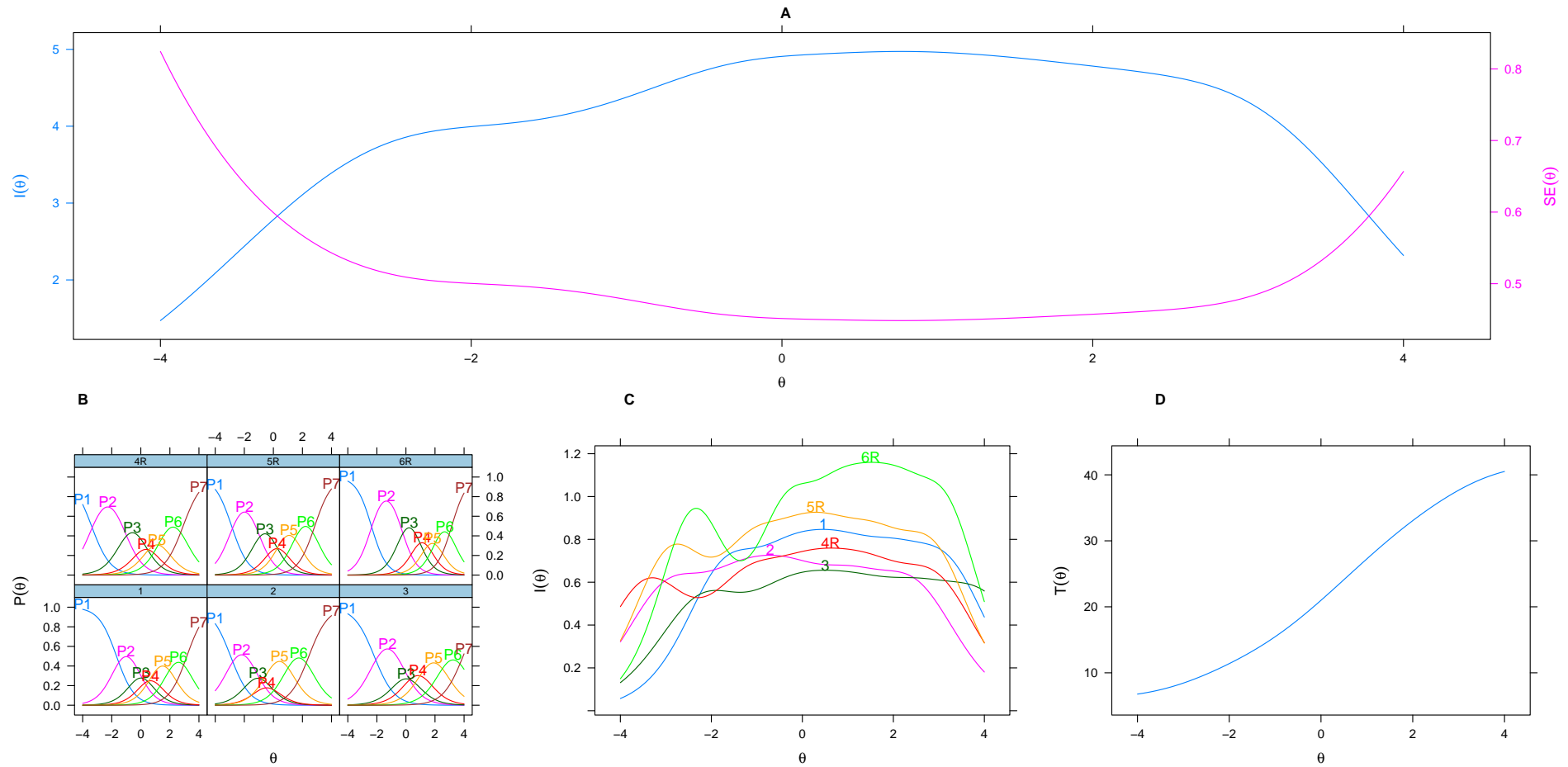
Figure 5.3. **A)**. Graded response model (GRM) scale information curve representing the information and standard error (reciprocal) for each level of the views latent trait. **B)** Category response curves modelling information and location parameters for each response category. **C)** Item information curves for each views item. **D)** Expected total scale score for each level of the views latent trait. Probability = P(response = 1 | θ). Parameter estimates are in Appendix D.
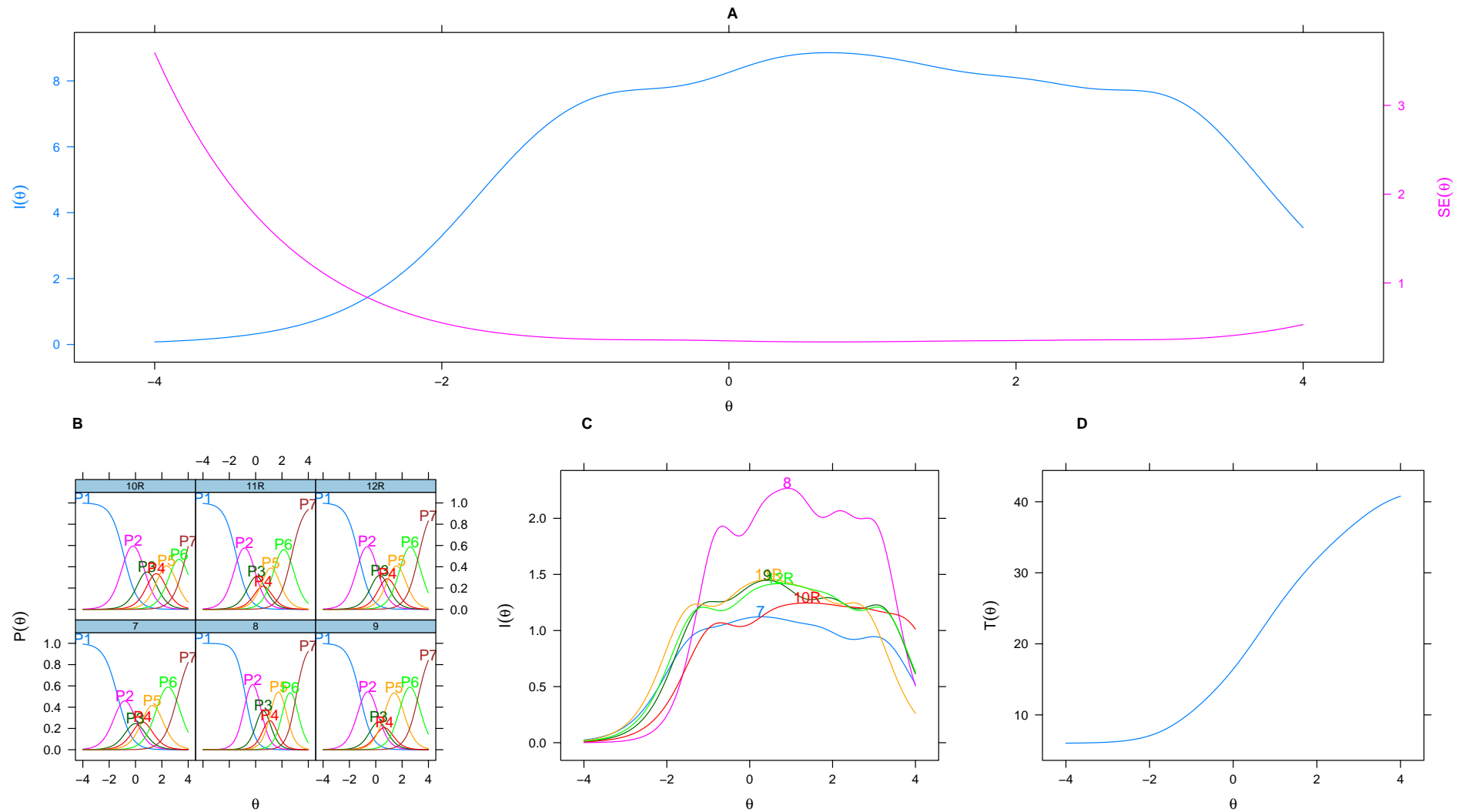
Figure 5.4. **A)** Graded response model (GRM) scale information curve representing the information and standard error (reciprocal) for each level of the tactics latent trait. **B)** Category response curves modelling information and location parameters for each response category. **C)** Item information curves for each tactics item. **D)** Expected total scale score for each level of the tactics latent trait. Probability = P(response = 1 | θ). Parameter estimates are in Appendix D.

Views Subscale validity. Consistent with our expectations, the Machiavellian Views subscale was associated with higher levels of misanthropy, negative worldviews, emotional detachment, and lower well-being. With estimates of latent associations at 1.00, the results supported Hypothesis 3A that the Views subscale would be associated strongly with misanthropy. Supporting Hypothesis 3B, Machiavellian views were positively correlated with HSNS, NARQ rivalry (but not admiration), and the Five Factor Model conceptualisation of neuroticism. Subjective happiness and global self-esteem were correlated negatively with the Views subscale. Nonetheless, the relationship with neuroticism became non-significant under HEXACO, and views were correlated with extraversion. Contrary to expectations, there was no relationship between any aspect of Machiavellianism and beliefs in reciprocity, that is, the belief that reciprocity is effective and widely utilised.

Tactics Subscale validity. Results also provided evidence of the Tactics subscale's validity though positive associations with antisocial and callous behaviour. Hypothesis 4A, which predicted medium - large correlations between Machiavellianism and psychopathy, was also supported by the data. The Tactics subscale associated with all aspects of psychopathy more strongly than the Views subscale, with stronger associations with the egocentricity / callousness and meanness psychopathy constructs, and less with disinhibition and antisociality constructs.

The results largely supported Hypothesis 4B, with the Tactics subscale relating to lower conscientiousness in all samples except for Sample 1B. In support of Hypothesis 4C, there was a non-significant relationship between tactics and dysfunctional impulsivity (standardised SEM paths from .09 to .04). In support of Hypothesis 4D, tactics was positively associated with interpersonal exploitation. Finally, in support of Hypothesis 4E, Machiavellian tactics predicted participants' intention to behave in line with goal attainment and utilitarian values over emphasising individual liberty in the moral dilemmas.

Table 5.6

The Relationships of the Views and Tactics Subscales with External Variables

Sub/Scale		TDMS	Views		Tactics	
		r	r	SEM Path	r	SEM Path
Sample 1A						
Subjective Happiness		-.30***	-.33***	-.39***	-.18***	-.05
Social Dominance Orientation		.25***	.22***	.26**	.18***	.10
Socially Desirable Responding		-.37***	-.22***	-.13	-.38***	-.47***
Dysfunctional Impulsivity		.20***	.16***	.17*	.16***	.09
Gender	Female†	-.26***	-.10**	-.01	-.30***	-.29***
Sample 1B						
Subjective Happiness		-.31***	-.41***	-.55***	-.14*	.09
Social Dominance Orientation		.29***	.20**	.10	.28***	.28**
Socially Desirable Responding		-.44***	-.34***	-.29**	-.39***	-.39**
Dysfunctional Impulsivity		.16**	.16**	.18	.11	.04
TIPI	Agree†	-.40***	-.35***	-.25***	-.32***	-.20***
	Consc†	-.10	-.07	-.04	-.09	-.07
	Emot†	-.08	-.21***	-.25***	.06	.15*
	Open†	-.06	-.06	-.05	-.04	-.02
	Extrav†	-.06	-.12	-.14*	.02	.07
Gender	Female†	-.17**	.04	.16**	-.29***	-.33***
Sample 2						
Subjective Happiness		-.37***	-.41***	-.42***	-.21***	-.06
TIPI	Agree†	-.50***	-.42***	-.31***	-.40***	-.28***
	Consc†	-.32***	-.19***	-.09*	-.33***	-.28***
	Emot†	.27***	.31***	.28***	.13***	.03
Interpersonal Exploitation		.60***	.31***	.09**	.65***	.72***
Misanthropy		.51***	.70***	1.00***	.15***	-.18***
Reciprocity	Belief	.03	.06	.09	-.01	-.04
	Positive	-.35***	-.22***	-.13**	-.35***	-.35***
Moral Dilemmas total		-.32***	-.13***	-.01	-.39***	-.47***
	FootBridge†	-.18***	-.03	.05	-.25***	-.26***
	Epidemic†	-.31***	-.16***	-.05	-.34***	-.31***
	Soldiers†	-.25***	-.13***	-.05	-.27***	-.24***
	Hospital†	-.23***	-.06	.04	-.30***	-.29***
Gender	Female†	-.20***	-.09**	-.02	-.22***	-.20***

Note. † Estimates in the SEM Path column made using semipartial correlations and not SEM Paths. Consc = Conscientiousness, Emot = Emotional Stability, Extra = Extraversion, Open = Openness to experience, Agree = Agreeableness. TIPI = Ten Item Personality Inventory. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 5.7

The Relationships of the Views and Tactics Subscales with External Variables Continued

Sub/Scale		TDMS r	Views r	Views SEM Path	Tactics r	Tactics SEM Path
Sample 3						
Gender	Female†	-.19**	.08	.05	.24***	.23**
Sample 4						
HEXACO	Honesty-Humility	-.53***	-.29***	-.17***	-.55***	-.64***
	Emotional Stability	-.22***	-.12**	-.05	-.23***	-.29***
	Extraversion	-.22***	-.24***	-.27***	-.11**	-.01
	Agreeableness	-.37***	-.33***	-.38***	-.27***	-.22***
	Conscientiousness	-.26***	-.14***	-.10	-.26***	-.29***
	Openness	-.07	-.09*	-.10*	-.02	-.01
GSE		-.34***	-.27***	-.23***	-.27***	-.21***
Gender	Female†	-.26***	-.10**	-.02	-.31***	-.29***
Sample 5						
IPIP-NEO	Neuroticism	.19**	.24***	.28**	.07	.00
	Extraversion	-.19**	-.24***	-.27**	-.07	.04
	Openness	-.06	-.07	-.04	-.01	-.03
	Agreeableness	-.70***	-.58***	-.54***	-.55***	-.43***
	Conscientiousness	-.34***	-.18**	-.11	-.34***	-.35***
ELSRP	Egocentricity	.68***	.43***	.30***	.64***	.64***
	Callousness	.53***	.33***	.22**	.51***	.53***
	Antisocial	.48***	.32***	.26**	.44***	.39***
TriPM	Boldness	.08	-.06	-.14	.17**	.26**
	Meanness	.69***	.51***	.43***	.59***	.52***
	Disinhibition	.45***	.32***	.28***	.40***	.34***
HSNS		.46***	.49***	.55***	.27***	.13
NARQ	Admiration	.13	.04	-.01	.16*	.20*
	Rivalry	.57***	.42***	.32	.49***	.40
Gender	Female†	-.24***	-.12	-.05	-.25***	-.23

Note. † Estimates in the SEM Path column made using semipartial correlations and not SEM Paths. HEXACO Facet level parameters are available in Appendix D. GSE = Global Self-Esteem Scale, IPIP = International Personality Item Pool Representation of the NEO-PI-R. ELSRP = Extended Levenson Self-Report Psychopathy Scale. TriPM = The Triarchic Psychopathy Measure. HSNS = Hypersensitive Narcissism Scale. NARQ = Narcissistic Admiration and Rivalry Questionnaire. TDMS = Two-Dimensional Machiavellianism Scale. * $p < .05$. ** $p < .01$. *** $p < .001$.

5.5 Discussion

This paper advances the two-dimensional definition of the latent Machiavellianism personality construct, by expanding upon existing nomological networks (Monaghan et al., 2018) to further explicate the core facets of Machiavellianism. The views and tactics dimensions emerge in the literature consistently, and with growing evidence of their divergent phenotypes the time is right for a new and improved measure. Therefore, we developed the Two-Dimensional Machiavellianism Scale (TDMS) to provide psychometrically robust and conceptually coherent measurement of Machiavellianism. Overall, this work advances a nuanced understanding of Machiavellianism and provides researchers with a psychometrically sound measurement tool to synthesise and extend existing research and pursue new lines of inquiry.

5.5.1 Conceptualising Two-Dimensional Machiavellianism

Measuring the two core components of Machiavellianism distinguishes between the underlying motivations and exploitative behaviour. The TDMS and its subscales reproduced variance in existing Machiavellianism measures, providing support for the measurement of equivalent underlying constructs. Importantly, this approach will reduce Type II error rates when opposing associations exist between views, tactics, and external measures. At the second-order level of analysis, Machiavellianism appears firmly grounded, axiomatically, within the low agreeableness and honesty-humility domain (Book et al., 2015; Jones & Paulhus, 2009; Muris et al., 2017; Paulhus & Williams, 2002). Neuroticism was associated with the views dimension, whereas conscientiousness was negatively associated with the tactics dimension. Supporting previous research (Monaghan et al., 2018), different Five Factor traits form the basis of each Machiavellianism dimension.

The level of temporal stability indicates that Machiavellianism is a stable personality construct, rather than a state-based attitude that is influenced by one's current social environment. Estimates of latent stability ranged from .73 (tactics dimension) to .76 (views dimension) reflecting similar constructs such as narcissism.

Temporal stability of the NARQ using Pearson's correlations range from .79 (the Admiration Subscale) to .76 (the Rivalry Subscale) over a five-week period (Back et al., 2013). These estimates suggest that the accumulation of developmental experiences conducive to Machiavellianism (e.g., Birkás et al., 2015; Láng, 2015; McIlwain, 2011; Slaughter, 2011) overwhelms fluctuations in one's present environment. This stability, in conjunction with metric invariance, indicates that each Machiavellianism dimension can be meaningful predictors of future behaviours.

Machiavellianism had small associations with estimates of dysfunctional impulsivity, and showed small to medium negative associations with conscientiousness (especially the Tactics subscale). Correlations between Machiavellianism and impulsivity have historically been mixed, with Machiavellianism conceptually aligned to strategic and not disinhibited behaviour (Christie & Geis, 1970; Jones & Paulhus, 2009). However, associations are not surprising when considering that, more broadly, antagonism and disinhibition measures are moderately correlated. When we included both disinhibition and meanness in a post-hoc multiple regression analysis, the semipartial correlation between Machiavellianism and disinhibition was only .26 (Sample 5; Views = .15, Tactics = .22). In contrast to previous measures, the TDMS appears to be appropriately indexing the strategic and calculated Machiavellianism construct.

The TDMS also provides important conceptual advancements regarding how Machiavellianism relates to broader personality traits and the Dark Triad (Paulhus & Williams, 2002). Machiavellian tactics are grounded in low to moderate levels of conscientiousness (supported in all samples besides Sample 1B) which mirrors the personality trait pattern for psychopathy (i.e., large correlations with agreeableness; moderate correlations with conscientiousness; Miller & Lynam, 2015). However, the insignificant correlation between higher order Machiavellianism and TriPM boldness suggests fearlessness, interpersonal dominance, and tolerance for novelty and risk are features unique to psychopathy. Therefore, it is likely that Machiavellianism lacks the underlying biological foundations of fearlessness and disinhibition that are

central to psychopathy (Patrick, 2010; Vernon, Villani, Vickers, & Harris, 2008).

Both TDMS dimensions had stronger associations with affective-interpersonal psychopathy traits (egocentricity/callousness) than more behavioural ones (e.g., antisocial), although this pattern was more pronounced for the Tactics subscale. Unsurprisingly, tactics had the largest associations with psychopathy traits in the SEM models, though the Views subscale had a similar pattern of associations in every instance, except for boldness. Nevertheless, the Machiavellian views dimension was situated within a constellation of meanness, hypersensitive narcissism, and NARQ rivalry but not admiration. These relationships align the views dimension with aggressive and antagonistic self-protection (self-defence, ego-threat) over assertive self-enhancement (self-promotion, ego-boost) aspects of narcissism.

Associations between the TDMS subscales and external measures aligned closely with our conceptual model and previous conceptualisations. For example, Rauthmann's (2012) hierarchical Machiavellianism structure (at Stratum II), with Machiavellian views largely capturing the affective (emotional detachedness) and cognitive (negative views) aspects, whereas tactics largely captured the behavioural (manipulation/exploitation) and agentic aspects.

The Tactics subscale was strongly associated with interpersonal exploitation, lower levels of reciprocity, and consequentialist ("the ends justify the means") morality styles. In line with our conceptual definitions, previous research has also demonstrated an inverse relationship between positive reciprocity and fair/cooperative behaviour, altruism, and positive emotional reactions to rewarding others (Perugini, Gallucci, Presaghi, & Ercolani, 2003). The pattern of associations, is consistent with previous nomological networks (Monaghan et al., 2018) and indicates that Machiavellian tactics dimension is typically characterised by a detached, antisocial, and strategic use of interpersonal manipulation as a means of achieving one's goals. A particularly interesting line future research might aim to identify key situational variables that moderate the relationship between Machiavellian tactics and antisocial behaviour (Hawley, 2003; Jones & Paulhus, 2017; Sakalaki et al., 2007; Williams,

Nathanson, & Paulhus, 2010; Wilson, Near, & Miller, 1998).

The Views subscale is also associated with lower global self-esteem, well-being, emotional stability, and estimates of misanthropy. In fact, the SEM path suggested that the misanthropy and views latent constructs were equivalent in Sample 2. This is consistent with the idea that Machiavellian views characterise human nature as weak, exploitative, and vulnerable. Past research as also found that this cynical view of the world predicts psychopathology (Monaghan et al., 2016), emotional processing deficits, lower subjective well-being, and choosing to defect (untrusting) over cooperate (trusting) in game experiments (Monaghan et al., 2018). It is likely that Machiavellian views generate and justify the callous and immoral behaviours that are measured by the tactics dimension (Rauthmann, 2013). The cynical and adversarial mindset Machiavellian views emphasise likely serves to reduce negative affect (shame, guilt; McIlwain, 2011) that would ordinarily arise from engaging interpersonal exploitation. The assumption that others are actively seeking to undermine one's well-being creates a disregard for their interests along with a fear-based urgency to pre-emptively defend oneself against exploitation by others, even if such measures violate social norms.

5.5.2   The Two-Dimensional Machiavellianism Scale

The TDMS provides robust estimates of the views and tactics dimensions, with psychometric properties specifically targeted to investigate non-clinical research populations. The TDMS is the only measure specifically designed to measure these two core components, is evenly balanced between protrait and contrait items, and represents a substantial psychometric improvement over existing measures. To that end, internal consistency was strong for the scale length ($\alpha = .74$ - $.86$), given that higher estimates likely indicate redundant information unless high levels of precision are required (e.g., clinical decisions for a specific individual; Clark & Watson, 1995; Nunnally, 1978). The TDMS provides the most information between low average to high average levels of Machiavellianism ($-2.5 < \theta > 2.5$ logits), providing accurate estimates with small standard errors. In light of this, caution should be

exercised when deriving conclusions about individuals who lie on extremes of the Machiavellianism continuum.

The robust factor structure and invariance modelling (CFA) provides the foundation for meaningful comparisons to be made in future research across samples, genders, and time. Our findings suggest the two-factor structure is stable and reproducible across contexts, augmenting existing research that demonstrated the universality of views and tactics across samples, genders, and cultures (Monaghan et al., 2018). The TDMS provided conceptually consistent associations with external validity measures and reproduced associations with the Mach-IV. Clearly, TDMS provides a valid operationalisation of two-dimensional theory and should, therefore, replace current measures and inform ongoing Dark Triad research.

5.5.3 Limitations and Conclusion

Standard limitations apply to scale constructions that primarily occur in Western undergraduate samples using self-report instruments. Given most criterion measures were self-report, we encourage further investigations into real-world behaviours. The further difficulty with measuring Machiavellianism through self-report is the tendency for socially desirable responses. Kowalski et al. (2018) reported similar negative associations between Machiavellianism (using the Mach-IV) and socially desirable responding, suggesting that one's interest in maintaining a positive social impression decreases as one becomes more Machiavellian. This relationship is consistent with the Machiavellianism construct and provides further evidence of construct validity. Given the direction of causality is unclear, this relationship can also be interpreted as lower levels of social desirability increase ones comfort in reporting Machiavellian traits. If that is the case, individuals high on Machiavellianism may still be underreporting. Additionally, we used the BIDR (Paulhus, 1984), which includes items similar to those measuring Machiavellianism items (e.g., "I sometimes tell lies if I have to"). In light of this, alternative measures of social desirability might be required to accurately estimate this relationship, given that impression management is likely a core component of those higher in Machiavellianism.

We adhered to ΔCFI guidelines that are commonly used for invariance modelling (Chen, 2007; Cheung & Rensvold, 2002). Given some recent research suggesting that this approach may be too liberal, we also interpreted results with more stringent guidelines in mind (Meade et al., 2008). Some caution should be taken when interpreting measurement invariance results pending future simulation studies to determine appropriate ΔCFI criteria.

Although two online samples comprised participants from USA, Canada, Australia, Malta, England, Cambodia, and Germany were included in the current research, we did not have the statistical power to test the factor structure within nationalities. Future work should be directed toward understanding cultural differences in the development and manifestation of Machiavellianism (Calvete & Corral, 2000; Kuo & Marsella, 1977; Monta, Rada, de Lucas Taracena, & Rodriguez, 2004; Okanes & Murray, 1982; Starr, 1975) since previous investigations have primarily focused on English speaking, Western cultures. Modified versions of the open source website developed for this study could be used as the platform to host this research.

IRT parameters (Appendix D) provide researchers with the capacity to reduce the TDMS into a shorter version. We believe 12 items are sufficiently parsimonious despite pressures for shorter measures. Researchers should be cautious when removing items not to reduce adequate content coverage of the views and tactics dimensions given the limited number of scale items. Further, the variation in responding between protrait and contrait items suggests that a balanced scale is particularly important (Furr, 2011). Any scale reduction should, therefore, aim to maintain this balance.

In sum, we are optimistic that the two-dimensional conceptualisation will catalyse a new era of research on Machiavellianism that will investigate the unique characterisics of the views and tactics dimensions. The TDMS provides an empirically robust operationalisation of this theory, which will advance our understanding of how and why people engage in the callous and immoral behaviour in organisations, politics, and societies.

Chapter 6

General Discussion

The overarching aim of this thesis has been to elucidate bidimensional Machiavellianism. Although the literature focuses on unidimensional Machiavellianism, there existed ample evidence of its multidimensionality. Research in this field was further hindered by the paucity of appropriate psychometric tools. The present research, therefore, focused on substantially improving an existing measure (named the Two-Dimensional Mach-IV (TDM-IV)) and developing a completely new instrument, the Two-Dimensional Machiavellianism Scale (TDMS). Improved psychometrics enabled robust nomological networks to be established, informing a two-dimensional theory of Machiavellianism. Within this framework, evidence emerged that overturned previous assumptions, by demonstrating that there is indeed a psychological cost to being *Machiavellian*.

Taking each step forward required substantial independent and unique research, outlined in the three empirical chapters (Chapters 3-5). Each empirical chapter is written as an independent manuscript, contributing to the field by disseminating theory and research. Chapters 3 and 4 have been published in an international journal (Personality and Individual Differences), while Chapter 5 is currently under review (Journal of Personality and Social Psychology). This Discussion will expound the key theoretical and psychometric contribution of this thesis, avenues of research currently underway, and important avenues of future research.

6.1   Theoretical Advancement in Machiavellianism

Researchers have largely focused on unidimensional interpretations of Machiavellianism from an atheoretical stance (see Wilson et al., 1996). Although researchers have previously speculated upon the existence of these two dimensions (Fehr et al., 1992; McIlwain, 2011), this thesis represents the first systematic test of this theory. Therefore, this thesis' major contribution is a strong conceptual and empirically robust two-dimensional model of Machiavellianism. This model will generate a singular narrative and lexicon across social, personality, evolutionary, and organisational domains of inquiry. At present, these fields remain largely divergent. Further, the two-dimensional theory will clarify currently inconsistent and conceptually incongruent research.

The studies presented in Chapters 3 to 5 demonstrate that each dimension has a unique nomological network and function (outlined in Figure 6.1). As a result, this information is lost when relying on a single dimension (illustrated in Figure 1.2). Encouragingly, analyses performed on each of the 23 datasets presented in this thesis provided homogeneous information about the views and tactics dimensions:

1. Views Dimension: an affective-cognitive component regarding one's philosophy regarding human nature - everyone is bad and vulnerable to impending exploitation, including oneself. This dimension facilitates fearful, defensive, and emotionally detached interpersonal affect and behaviour.

2. Tactics Dimension: a cognitive-behavioural component regarding how best to interact with people - a willingness to treat others instrumentally to achieve one's goals, even at the cost of others' rights, interests, and welfare. The behavioural consequences of this dimension involve lying, cheating, stealing, and delinquency, but also cooperation when that is the best option for achieving one's goals.

6.1.1 Machiavellian Views

Overall, the research presented in this thesis demonstrated that people who were higher in Machiavellian views were more likely to report difficult childhood experiences, such as chaotic family units, peer conflict, and trauma/abuse. These findings are congruous with numerous past investigations that have linked difficult early life experiences to a misanthropy and lower levels of well-being in adulthood (Cicchetti & Toth, 1995). In support of this research, higher levels of Machiavellian views were also associated with lower levels of emotional regulation and empathy, stronger feelings of detachment, lower levels of subjective well-being and global self-esteem, and with domains of psychopathology (such as depression, anxiety, fear, and paranoia). These findings support Machiavellian views as a distrusting and negative view of the world, originating in difficult early life experiences.

Chapter 4 demonstrated that Machiavellian views associates with defensive and distrusting behaviour. Individuals higher in Machiavellian views were more likely to defect (untrusting behaviour) over cooperate (trusting behaviour) in game experiments. Therefore, behavioural consequences of Machiavellianism are not limited to the tactics domain. These findings replicate previous work linking unidimensional Machiavellianism to being more hypervigilant to exploitation, more suspicious of experimental manipulations, and perceiving collaborators as untrustworthy (Bogart et al., 1970; Exline et al., 1970; Geis & Moon, 1981; Sakalaki et al., 2007). Overall, Machiavellian views captures both cognitive and behavioural aspects of a distrusting and cynical world-view.

6.1.2 Machiavellian Tactics

Machiavellian tactics predicted exploitative and duplicitous interpersonal exploitation. The results in Chapters 4 and 5 demonstrated that individuals higher in Machiavellian tactics were more willing to endorse interpersonal exploitation and emotional manipulation, less willing to reciprocate the favours of others, and more sensitive to reward over punishment. These finding are consistent with unidimensional research linking Machiavellian tactics, axiomatically, to interpersonal exploit-

ation (Austin et al., 2007; Fehr et al., 1992; Jones & Paulhus, 2009), when more bene-
ficial than cooperation (Geis, 1970; Gunnthorsdottir et al., 2002). As demonstrated
in Chapter 5, Machiavellian tactics predicted utilitarian / outcome-focused beha-
viours over valuing individual liberty in a range of moral dilemmas. The strength of
this relationship was relatively strong (structural equation modelling (SEM) path =
.47), providing support for Machiavellian tactics resulting in real-world exploitative
behaviours.

Interestingly, the Tactics subscale only associated with externalising / impuls-
ivity psychopathological domains substantially (although the Tactics subscale did
associate weakly with depression), detailed in Chapter 3. This suggests that one
can engage in Machiavellian tactics with minimal implication for one's well-being
(psychopathology further discussed below). The dearth of emotional consequence
could be due to justifying these behaviours within Machiavellian views to bypass
associated shame and guilt (McIlwain, 2011), or due to emotional deficits nested
within lower emotional intelligence, empathy, and higher psychopathic traits (Ali
et al., 2009; Andrew et al., 2008; Muris et al., 2017). Additionally, Machiavellian
tactics associated with measures of socially desirable responding, consistent with
previous work, suggest higher levels of self-monitoring and impression management
as a core component of Machiavellian duplicity (Bolino & Turnley, 2003; Fehr et al.,
1992; Jones & Paulhus, 2009; Leone & Corte, 1994). Overall, the results in Chapters
3 to 5 provide a strong explication of the nature of the tactics dimension.

6.1.3   Machiavellianism as a Higher-Order Construct

Machiavellianism is the manifestation of both dimensions, meaning that it is an
"emergent" and not an "aggregate" construct (Edwards, 2001; Fehr et al., 1992).
One cannot be considered highly Machiavellian on the strength of only one dimen-
sion. For that, one must hold a cynical and emotionally detached view of others
and be willing to use others pragmatically as objects. To illustrate this point, Ma-
chiavellian views predicted hypervigilance to threat and distrusting behaviour in
game scenarios (Chapter 4), whereas the Tactics subscale predicted goal-orientated

1) **Strength of Machiavellian Views**

Low **High**

- Trusting and positive view of humanity
- Believes interpersonal exploitation is rare and people are generally virtuous
- Higher emotional intelligence and empathy
- Lower on vulnerable narcissistic traits
- More trusting of others in social situations
- Higher subjective well-being and less vulnerable to psychopathology
- Higher on agreeableness and emotional stability

- Cynical and distrusting view of humanity
- Believes everyone, including oneself, is vulnerable to impending exploitation
- More emotionally disconnected and alexithymic.
- Lower empathy and theory of mind
- More vulnerable to psychopathology and lower subjective well-being
- Higher on vulnerable narcissistic traits
- Less likely to trust others when collaborating
- Lower in agreeableness and emotional stability
- More likely to restrict self-disclosure

2) **Strength of Machiavellian Tactics**

Low **High**

- Will protect the rights, welfare, and property of others over achieving individual goals
- More likely to follow rules and adhere to promises, even to personal detriment
- More likely to be older
- More likely to be a woman
- Lower egocentricity/antagonism psychopathic traits
- Higher in conscientiousness, agreeableness, and honesty-humility traits

- Selfish pursuit of one's goals, even at the cost of other's rights, interests, and welfare
- More likely to lie, cheat, exploit
- Treats others instrumentally
- More likely to be younger
- More likely to be a man
- More likely to defect from alliances or break promises
- Higher egocentricity/antagonism psychopathic traits
- Lower in conscientiousness, agreeableness, and honesty-humility traits

Figure 6.1. The two-dimensional Machiavellianism personality construct with descriptors for higher levels of each trait. This figure expands upon Figure 1.2 in Chapter 1, which conceptualised Machiavellianism as only a single continuum of normal personality functioning.

behaviour over respect for the rights of others in moral dilemmas (Chapter 5). Each dimension adds unique, not equivalent, information about the underlying Machiavellianism latent trait.

Fehr and colleagues (1992) noted that "the total score may be more useful in predicting certain behaviors" (p. 109). The combination of being wary of others' motives protects against the exploitation of others, while being able to exploit others for your own goals facilitates positive outcomes (Christie & Geis, 1970; DePaulo & Rosenthal, 1979; Geis & Moon, 1981; Gunnthorsdottir et al., 2002; Jones & Paulhus, 2009; Shultz, 1993). Under this conceptual framework, future research should consider utilising alternative methods of calculating one's Machiavellianism, such as summing an individual's responses on each scale item, then calculating the averages of an individual's Views and Tactics subscale scores, or extracting latent

scores based on item response theory (IRT), as demonstrated in Chapter 5.

A central tenant of two-dimensional Machiavellianism theory is that Machiavellian views generate and justify Machiavellian tactics, to bypass shame and guilt normally associated with exploiting others (McIlwain, 2003; 2011; 2012). If one believes others are exploitative and "bad", it is easier to rationalise disregarding their rights, values, and concerns (Rauthmann, 2013). Further, this thesis demonstrated that the views dimension is associated with lower emotional intelligence (intra- and inter-individual), which may also reduce awareness of emotional response to exploiting others and the emotional response of victims (McHoskey et al., 1998; McIlwain, 2011; Mudrack, 1990). Although postulated here, this causal direction was not directly tested in this research and is an essential component for ongoing validation of the two-dimensional theory. Specifically, future analyses should determine mediation or moderation effects between the two subscales, with key behavioural outcomes such as exploitative behaviour or breaking promises in collaborative environments.

6.2   Demographics

Chapter 4 investigated the association between Machiavellianism and gender using standard and meta-analytical approaches. Congruent with previous research, males reported higher levels of Machiavellianism consistently, with effect sizes of .21 (tactics dimension) to .24 (views dimension). These findings are not surprising given research consistently demonstrates higher levels of Machiavellianism in men than women (Christie & Geis, 1970; Jones & Paulhus, 2009), higher levels of externalising psychopathology and psychopathy (Patrick, 2005), and higher levels of misanthropy, suspicion, and competitive world-views (Smith, 1997). Nevertheless, SEM in Chapter 5 suggested that, in fact, the relationship between views and gender became non-significant (in five out of six datasets) when accounting for the tactics latent trait. Therefore, the higher level of Machiavellian views among males is due to the shared variance with Machiavellian tactics.

From early adulthood, Machiavellianism is a relatively stable personality con-

struct. Chapter 5 demonstrated the latent stability estimates at .73 (tactics dimension) to .76 (views dimension) reflecting the latent stability of similar constructs such as narcissism (Back et al., 2013). Although the meta-analysis in Chapter 4 supported previous research suggesting no effect of age on Machiavellianism (e.g., Barlett & Barlett, 2015; Rawwas & Singhapakdi, 1998; Vitell et al., 1991), regression suggested a weak overall decrease with age. Although small (β = -.05 to -.12), this trend accumulates, resulting in a substantial reduction in average Machiavellianism across the entire lifespan. The gradual decrease in Machiavellianism is congruent with general trends in the maturation of antagonistic personality traits and externalising psychopathology (Bongers, Koot, van der Ende, & Verhulst, 2004; Caspi, Roberts, & Shiner, 2005). It is important to note, however, that these models suggest an average negative trend over age, and not change within one individual. Therefore, future longitudinal analyses are required to determine how Machiavellianism changes with age.

6.3   Aetiology

As iterated throughout this thesis, there is no evidence of genetic involvement in Machiavellianism (Campbell et al., 2009; Vernon et al., 2008), outside its basis in broader (genetically grounded; DeYoung et al., 2010) personality traits (Campbell et al., 2009). Based on two-dimensional theory and the nomological networks presented in Chapters 4 and 5, developmental hypotheses can be proposed.

In line with earlier theory (Fehr et al., 1992; Hunter et al., 1982; McIlwain, 2003; Rauthmann, 2013), it is likely that Machiavellian views develop through poor environmental influences during childhood and adolescence that shape fear, distrust, and social disconnection, such as dysfunctional/aggressive parenting, exposure to any form of abuse, or other forms of trauma (Abell et al., 2014; Láng & Birkás, 2014, 2015). These experiences act upon a foundation of lower inherited or acquired affective sensitivity (McIlwain, 2003), agreeableness, and neuroticism (Muris et al., 2017). The developing world-view facilitates the need to defend oneself, and to pre-emptively manipulate the situation to serve one's personal interests. This results in

poorer well-being and higher levels of psychopathology. Importantly, Machiavellian views minimise the guilt and shame typically associated with disregarding other people's liberty, allowing for the development of Machiavellian tactics to both survive and benefit. For example, if one holds the view that others will seek to take advantage of them, then pre-emptively manipulating the situation to serve one's interests is a logical strategy for self-preservation.

Machiavellian tactics are further grounded in lower levels of conscientiousness, utilitarian over universal moral development, lower empathy and emotionality, higher levels of psychopathy (particularly meanness / boldness domains), and developmental influences that suggest that exploitative strategies are efficacious. However, this aetiological model is largely based on retrospective reports (e.g., Abell et al., 2014; Láng, 2015; Láng & Birkás, 2015; Siwy-Hudowska & Pilch, 2014) and cross-sectional surveys or behavioural observations of children and adolescents (e.g., Lau & Marsee, 2013; McIlwain, 2012; Nachamie, 1970; Repacholi et al., 2003; Slaughter, 2011). As yet there is no definitive data on the developmental course of the views and tactics dimensions (Fehr et al., 1992; McIlwain, 2003).

Several researchers have conducted impressive studies into longitudinal development of Machiavellianism (De Clercq, Hofmans, Vergauwe, De Fruyt, & Sharp, 2017; Klimstra, Sijtsema, Henrichs, & Cima, 2014). For example, De Clercq and colleagues (2017) analysed Dark Triad traits in a five-wave multi-informant design across 10 years, spanning childhood, adolescence, and early adulthood. The results suggested a weak negative trend of aggressiveness, dominance, and impulsivity over age (latent growth slope parameters from -.06 to -.03), with a shared growth pattern (conceptualised as antagonism / externalising) between their conceptualisations of each Dark Triad trait. However, these studies were grounded in Dark Triad conceptualisations that focus only on Machiavellian tactics at the exclusion of the views dimension. No study, to date, has investigated the longitudinal development of Machiavellianism specifically.

It is also likely that there are multiple avenues to Machiavellianism. For example,

individuals from excessively privileged backgrounds may also develop Machiavellian views through feeling superior to the masses and that they are above normative social rules and laws. High socio-economic status (being upper class) is strongly implicated in entitlement and narcissistic views and behaviour (Piff, 2014). As a result, more entitled and Narcissistic Machiavellians might justify their views and tactics as important decisions for the good of the people - that is, for people who are incapable of making their own decisions. This perspective that has not yet been investigated in the literature.

Given the TDMS' capacity to calculate stable parameter estimates for views and tactics, a range of aetiological hypotheses can be investigated and tested. Thanks to recent advances in statistical methods, researchers can now estimate latent over observed changes. Latent Curve (LCM; McArdle & Epstein, 1987) and Latent Change Curve models (LCSM; McArdle & Nesselroade, 2003) are ideal for identifying the developmental course of two-dimensional Machiavellianism; they provide stronger indications of causality and estimate the influence of covariates. Researchers should utilise LCSM to advance the following theoretical questions:

1. Point of differentiation. Are views and tactics indeed separate in children, or do they exist as a general disposition towards instrumentality that later develops into the views and tactics dimensions (Nachamie, 1970; Sutton & Keogh, 2001)?

2. Causal direction. Does the development of Machiavellian views facilitate the development of Machiavellian tactics (McIlwain, 2003)?

3. Developmental influences. How do key developmental factors influence each dimension's development and stability (Abell et al., 2014; Láng & Birkás, 2014, 2015)?

4. Dark Triad differentiation. How do developmental pathways differ in Machiavellianism, narcissism, and psychopathy (De Clercq et al., 2017)?

6.4   Advances in Measurement

Two psychometrically robust measures are now available for ongoing research into Machiavellianism. First, the two-dimensional Mach-IV (TDM-IV) provides an avenue for researchers to re-analyse existing datasets from a bidimensional perspective. There are many interesting findings in the literature that would benefit from this approach, including hard-to-acquire datasets, such as studies into behavioural genetics (Campbell et al., 2009; Vernon et al., 2008), organisational behaviour (Gunnthorsdottir et al., 2002; Sakalaki et al., 2007), or past studies into childhood Machiavellianism (McIlwain, 2003; Repacholi et al., 2003; Slaughter, 2011). Results from these studies, in combination with the nomological network presented in Chapter 4, could direct ongoing research projects with minimal investment.

Second, the TDMS provides more robust estimates of the views and tactics dimensions and should replace the Mach-IV. The two-factor structure fitted the data well based on confirmatory factor analysis, and was invariant across samples, genders, and over a three-month period (based on SEM. IRT suggested items that provided the most accurate estimates in the normal range, which is appropriate for studies of a normal population. Both subscales associated with external variables in line with their conceptual definitions, providing evidence of their validity in six independent samples.

Of benefit to the personality research literature would be an analysis of differential item functioning (DIF), under the IRT framework, among subgroups such as gender, socio-political ideologies, and cultures. DIF identifies whether subpopulations respond to items differently, despite equivalent levels of the latent trait. Substantial DIF suggests that an item measures Machiavellianism differently from one population to another and is biasing comparisons among these groups (see Morizot, Ainsworth, & Reise, 2009). Additional information would also be gleaned about the nature of these populations based upon these results.

To restate the warnings presented in Chapter 5, caution should be exercised when shortening the TDMS, even though IRT parameters (Appendix D) may provide

the capacity to do this meaningfully. Twelve items appear sufficiently parsimonious, with shorter measures likely to create issues with content coverage and method factor modelling. Instead, researchers should build upon open-source websites, such as those outlined in Appendix A, which allow free distribution of surveys and individualised participate feedback, to encourage survey participation and conscientious responding[1].

6.5 Dark Triad

Returning to the Dark Triad constellation of antagonistic personality traits, and the debate surrounding Machiavellianism's place within it (Book et al., 2015; Glenn & Sellbom, 2015; Miller et al., 2016). Differentiating Machiavellianism from psychopathy is particularly important, given strong arguments that psychopathy encompasses Machiavellianism. For example, core components of Machiavellianism are directly captured by the Psychopathy Checklist - Revised (PCL-R; Hare et al., 1990), in the Conning/Manipulative, Callousness, and Pathological Lying subscales. The Psychopathic Personality Inventory (Lilienfeld & Andrews, 1996) even contains the "Machiavellian Egocentricity" subscale. Glenn and Sellbom (2015) reported that "it is unclear how adding measures of narcissism and Machiavellianism to a psychopathy measure will create something that is incrementally more informative" (p. 364).

Machiavellian tactics are based in low-moderate levels of conscientiousness and moderate levels of agreeableness, the same pattern as for psychopathy (Miller & Lynam, 2015). However, psychopathy has a much stronger genetic basis (Campbell et al., 2009; Vernon et al., 2008), due to implicated higher-order brain regions that influence planfulness, affect regulation, and behavioural inhibition, and lower brain structures (such as the amygdala) that influence fearlessness and aggression (Patrick, 2010; Patrick & Bernat, 2009). Without these neurological deficits, Machiavellianism only has weak associations with these cognitive deficits, allowing for

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[1]A psychometrical aside: there appears little research into the relationship between customised feedback, conscientious responding, and the quality of data. This project would have important benefits for survey measurement broadly.

more controlled and strategic manipulation and alliances, unless under high cognitive load (Hawley, 2003; Jones & Paulhus, 2017). Further, the deficits in affective empathy (based on self-report and behavioural tasks) typically associated with Machiavellianism appear to be solely due to the construct overlap with psychopathy, becoming insignificant in multivariate analyses of the Dark Triad (Wai Tiliopoulos, 2012).

Machiavellianism and psychopathy clearly differ in their motivations, despite phenotypically similar behaviours (agentic striving for self-beneficial goals at the expense of others). The research presented in this thesis suggests that Machiavellianism represents a fearfulness and cynicism that rationalises the exploitation of others by reducing associated guilt and shame. These views are unique to Machiavellianism, with minimal reference to cynicism in the psychopathy literature, and cynicism is part of the residual when removing psychopathy variance from the Dark Triad composite (Glenn & Sellbom, 2015). In contrast, psychopathy captures disinhibited, fearless, dominant, and predatory aggression (Patrick, 2010). From the triarchic perspective, Machiavellianism aligns with affective-interpersonal psychopathy traits (egocentricity/callousness) rather than more behavioural ones (e.g., antisocial/disinhibition). The theory presented in this thesis allows for psychopathy and Machiavellianism to be clearly differentiated, clarifying the ongoing debate in the literature.

Although distinct from psychopathy, Machiavellian views overlap with vulnerable aspects of narcissism, that is, aggressive and antagonistic self-protection (self-defence, ego-threat) over assertive self-enhancement (self-promotion, ego-boost). The two-dimensional approach paves the way for researchers to investigate more nuanced Dark Triad models and resolve the conceptual debates. For example, an antagonistic core trait with diverging motivations or through developing multi-dimensional Dark Triad models.

Much Dark Triad research, therefore, loses core features of all three traits (see Glenn & Sellbom, 2015; Sleep et al., 2017) by only estimating unique contributions

to the outcome of interest or reducing all three traits to singular value. There are serious concerns about this line of inquiry, especially given ongoing research into Machiavellianism within the Dark Triad literature treating Machiavellianism as only aggressive/manipulative behaviour (De Clercq et al., 2017; Klimstra et al., 2014; Muris et al., 2017). This is especially troublesome given prevailing Dark Triad measures do not include Machiavellian views items, such as the Dirty Dozen measure which is rapidly gaining prominence (Jonason & Webster, 2010; Muris et al., 2017)[2]. This thesis stresses the need to include the views dimension in Dark Triad research, given its essential place as the motivation behind Machiavellianism.

Additionally, several researchers have expanded the Dark Triad to encompass "everyday sadism" - the enjoyment of other's suffering (Buckels, Jones, & Paulhus, 2013; Chabrol et al., 2009; Međedović & Petrović; Paulhus, 2014). Correlations among "Dark Tetrad" traits range from .20 to .60, sharing core features of anti-sociality and low empathy (Paulhus, 2014). Several studies argue that sadism is an important and unique addition to understanding malevolent behaviour. For example, Chabrol et al (2009) demonstrated that sadism predicted delinquent behaviour, above and beyond, the other Dark Triad traits in male juveniles.

When considering two-dimensional Machiavellianism, Međedović and Petrović (2015) demonstrated that the Mach-IV's Tactics subscale was a stronger predictor of core sadism ("I enjoy hurting people") than the Views subscale, whereas both Mach-IV subscales predicted political sadism equally ($r = .37$). These findings are not surprising given items in political sadism appear to largely measure key utilitarian concepts (e.g., "If lives were threatened, I would be in favour of torturing a terrorist"). There is also a clear differentiation between Machiavellian Tactics and sadistic behaviour, with the later concerned with the active seeking of others' suffering which the former would conceive as unproductive. Interest in the Dark Tetrad is growing quickly, and the conceptual concerns with the Dark Triad raised throughout this thesis need to be expanded to encompass sadism.

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[2]Interestingly, Jonason and Webster's (2010) factor analysis of the Dirty Dozen measure placed the item "I tend to be cynical" into psychopathy based on EFA.

6.6 Well-being and Psychopathology

The secondary aim of this thesis was to identify whether higher levels of Machiavellianism associates with lower well-being. Made possible through the two-dimensional perspective, this thesis clearly demonstrates throughout all empirical chapters that Machiavellianism is consistently associated with all domains of psychopathology and with lower subjective well-being. Machiavellian views are largely implicated in lower well-being and all major domains of psychopathology: depression, fear, anxiety, impulsivity, and externalising psychopathology (Kotov et al., 2011; Krueger & Markon, 2006). In contrast, Machiavellian tactics appear to only relate, somewhat axiomatically, to externalising psychopathology with little unique influence on well-being and subjective happiness.

These findings clarify inconsistent findings between Machiavellianism and mental health (Christie & Geis, 1970; Skinner, 1982). For example, researchers have demonstrated weak (Jakobowitz & Egan, 2006; Ramanaiah et al., 1994) to no relationship (Allsopp et al., 1991; McNamara, Durso, & Harris, 2007; Paulhus & Williams, 2002) between Machiavellianism and anxiety. Approaches that do not distinguish between the dimensions or only measure Machiavellian tactics would be unable to identify the strong relationship between Machiavellian views and well-being. Therefore, the ability for past researchers to identify this relationship would have been contingent upon the relative levels of Machiavellian views and tactics in their data.

The inconsistent relationship between Machiavellianism and neuroticism might also be partially explained by differential gender roles. Czibor et al. (2017) demonstrated that in females, Machiavellianism is associated with anxiety, vulnerability, harm avoidance, and hypersensitivity. In contrast, Machiavellianism in males associates with self-confidence, opportunism, and risk-taking. This suggests the presence of gendered strategies, largely suspected in the broader literature, but rarely investigated (Jonason & Buss, 2012; Jones & Paulhus, 2009). As a result, variations in gender ratios (especially investigations using male samples) would influence the re-

lationship between Machiavellianism and psychopathology. Although this variation was not investigated in the current thesis given that Czibor et al.s (2017) research was published after Chapter 3 was published, it appears an important avenue for ongoing research.

When looking at higher levels of Machiavellianism, it is important to consider the prevailing clinical model of personality functioning in relation to the emerging measures and models section (Section III) of the DSM-5 (American Psychiatric Association; 2012). Although only elevated to the alternative models section, the dimensional approach is an important step towards marrying qualitative diagnoses and empiricism with clinical classification (Krueger, Hopwood, Wright, & Markon, 2014; Krueger & Markon, 2014). This model of personality considers both personality functioning as well as pathological personality traits. Personality functioning captures deficits in ones sense of a clear and coherent self and deficits in mature and empathetic interpersonal functioning. Each personality disorder can also be considered a specific constellation of five core traits: negative affect, detachment, antagonism, disinhibition, and psychotism. These five traits closely mirror the Five Factor Model (FFM; Digman, 1996; Goldberg, 1999), modified for clinical over normal personality variation.

The DSM-5 alternative framework maps onto Machiavellianism clearly, with impairments in self functioning characterised by issues with identity (egocentric worldview) and self-direction (reduced internal drive to comply with laws and norms). Under this model, Machiavellianism also represents impairment with interpersonal functioning due to reduced empathy and intimacy (exploitation as a primary means of relating to others over creating close bonds). High levels of Machiavellianism would likely correspond with trait elevations in antagonism (manipulativeness, callousness, and deceitfulness facets) and disinhibition (due to the irresponsibility facet disregard for obligations, commitments, and promises). Although no work to date has investigated two-dimensional Machiavellianism and DSM-5 diagnoses, Machiavellian tactics may represent deficits in the interpersonal functioning domain,

whereas Machiavellian views might represent deficits in self-functioning.

This model also helps to differentiate Machiavellianism from psychopathy. Psychopathy loads more heavily on egocentricity, impulsivity, irresponsibility, and distractibility whereas Machiavellianism loads more heavily on rigid perfectionism given its emphasis on planned strategy (see Grigoras & Willie, 2017). Overall, higher levels of Machiavellianism can be assessed under the new DSM-5 alternative personality framework, with Machiavellianisms constellation of traits falling into a diagnosis of anti-social personality disorder without the psychopathy specifier (recklessness, impulsivity, bold interpersonal style, and lack of anxiety). As such, the alternative DSM-5 model of personality disorders may capture and describe high levels of Machiavellianism in a way previously not possible with earlier classification systems (excluding the use of Personality Disorder Not Otherwise Specified). This could assist clinicians in considering Machiavellianism in their work with clients; however, further research is required into clinical work with highly Machiavellian individuals.

When interpreting these findings, it is important to remember that Christie and Geis (1970) argued that *gross psychopathology* would distort a leader's objectivity and, therefore, their ability to use others instrumentally. The findings of this research do not necessarily contradict these assumptions, given the effect sizes were only moderate. It is clear that highly Machiavellian and successful leaders, such as Bonaparte, Stalin, and Hitler, were far from the epitome of mental health (Hershman & Lieb, 1994). Therefore, successful Machiavellian leaders might retain the ability to exploit others effectively while suffering the psychopathological consequences of their world-views.

In fact, it is likely that Machiavellian tendencies can offer advantages for reproductive success and for leadership. Jonason, Duineveld, and Middleton (2015) argued that Machiavellian moral flexibility, non-communal social strategy (endorsing social relationships primarily as networking tools to gain advantages), and cynicism (which reduces the likelihood that highly Machiavellian individuals will be manipulated or will place themselves at a disadvantage by adhering to a pro-social norm)

are tendencies that translate into increased survival and reproductive success, unless the group rejects the non-social group member. Similarly, distrusting others and distancing oneself from others is adaptive within specific leadership roles. For example, distrust within the Stalinist central committee was crucial for one's survival within the ongoing struggle for power. Therefore, Machiavellianism can also offer substantial benefits within the right environment.

6.7 Future Research Directions

One limitation of this research is the focus on self-report measures. Although Chapters 4 and 5 included behavioural measures, this research would be strengthened through objective evidence of predictive validity. This was a strength of Christie and Geis's (1970) original research into Machiavellianism, providing substantial evidence of the Mach-IVs capacity to reliably predict engaging in exploitative and duplicitous behaviour in behavioural experiments. The TDMS captures the majority of Mach-IV variance and, therefore, its predictive power. However, it is important to build evidence of the TDMS' capacity to predict future exploitative behaviour. Based on the presented theory, Machiavellian tactics should predict engaging in exploitative and manipulative behaviour only when advantageous, while views should predict believing others will always do likewise (Sakalaki et al., 2007; Wilson et al., 1998).

A second important area of future investigation is identifying subgroups of individuals who exhibit unique phenotypic Machiavellianism profiles. The underlying Machiavellianism latent construct is continuous (Beller & Bosse, 2017); however, this does not preclude subgroups forming with particular Machiavellian proclivities. Latent Profile Analysis (LPA; Lanza, Flaherty, & Collins, 2003) could identify individuals who fit the notorious label "high Mach" (suggested by Christie & Geis, 1970) scoring high on both views and tactics dimensions, or even "strategic Machiavellians" (suggested by Jones & Paulhus, 2009) who would score high on tactics and low on impulsivity. Identification of these subgroups are important because Machiavellian archetypes, such as the "cool" rational operator, are regularly referenced in the literature, yet an empirical basis for their existence needs stronger support.

The benefits of this line of research extend beyond identifying whether these hypothesised subgroups exist. Variables that predict membership within these subgroups, known as distal predictors, can be identified. For example, researchers can identify characteristics that typify individuals high on Machiavellian views, who nonetheless do not develop Machiavellian tactics, or identify the life experiences that shape someone to become a successful and strategic Machiavellian. Once the distal predictors of subgroups have been identified, future research should aim to identify whether these factors are modifiable (and can be utilised for organisational goals), to what extent each subgroup is permeable, and the unique behavioural consequences of each Machiavellian subgroup.

6.7.1   Universality: Translation and Cross-Cultural Work

Machiavelli's "the ends must justify the means" mentality is by no means limited to Western culture. Dictators have advocated for this form of statecraft for millennia, and it is nested within the moral debates of Mills, Bentham, and Kant. Additionally, Christie and Geis (1970) developed the Machiavellianism personality construct in relation to both Machiavelli and non-western power theory, such as Sun Tzu and Chanakya. Chanakya's (Kautilya) *Arthashastra* ("The Science of Politics") is an Indian treatise on statescraft that contains similar, if not more extreme, lessons on leadership to Machiavelli's *Prince*[3], and was written sometime between the 2nd and 3rd centuries BCE (Olivelle, 2013) in Hindi. Despite Machiavellianism's cross-cultural lineage and relevance, little to no work has investigated the influence of culture on Machiavellianism (e.g., Calvete & Corral, 2000; Kuo & Marsella, 1977; Monta, Rada, de Lucas Taracena, & Rodriguez, 2004; Okanes & Murray, 1982; Oksenberg, 1971; Starr, 1975), and thus culture is even neglected in major reviews (i.e., Fehr et al., 1992; Jones & Paulhus, 2009; Muris et al., 2017).

Nevertheless, some work has looked at Machiavellianism cross-culturally, translating the Mach-IV into German (Rauthmann, 2013), Korean (Ashton et al., 2000), Arabic (Mostafa, 2007; Starr, 1975), French (Aïn et al., 2013), Spanish (Calvete

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[3]For example, Chanakya is often quoted as stating "A person should not be too honest. Straight trees are cut first, and honest people are screwed first".

& Corral, 2000), Dutch (Vleeming, 1984), and a Chinese language (Oksenberg, 1971). Several research teams have also developed German Machiavellianism scales with promising psychometric properties (Cloetta, 1983; Henning, 1983; Henning & Six, 1977; Ulbrich-Herrmann, 2008), and growing interest into the Dark Triad has been the catalyst of more recent translations of the combined Dark Triad measure (e.g., Czarna, Jonason, Dufner, & Kossowska, 2016). This work is promising, yet largely focuses on testing the psychometric properties of translated measures, without identifying cross-cultural equivalence (measurement invariance / differential item functioning) or the source of cross-cultural variation.

The post-hoc methodology employed in Chapter 4 also limits the identification of factors that influence variation in Machiavellianism across cultures. Systematic investigation into cross-cultural variation is required, with cultural groups and variables of interest selected a priori. Specifically, cultural selection should allow modelling of variation due to political climate, traditionalism/religious conservativism, education, socio-political views (social dominance orientation and authoritarianism), environmental, and familial factors, or Hofstede's dimensions of cultural differences. Given a range of studies found no change in Mach-IV scores between cultural groups (e.g., Kuo & Marsella, 1977), it is likely that university students are more homogenous and may differ from the general public in some national cultures (Hanel & Vione, 2016). Therefore, efforts should be made to test less westernised and educated populations (somewhat of a standard critique to modern psychological theory).

To generate cross-cultural research, the TDMS has been recently translated into Norwegian using appropriate back-translated Bristol methodology (Hambleton, Merenda, & Spielberger, 2004). Norway is more liberal (socially and economically), egalitarian, and has a greater emphasis on gender equality than the US (Lease et al., 2013). The influence of these variables on Machiavellianism can be identified through comparing these two cultures. Research teams are also preparing to translate the TDMS for usage in India, Croatia, and Ghana.

6.8   Conclusions

This thesis provides insight into interpersonal exploitation and antagonism through three broad conclusions regarding the Machiavellianism personality trait. First, Machiavellianism is best conceptualised as capturing two underlying dimensions. An affective-cognitive component capturing cynical views of humans and the world, which justifies the behavioural component, the endorsement of immoral behaviours to achieve one's goals. Second, it provides two psychometrically sound measures to replace existing instruments and facilitate future research. Finally, it overturns the assumption that there is no mental health cost to be Machiavellian, with the views component resulting in lower well-being. Overall, this thesis provides strong theoretical advancements into understanding antagonism and why people act immorally to achieve self-centred goals. By returning to the Machiavellianism's roots, the reader is left to ponder Machiavelli's exposition of views, tactics, and the interconnection between them:

Any man who tries to be good all the time is bound to come to ruin among the great number who are not good. Hence a prince who wants to keep his authority must learn how not to be good, and use that knowledge, or refrain from using it, as necessity requires.

The Prince, Machiavelli, p. 47

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Appendices

Appendix A

Companion Website

https://tinyurl.com/Machiavellianismscale

The companion website offers an open source (free) method for assessing one's Machiavellianism and focuses on the public communication of this research. The website contains background information on two-dimensional Machiavellianism, the new scale, and provides participants with estimates of their level of Machiavellianism. The website was developed during Shiny, a website app package for R-Studio. R-Studio hosts the website and R a server. The user interface was developed using Shiny Dashboard, and data storage using Google Sheets (with the Googlesheet package).

The primary purpose of the website is for the public communication of science, with participants able to "opting in" to add their results to the study. Access to all components of the site was, in no way, contingent upon participating in the study. Estimates and respective confidence intervals are based on inferential (norms), Item Response Theory (IRT), and Bayesian methods. Overall, this was a positive method for proliferating the research, developing awareness, and providing public access to the research in an digestible manner. Information on the distribution of the site is available on page A.2. Further, this site commits to open access research, with the measure, data, and psychometric information freely available to prospective researchers.

Given the benefit to the research community offered by the website design, a method of collecting data and providing researchers with the capacity to provide automated feedback, the base code is freely available to the wider research community on GitHub:

https://github.com/ConalMonaghan/Machiavellianism

The following sections contain images (screens) from the website followed by distribution information, and finally, the skeleton code for the website.

A.1 Website Screens

Below are selections of pages from the accompanying Machiavellianism website.
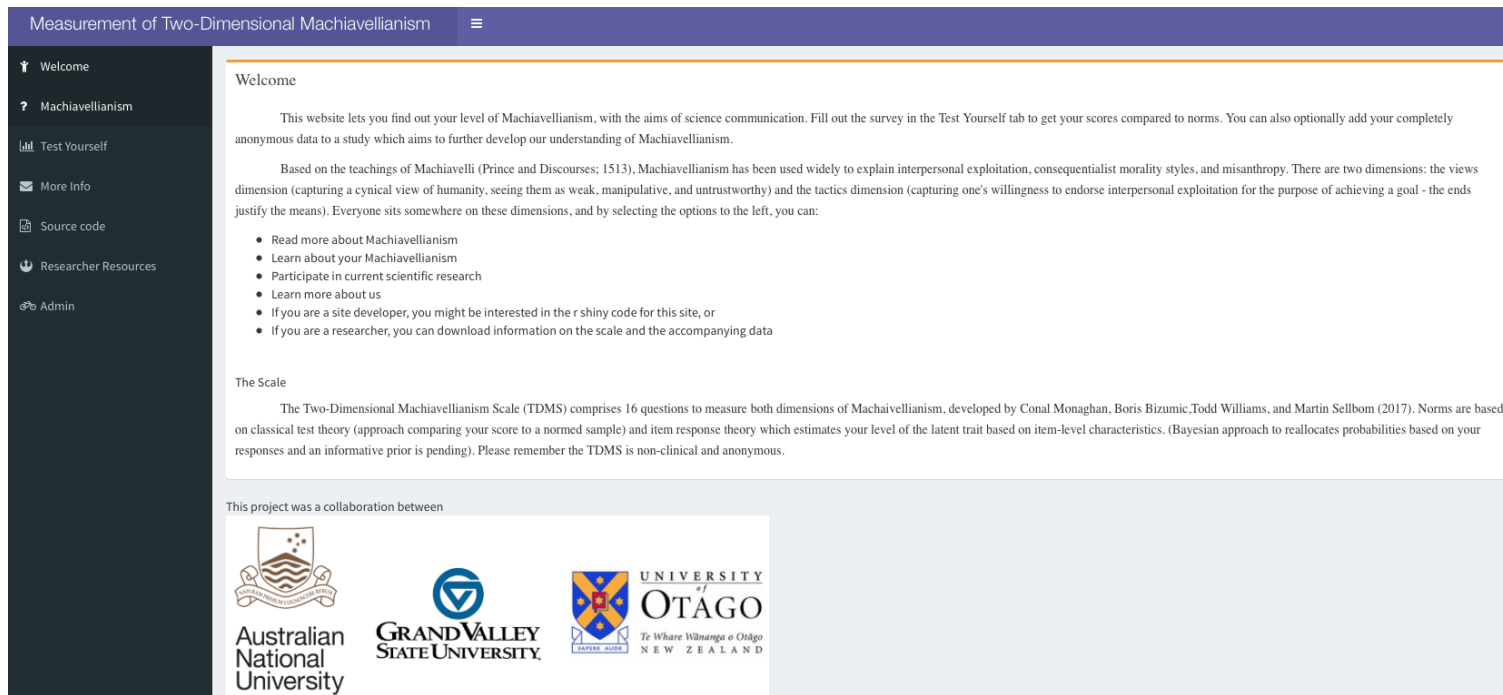
Figure A1. Front page of the website, which outlines the purpose and function of the website.

Figure A2. Test yourself section, with ethics information and the participant information sheet. Participants must "opt in" to the study by clicking "Proceed". The participant information sheet is available for download by clicking the "downloaded here" button.

Here are some additional questions that will eventually allow us to create more accurate estimates of Machiavellianism. These are optional and will not alter your estimate but will allow us to create more accurate estimates in the future

What is your ethnicity (e.g., Caucasian, Asian, African-American)

```
Enter your ethnicity here
```

What is your gender identity?

```
Female                                                                          ▼
```

What country are you from?

```
Enter your country here
```

What is your age?

```
Enter your Age
```

What is your stance on government involvement in economics (economic liberalism)? Ranging from a free market with negligible government involvement from a minimal government - that is, people should be free to run their businesses and accumulate wealth as they feel fit with no / minimal taxation (0), to, all markets should be strictly controlled by a large government to spread wealth equally and to control against exploitation - heavy taxation with highly regulated markets (100)

What is your stance on government involvement in society? Ranging from a government should have no influence on society (social liberalism) - we should be free to believe, love, and do what we want (0), to, the government must stringently control what is acceptable in society, what people believe, and who they marry (social conservativism) (100)
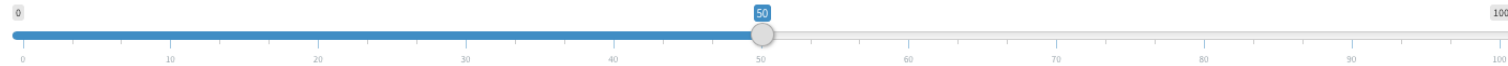
How religious are you? Ranging from not at all / athiest (0) to devout/literalist religious beliefs (100)
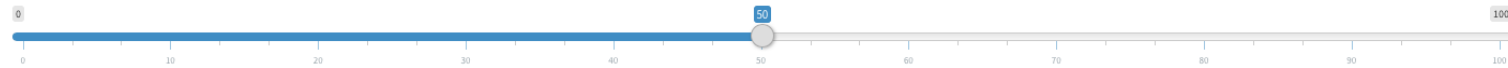
How accurately did you answer the questions?

```
Skimmed the questions without reading / did not respond accurately            ▼
```

Do you consent to having your anonymous data stored for research

🔘 Sure
⚪ No, erase all evidence I was here

```
👤 Submit and get your Machiavellianism
```

Figure A3. Survey completion section.

Test Yourself

Compare to Norms   IRT   Bayes

Your Results (Select Your Estimation)

Classical Response Theory - Comparison to Normative Data
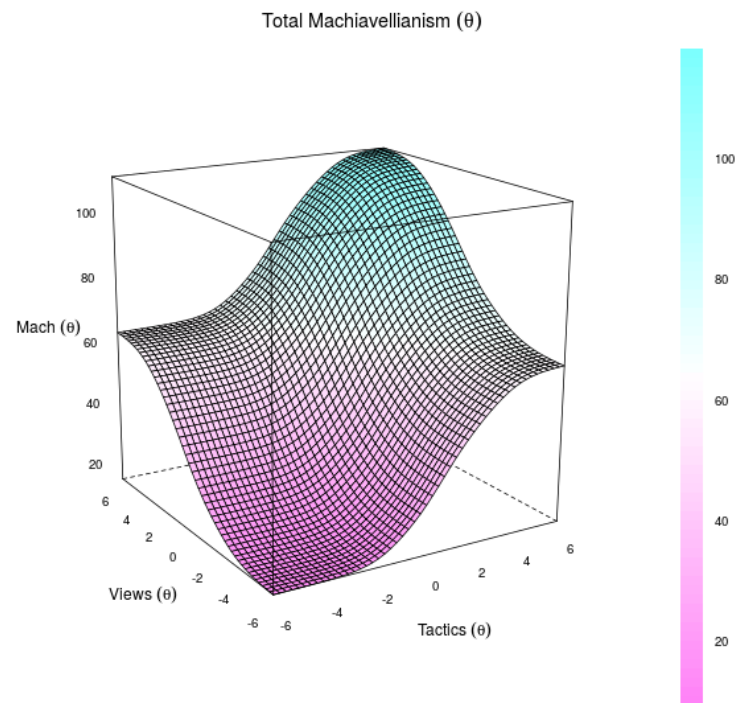
Your level of Machiavellianism, Machiavellian Views, and Machiavellian Tactics based on Classical Test Theory (CTT) analysis. This is calculated based on norms created from 1494 participants that completed the survey online (980 undergraduate students and 474 general public), 34% male with a mean age of 25.44 (SD = 11.51). Shaded area is your percentile, thus if you received a level of .70, you scored above 70% of these respondents. Lower scores relate to more anti-Machiavellianism traits while higher scores relate to more Machiavellian traits.
- View Dimension captures your cynical view of humanity - perceiving others as weak, manipulative, and untrustworthy
- Tactics Dimension captures your willingness to endorse interpersonal exploitation for the purpose of achieving a goal - the ends justify the means

For SurveyCircle users (www.surveycircle.com): The Survey Code of this survey is: PHQP-UB7Q-4PQB-EC9J

Your Machiavellianism

You have received an estimated overall Machiavellianism score of 4 , the tendency to rationalise exploting and objectifying others. You scored higher than 82.53 % of your peers, with a confidence interval (95%) ranging from 59.29 to 94.92 . The plot above shows where you sat compared to your peers, with higher Machiavellianism scores as your move right, and the coloured in section representing peers you scored higher than.

Figure A4. Example feedback section using classical test theory to calculate estimates.

Figure A5. Example of Item Response Theory (IRT) feedback for Machiavellian Views subscale.

The Two-Dimensional Machiavellianism Scale (TDMS) and normative data is part of Conal Monaghan's PhD thesis, and will be published in a peer-reviewed journal shortly. The scale was developed in collaboration with Boris Bizumic (at the Australian National University's (ANU) Research School of Psychology, Todd Williams at Grand Valley State University's Psychology Department in Alberta, Canada, and Martin Sellborn at University of Otago's Department of Psychology in New Zealand.

The scale performed well on six validation samples using item-analysis, exploratory and confirmatory factor analysis, item-response theory, and correlations with existing scales (convergent and divergent validity estimates). The scale is public domain, if you are interested in using the scale, please contact me at: Conal.Monaghan@anu.edu.au

This scale should be referenced as:

Monaghan, C., Bizumic, B., Williams, T., & Sellborn, M. *Two-Dimensional Measure of Machiavellianism: Conceptualisation and Measurement of the Views and Tactics Dimensions.* Manuscript in Preparation, Australian National University, Canberra, Australia.

Additional Information

For more information on two-dimensional Machiavellianism and its link to psychopathology Click Here. Measurement of two-dimensional Machiavellainism was based on a derivative of the Mach-IV (Christie & Geis, 1970) called the two-dimensional Mach-IV (TDM-IV) developed in this paper.

The code for this website will be uploaded shortly to GitHub

RG Several published articles on two-dimensional Machiavellianism are avaliable at my ResearchGate along with related research,

with all conference posters also publically avaliable Open Science Framework (data will be made avaliable shortly)

Powered by:

R Studio

Survey Distribution

For distributing our survey, we would like to thank:

- The Inquisitive Mind
- Social Psychology Network
- Online Psych Research
- Survey Circle
- Psychology Research on the Net

Reddit

We have also just launched our subreddit, feel free to comment on your thoughts regarding the site, Machiavellianism, your results, or psychometrics more broadly.

r/MachiavellianismScale

Figure A6. Additional information page containing information on the distribution and collaboration involved on the project.

A.2 Current Distribution

Figure A7. Current distribution of the site, as of 20 May 2018 using Google Analytics data platform. Y-axis represents visits per week. A total of 1,560 people visited the site. Of those, 12.30% were returning users. Most uses occurred in the first few months. Users were primarily less than 35 years of age, with slightly more males than females accessing the site.
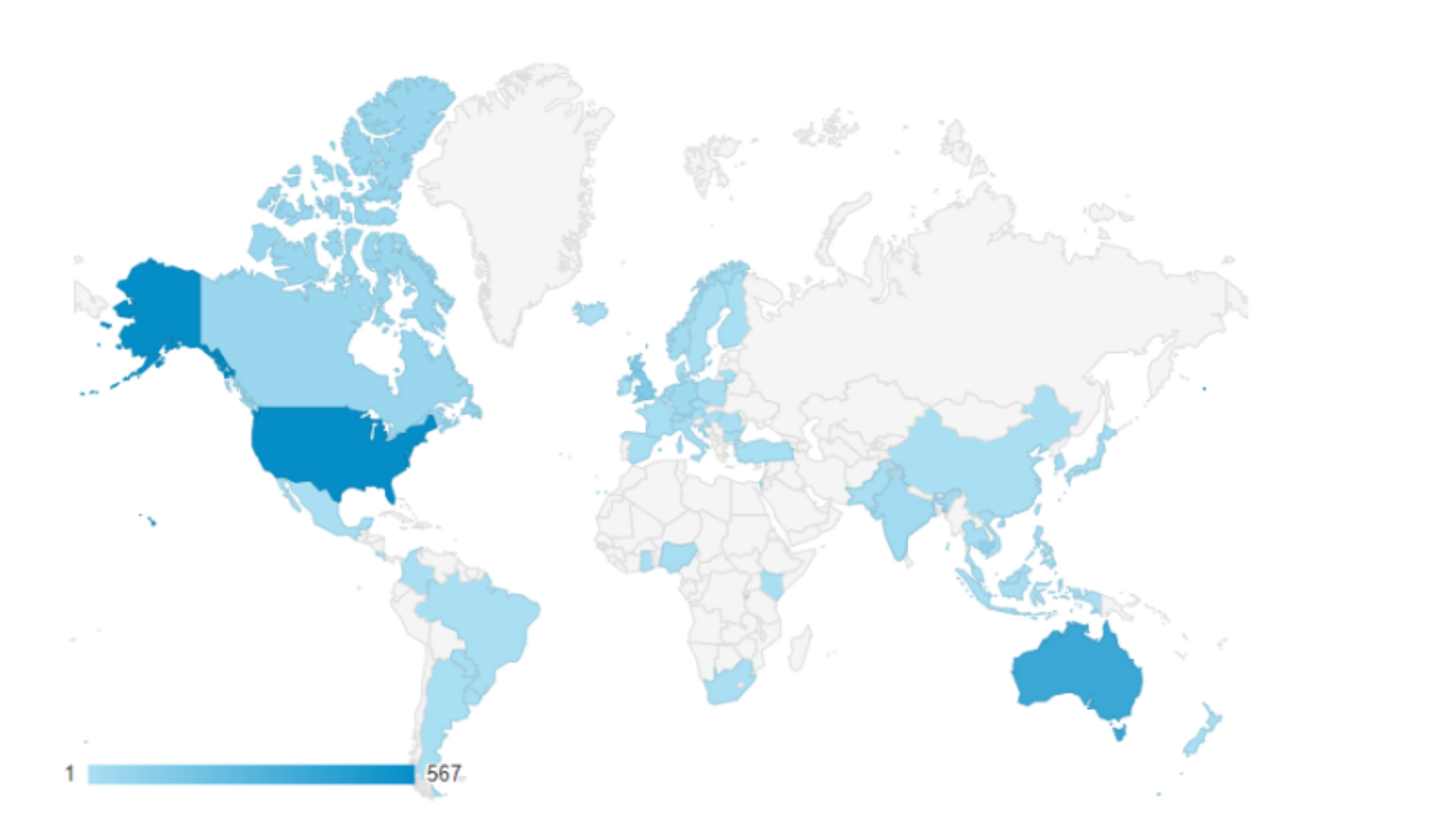
Figure A8. Distribution of the site based on usages (IP address). Most users of the cite were based in the United States and Australia. Greater than 50 participants were from Cambodia, the United Kingdom, and Canada. Smaller amounts of users were from Germany, South Korea, the Philippines, Japan, and from the Netherlands.

A.3   Base Code

The base "skeleton" code for ongoing researchers to use to build their own websites is below (under Apache 2.0 Licensing).

The code is annotated and should take minimal Shiny Server skills to implement. You will require a Google account with Googlesheets. The code will make a new file in there which will be amended whenever a user completes the survey. The code links using the file reference "Key". Before usage, the authorisation token must be created and placed into your app folder, and a new GoogleSheet must be created (below).

```r
1   #  Note that before this will work you will need to run the following in your console (once you have installed
        googlesheets() )
2    1) ttt <- gs_auth()          #  now follow the .html prompts to login
3    2) saveRDS(ttt, "ttt.rds") #  then copy ttt.rds file to the app's Dir()
4    3) Now one needs to create a worksheet to use using the following code:
5
6   Data <- gs_new("Data") %>%
7   gs_ws_rename(from = "Sheet1", to = "Data")
8
9   4) Insert the titles
10  Data <- Data %>%
11  gs_edit_cells(ws = "Data", input = cbind("Score1", "Score2", "Time", "Mean"), trim = TRUE)
12  #  Note you will need to manually add one row of data to your GoogleSheet otherwise it will not run
13
14                          #########################################################
15                          ## This is the UI logic for a Shiny web application.    ##
16                          ## This produces what users see                        ##
17                          #########################################################
18
19  # Setup
20  library("shiny")
21  library("shinydashboard")
22  library("googlesheets")
23  library("DT")
24
25  shinyUI(
26      dashboardPage(skin = "blue", # UI = User interface, this produces .html code for the end user.
27  # Application title
28      dashboardHeader(title = "Your cool measurement website", titleWidth = 500),
29  # Set out the tabs.
30  dashboardSidebar(sidebarMenu(
31          menuItem("Welcome", tabName = "About", icon = icon("child")),
32          menuItem("Test Yourself", tabName = "Test", icon = icon("bar-chart-o")),
33          menuItem("Researcher Resources", tabName = "Researchers", icon = icon("rebel"))
34  )
35      ),                                          #  This closes the menu options
36
37
38  # Code for the full body
39  tabItems(                                       #  Start the tab items
40  tabItem(tabName = "About",                      #  Tab title
41  box(title = "Welcome",  width = 40,             #  Start about Tab
```

```
42
43  "Here is the intro page, place information here about your work"
44  )                                                       #  Close tab item 1
45       ),
46  tabItem(tabName = "Test", tags$title("Your Test"),     #  Start "Test" tab and .html title tag
47  h2("Test Yourself"),                                    #  Tab for your scale items
48
49  conditionalPanel("input.m == 0",                        #  This means participants have to accept below to
         proceed
50  #  Here you can place information on the scale and your ethics participant information. For example:
51  tags$b("Receiving your results is, in no way, based on whether you want your data included in the study.
         Therefore, you will still receive your results if you do not want your results included"),
52
53  "More information on the study, your rights as a participant, data storage and collection, and ethics can be",
         downloadButton("Participantinfo", "downloaded here"),  tags$hr(), "The ethical aspects of this research
         have been approved by the Human Research Ethics Committee (Protocol XXX). If you have any concerns please
         contact us",                                   #  Include Participant information sheet in base folder
         as "Participantinfo"
54
55  "If you agree and wish to take the test enter click proceed", tags$br(),
56
57  actionButton(inputId = "m", label = "Proceed", icon = NULL)   ),  # Participants must accept to proceed
58
59  conditionalPanel("input.m == 1",                        #  This panel opens when proceed is clicked
60       conditionalPanel("input.n == 0",                   #  Main panel for the survey, this is nested within m
61  box(width = 100,                                         #  Start a box for the survey
62  # Survey text
63  "Please indicate how much you agree or disagree with the following statements.
64  Note that there are no right or wrong answers, and that your responses are not recorded
65  in any way. Try to answer how each statement relates to you over the past year, not how you
66  are feeling currently.",
67  tags$hr(),
68  selectInput(inputId = "Score1",                         #  What we are calling the object
69  label = "Item 1 Content",                               #  Question
70  choices = c("Disagree Strongly" = 1, "Disagree" = 2, "Disagree Somewhat " = 3, "Neither Agree nor Disagree" =
         4, "Agree Somewhat" = 5, "Agree" = 6, "Agree Strongly" = 7),
71           selected = 4
72  ),
73  # Example of a reverse coded item
74  selectInput(inputId = "Score2",                         #  What we are calling the object
75  label = "Item 2 Content",                               #  Question
76  choices = c("Disagree Strongly" = 7, "Disagree" = 6, "Disagree Somewhat " = 5, "Neither Agree nor Disagree" =
         4, "Agree Somewhat" = 3, "Agree" = 2, "Agree Strongly" = 1),
77           selected = 4
78  ),
79  selectInput(inputId = "Score3",                         #  What we are calling the object
80  label = "Item 3 Content",                               #  Question
81  choices = c("Disagree Strongly" = 1, "Disagree" = 2, "Disagree Somewhat " = 3, "Neither Agree nor Disagree" =
         4, "Agree Somewhat" = 5, "Agree" = 6, "Agree Strongly" = 7),
82           selected = 4
83  ),
84  # Example of a reverse coded item
85  selectInput(inputId = "Score4",                         #  What we are calling the object
86  label = "Item 4 Content",                               #  Question
87  choices = c("Disagree Strongly" = 7, "Disagree" = 6, "Disagree Somewhat " = 5, "Neither Agree nor Disagree" =
         4, "Agree Somewhat" = 3, "Agree" = 2, "Agree Strongly" = 1),
88           selected = 4
89  ),
90  selectInput(inputId = "Score5",                         #  What we are calling the object
91  label = "Item 5 Content",                               #  Question
```

```r
 92 choices = c("Disagree Strongly" = 1, "Disagree" = 2, "Disagree Somewhat " = 3, "Neither Agree nor Disagree" =
        4, "Agree Somewhat" = 5, "Agree" = 6, "Agree Strongly" = 7),
 93         selected = 4
 94 ),
 95 # Can add as many items as you want here. Change later calculations to accommodate changes
 96 tags$br(),tags$hr(),                            #  Add some space for formatting
 97 #  Can also add demographic questions (examples)
 98 #  Country
 99 textInput("Country", label = "What country are you from?",
100 value = "Enter your country here"),
101 #  Age
102 textInput("Age", label = "What is your age?",
103 value = "Enter your Age"),
104 #  Economic Liberalism
105 sliderInput("eco_Liberal", label = "What is your stance on government involvement in economics (economic
        liberalism)? Ranging from a free market with negligible government involvement from a minimal government -
         that is, people should be free to run their businesses and accumulate wealth as they feel fit with no /
        minimal taxation (0), to, all markets should be strictly controlled by a large government to spread wealth
         equally and to control against exploitation - heavy taxation with highly regulated markets (100)", min =
        0, max = 100, value = 50),
106 #  Social Liberalism
107 sliderInput("Soc_Liberal", label = "What is your stance on government involvement in society? Ranging from a
        government should have no influence on society (social liberalism) - we should be free to believe, love,
        and do what we want (0), to the government must stringently control what is acceptable in society, what
        people believe, and who they marry (social conservativism) (100)", min = 0, max = 100, value = 50),
108 #  Response Accuracy
109 selectInput(inputId = "Real",                       #  What we are calling the object
110 label = "How accurately did you answer the questions?",     #  Question
111 choices = c("Skimmed the questions without reading / did not respond accurately" = 1, "Briefly read the
        questions and responded" = 2, "Read the questions and answered accurately" = 3, "Read each question in
        depth and thought conscientiously about each response" = 4)
112 ),
113 #  Insert radio button for data storage consent
114 radioButtons("Agree", label = h3("Do you consent to having your anonymous data stored for research"),
115 choices = list("Yes I do" = 1, "No I do not" = 2
116 )
117     ),
118 #  Submit and continue to results
119 actionButton(inputId = "n", label = "Submit and get your Score", icon = icon("user-circle"))
120
121 # This is the action button which will change n from 0 to 1 when clicked. (Still all within the m box)
122 )                                        #  Close box within n == 0
123     ),                                   #  Close conditional panel for survey  == 0  ( the Survey questions)
124
125 conditionalPanel("input.n == 1",         #  Start the conditional Panel for the Results, n == 1
126 tabBox(                                  #  Start Tabbox for results
127 title = "Your Results", width = 100,
128
129 tabPanel("Compared to our normative sample",     # Table Panel 1 Open
130 h2("Put information about the norms and what people's scores mean here."),
131 #  Below is where the rShiny score feeds things back to participants
132 h2("Your Score"), plotOutput("Curve"), textOutput("hOutput")
133
134 )                                        #  Close tab panel
135     )                                    #  Close tab Box
136         )                                #  Close input.n == 1 conditional
                                                                        Panel for survey vs results
137             )                                            #  Close box for results m = 1
138                 ),                                       #  Close results tab item
139 tabItem(tabName = "Info about us",                       #  Start researcher tab
```

```
140  box(title = "Info about us", width = 10,
141  "Place information about your researcher's here!"
142  )                                                            #  Close box
143      )                                                        #  Close info about us
144  # If you want to add more tabs, add these here and then make sure to add new tab items into the
          dashboardSidebar(sidebarMenu()) section at the beginning
145  )                                                            #  Close Tab items
146      )                                                        #  Dashboard dashboardPage
147          )                                                    #  Full UI close
```

Listing A.1: Website Skeleton Code: User Interface

Now we have the code for the Server (below)

```
1                        ########################################################
2                        ## This is the server logic for a Shiny web application  ##
3                        ## This turns the inputs into outputs                      ##
4                        ########################################################
5
6    # Setup the app
7    library("shiny")
8    library("tigerstats")
9    library("mirt")
10   library("shinydashboard")
11   library("googlesheets")
12   library("dplyr")
13   # If "PURR" creates issues, install an earlier version of Dplyr using DevTools
14   # See additional infomation on github and Rshiny's website if you need help running the code
15
16   # Setup token for storing data (Stored in dir()) -> use the googlesheets package to create a ttt.rds token for
          your googledrive account.
17   gs_auth(new_user = FALSE, gs_auth(token = "ttt.rds")) # Store the ttt.rds file in your working directory. This
          will let the web app automatically login to your Google Drive when uses create an instance
18   Data <- gs_key("XXXXXXXXXXXX")                                #  Write your GS key for
          the google sheet you want to add data to. Keys create less issues that file names
19
20   shinyServer(function(input, output) {                            #  Opens the server side
21   #  Calculate overall scores by summing items 1-5. Modify here for your needs
22   Score <- reactive({as.numeric(
23       (as.numeric(input$Score1) + as.numeric(input$Score2) + as.numeric(input$Score3) + as.numeric(input$Score4)
           + as.numeric(input$Score5)
24       )/5      #  To create scale means
25   )
26       })
27
28                        ##############  Create Plot  #####################
29   output$Curve <- renderPlot({
30           pnormGC(Score(),region="below", mean=XX.XX,   # Insert Mean and SD from your comparison sample
31           sd=XX.XX,graph=TRUE)
32     })
33
34
35
36
37
38
39
40                        ##############  Create Text  #####################
41   output$Output <- renderText({
```

```
42                  paste("You have received an estimated overall score of", Score(), "You scored higher than", round
                       (pnormGC((Score())), region="below", mean=XX.XX, sd=XX.XX)*100, 2), "% of your peers, with a
                       confidence interval (95%) ranging from", round(pnormGC((Score() - XX.XX)), region="below",
                       mean=XX.XX, sd=XX.XX)*100, 2), "to", round(pnormGC((Score() + .XX)), region="below", mean=XX.
                       XX, sd=XX.XX)*100, 2),". The plot above shows where you sat compared to your peers, with
                       higher scores as your move right, and the coloured in section representing peers you scored
                       higher than.")
43                      })
44
45                   ############## Setup Data download ########################
46 #  Run this code to establish a dataset using the ttt token
47 #  Data <- gs_new("Data") %>%                                    #  Establish new Dataset
48 #                   gs_ws_rename(from = "Sheet1", to = "Data")       #  Establish new Worksheet
49 #  Setupvalues <- rbind(c("Time", "Score1", "Score2", "Score3", "Score4", "Score5",#  Column titles
50 #                  "Full Scale Score", "Country", "Age", "eco_Liberal", "Soc_Liberal", "Agree",
                      "Accuracy"), c(seq(1,12))                           #  Just create a blank row
51 #                  )
52 #  Data <- Data  %>%
53 #                  gs_edit_cells(ws = "Data", input = Setupvalues, trim = TRUE)   #  Change frame to
                                                                 appropriate and add setup values
54 #  files in google sheets can be accessed through  > gs_ls()
55
56 # Make a results vector comprising the participant data which we can then add to our Google data
57   Results <- reactive(c(
58                  input$Score1, input$Score2, input$Score3, input$Score4, input$Score5, input$Score6, input
                       $Score7, input$Score8, input$Score9, input$Score10, input$Score11, input$Score12,
                       input$Score13, input$Score14, input$Score15, input$Score16, Score(), input$Country,
                       input$Age, input$eco_Liberal, input$Soc_Liberal, input$Agree, input$Real, Sys.time()
59 )
60      )
61
62 # Reactive function to send data to Google. This will add the new row at the bottom of the dataset in Google
        Sheets
63   observeEvent(input$n, {                                        #  Observe submit action
64     Data  <- Data  %>%                                           #  Occasionally there are some issues
           if there is not at least 1-2 rows of data in the file. Best to make suedo data
65     gs_add_row(ws = "Data", input = Results())                   #  When actionbutton is pressed this
           will add their data to the good .doc
66 }
67      )
68
69 #  Full download. This allows for a button "Fulldownload" to be included, which will download your data as "
        Website Data.xlsx" when clicked. Note: your data will also, always, be up to date in your Google Sheets.
        This allows ppl to download the data straight from the site if you want. Button NOT in the current UI. Add
         if desired.
70   Filename <- paste0("Website Data", Sys.Date(), ".xlsx")         #  Label the filename, with date
71 observeEvent(input$Fulldownload, {                              #  Creates the download of Data into
                                                                 the Google Sheets file
72     gs_title("Data") %>%
73     gs_download(to = Filename)    }
74 )
75      })   # Close whole server code
```

Listing A.2: Website Skeleton Code: Server End

Finally, the data can be imported directly in the working directory. The gs_auth() function from the Googlesheets package authorises your computer to access the Google sheet using the local token created earlier, then gs_key() selects the sheet, before dplyer package is used to integrate the file into your console. See Jenny Bryan and Joanna Zhao's Googlesheets Basic Usage website (https://cran.r-project. org/web/packages/googlesheets/vignettes/basic-usage.html) for more information on these functions.

```
1  #### Live data extraction ####
2  gs_auth(new_user = FALSE, gs_auth(token = "ttt.rds")) # token ttt.rds needs to be in the working directory
3  Data   <- gs_key("XXXXXX")    # Insert the gs_key for the file of interest here
4  Data <- Data %>%
5        gs_read(ws = "Data") # This is the worksheet within the Google Sheets file that you want
```

Listing A.3: Pull code for retrieving Google sheets file into local R console

Appendix B

Supplementary Material for Chapter 3

Table B.1

Items of the MACH-IV Scale

Item Number	Item	Original Subscale
1	Never tell anyone the real reason you did something unless it is useful to do so.	T
2	The best way to handle people is to tell them what they want to hear.	T
3	One should take action only when sure it is morally right. (R)	T
4	Most people are basically good and kind. (R)	V
5	It is safest to assume that all people have a vicious streak and it will come out when they are given a chance.	V
6	Honesty is the best policy in all cases. (R)	T
7	There is no excuse for lying to someone else. (R)	T
8	Generally speaking, people won't work hard unless they're forced to do so.	V
9	All in all, it is better to be humble and honest than to be important and dishonest. (R)	M
10	When you ask someone to do something for you, it is best to give the real reasons for wanting it rather than giving reasons which carry more weight. (R)	T
11	Most people who get ahead in the world lead clean, moral lives. (R)	V
12	Anyone who completely trusts anyone else is asking for trouble.	T
13	The biggest difference between most criminals and other people is that the criminals are stupid enough to get caught.	V
14	Most people are brave. (R)	V
15	It is wise to flatter important people.	T
16	It is possible to be good in all respects. (R)	T
17	Barnum was wrong when he said that there's a sucker born every minute. (R)	V
18	It is hard to get ahead without cutting corners here and there.	V
19	People suffering from incurable diseases should have the choice of being put painlessly to death.	M
20	Most people forget more easily the death of their mother and/or father than the loss of their property.	V

Note. T = Tactics, V = Views, M = Morality. R = Reverse scored.
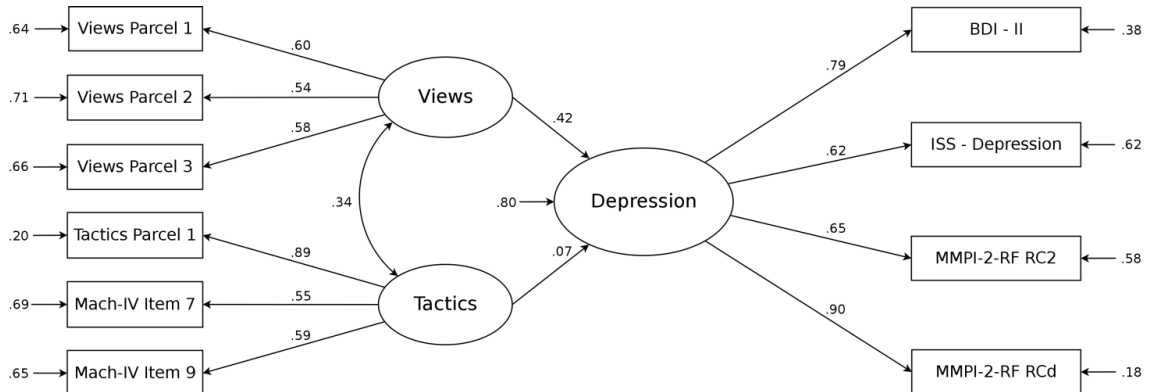
Figure B.1. SEM model of the Two-Dimensional Mach-IV (TDM-IV) Tactics and Views subscales predicting the depression psychopathology construct. Coefficients are standardised. BDI - II = Beck's Depression Inventory - II, ISS - Depression = Internal States Scale - depression subscale, MMPI-2-RF RC2 = MMPI-2-RF low positive emotions scale, MMPI-2-RF RCd = MMPI-2-RF demoralization scale. All coefficients are significant ($p < .01$) except for the path between tactics and depression ($p = .04$).
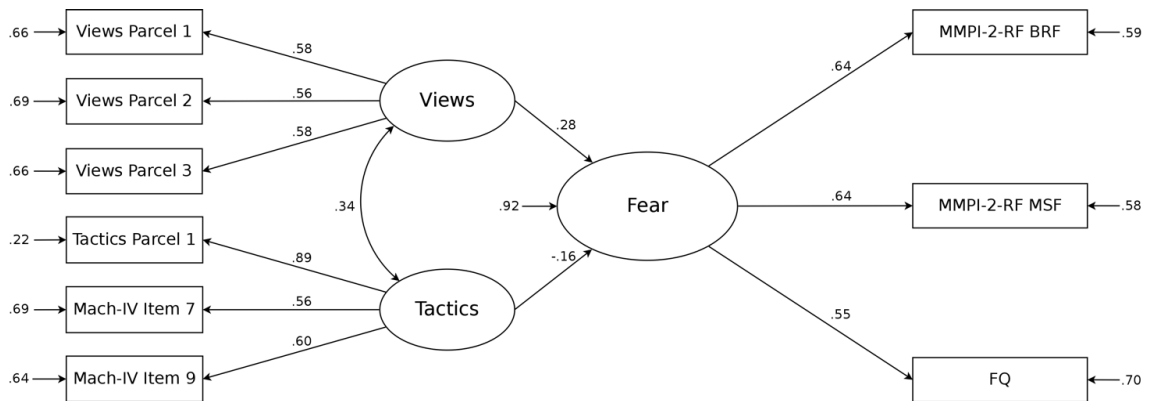
Figure B.2. SEM model of the Two-Dimensional Mach-IV (TDM-IV) Tactics and Views subscales predicting the fear psychopathology construct. Coefficients are standardised. FQ = Fear Questionnaire, MMPI-2-RF MSF = MMPI-2-RF multiple specific fears scale, MMPI-2-RF BRF = MMPI-2-RF behaviour-restricting fears scale. All coefficients are significant ($p < .01$).
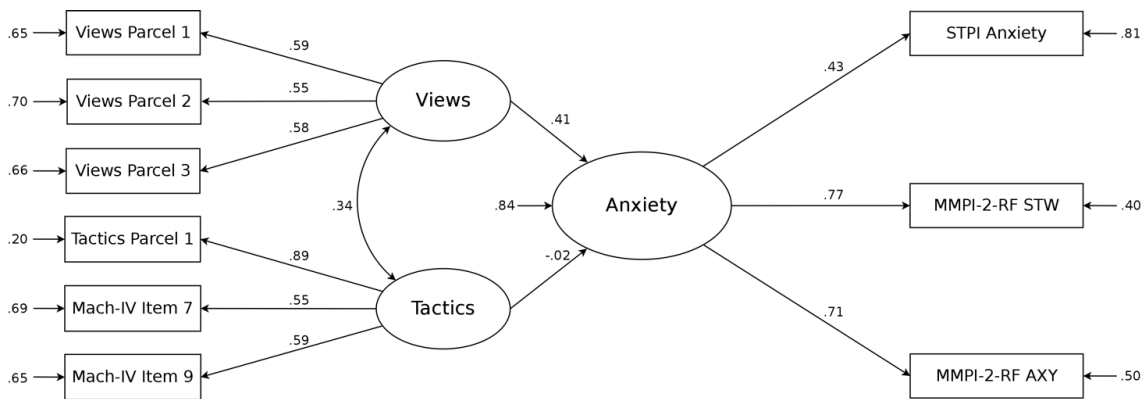
Figure B.3. SEM model of the Two-Dimensional Mach-IV (TDM-IV) Tactics and Views subscales predicting the anxiety psychopathology construct. Coefficients are standardised. MMPI-2-RF AXY = MMPI-2-RF anxiety scale, MMPI-2-RF STW = MMPI-2 - RFstress / worry scale, STPI Anxiety = State-Trait Personality Inventory (STPI) trait anxiety subscale. All coefficients are significant ($p < .01$) except for the path between tactics and anxiety ($p = .67$).
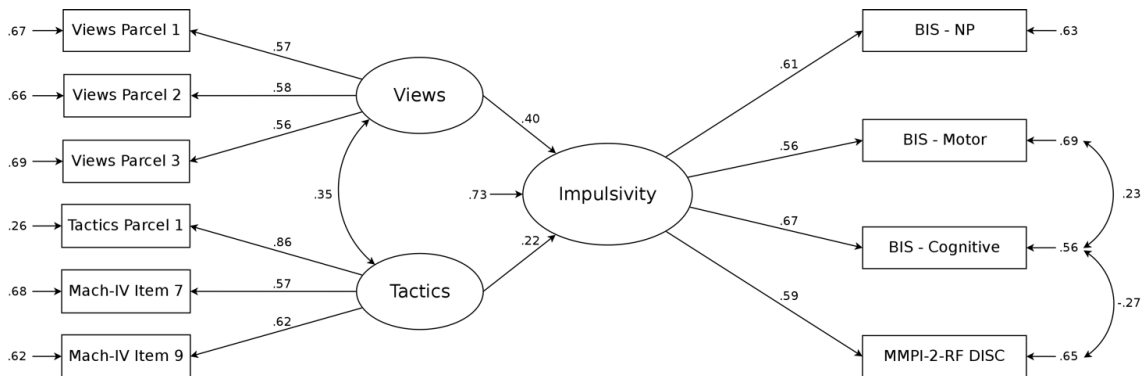
Figure B.4. SEM model of the Two-Dimensional Mach-IV (TDM-IV) Tactics and Views subscales predicting the impulsivity psychopathology construct. Coefficients are standardised. MMPI-2-RF DISC = MMPI-2-RF disconstraint scale (PSY-5), BIS Cognitive = Barratt Impulsivity Scale's (BIS-11) cognitive subscale, BIS Motor = BIS-11 motor subscale, BIS NP = BIS-11 non-planning subscale. All coefficients are significant ($p < .01$).
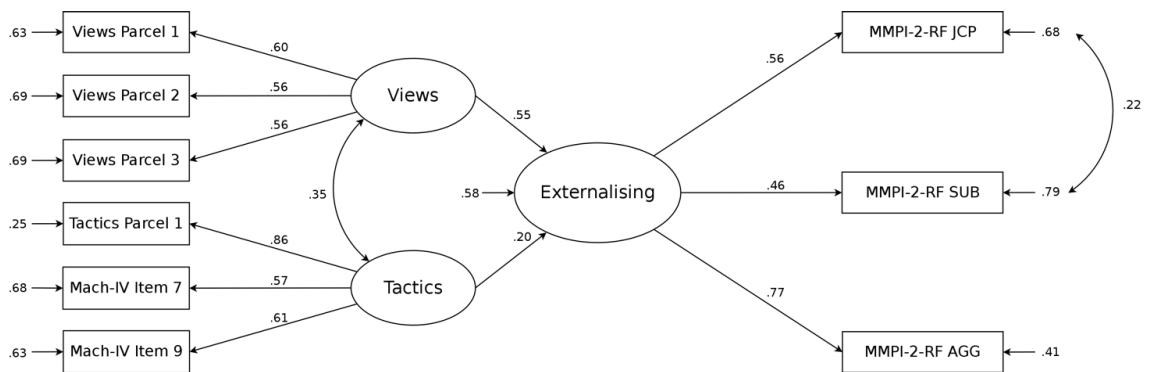
Figure B.5. SEM model of the Two-Dimensional Mach-IV (TDM-IV) Tactics and Views subscales predicting the externalising psychopathology construct. Coefficients are standardised. MMPI-2-RF SUB = MMPI-2-RF substance abuse scale, MMPI-2-RF AGG = MMPI-2-RF aggression scale, MMPI-2-RF JCP = MMPI-2-RF juvenile conduct problems scale. All coefficients are significant ($p < .01$).
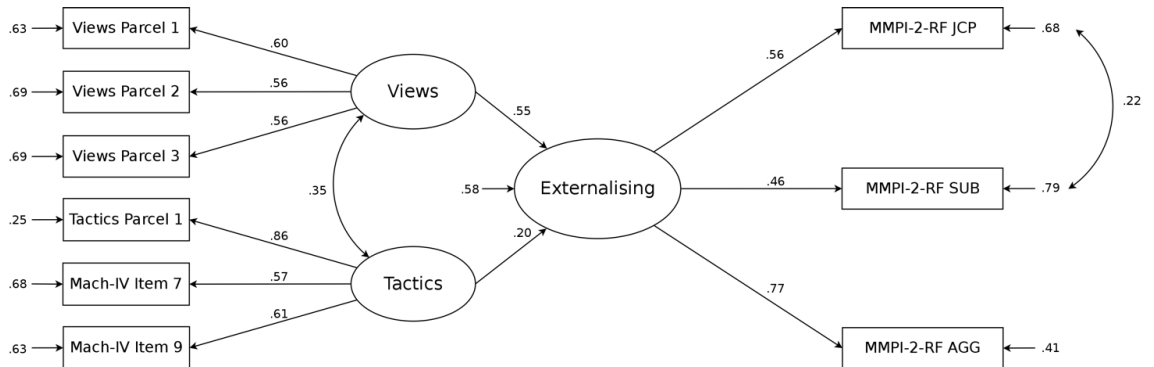
Figure B.6. Figure B.6: SEM model of the Two-Dimensional Mach-IV (TDM-IV) Tactics and Views subscales predicting the thought dysfunction psychopathology construct. Coefficients are standardised. MIS = Magical Ideation Scale (MIS), PAS = Perceptual Aberration Scale (PAS), MMPI-2-RF RC8 = MMPI-2-RF aberrant experiences (RC8) scale, MMPI-2-RF RC6 = MMPI-2-RF ideas of persecution (RC6) scale. All coefficients are significant ($p < .01$) except for the path between tactics and thought dysfunction ($p = .93$).

Appendix C

Supplementary Material for Chapter 4

Table C.1

MACH-IV and TDM-IV Items

Item Number	Item	Original Subscale	TDM-IV Subscale
1	Never tell anyone the real reason you did something unless it is useful to do so.	T	-
2	The best way to handle people is to tell them what they want to hear.	T	-
3	One should take action only when sure it is morally right. (R)	T	-
4	Most people are basically good and kind. (R)	V	V
5	It is safest to assume that all people have a vicious streak and it will come out when they are given a chance.	V	V
6	Honesty is the best policy in all cases. (R)	T	T
7	There is no excuse for lying to someone else. (R)	T	T
8	Generally speaking, people won't work hard unless they're forced to do so.	V	V
9	All in all, it is better to be humble and honest than to be important and dishonest. (R)	M	T
10	When you ask someone to do something for you, it is best to give the real reasons for wanting it rather than giving reasons which carry more weight. (R)	T	T
11	Most people who get ahead in the world lead clean, moral lives. (R)	V	-
12	Anyone who completely trusts anyone else is asking for trouble.	T	V
13	The biggest difference between most criminals and other people is that the criminals are stupid enough to get caught.	V	V
14	Most people are brave. (R)	V	-
15	It is wise to flatter important people.	T	-
16	It is possible to be good in all respects. (R)	T	-
17	Barnum was wrong when he said that there's a sucker born every minute. (R)	V	-
18	It is hard to get ahead without cutting corners here and there.	V	V
19	People suffering from incurable diseases should have the choice of being put painlessly to death.	M	-
20	Most people forget more easily the death of their mother and/or father than the loss of their property.	V	-

Note. TDM-IV = Two-Dimensional Mach-IV. T = Tactics, V = Views, M = Morality. R = Reverse scored. Error terms for items six and seven should be allowed to covary when fitting the TDM-IV model using confirmatory factor analysis. Items in the Kiddie Mach (Nachamie, 1999) closely resemble the items above with slight wording changes to reduce the reading and conceptual levels.

Descriptions of Behavioural Studies

The prisoner's dilemma game. In this variation of the dilemma, participants were asked to imagine that they have been randomly paired with another person and must choose between option A and option B. If they and their imaginary partner choose option A, then both receive a moderate reward of 20 points (non-zero sum). If both they and their partner choose option B, both will receive a lesser reward of 10 points (Nash Equilibrium). However, if one person chooses option A and the other chooses option B, then the person who chose option A receives a small reward (5 points), while the person who chose option B receives a larger reward (25 points). Cooperation is the best mutual outcome (both choosing option A) but requires the participant to trust that the hypothetical accomplice will not defect by choosing option B (dominant strategy). Participants were asked to rate their behavioral intention on a 11-point scale ranging from cooperate (0) to defect (10).

Trust game. Dyads interact to win real money ($10-$40). Player 1 moves first, either taking a safe (untrusting) option to assign money to each player ($10), or the riskier (trusting) option of passing to Player 2. If this happens (subgame initiation), Player 2 can either reciprocate the trust by assigning themselves $25 and Player 2 $15 or take all $40 (dominant strategy). This is also a non-zero sum where the best mutual outcome is contingent upon Player 1's trust, and Player 2's cooperation.

Iowa Gambling Task. Participants are sequentially presented with 100 virtual cards from four decks on a computer screen. Each deck of cards has a different win to loss ratio. Some cards offer more money but a high chance of losing money, and others vice versa. Riskier (two of the four) decks are defined as disadvantageous as they lead to long-term losses, while safer (other two) decks are considered advantageous given they lead to long-term profits. Measures of performance are money earnt overall, and ratio of advantageous to disadvantageous decks [(disadvantageous - advantageous)].

Table C.2

TDM-IV Confirmatory Factor Analysis Model Fit Estimates by Dataset

Study		Model	Fit Estimates						Correlations		ANOVA	
Author (s)	Year		χ^2	p	CFI	NNFI	SRMR	RMSEA [95% CI]	Views & Tactics	Items 6 & 7	χ^2 Diff	p
Ashton, Lee, & Son	2000	Two-factor	116.16	< .001	.905	.870	.051	.067 [.054, .080]	.70	.08		
		One-factor	179.12	< .001	.834	.780	.062	.087 [.074, .099]			62.97	< .001
Bizumic & Fung	2016	Two-factor	76.20	< .001	.949	.931	.053	.052 [.036, .067]	.53	.45		
		One-factor	173.72	< .001	.835	.782	.077	.091 [.078, .105]			97.52	< .001
Gunnthorsdottir, McCabe, & Smith	2002	Two-factor	40.05	.186	.989	.985	.037	.029 [.000, .056]	.76	.53		
		One-factor	71.72	< .001	.943	.924	.050	.065 [.044, .087]			31.66	< .001
Láng	2015a	Two-factor	69.93	< .001	.919	.890	.060	.065 [.044, .086]	.48	.34		
		One-factor	132.65	< .001	.785	.715	.086	.104 [.086, .123]			62.72	< .001
Láng & Birkás	2014	Two-factor	49.36	.033	.962	.949	.041	.033 [.010, .051]	.44	.03		
		One-factor	127.71	< .001	.784	.714	.065	.078 [.064, .092]			78.35	< .001
Personality testing	2015	Two-factor	684.71	< .001	.983	.977	.027	.041 [.039, .044]	.74	.39		
		One-factor	3348.39	< .001	.913	.884	.055	.092 [.089, .094]			2663.70	< .001
Sellbom	2012	Two-factor	84.29	< .001	.929	.903	.060	.057 [.042, .073]	.38	.43		
		One-factor	163.21	< .001	.820	.762	.078	.090 [.076, .104]			78.93	< .001
Williams	2014a	Two-factor	62.60	.001	.946	.926	.043	.040 [.025, .055]	.37	.47		
		One-factor	131.62	< .001	.821	.763	.069	.072 [.059, .085]			69.02	< .001
Williams	2014b	Two-factor	90.47	< .001	.940	.918	.043	.045 [.034, .056]	.28	.41		
		One-factor	295.89	< .001	.725	.636	.082	.094 [.085, .104]			205.42	< .001
Williams	2015	Two-factor	92.88	< .001	.902	.867	.053	.057 [.044, .071]	.31	.49		
		One-factor	187.72	< .001	.749	.668	.082	.090 [.078, .103]			94.84	< .001
Marginal Fits												
Median		Two-factor	69.93	.002	.940	.918	.053	.053 [.039, .071]	.44	.42		
Range		Two-factor	[40.05, 684.71]	[< .001, .19]	[.902, .989]	[.867, 985]	[.027, .060]	[.029, .067]	[.28, .76]	[.03, .53]		
Median		One-factor	228.06	< .001	.712	.630	.087	.111 [.096, .121]				
Range		One-factor	[142.86, 5681.71]	[< .001, < .001]	[.555, .851]	[.428, .809]	[.063, .103]	[.082, .129]				

Note. $k = 10$. *df* for all two-factor models was 33, and 35 for all one-factor models. Only datasets with a power for estimating the model that exceeded .80 were included. Correlations between items 6 and 7 (far right column) represents correlations between error terms, for the two-factor models. χ^2 difference tests the difference between the one and two-factor models.

Table C.3

Mach-IV Confirmatory Factor Analysis Model Fit Estimates by Dataset

Study		Model	Fit Estimates					
Author (s)	Year		χ^2	p	CFI	NNFI	SRMR	RMSEA [95% CI]
Ashton, Lee, & Son	2000	Three-factor	604.83	< .001	.728	.690	.066	.068 [.062, .074]
		One-factor	651.15	< .001	.701	.665	.067	.071 [.065, .076]
Bizumic & Fung	2016	Three-factor	960.22	< .001	.562	.502	.103	.098 [.092, .104]
		One-factor	1013.05	< .001	.535	.480	.100	.100 [.095, .107]
Gunnthorsdottir, McCabe, & Smith	2002	Three-factor	456.19	< .001	.765	.733	.074	.082 [.073, .091]
		One-factor	492.54	< .001	.738	.708	.075	.086 [.077, .094]
Láng	2015a	Three-factor	609.85	< .001	.596	.540	.094	.100 [.091, .108]
		One-factor	623.96	< .001	.586	.537	.094	.100 [.092, .109]
Láng & Birkás	2014	Three-factor	550.59	< .001	.680	.636	.070	.071 [.055, .078]
		One-factor	566.31	< .001	.670	.631	.071	.072 [.065, .078]
Personality testing	2015	Three-factor	10153.10	< .001	.868	.850	.051	.072 [.071, .073]
		One-factor	11927.92	< .001	.844	.826	.053	.077 [.073, .086]
Sellbom	2012	Three-factor	621.40	< .001	.662	.615	.083	.076 [.070, .082]
		One-factor	673.60	< .001	.625	.581	.082	.079 [.069, .081]
Williams	2014a	Three-factor	617.41	< .001	.563	.502	.080	.070 [.064, .076]
		One-factor	698.53	< .001	.487	.426	.076	.075 [.069, .081]
Williams	2014b	Three-factor	894.46	< .001	.587	.531	.076	.071 [.066, .075]
		One-factor	1051.41	< .001	.500	.441	.078	.077 [.073, .082]
Williams	2015	Three-factor	641.10	< .001	.562	.501	.078	.072 [.066, .077]
		One-factor	743.95	< .001	.469	.407	.081	.078 [.073, .083]
Marginal Fits								
Median		Three-factor	619.40	.629	.578	.077	.072	.629 [.068, .078]
Range		Three-factor	[456.19, 10153.10]	[< .001, < .001]	[.562, .868]	[.501, .850]	[.051, .103]	[.068, .100]
Median		One-factor	.686	.605	.559	.077	.078	.605 [.073, .083]
Range		One-factor	[492.54, 11927.92]	[< .001, < .001]	[.469, .844]	[.407, .826]	[.053, .100]	[.071, .100]

Note. $k = 10$. *df* for all three-factor models was 167, and 170 for all one-factor models. For the three-factor structure, models 1:8 were not positive definite, and therefore could not be estimated properly.

Author(s) and Year	Males		Females		Female	Male	SMD [95% CI]
	Mean	SD	Mean	SD			
Ashton, Lee, & Son, 2000	3.28	0.73	3.29	0.61			-0.0 [-0.2, 0.2]
Austin, Farrelly, Black, & Moore (a), 2007	2.74	0.55	2.4	0.49			0.8 [0.5, 1.2]
Austin, Farrelly, Black, & Moore (b), 2007	2.57	0.57	2.38	0.49			0.5 [0.2, 0.8]
Birkas, Csatho, Gacs, and Bereczkei, 2015	3.49	0.75	3.34	0.67			0.3 [-0.2, 0.8]
Bizumic & Fung, 2016	3.65	0.82	3.32	0.75			0.5 [0.3, 0.8]
Gunnthorsdottir, McCabe, & Smith, 2002	3.32	1	3.05	0.93			0.3 [0.0, 0.6]
Lang, 2015	3.46	0.9	3.3	0.84			0.2 [-0.1, 0.5]
Lang & Birkas, 2014	3.76	0.78	3.62	0.79			0.2 [-0.0, 0.5]
Lau & Marsee, 2013	2.37	0.58	2.3	0.52			0.2 [-0.3, 0.6]
Lee and Ashton, 2004	2.63	0.57	2.42	0.48			0.5 [0.1, 0.8]
Personality Testing, 2015	3.39	0.8	3.07	0.77			0.4 [0.4, 0.5]
Willams (a), 1994	2.53	0.46	2.45	0.4			0.3 [0.0, 0.5]
Willams (b), 1994	2.53	0.47	2.43	0.4			0.3 [0.1, 0.5]
Willams (c), 1995	2.58	0.45	2.47	0.4			0.3 [0.1, 0.6]
RE Model for All Studies (k = 14, Q = 33.48, df = 13, p <.01; I^2 = 61.8%)							0.3 [0.2, 0.4]

Figure C.1. Forest plot for the effect of gender on Machiavellianism (TDM-IV) based on standardised mean differences (SMD). RE = Random Effects. Estimates are before adjusting for the moderator. See text for final estimates. CI = confidence interval. Austin, Farrelly, Black, and Moore (2007) (a) and (b) refer to Dataset 1 and 2, respectively. Lang (2015) refers to Lang 2015a.

	Males		Females					
Author(s) and Year	Mean	SD	Mean	SD	Female	Male		SMD [95% CI]
Ashton, Lee, & Son, 2000	3.39	0.83	3.33	0.71				0.1 [-0.1, 0.3]
Austin, Farrelly, Black, & Moore (a), 2007	2.71	0.65	2.33	0.53				0.9 [0.5, 1.3]
Austin, Farrelly, Black, & Moore (b), 2007	2.58	0.65	2.33	0.57				0.6 [0.3, 0.8]
Birkas, Csatho, Gacs, and Bereczkei, 2015	3.78	0.96	3.74	0.95				0.1 [-0.4, 0.5]
Bizumic & Fung, 2016	3.74	0.91	3.37	0.87				0.5 [0.3, 0.8]
Gunnthorsdottir, McCabe, & Smith, 2002	3.62	1.02	3.27	1.01				0.4 [0.1, 0.7]
Lang, 2015	3.88	1.02	3.77	0.99				0.1 [-0.2, 0.4]
Lang & Birkas, 2014	4.15	0.91	4.13	0.98				0.0 [-0.2, 0.3]
Lau & Marsee, 2013	2.47	0.7	2.46	0.63				0.0 [-0.4, 0.5]
Lee and Ashton, 2004	2.8	0.67	2.5	0.59				0.6 [0.2, 1.0]
Personality Testing, 2015	3.44	0.84	3.14	0.82				0.4 [0.4, 0.4]
Willams (a), 1994	2.66	0.59	2.59	0.5				0.2 [-0.1, 0.4]
Willams (b), 1994	2.65	0.57	2.55	0.48				0.3 [0.0, 0.5]
Willams (c), 1995	2.66	0.55	2.63	0.51				0.1 [-0.2, 0.4]

RE Model for All Studies (k = 14, Q = 41.56, df = 13, p <.01; I^2 = 75.1%)   0.3 [0.2, 0.4]

-3.0   -2.0   -1.0   0.0   1.0   2.0

Standardized Mean Difference (SMD)

Figure C.2. Forest plot for the effect of gender on Machiavellian views based on standardised mean differences (SMD). RE = Random Effects. Estimates are before adjusting for the moderator. See text for final estimates. CI = confidence interval. Austin, Farrelly, Black, and Moore (2007) (a) and (b) refer to Dataset 1 and 2, respectively. Lang (2015) refers to Lang 2015a.

Author(s) and Year	Males		Females				SMD [95% CI]
	Mean	SD	Mean	SD	Female	Male	
Ashton, Lee, & Son, 2000	3.11	0.85	3.22	0.8			-0.2 [-0.4, 0.1]
Austin, Farrelly, Black, & Moore (a), 2007	2.79	0.71	2.52	0.73			0.4 [0.1, 0.8]
Austin, Farrelly, Black, & Moore (b), 2007	2.55	0.88	2.45	0.74			0.2 [-0.1, 0.4]
Birkas, Csatho, Gacs, and Bereczkei, 2015	3.05	1.06	2.73	0.77			0.5 [-0.0, 0.9]
Bizumic & Fung, 2016	3.52	1.14	3.24	1.01			0.3 [0.1, 0.6]
Gunnthorsdottir, McCabe, & Smith, 2002	2.85	1.27	2.7	1.18			0.1 [-0.2, 0.4]
Lang, 2015	2.84	1.26	2.6	1.05			0.2 [-0.1, 0.6]
Lang & Birkas, 2014	3.19	1.05	2.85	1			0.5 [0.2, 0.7]
Lau & Marsee, 2013	2.21	0.76	2.05	0.77			0.3 [-0.2, 0.7]
Lee and Ashton, 2004	2.38	0.68	2.3	0.55			0.2 [-0.3, 0.6]
Personality Testing, 2015	3.32	1	2.95	0.95			0.4 [0.4, 0.5]
Willams (a), 1994	2.35	0.6	2.25	0.58			0.2 [-0.0, 0.5]
Willams (b), 1994	2.34	0.63	2.25	0.62			0.2 [-0.0, 0.4]
Willams (c), 1995	2.45	0.61	2.23	0.61			0.4 [0.2, 0.7]
RE Model for All Studies (k = 14, Q = 39.67, df = 13, p <.01; I^2 = 63.9%)							0.3 [0.2, 0.4]

Standardized Mean Difference (SMD)

-3.0   -2.0   -1.0   0.0   1.0   2.0

Figure C.3. Forest plot for the effect of gender on Machiavellian tactics based on standardised mean differences (SMD). RE = Random Effects. Estimates are before adjusting for the moderator. See text for final estimates. CI = confidence interval. Austin, Farrelly, Black, and Moore (2007) (a) and (b) refer to Dataset 1 and 2, respectively. Lang (2015) refers to Lang 2015a.
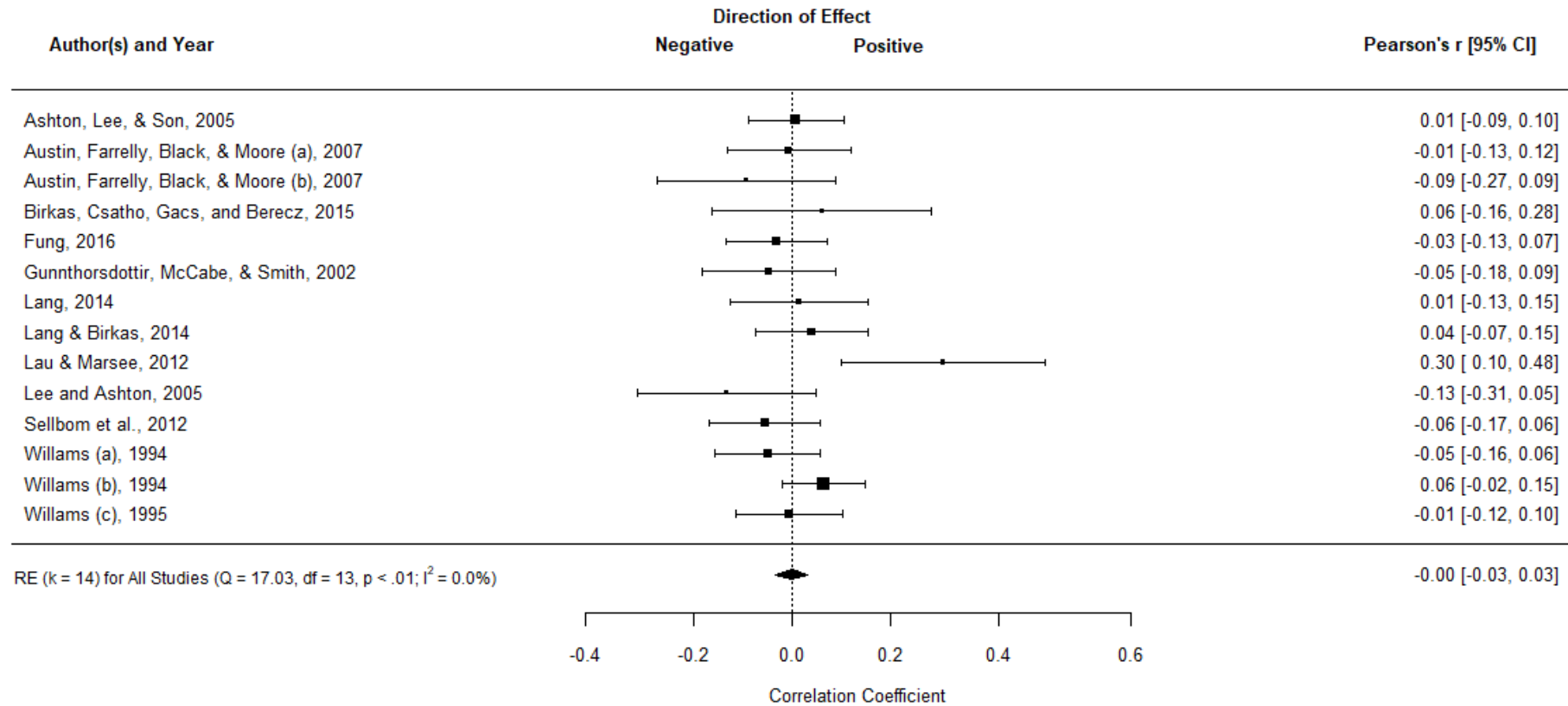
Figure C.4. Forest plot for the effect of age on Machiavellianism (TDM-IV). RE = Random Effects. Estimates are before adjusting for the moderator. See text for final estimates. CI = confidence interval. Austin, Farrelly, Black, and Moore (2007) (a) and (b) refer to Dataset 1 and 2, respectively. Lang (2015) refers to Lang 2015a.
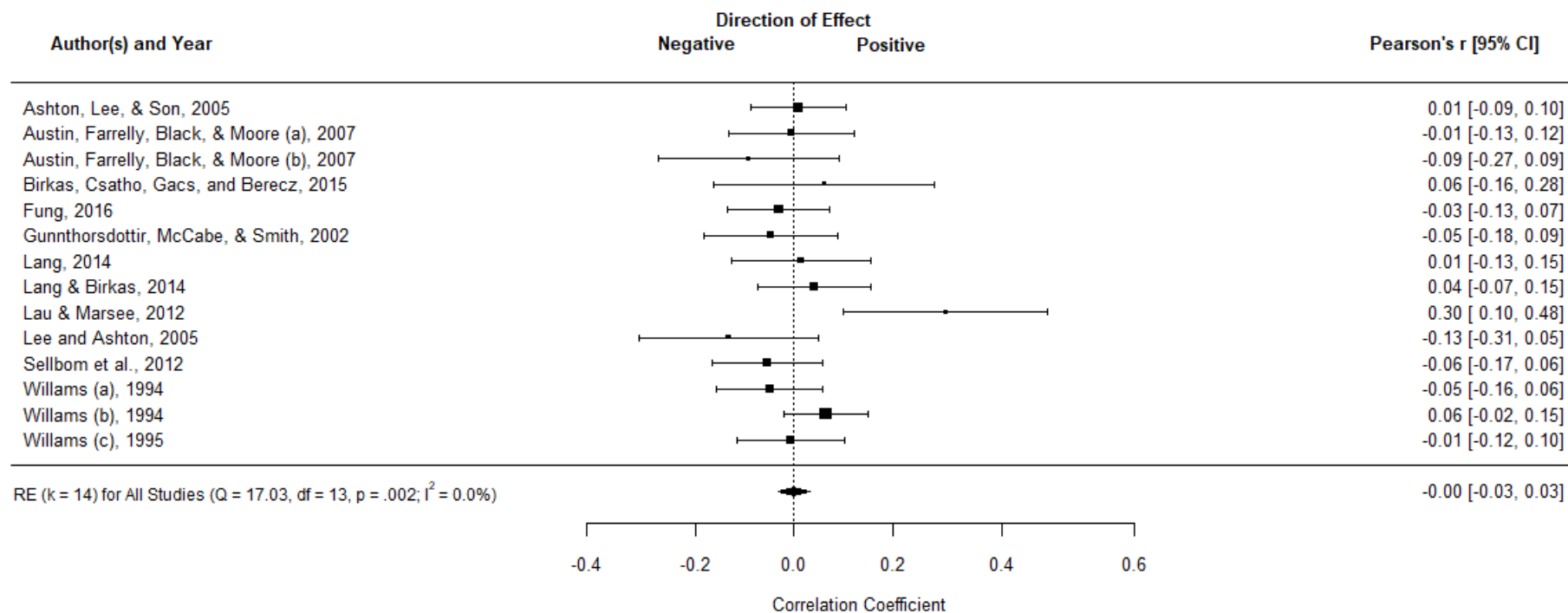
Figure C.5. Forest plot for the effect of age on Machiavellian Views (TDM-IV Views Subscale). RE = Random Effects. Estimates are before adjusting for the moderator. See text for final estimates. CI = confidence interval. Austin, Farrelly, Black, and Moore (2007) (a) and (b) refer to Dataset 1 and 2, respectively. Lang (2015) refers to Lang 2015a.
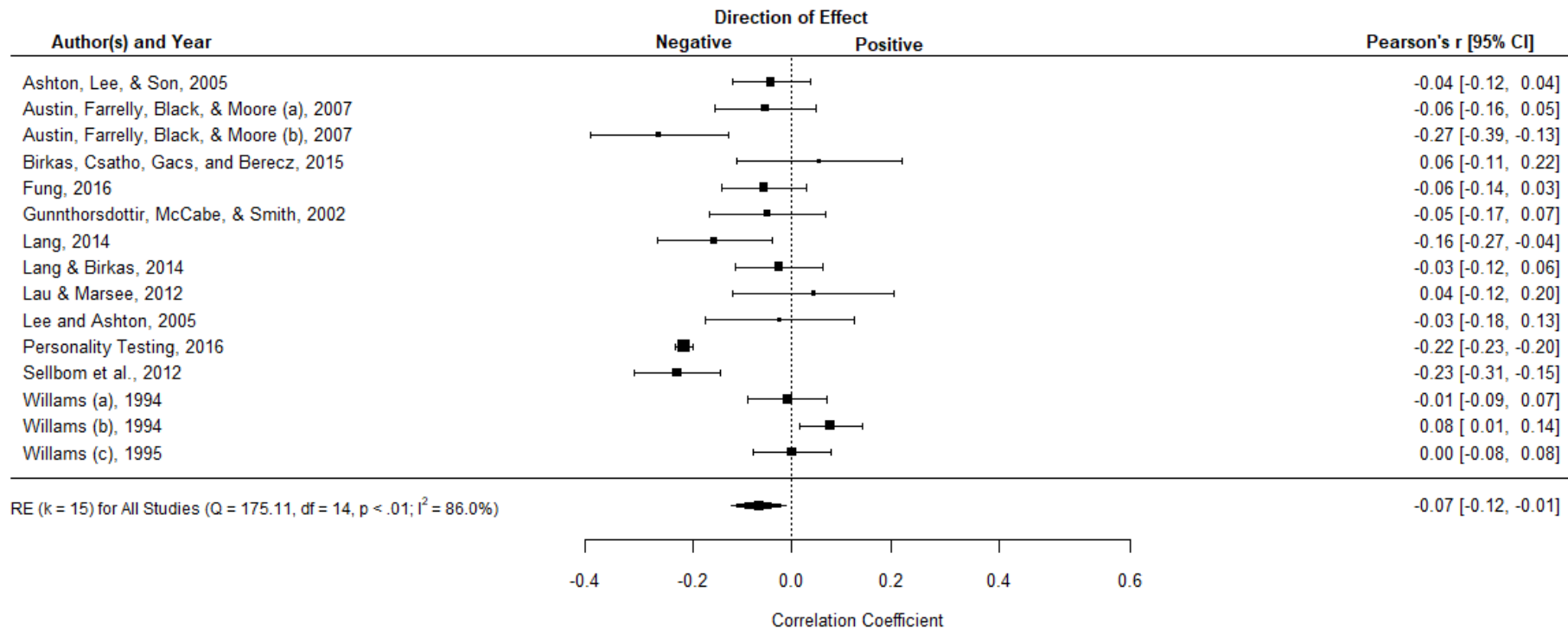
Figure C.6. Forest Plot for the Effect of Age on Machiavellian Tactics (TDM-IV Tactics Subscale). RE = Random Effects. Estimates are before adjusting for the moderator. See text for final estimates. CI = confidence interval. Austin, Farrelly, Black, and Moore (2007) (a) and (b) refer to Dataset 1 and 2, respectively. Lang (2015) refers to Lang 2015a.

Estimates of Demographic Influences on Machiavellianism Without Co-variates or Excluded Datasets

Gender. Barebones (only weighted by sample size) estimates for TDM-IV on Gender: $\hat{g}$ = .36 [.30, .42], SE = .031, Q(13) = 49.988, $p < .01$, I^2 = 71.58%, τ^2 = .020 [.009, .039]. Views: $\hat{g}$ = .31 [.24, .37], SE = .033, Q(13) = 55.31, $p < .001$, I^2 = 74.42%, τ^2 = .023 [.011, .044]. Tactics: $\hat{g}$ = .32 [.25, .38], SE = .033, Q(13) = 56.74, $p < .001$, I^2 = 75.04%, τ^2 = .024 [.012, .045].

Age. Age estimates with all datasets ($k = 15$) and covariates: TDM-IV: ρ = -.07 [-.25, .12], Q(12) = 118.60, $p < .001$, I^2 = 84.79%, τ^2 = .016; views: ρ = -.01 [-.15, .17], Q(12) = 83.930, $p < .01$, I^2 = 75.62%, τ^2 = .001. Removing one sample (Lau & Marsee, 2013) reduced I^2 estimates substantially from each meta-analysis given a positive effect of age. Further, the removed Personality Testing (2015) dataset had significant negative effects for age on all aspects of Machiavellianism. Estimates of tactics dimension included all samples.

Barebones (only weighted by sample size) parameters for: TDM-IV: $\hat{r}$ = -.02 [-.07, .02], SE = .023, Q(13) = 39.34, $p < .01$, I^2 = 64.19%, τ^2 = .005 [.002, .011]; views: $\hat{r}$ = .00 [-.03, .03], SE = .015, Q(13) = 18.438, $p = .142$, I^2 = 23.52%, τ^2 = .001 [.000, .004]; tactics: $\hat{r}$ = -.16 [-.22, .11], SE = .026, Q(14) = 177.794, $p < .01$, I^2 = 91.95%, τ^2 = .018 [.012, .027].

Regression estimates including Sellbom et al. (2012): $TDM - IV_{7-point}$, β = -.16, SE =.00, t = -7.73, $p < .001$; $views_{7-point}$, β = -.05, SE =.00, t = -2.57, p = .01; and $tactics_{7-point}$, β = -.23, SE =.00, t = -11.11, $p < .001$. Machiavellianism regressed on age without gender covariate: $TDM - IV_{5-point}$, β = -.12, SE =.01, t = -13.04, $p < .001$; $TDM - IV_{7-point}$, β = -.07, SE =.02, t = -3.30, $p < .001$; $views_{5-point}$, β = -.11, SE =.00, t = -12.32, $p < .001$; $views_{7-point}$, β = -.04, SE =.02, t = -1.78, p = .075; $tactics_{5-point}$, β = -.09, SE =.01, t = -10.79, $p < .001$; and $tactics_{7-point}$, β = -.09, SE =.02, t = -3.92, $p < .001$.

ANCOVA Results for Cultural Comparisons

Table C.4

Adjusted Means for TDM-IV after Controlling for Gender

Culture	Adj. Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Korean	3.27 (3.28)	.028 (.029)	3.22 (3.23)	3.33 (3.34)
Hungarian	3.62 (3.62)	.032 (.032)	3.55 (3.56)	3.68 (3.69)
Australian	3.43 (3.41)	.035 (.036)	3.36 (3.33)	3.50 (3.48)
US	3.15 (3.16)	.062 (.019)	3.02 (3.04)	3.27 (3.27)

Note. Estimates are based on adjusting gender (gender = .61) and bootstrapping (1000 samples). Adj. = Adjusted. Std. = Standard. Parameters in brackets are estimated without the gender covariate, $F(3,1898) = 19.73$, $p < .001$, $\eta^2_{partial} = .04$.

Table C.5

Post-Hoc Comparisons for TDM-IV after Controlling for Gender

Culture for Comparison		Mean Difference	Std. Error	Significance	95% Confidence Interval	
					Lower	Upper
Korean	Hungarian	-.34 (-.34)	.04 (.04)	< .001 (< .001)	-.42 (-.43)	-.25 (-.25)
	Australian	-.15 (-.13)	.05 (.05)	.002 (.004)	-.24 (-.22)	-.06 (-.04)
	US	.12 (.13)	.07 (.07)	.081 (.063)	-.01 (-.01)	.26 (.26)
Hungarian	Korean	.34 (.34)	.04 (.04)	< .001 (< .001)	.25 (.25)	.42 (.42)
	Australian	.19 (.21)	.05 (.05)	< .001 (< .001)	.10 (.12)	.28 (.30)
	US	.47 (.46)	.07 (.07)	< .001 (< .001)	.34 (.32)	.61 (.61)
Australian	Korean	.15 (.13)	.05 (.05)	.002 (.004)	.06 (.04)	.24 (.22)
	Hungarian	-.19 (-.21)	.05 (.05)	< .001 (< .001)	-.28 (-.30)	-.10 (-.12)
	US	-.28 (-.25)	.07 (.07)	.002 (< .001)	.14 (.12)	.41 (.39)
US	Korean	-.12 (-.13)	.07 (.07)	.081 (.063)	-.26 (-.26)	.01 (.01)
	Hungarian	-.47 (-.46)	.07 (.07)	< .001 (< .001)	-.61 (-.61)	-.34 (-.32)
	Australian	-.28 (-.25)	.07 (.07)	.002 (< .001)	-.41 (-.39)	-.14 (-.12)

Note. Estimates are based on adjusting gender (gender = .61) and bootstrapping (1000 samples). Std. = Standard. Parameters in brackets are estimated without the gender covariate.

Table C.6

Adjusted Means for Views after Controlling for Gender

Culture	Adj. Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Korean	3.16 (3.17)	.032 (.038)	3.28 (3.30)	3.41 (3.42)
Hungarian	4.05 (4.06)	.042 (.037)	3.97 (3.99)	4.13 (4.14)
Australian	3.49 (3.47)	.040 (.041)	3.41 (3.40)	3.57 (3.55)
US	3.41 (3.41)	.063 (.056)	3.28 (3.28)	3.53 (3.54)

Note. Estimates are based on adjusting gender (gender $= .61$) and bootstrapping (1000 samples). Adj. = Adjusted. Std. = Standard. Parameters in brackets are estimated without the gender covariate, $F(3,1898) = 17.83$, $p < .001$, $\eta^2_{partial} = .10$.

Table C.7

Post-Hoc Comparisons for Views after Controlling for Gender

Culture	for Comparison	Mean Difference	Std. Error	Significance	95% Confidence Interval	
					Lower	Upper
Korean	Hungarian	-.71 (-.70)	.05 (.05)	< .001 (< .001)	-.81 (-.80)	-.60 (-.60)
	Australian	-.14 (-.12)	.05 (.05)	.011 (.035)	-.24 (-.22)	-.04 (-.01)
	US	-.06 (-.05)	.07 (.07)	.386 (.482)	-.20 (-.19)	.07 (.09)
Hungarian	Korean	.71 (.70)	.05 (.05)	< .001 (< .001)	.60 (.60)	.81 (.80)
	Australian	.56 (.59)	.06 (.06)	< .001 (< .001)	.45 (.48)	.67 (.70)
	US	.64 (.65)	.07 (.08)	< .001 (< .001)	.50 (.50)	.79 (.81)
Australian	Korean	.14 (.12)	.05 (.05)	.011 (.035)	.04 (.22)	.24 (.22)
	Hungarian	-.56 (-.59)	.06 (.06)	< .001 (< .001)	-.67 (-.48)	-.45 (-.48)
	US	.08 (.06)	.07 (.08)	.280 (.408)	-.06 (.22)	.22 (.22)
US	Korean	.06 (.05)	.07 (.07)	.386 (.482)	-.07 (-.09)	.20 (.19)
	Hungarian	-.64 (-.65)	.08 (.08)	< .001 (< .001)	-.79 (-.81)	-.50 (-.50)
	Australian	-.08 (-.06)	.07 (.08)	.280 (.408)	-.22 (-.22)	.06 (.08)

Note. Estimates are based on adjusting gender (gender $= .61$) and bootstrapping (1000 samples). Std. = Standard. Parameters in brackets are estimated without the gender covariate. Parameters in brackets are estimated without the gender covariate.

Table C.8

Adjusted Means for Tactics after Controlling for Gender

Culture	Adj. Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Korean	3.16 (3.17)	.035 (.042)	3.09 (3.11)	3.23 (3.24)
Hungarian	3.00 (2.96)	.041 (.042)	2.88 (2.87)	3.04 (3.05)
Australian	3.33 (3.31)	.047 (.045)	3.24 (3.22)	3.42 (3.41)
US	2.76 (2.77)	.076 (.062)	2.62 (3.62)	2.92 (2.93)

Note. Estimates are based on adjusting gender (gender = .61) and bootstrapping (1000 samples). Adj. = Adjusted. Std. = Standard. Parameters in brackets are estimated without the gender covariate, $F(3,1898) = 25.69$, $p < .001$, $\eta^2_{partial} = .03$.

Table C.9

Post-Hoc Comparisons for Tactics after Controlling for Gender

Culture	for Comparison	Mean Difference	Std. Error	Significance	95% Confidence Interval	
					Lower	Upper
Korean	Hungarian	.20 (.21)	.05 (.06)	<.001 (.002)	.08 (.10)	.30 (.33)
	Australian	-.17 (-.15)	.06 (.06)	.005 (.010)	-.30 (-.26)	-.05 (-.03)
	US	.40 (.40)	.08 (.08)	<.001 (<.001)	.23 (.23)	.56 (.56)
Hungarian	Korean	-.20 (-.21)	.05 (.06)	<.001 (.002)	-.30 (-.33)	-.08 (-.10)
	Australian	-.37 (-.36)	.06 (.06)	<.001 (<.001)	-.50 (-.48)	-.25 (-.24)
	US	.20 (.18)	.09 (.09)	.030 (.041)	.01 (.01)	.37 (.36)
Australian	Korean	.17 (.15)	.06 (.06)	.005 (.010)	.05 (.03)	.30 (.26)
	Hungarian	.37 (.36)	.06 (.06)	<.001 (<.001)	.25 (.24)	.50 (.48)
	US	.57 (.54)	.09 (.09)	<.001 (<.001)	.39 (.36)	.74 (.72)
US	Korean	-.40 (-.40)	.08 (.08)	<.001 (<.001)	-.56 (-.56)	-.23 (-.23)
	Hungarian	-.20 (-.18)	.08 (.09)	.030 (.041)	-.37 (-.36)	-.01 (-.01)
	Australian	-.57 (-.54)	.09 (.09)	<.001 (<.001)	-.74 (-.72)	-.39 (-.36)

Note. Estimates are based on adjusting gender (gender = .61) and bootstrapping (1000 samples). Std. = Standard. Parameters in brackets are estimated without the gender covariate.

Nomological Network SEM Model Fit Estimates

Table C.10

Behavioural Domain

| Sub-Domain | Scale | Subscale | Fit Estimates | | | | | | | | Dataset |
			χ^2	p	CFI	NNFI	SRMR	RMSEA	RMSEA Lower CI	RMSEA Upper CI	
Self-report	EMS	EM	112.746	< .001	.878	.837	.068	.072	.057	.088	4
	SPSRQ		106.875	< .001	.727	.634	.117	.112	.087	.139	7
		Punishment	84.942	< .001	.743	.656	.087	.092	.064	.119	7
		Reward	89.956	< .001	.740	.651	.090	.097	.069	.124	7
Behaviour	Prisoner's		79.811	< .001	.940	.919	.056	.051	.034	.067	13

Note. Datasets: 4 = Austin et al. (2007b); 7 = Birkás et al. (2015); 13 = Bizumic and Fung (2016). *df* for all models was 41. Dependent latent variance was estimated using (1-α)*indicator variance.

Table C.11

Personality Domain

Sub-Domain	Scale	Subscale	Fit Estimates								Dataset
			χ^2	p	CFI	NNFI	SRMR	RMSEA	RMSEA Lower CI	RMSEA Upper CI	
Broad	Big Five	Conscientiousness	66.170	.008	.907	.875	.070	.062	.032	.089	1
			129.832	< .001	.850	.799	.073	.081	.065	.096	4
			91.859	< .001	.936	.914	.056	.051	.037	.065	9
		Agreeableness	56.012	.059	.947	.929	.060	.048	.001	.077	1
			47.145	.236	.980	.973	.052	.028	.001	.060	3
			111.074	< .001	.885	.846	.068	.072	.056	.088	4
			94.314	< .001	.936	.915	.057	.052	.039	.066	9
		Neuroticism	60.684	.024	.923	.897	.067	.055	.020	.083	1
			60.610	.025	.932	.908	.058	.050	.019	.076	3
			118.174	< .001	.862	.816	.071	.075	.059	.091	4
			89.264	< .001	.933	.910	.056	.050	.036	.064	9
		Extraversion	52.681	.104	.952	.936	.060	.042	.001	.073	1
			50.631	.144	.965	.953	.055	.035	.001	.064	3
			111.781	< .001	.873	.829	.068	.072	.056	.088	4
			100.066	< .001	.919	.891	.059	.055	.042	.069	9
		Openness	55.902	.060	.940	.920	.061	.048	.001	.077	1
			52.631	.105	.956	.941	.053	.039	.001	.067	3
			106.631	< .001	.880	.838	.068	.069	.053	.085	4
			101.660	< .001	.918	.890	.059	.056	.042	.070	9
	HEXACO	Honesty	66.528	.007	.919	.892	.064	.063	.033	.089	1
		Conscientiousness	54.408	.078	.946	.928	.060	.045	.001	.075	1
		Agreeableness	54.082	.083	.949	.931	.060	.045	.001	.075	1
		Emotional Stability	68.113	.005	.902	.869	.067	.065	.036	.091	1
		Openness	52.918	.101	.952	.935	.060	.043	.001	.073	1
		Extraversion	61.879	.019	.921	.894	.065	.057	.024	.084	1
Psychopathy	PPI (total)		95.919	< .001	.939	.918	.053	.053	.039	.067	9
		F-D (PPI-I)	97.006	< .001	.921	.894	.058	.054	.040	.068	9
		I-AS (PPI-II)	93.023	< .001	.941	.921	.057	.052	.038	.066	9
		Cold (PPI-III)	108.804	< .001	.913	.883	.061	.059	.046	.073	9
	LSRP		86.239	< .001	.951	.934	.055	.054	.038	.070	9
			94.322	< .001	.945	.926	.058	.052	.039	.066	13
		Primary	76.168	.001	.907	.875	.068	.074	.047	.099	1
			160.321	< .001	.908	.876	.053	.072	.060	.083	2
			90.405	< .001	.947	.929	.056	.056	.040	.072	9
			95.588	< .001	.943	.923	.058	.053	.039	.067	13
		Secondary	77.667	< .001	.950	.933	.052	.048	.032	.065	9
			92.354	< .001	.935	.913	.056	.052	.038	.066	13
Narcissism	HSNS		70.099	.003	.958	.944	.051	.043	.025	.060	13
	NPI		55.077	.070	.945	.926	.060	.047	.001	.076	1
			99.170	< .001	.921	.893	.058	.055	.041	.069	9

Note. Datasets: 1 = Lee and Ashton (2005); 2 = Ashton, Lee, and Son (2000); 3 = Austin et al. (2007 Dataset 1); 4 = Austin et al. (2007 Dataset 2); 9 = Sellbom et al., (2012); 13 = Bizumic and Fung (2016). *df* for all models was 41. Dependent latent variance was estimated using (1-α)*indicator variance.

Table C.12

Development Domain

Sub-Domain	Scale	Subscale	Fit Estimates								Dataset
			χ^2	p	CFI	NNFI	SRMR	RMSEA	RMSEA Lower CI	RMSEA Upper CI	
Environment	FACES		49.847	.162	.976	.968	.040	.023	.000	.043	5
		Flexibility	49.270	.176	.978	.970	.040	.022	.000	.042	5
		Cohesion	48.635	.193	.980	.973	.039	.021	.000	.042	5
		Family Communication	68.507	.005	.932	.909	.046	.041	.023	.057	5
		Family life	55.016	.071	.964	.951	.042	.029	.000	.047	5
	CATS		66.987	.006	.939	.918	.056	.049	.026	.070	6
		Neglect	66.393	.007	.942	.922	.054	.048	.025	.069	6
		Punishment	68.454	.005	.938	.916	.055	.050	.028	.070	6
		Sexual Abuse	64.846	.010	.945	.927	.053	.046	.023	.067	6
	IPPA	Trust	58.519	.037	.955	.940	.043	.032	.008	.050	5
		Communication	57.979	.041	.956	.941	.043	.032	.007	.050	5
		Alienation	51.314	.130	.973	.963	.040	.025	.000	.044	5
World-view	Belief in Just World		79.245	< .001	.932	.909	.043	.041	.027	.055	10
	Belief in a Dangerous World		175.171	< .001	.873	.829	.053	.061	.052	.071	11
			112.519	< .001	.870	.825	.069	.072	.057	.088	12

Note. Datasets: 5 = Láng and Birkás (2014); 6 = Láng (2015a); 10 = Williams (1994a); 11 = Williams (1994b); 12 = Williams (1995). *df* for all models was 41. Dependent latent variance was estimated using (1-α)*indicator variance.

Table C.13

Emotionality Domain

Sub-Domain	Scale	Subscale	Fit Estimates								Dataset
			χ^2	p	CFI	NNFI	SRMR	RMSEA	RMSEA Lower CI	RMSEA Upper CI	
Intelligence	Bar-On (EQ total)		48.179	.205	.975	.966	.052	.031	.000	.061	3
		Intrapersonal	51.013	.136	.962	.949	.055	.036	.000	.065	3
		Interpersonal	53.238	.095	.960	.946	.055	.040	.000	.068	3
		Stress manage	50.110	.156	.966	.955	.052	.034	.000	.064	3
		Adaptability	47.829	.215	.974	.966	.052	.030	.000	.061	3
		General mood	50.452	.148	.967	.955	.054	.035	.000	.064	3
	MSCEIT		64.812	.010	.920	.893	.060	.056	.027	.080	3
		Experiential	64.906	.010	.918	.890	.061	.056	.028	.080	3
		Strategic	55.377	.066	.950	.933	.055	.043	.000	.070	3
	TEIQue-SF		114.098	< .001	.873	.830	.069	.073	.057	.089	4
Experience	EES		98.351	< .001	.925	.899	.058	.054	.041	.068	9
	External Contingency Focus		77.348	.001	.939	.918	.042	.040	.026	.054	10
			113.324	< .001	.934	.911	.042	.045	.035	.055	11
			120.013	< .001	.884	.845	.052	.059	.047	.071	12
	Global self-esteem		70.573	.003	.950	.932	.041	.036	.021	.050	10
			99.870	< .001	.945	.926	.041	.041	.031	.051	11
			96.403	< .001	.913	.884	.049	.049	.037	.062	12
	EMS	Poor Emotion Skills	109.861	< .001	.876	.833	.068	.071	.055	.087	4
		Concealment	112.519	< .001	.870	.825	.069	.072	.057	.088	4

Note. Datasets: 3 = Austin et al. (2007 Dataset 1); 4 = Austin et al. (2007 Dataset 2); 9 = Sellbom et al. (2012); 10 = Williams (1994a); 11 = Williams (1994b); 12 = Williams (1995). *df* for all models was 41. Dependent latent variance was estimated using (1-α)*indicator variance.
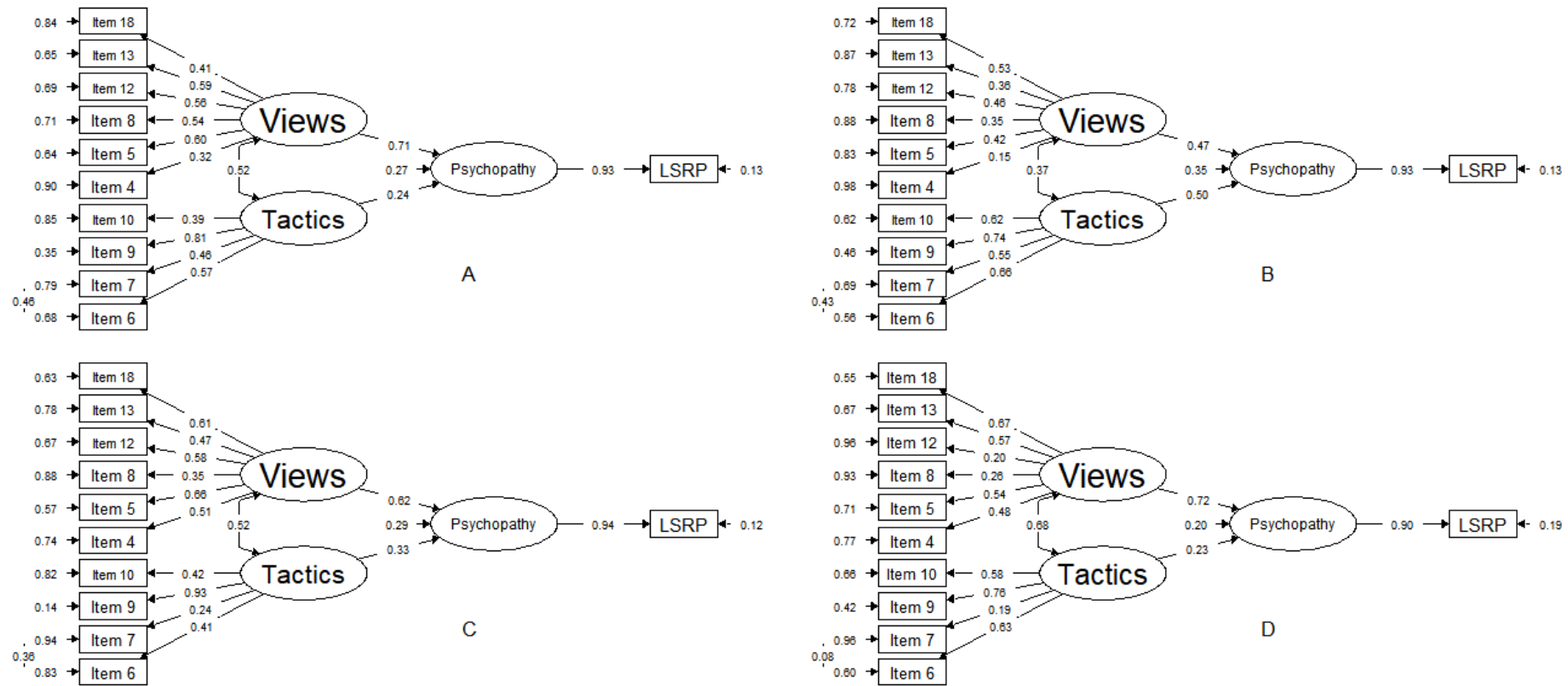
Figure C.7. Figures A (Bizumic and Fung, 2016) and B (Sellbom et al., 2012) estimate psychopathy, Figures C (Lee & Ashton, 2005) and D (Ashton, Lee, & Son, 2000) estimate primary psychopathy. Dependent latent variable was estimated from a single indicator, the mean of the respective scale, with the error variance estimated using $(1-\alpha)*SD^2_{indicator}$. All pathways are standardised. All model fit estimates are in Appendix D.12 and D.13.
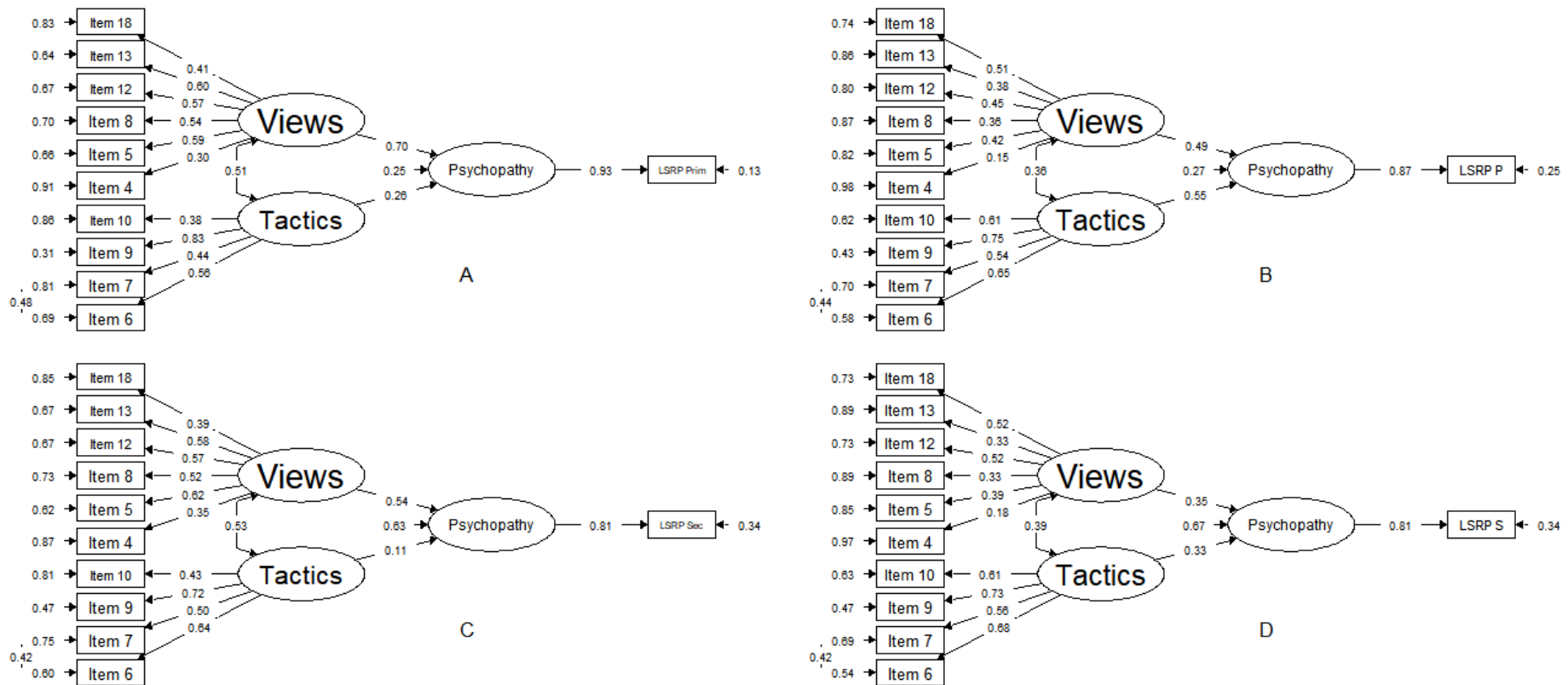
Figure C.8. Figures A (Bizumic & Fung, 2016) and B (Sellbom et al., 2012) are estimates of primary psychopathy, Figures C (Bizumic & Fung, 2016) and D (Sellbom et al., 2012) are estimates of secondary psychopathy. Dependent latent variable was estimated from a single indicator, the mean of the respective scale, with the error variance estimated using $(1-\alpha)*SD^2_{indicator}$. All pathways are standardised. All model fit estimates are in Appendix D.12 and D.13.
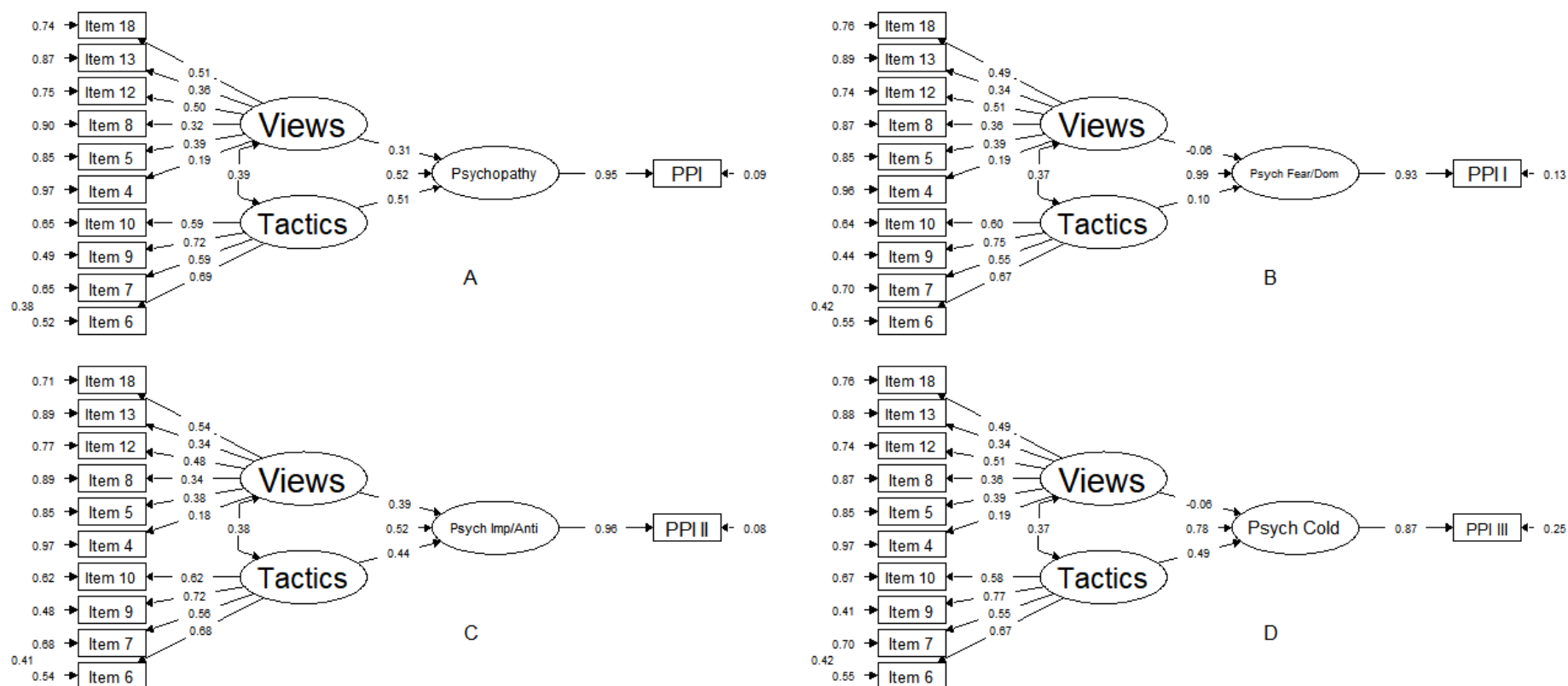
Figure C.9. Figures A, B, C, and D estimate psychopathy using the Psychopathic Personality Inventory (PPI) from Sellbom et al. (2012). Dependent latent variable was estimated from a single indicator, the mean of the respective scale, with the error variance estimated using $(1-\alpha)*SD^2_{indicator}$. All pathways are standardised. All model fit estimates are in Appendix D.12 and D.13.

Figure C.10. Figures A (Lee & Ashton, 2005) and B (Sellbom et al., 2012) estimate narcissism under the Narcissism Personality Inventory (NPI), and C estimates narcissism using the Hypersensitive Narcissism Scale (Bizumic & Fung, 2016). Dependent latent variable was estimated from a single indicator, the mean of the respective scale, with the error variance estimated using $(1-\alpha)*SD^2_{indicator}$. All pathways are standardised. All model fit estimates are in Appendix D.12 and D.13.
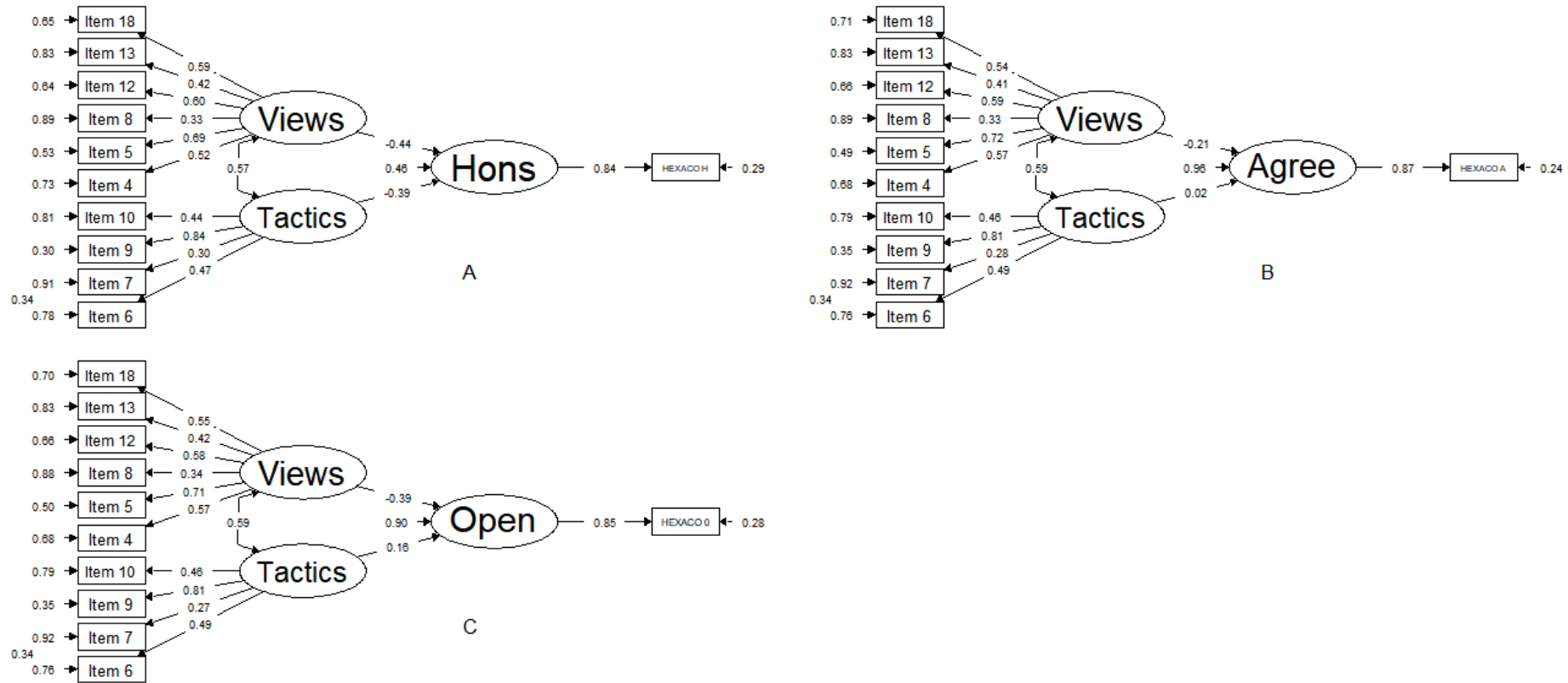
Figure C.11. Under the HEXACO framework, Figure A estimates Honesty / Humility, Figure B estimates Agreeableness, and Figure C estimates Openness to Experience (Lee & Ashton, 2005). Dependent latent variable was estimated from a single indicator, the mean of the respective scale, with the error variance estimated using $(1-\alpha)*SD^2_{indicator}$. All pathways are standardised. All model fit estimates are in Appendix D.12 and D.13.

Figure C.12. Under the HEXACO framework, Figure A estimates Neuroticism, Figure B estimates Extraversion, and Figure C estimates Conscientiousness (Lee & Ashton, 2005). Dependent latent variable was estimated from a single indicator, the mean of the respective scale, with the error variance estimated using $(1-\alpha)*SD^2_{indicator}$. All pathways are standardised. All model fit estimates are in Appendix D.12 and D.13.
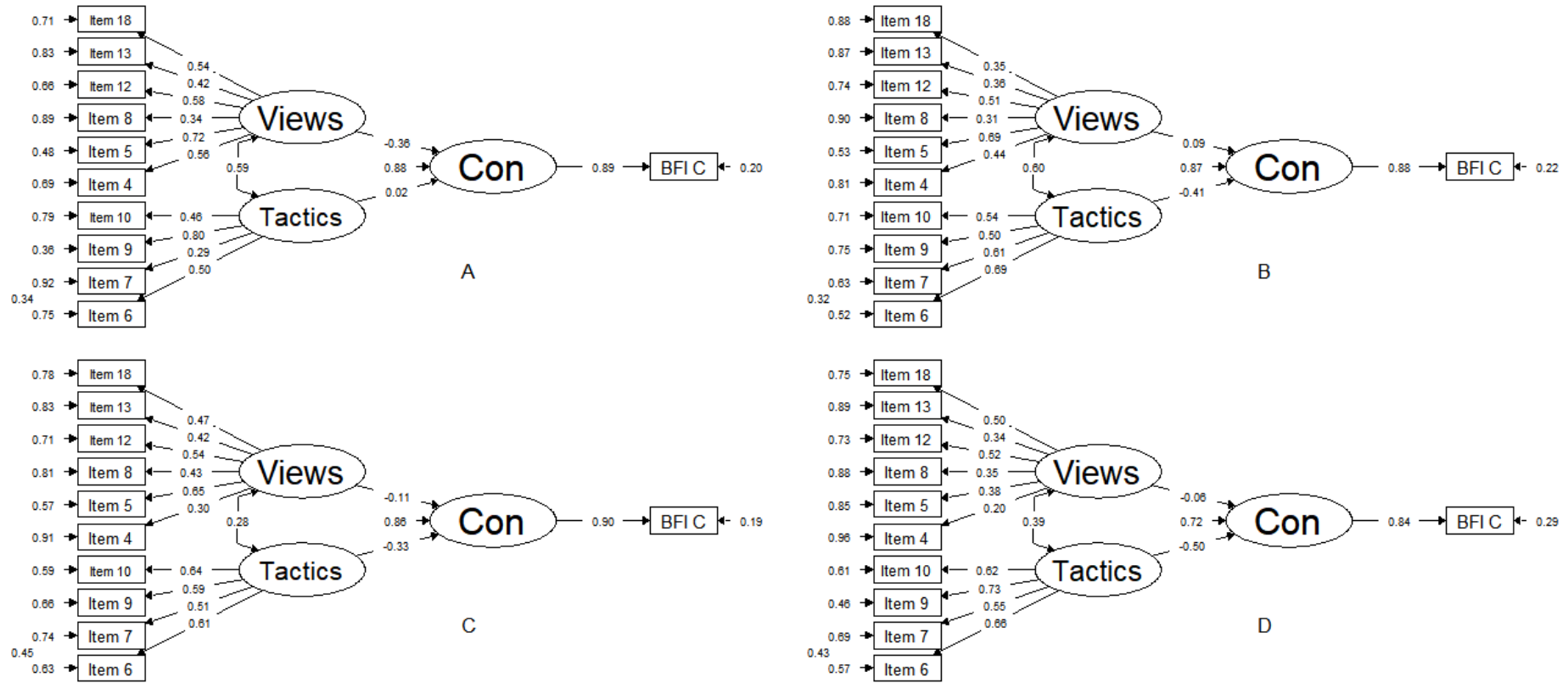
Figure C.13. Figures A (Lee & Ashton, 2005), B (Austin et al., 2007 Dataset 1), C (Austin et al., 2007 Dataset 2), and D (Sellbom et al., 2012), estimate Conscientiousness under the Big 5 framework. Dependent latent variable was estimated from a single indicator, the mean of the respective scale, with the error variance estimated using $(1-\alpha)*SD^2_{indicator}$. All pathways are standardised. All model fit estimates are in Appendix D.12 and D.13.
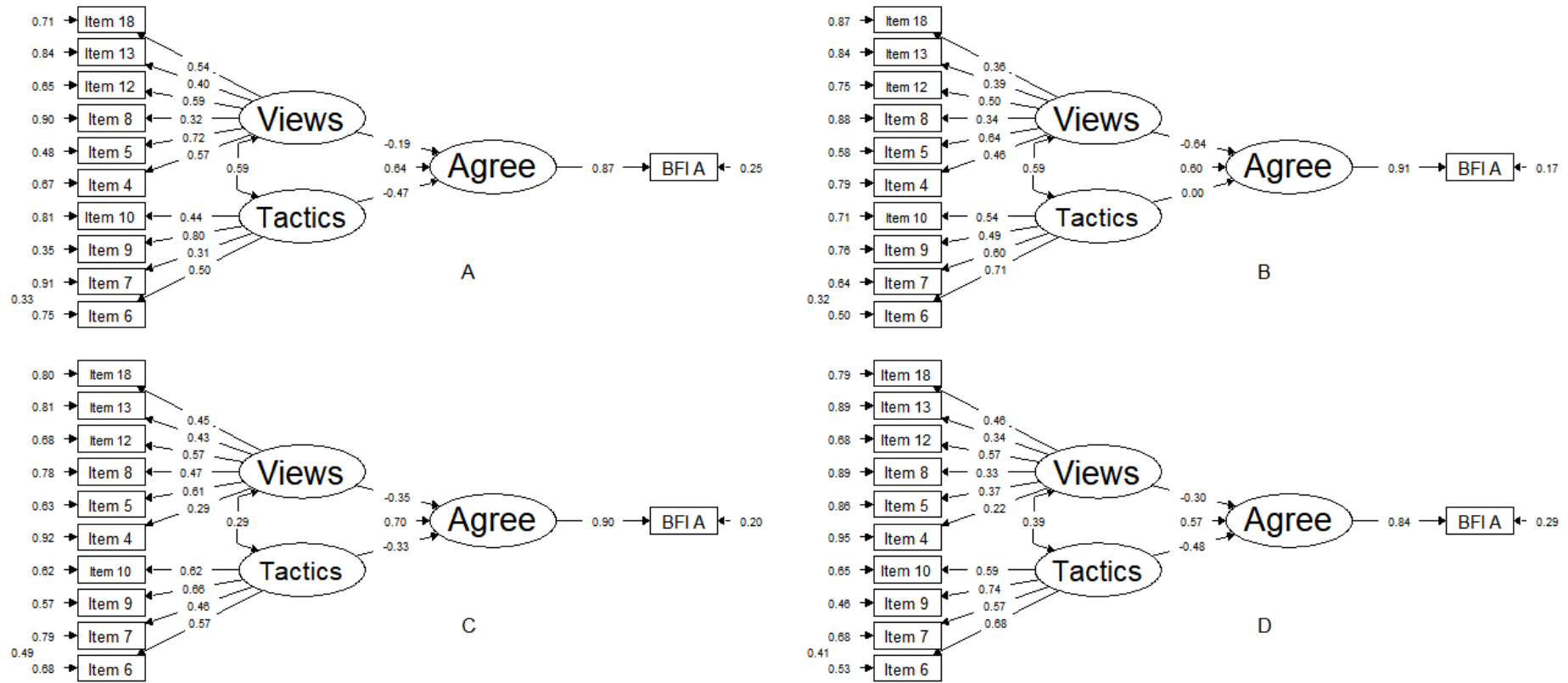
Figure C.14. Figures A (Lee & Ashton, 2005), B (Austin et al., 2007 Dataset 1), C (Austin et al., 2007 Dataset 2), and D (Sell-bom et al., 2012) estimate Agreeableness under the Big 5 framework. Dependent latent variable was estimated from a single indicator, the mean of the respective scale, with the error variance estimated using $(1-\alpha)*SD^2_{indicator}$. All pathways are standardised. All model fit estimates are in Appendix D.12 and D.13.
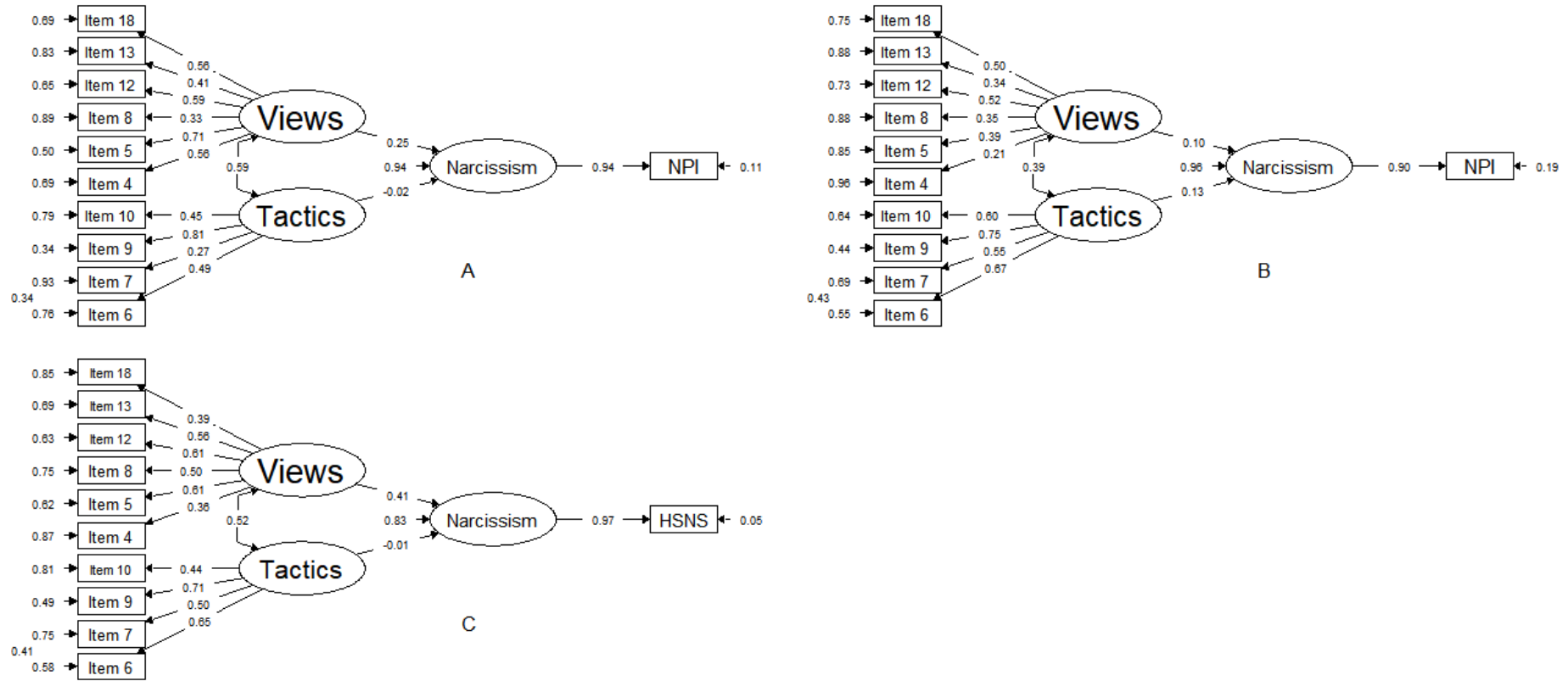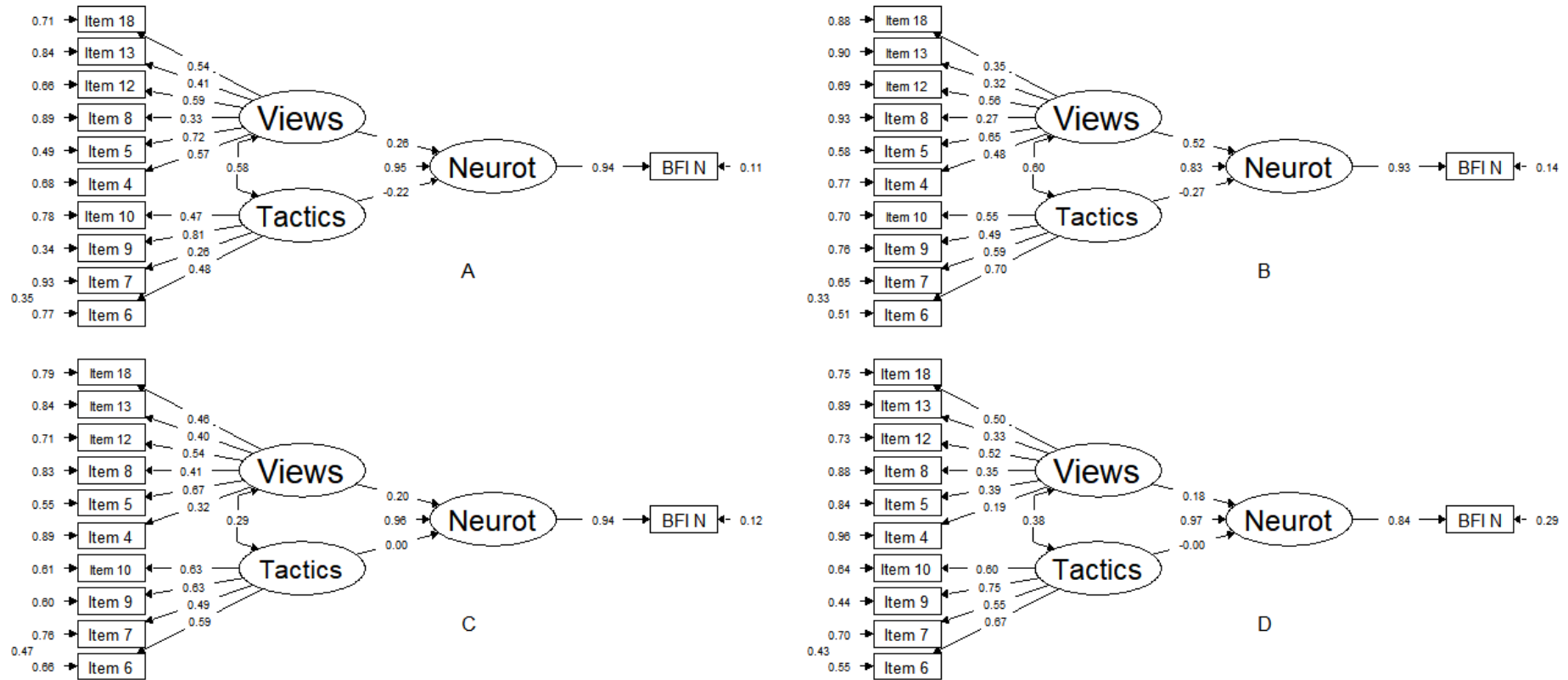
Figure C.15. Figures A (Lee & Ashton, 2005), B (Austin et al., 2007 Dataset 1), C (Austin et al., 2007 Dataset 2), and D (Sellbom et al., 2012) estimate Neuroticism under the Big 5 framework. Dependent latent variable was estimated from a single indicator, the mean of the respective scale, with the error variance estimated using $(1-\alpha)*SD^2_{indicator}$. All pathways are standardised. All model fit estimates are in Appendix D.12 and D.13.
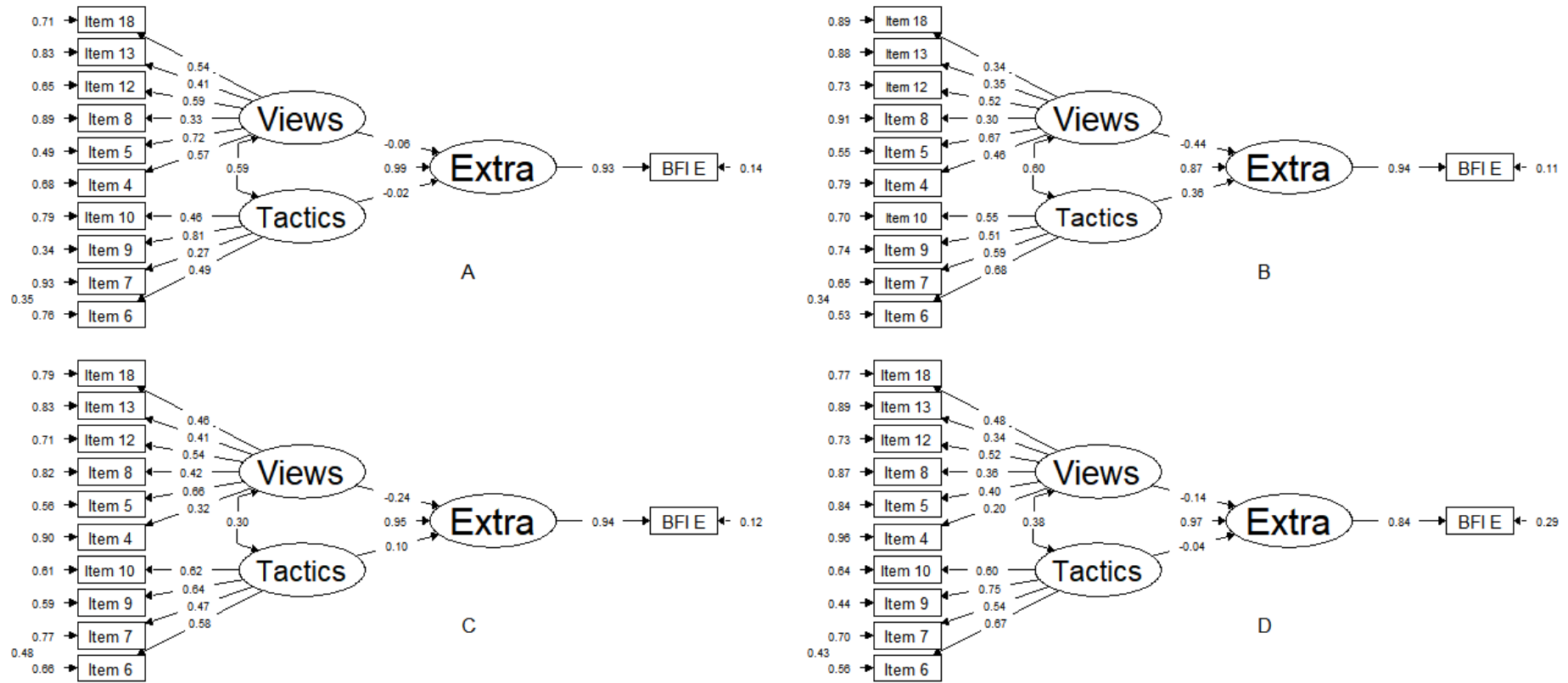
Figure C.16. Figures A (Lee & Ashton, 2005), B (Austin et al., 2007 Dataset 1), C (Austin et al., 2007 Dataset 2), and D (Sellbom et al., 2012) estimate Extraversion under the Big Five framework. Dependent latent variable was estimated from a single indicator, the mean of the respective scale, with the error variance estimated using $(1-\alpha)^*SD^2_{indicator}$. All pathways are standardised. All model fit estimates are in Appendix D.12 and D.13.
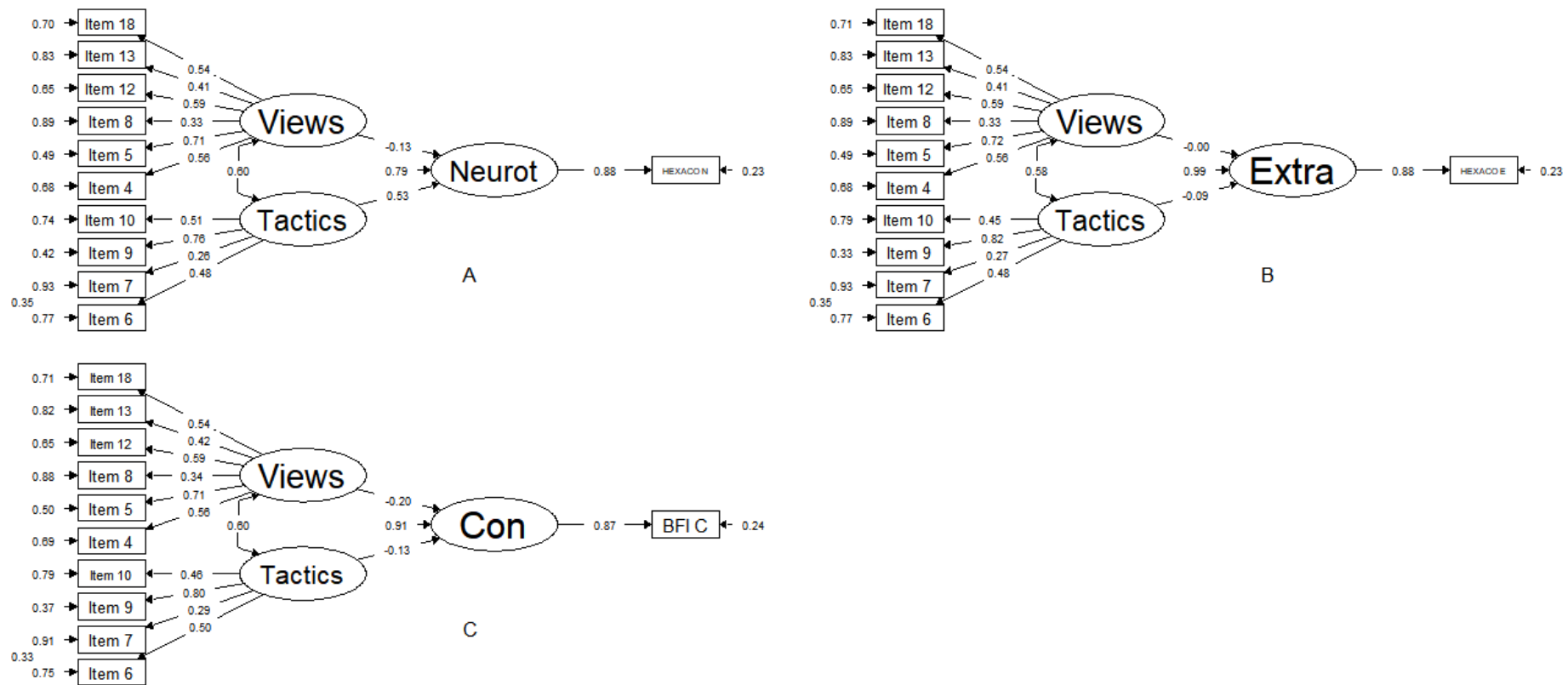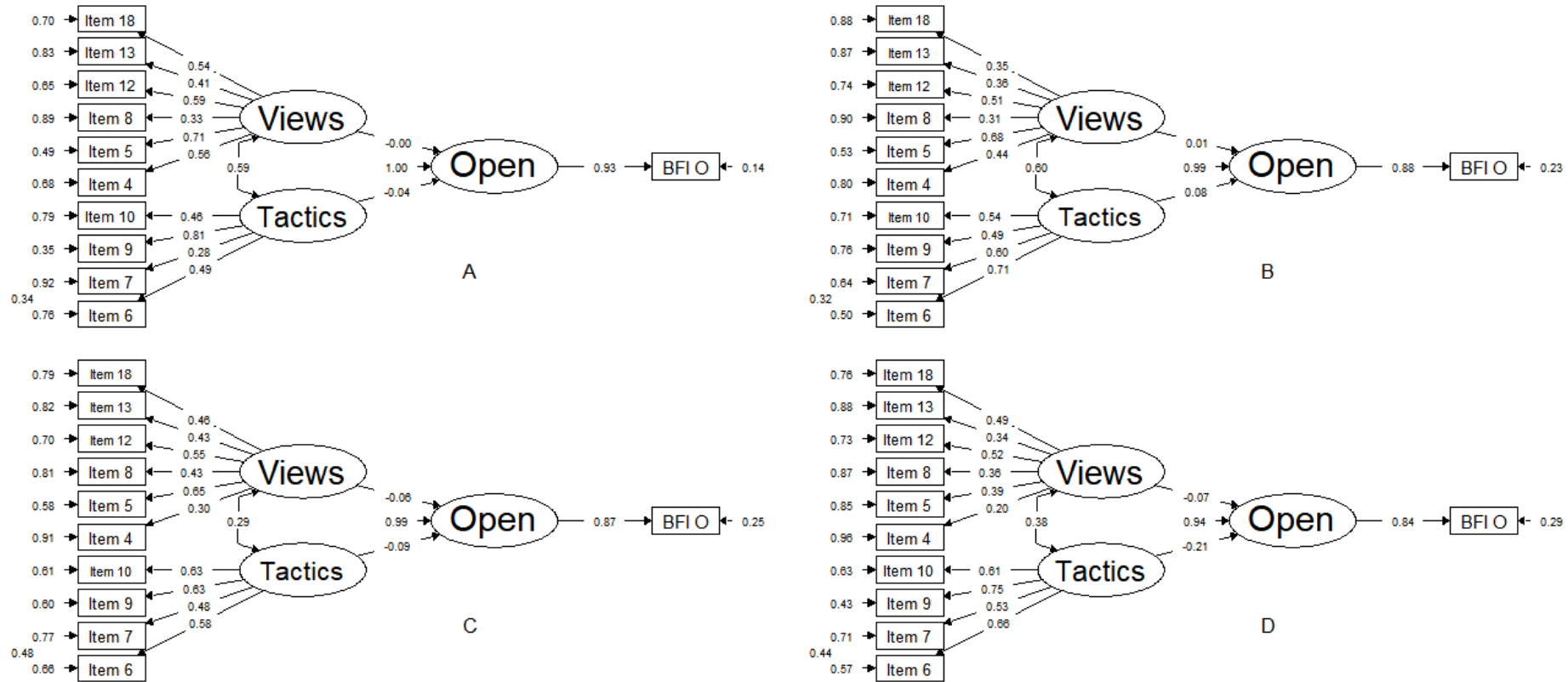
Figure C.17. Figures A (Lee & Ashton, 2005), B (Austin et al., 2007 Dataset 1), C (Austin et al., 2007 Dataset 2), and D (Sell-bom et al., 2012) estimate Openness to Experience under the Big 5 framework. Dependent latent variable was estimated from a single indicator, the mean of the respective scale, with the error variance estimated using $(1-\alpha)*SD^2_{indicator}$. All pathways are standardised. All model fit estimates are in Appendix D.12 and D.13.
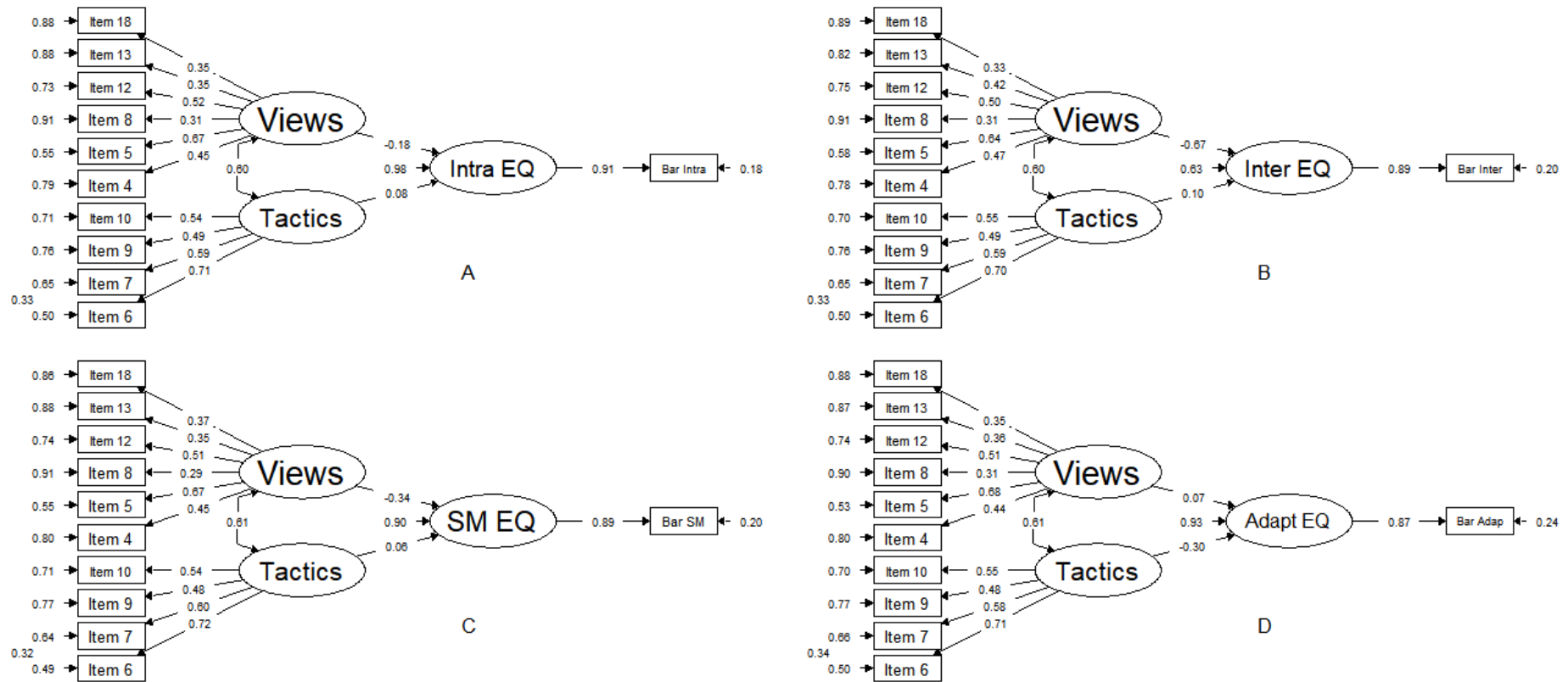
Figure C.18. Figures represent estimates of emotional intelligence from the Bar-On EQ-i:S from Austin, Farrelly, Black, and Moore (2007 Dataset 1). Figure A estimates intrapersonal, Figure B estimates interpersonal, Figure C estimates stress management, and Figure D estimates adaptability. Dependent latent variable was estimated from a single indicator, the mean of the respective scale, with the error variance estimated using $(1-\alpha)*SD^2_{indicator}$. All pathways are standardised. All model fit estimates are in Appendix D.12 and D.13.
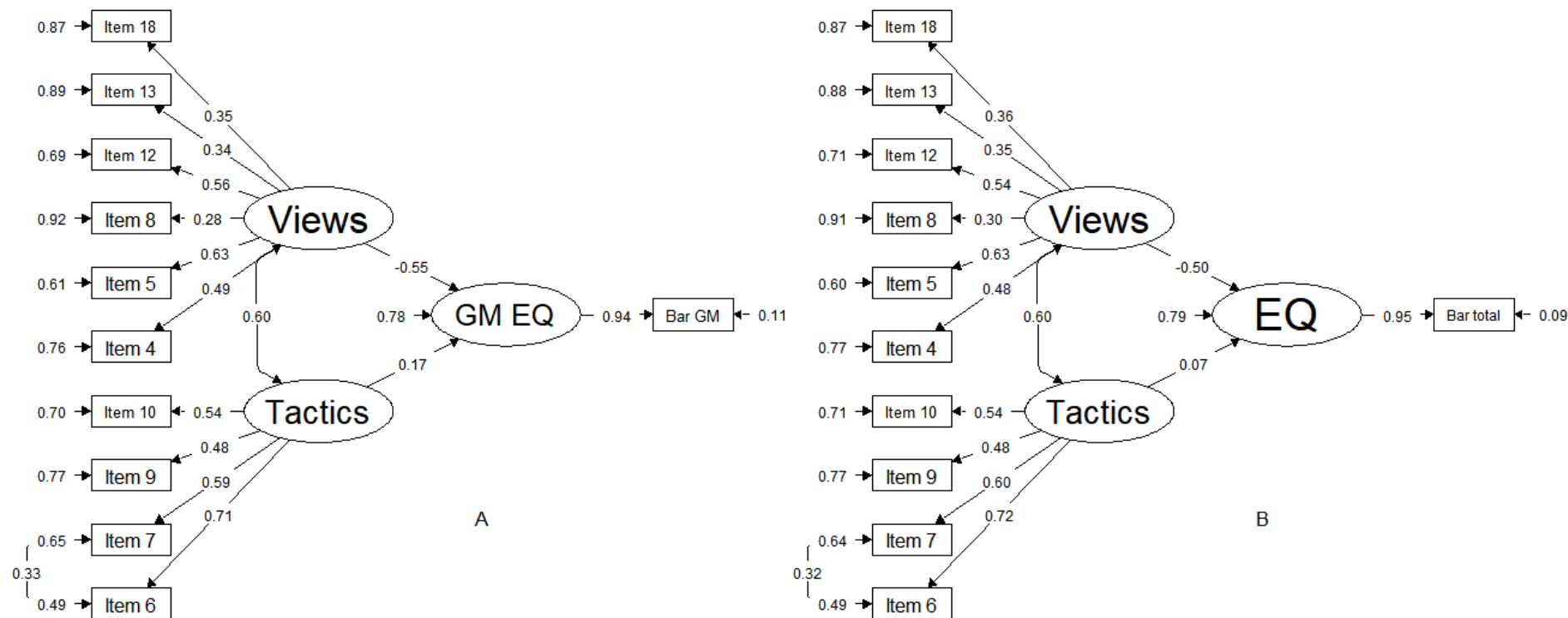
Figure C.19. Figures represent estimates of emotional intelligence from the Bar-On EQ-i:S from Austin, Farrelly, Black, and Moore (2007 Dataset 1). Figure A estimates general mood, and Figure B estimates the overall emotional quotient (full scale score). Dependent latent variable was estimated from a single indicator, the mean of the respective scale, with the error variance estimated using $(1-\alpha)*SD^2_{indicator}$. All pathways are standardised. All model fit estimates are in Appendix D.12 and D.13.
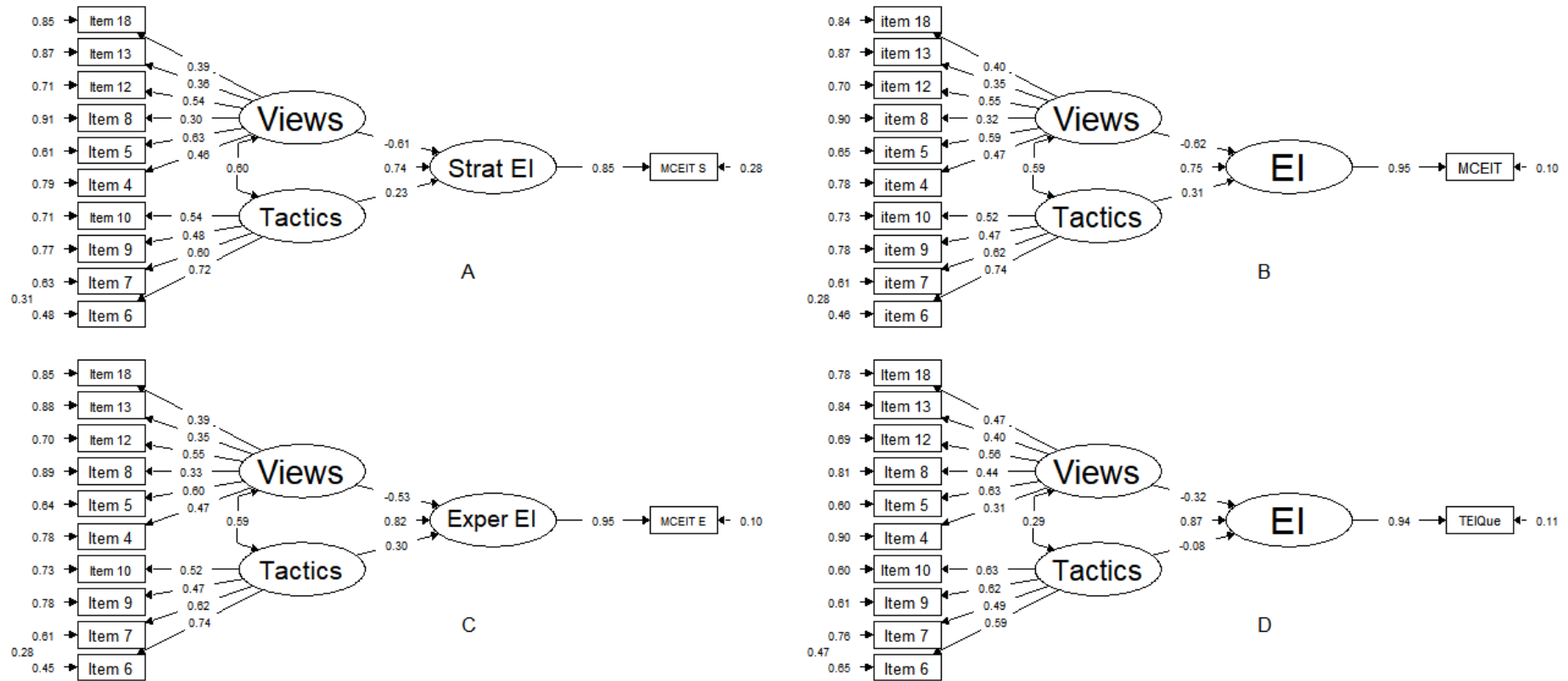
Figure C.20. Figures A to C represent estimates of emotional intelligence from the Mayer-Salovey-Caruso emotional intelligence test (MSCEIT 2.0) in Austin, Farrelly, Black, and Moore (2007 Dataset 1). Figure A estimates Strategic, Figure B estimates overall emotional intelligence, and Figure C estimates experiential emotional intelligences. Figure D estimates emotional intelligence (EI) from the Trait Emotional Intelligence Questionnaire-Short Form (TEIQue-SF) from Austin, Farrelly, Black, and Moore (2007b). Dependent latent variable was estimated from a single indicator, the mean of the respective scale, with the error variance estimated using $(1-\alpha)*SD^2_{indicator}$. All pathways are standardised. All model fit estimates are in Appendix D.12 and D.13.
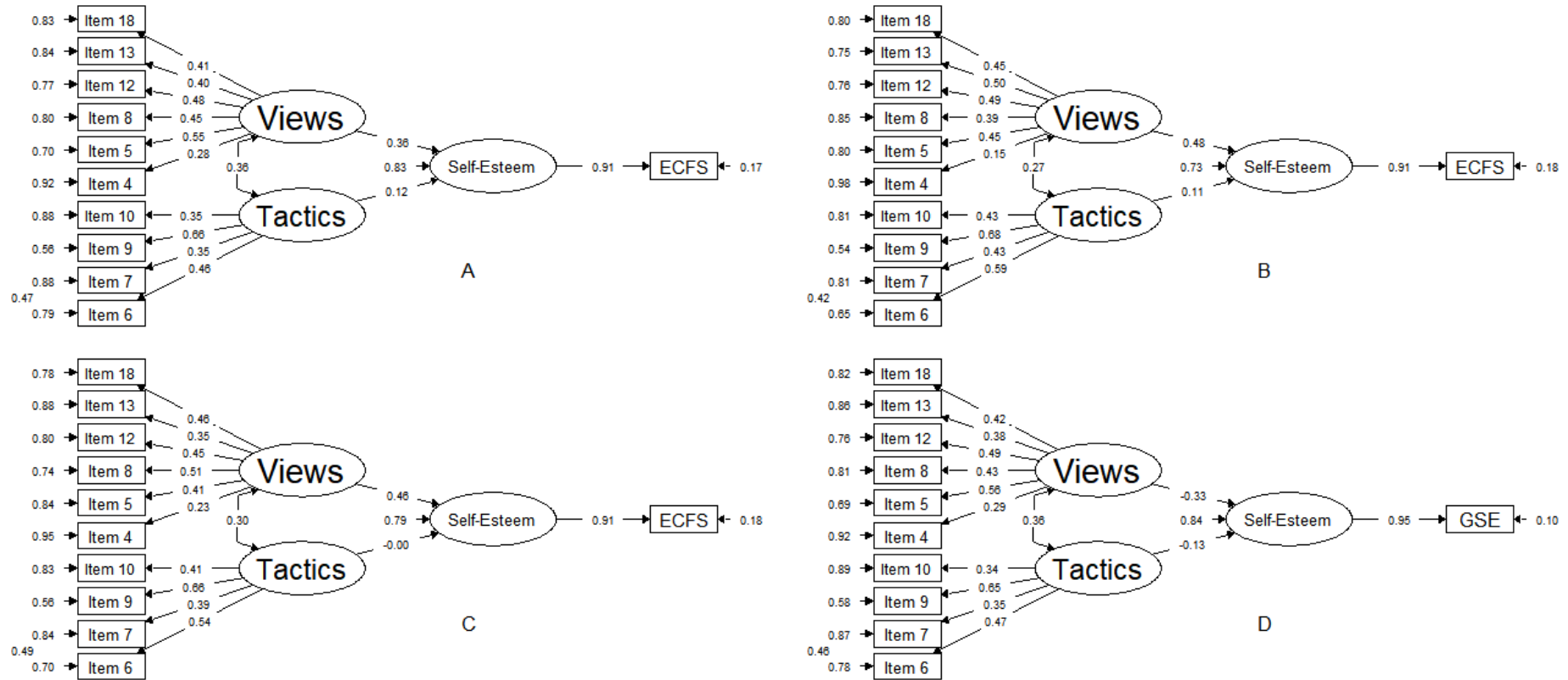
Figure C.21. Figures A (Williams, 1994a), B (Williams, 1994b), and C (Williams, 1995) represent estimates of self-esteem using the Extrinsic Contingency Focus Scale, while Figure D (Williams, 1994a) estimates self-esteem using the Global Self-Esteem Scale. Dependent latent variable was estimated from a single indicator, the mean of the respective scale, with the error variance estimated using $(1-\alpha)*SD^2_{indicator}$. All pathways are standardised. All model fit estimates are in Appendix D.12 and D.13.
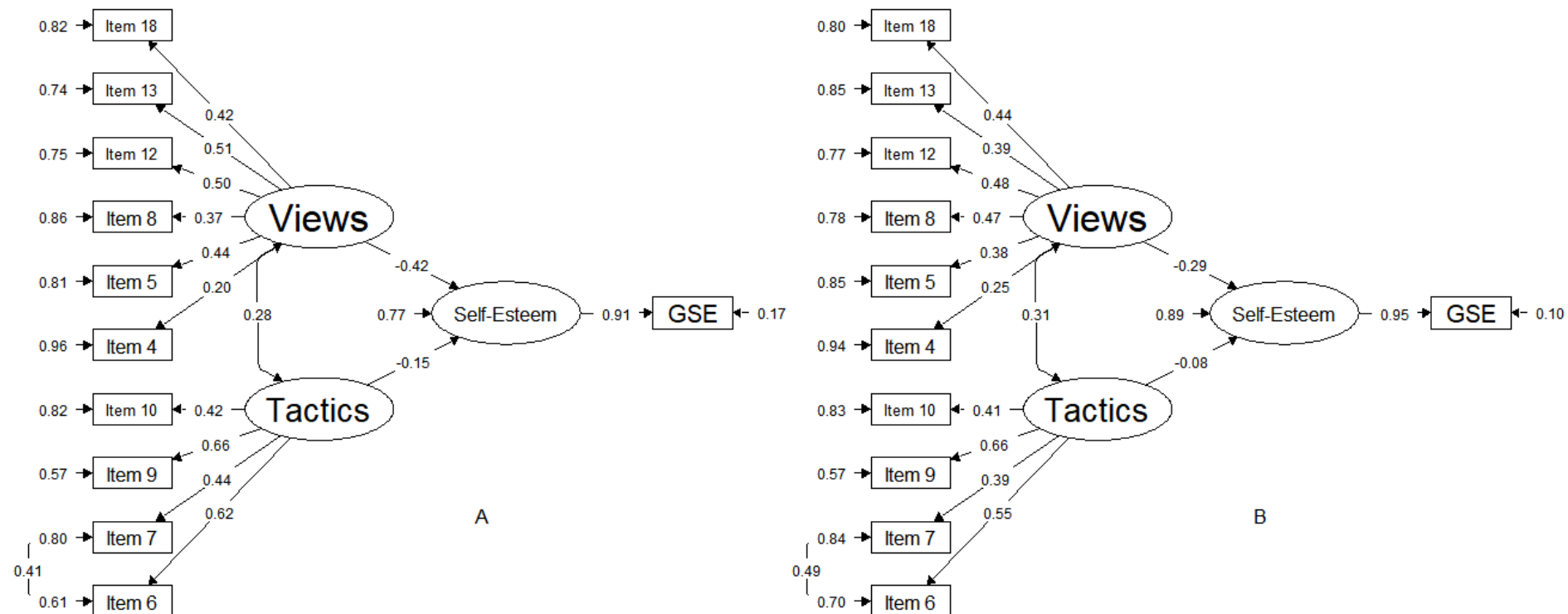
Figure C.22. Figures E (Williams, 1994b) and F (Williams, 1995) represent estimates of self-esteem using the Global Self-Esteem Scale. Dependent latent variable was estimated from a single indicator, the mean of the respective scale, with the error variance estimated using $(1-\alpha){*}SD^2_{indicator}$. All pathways are standardised. All model fit estimates are in Appendix D.12 and D.13.

Figure C.23. Figure A (Sellbom et al., 2012) estimates empathy using the Emotional Empathy Scale, Figure B (Austin, Farelly, Black, & Moore, 2007 Dataset 2) estimates poor emotional regulation skills, and Figure C (Austin, Farelly, Black, & Moore, 2007 Dataset 2) estimates emotional concealment using the Emotional Manipulation Scale. Dependent latent variable was estimated from a single indicator, the mean of the respective scale, with the error variance estimated using $(1-\alpha)*SD^2_{indicator}$. All pathways are standardised. All model fit estimates are in Appendix D.12 and D.13.
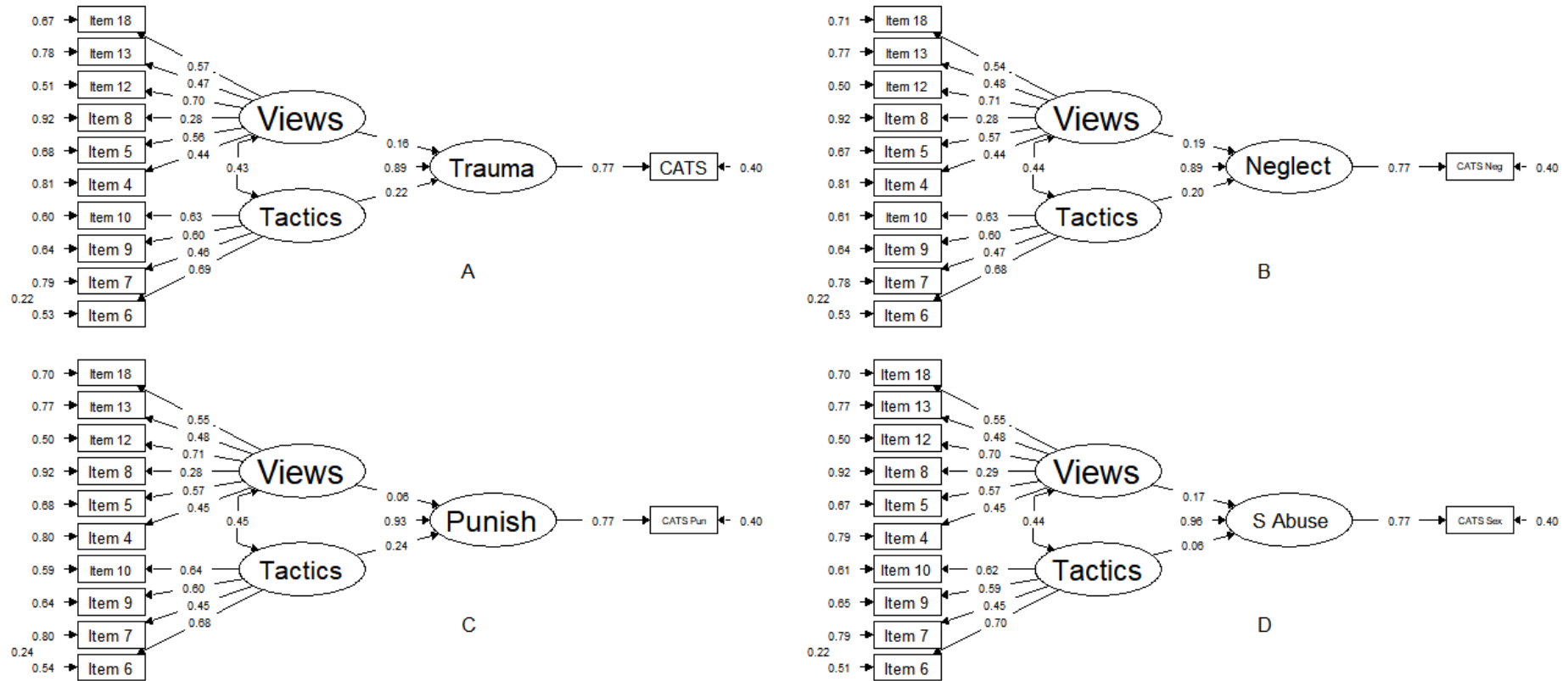
Figure C.24. Using the Child Abuse and Trauma Scale (CATS) from Láng (2015a), Figure A estimates overall trauma, Figure B estimates neglect from the neglect/negative home atmosphere subscale, Figure C estimates household punishment using the punishment subscale, and Figure D estimates sexual abuse using the sexual abuse subscale. Dependent latent variable was estimated from a single indicator, the mean of the respective scale, with the error variance estimated using $(1-\alpha)*SD^2_{indicator}$. All pathways are standardised. All model fit estimates are in Appendix D.12 and D.13.
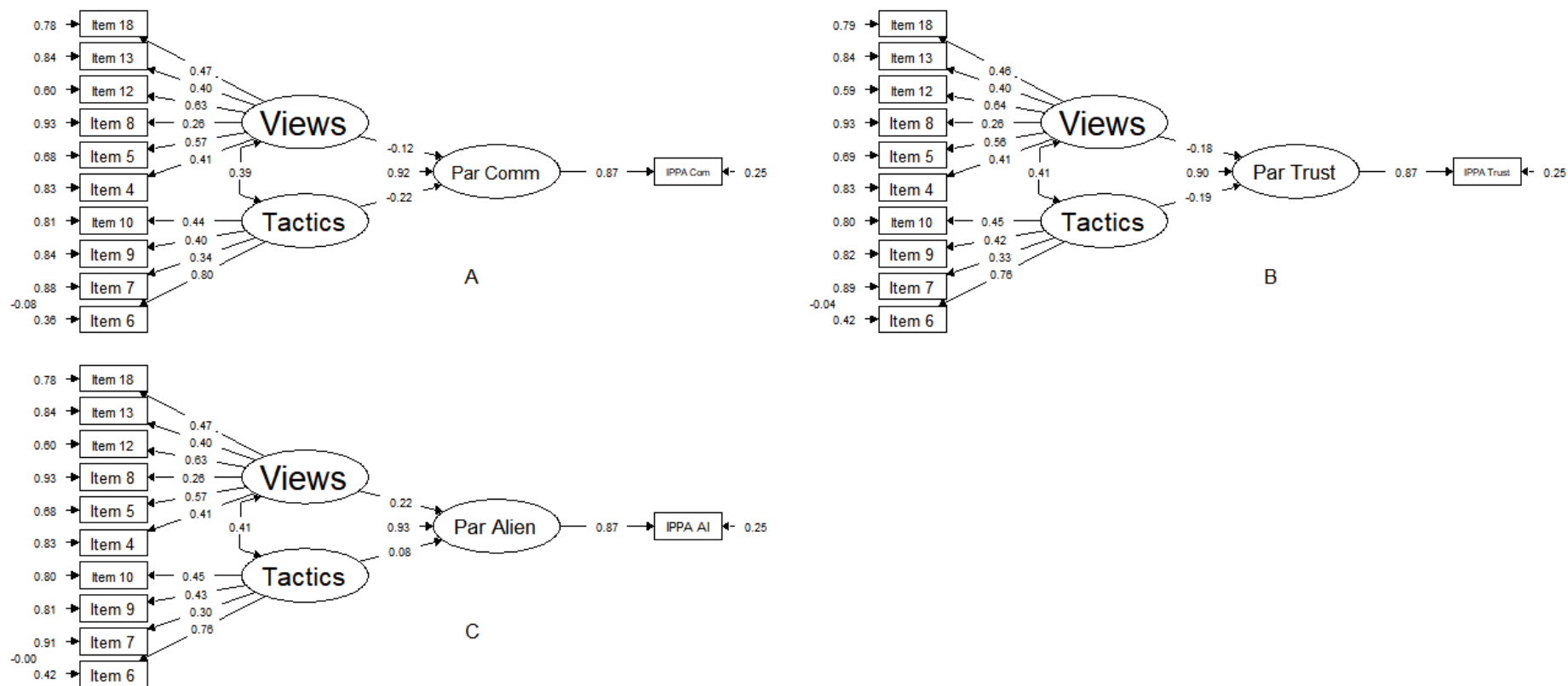
Figure C.25. Based on the Inventory of Parent and Peer attachment (IPPA) from Láng and Birkás (2014), Figure A estimates parental communication using the communication subscale, Figure B estimates parental trust using the trust subscale, and Figure C estimates parental alienation using the alienation subscale. Dependent latent variable was estimated from a single indicator, the mean of the respective scale, with the error variance estimated using $(1-\alpha)*SD^2_{indicator}$. All pathways are standardised. All model fit estimates are in Appendix D.12 and D.13.
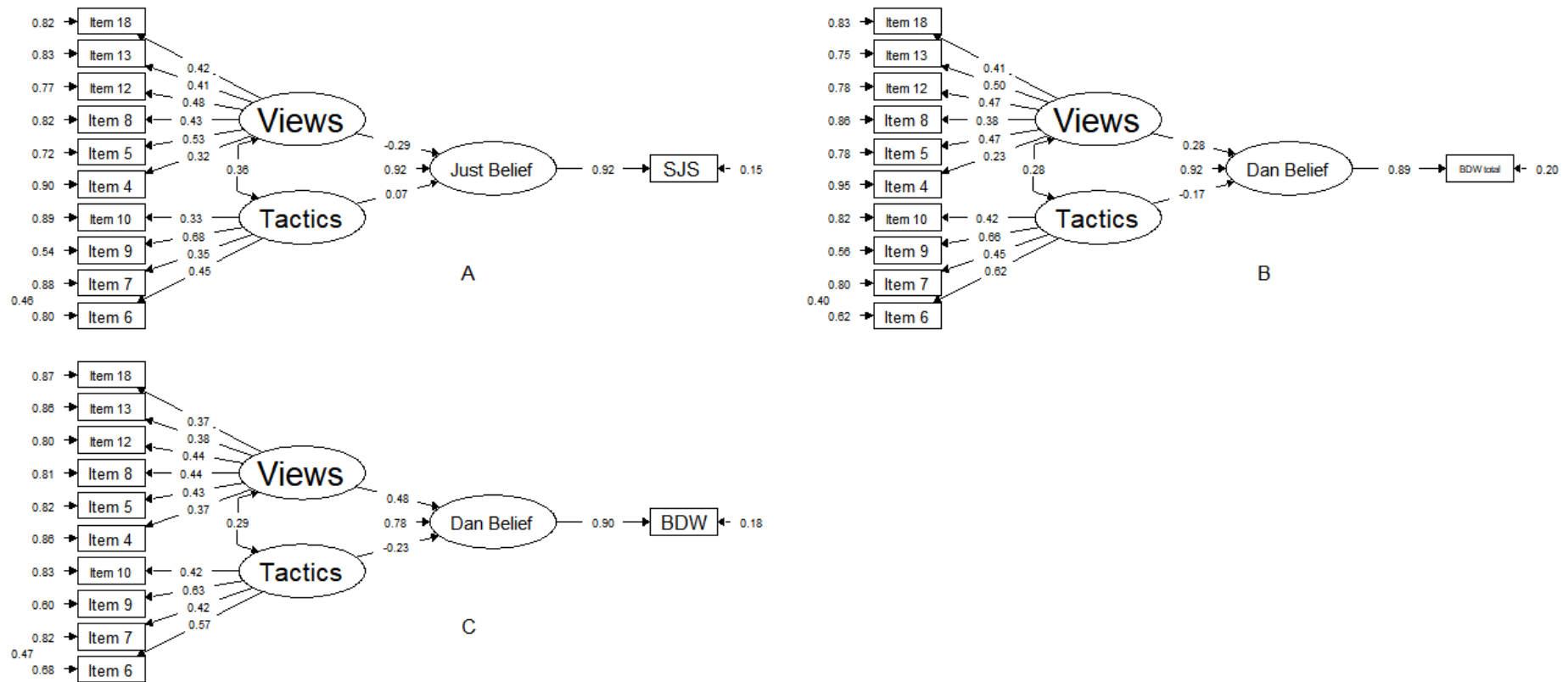
Figure C.26. Figure A estimates belief in a just world using the System Justification Scale while Figures B and C estimate the belief that the world is dangerous using the Belief in a Dangerous World (BDW) scale; from Williams 1994a, 1994b, and 1995 respectively. Dependent latent variable was estimated from a single indicator, the mean of the respective scale, with the error variance estimated using $(1-\alpha)*SD^2_{indicator}$. All pathways are standardised. All model fit estimates are in Appendix D.12 and D.13.
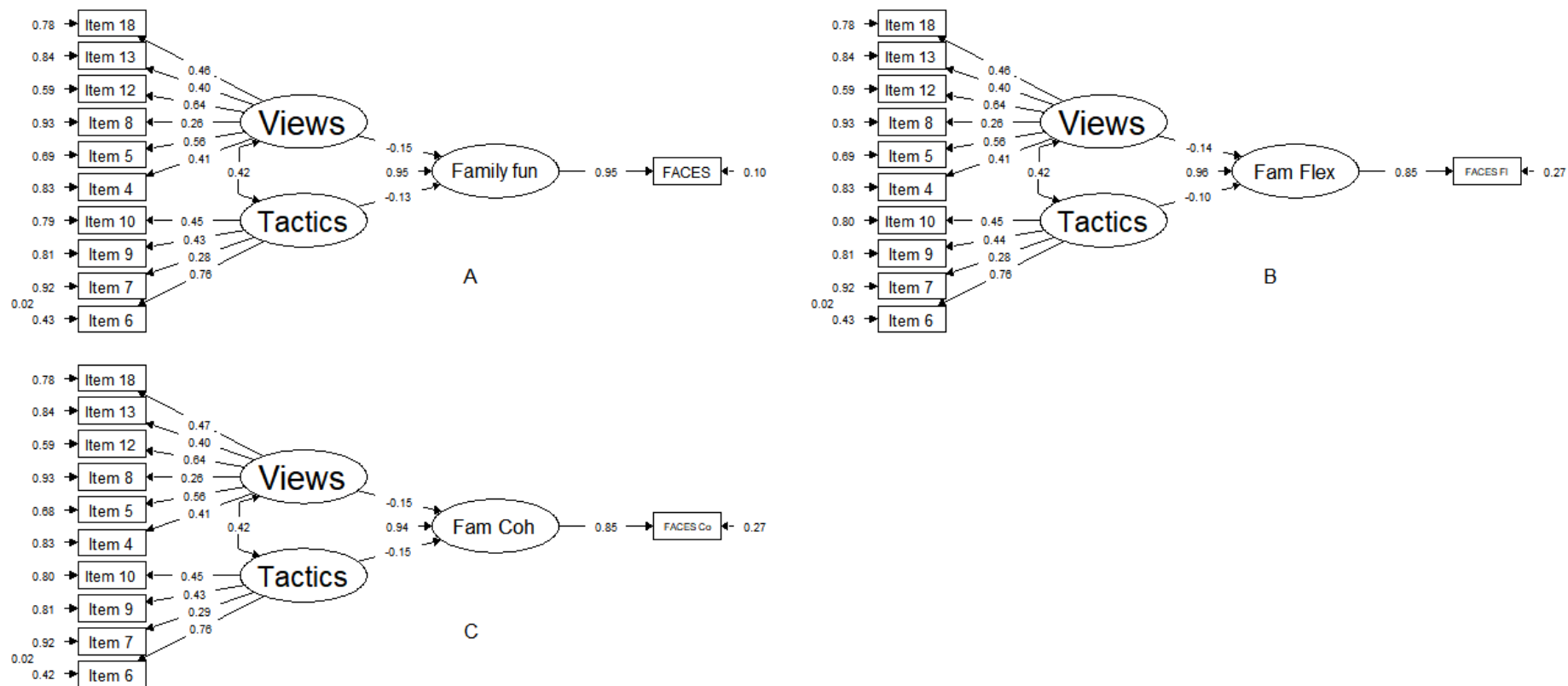
Figure C.27. Using the Family Adaptability and Cohesion Evaluation Scales IV (FACES) from Láng and Birkás (2014), Figure A estimates overall family functioning, Figure B estimates family flexibility using the family flexibility ratio score, Figure C estimates family cohesion using the cohesion ratio score. Dependent latent variable was estimated from a single indicator, the mean of the respective scale, with the error variance estimated using $(1-\alpha)*SD^2_{indicator}$. All pathways are standardised. All model fit estimates are in Appendix D.12 and D.13.
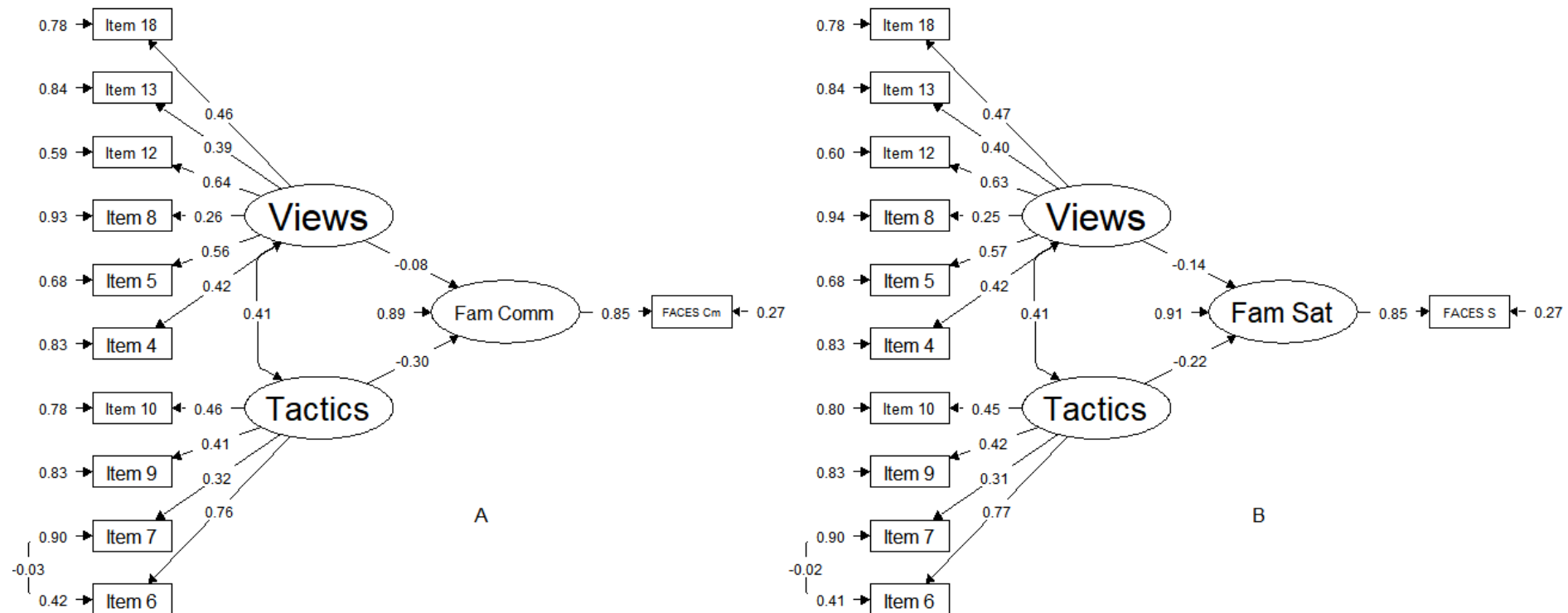
Figure C.28. Using the Family Adaptability and Cohesion Evaluation Scales IV (FACES) from Láng and Birkás (2014), Figure A estimates family communication using the family communication subscale, and Figure B estimates family satisfaction using the satisfaction with family life subscale. Dependent latent variable was estimated from a single indicator, the mean of the respective scale, with the error variance estimated using $(1-\alpha)*SD^2_{indicator}$. All pathways are standardised. All model fit estimates are in Appendix D.12 and D.13.
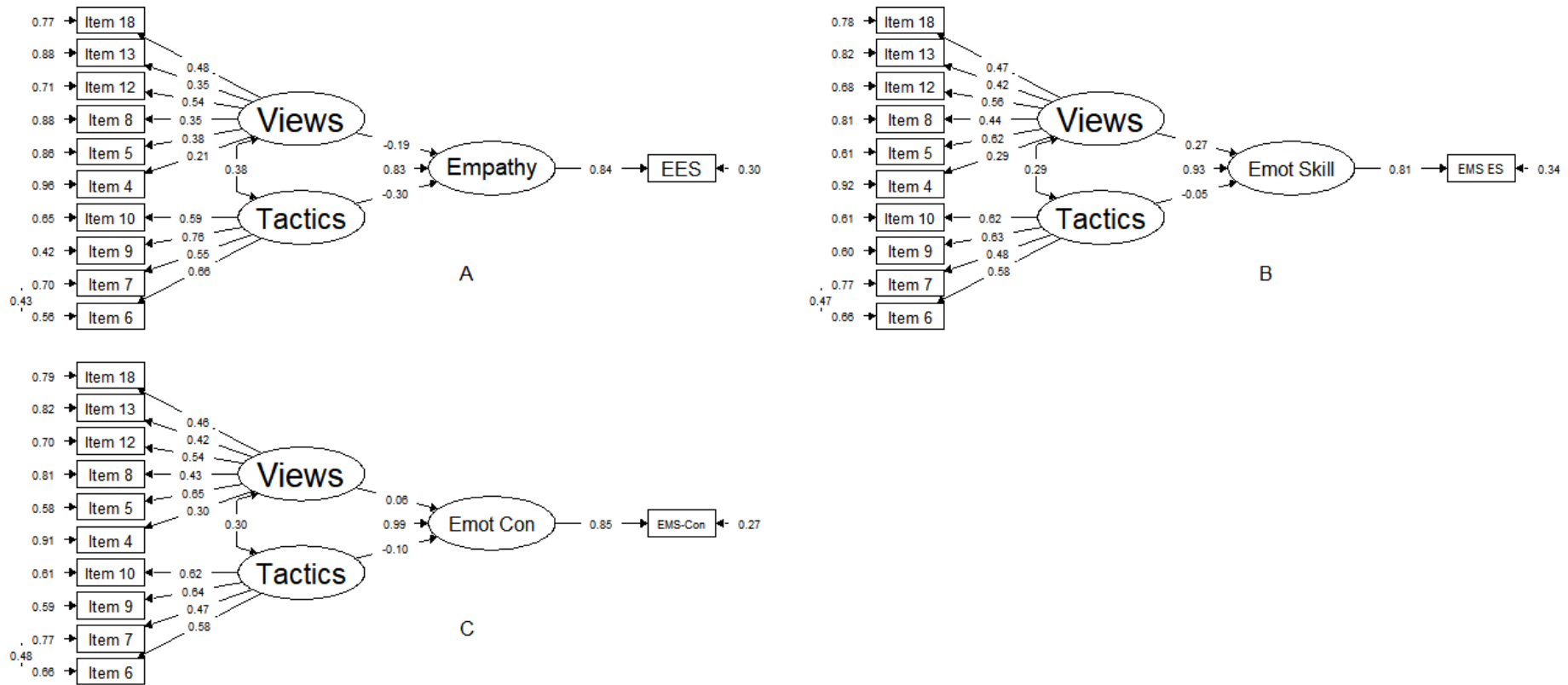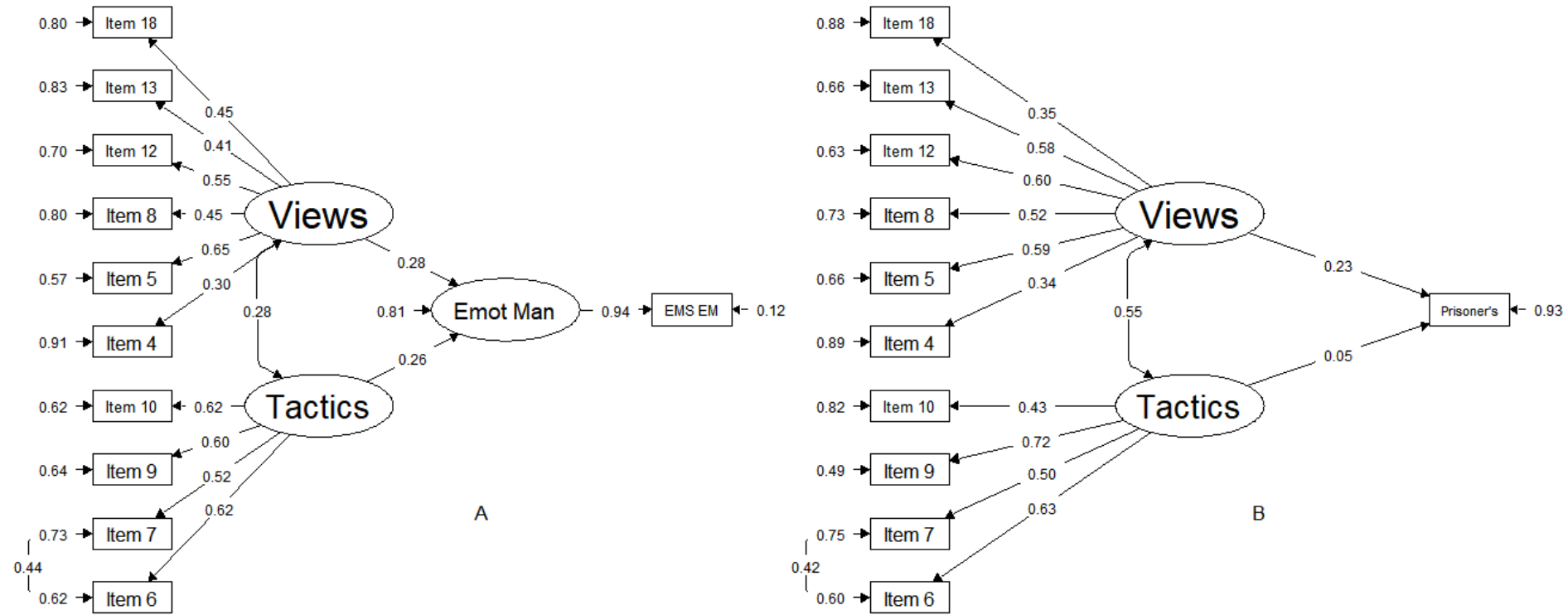
Figure C.29. Figure A estimates emotional manipulation using the emotional manipulation subscale (EMS) from Austin, Farelly, Black, and Moore (2007 Dataset 2), while Figure B estimates defection in the prisoner's dilemma from Bizumic and Fung (2016). Emotional manipulation latent variable was estimated from a single indicator, the mean of the scale, with the error variance estimated using $(1-\alpha)*SD^2_{indicator}$. The prisoner's dilemma manifest, and not latent, variable was estimated given the absence a scale to estimate variance. All pathways are standardised. All model fit estimates are in Appendix D.12 and D.13.

Appendix D

Supplementary Material for Chapter 5

A Range of Moral Dilemmas, Modified from Moore, Clark, and Kane (2008)

These are primary moral dilemmas widely used in philosophy and game theory. They contrast consequentialism with categoricalism. People's responses represent their moral stance with higher scores suggesting more categorical ethical stances. Items selected to have differing levels of difficulty along the consequentialism - categoricalism latent trait. Participants were asked to rate how they would respond to each dilemma between *Definitely* (0) and *Never / under no Circumstances* (7).

Footbridge A runaway trolley is heading down the tracks toward five workers who will be killed if the trolley proceeds on its present course. You are standing next to the track on which the trolley is traveling, but you are too far from the workers to warn them of the impending danger. Next to you there is a very large stranger who is minding his own business. It occurs to you that if you pushed this person onto the tracks in front of the trolley, it will stop the trolley and save the five workers from certain death. You are 100% certain that this action will stop the trolley and that it will kill the stranger. No other actions are available to you. *Should you push the stranger to save the workers?*

Epidemic A viral epidemic has spread across the globe killing thousands of people. You are a medical researcher and have developed two substances in your laboratory. You know that one of them is the vaccine, and that the other substance is deadly. You do not know which substance is the vaccine because both of the vials have been mislabeled. Once you figure out which substance is the vaccine you can create more to save thousands of lives. Time is precious, and you have two lab assistants working with you. The only way to identify the vaccine with certainty is to inject a different substance into each of your assistants against their wishes. One person will live, one person will die, and you will be able to start saving lives with your vaccine. *Should you inject the lab assistants with the substances to identify which one is the vaccine?*

Soldiers You are the leader of a small group of soldiers, and all of you are out of ammunition. You are on your way back from a completed mission deep in enemy territory when one of your men steps in a trap set by the enemy. His leg is badly injured and caught in the trap. You cannot free him from this trap without killing him. However, if you leave him behind, the enemy troops will find him and torture him to death. The soldier begs you not to leave him behind. The enemy troops are closing in on your position. It is not safe for you or your men to remain with your trapped comrade any longer. In order to prevent this man's needless suffering at the hands of the enemy, you could personally kill him by stabbing him in the heart. *Should you stab the man in the heart to prevent his suffering at the hands of the enemy?*

Hospital You are an orderly in a hospital during the night shift. You notice that a chemical has just been spilled in a room containing six patients. This chemical is highly toxic and if left on the floor will rapidly evaporate creating a poisonous gas. This will inevitably kill all of the patients in the room. This chemical cannot simply be mopped up, nor can it be soaked up with towels or sheets. However, because you have worked around this chemical before, you know that this chemical absorbs into human skin very rapidly. You could pull one of the patients out of bed onto

the spill so that the chemical will completely soak into this person's skin instead of evaporating into the air in the room. This will quickly kill the one patient but save the other five patients from the gas. *Should you kill this patient to save the others?*

Table D.1

Item Subscale, Abbreviated Content, and Response Frequencies for the TDMS in Sample 1

#	Abbreviated Content	Proportion of Responses per Scale Category							Mean (*SD*)	*r*-drop
		1	2	3	4	5	6	7		
Views Subscale										
1	Human nature is dishonest	.13	.34	.22	.13	.14	.04	.01	2.99 (1.44)	.52
2	People will take advantage of others	.03	.14	.16	.12	.35	.16	.04	4.27 (1.50)	.48
3	Nice things have another agenda	.06	.35	.22	.18	.14	.03	.01	3.13 (1.32)	.49
4R	People trust each other	.01	.19	.32	.16	.19	.11	.02	3.73 (1.38)	.53
5R	People prefer to help each other	.01	.16	.29	.20	.24	.08	.02	3.78 (1.31)	.46
6R	People are essentially good	.05	.38	.34	.14	.06	.03	.01	2.89 (1.15)	.52
Tactics Subscale										
7	Unethical for greater good	.09	.23	.18	.18	.21	.09	.01	3.54 (1.54)	.56
8	Advantage of others for goal	.17	.37	.21	.10	.11	.03	.01	2.70 (1.37)	.68
9	Mislead others	.12	.30	.19	.11	.21	.06	.01	3.20 (1.52)	.53
10R	Honest over getting ahead	.21	.43	.18	.11	.05	.02	.00	2.40 (1.18)	.58
11R	Never justified to deceive others	.10	.29	.22	.12	.16	.09	.02	3.31 (1.58)	.61
12R	Not worth doing if unethical	.11	.33	.22	.16	.13	.04	.00	3.03 (1.38)	.64

Note. Subscale T = Tactics, V = Views. R = Reverse-coded. Scale values from 1-7 for positive items and 7-1 for negative items correspond to *Disagree Strongly* to *Agree Strongly*. *r*-drop is the item-total correlation with the respective item's variance replaced with an estimate of the common variance (i.e., SMC). Estimates are displayed from Sample 1 only. Figure 1 in the main document contains visual representation of frequencies (plots).

Table D.2

IRT Parameter Estimates and Item Fit for Views and Tactics Subscales in Sample 2

Item	α (*SE*)	1	*SE*	2	*SE*	3	*SE*	4	*SE*	5	*SE*	6	*SE*	$S - \chi^2$	*df*	*p*
					Information and Threshold Parameters										Item Fit	
Views																
1	1.63 (.06)	-1.67	.06	-.34	.03	.36	.03	.98	.04	2.02	.07	3.17	.12	153.15	100	.001
2	1.51 (.06)	-2.94	.11	-1.44	.05	-.69	.04	-.22	.03	1.05	.04	2.44	.09	157.69	99	<.001
3	1.42 (.06)	-2.18	.08	-.37	.04	.40	.03	1.26	.05	2.55	.09	3.93	.17	133.62	101	.017
4R	1.55 (.06)	-3.39	.14	-1.18	.95	.02	.03	.71	.04	1.53	.06	2.91	.11	142.02	97	.002
5R	1.72 (.06)	-2.87	.10	-1.10	.04	-.06	.03	.59	.03	1.58	.05	2.85	.10	98.19	96	.419
6R	1.93 (.07)	-2.38	.08	-.33	.03	.76	.03	1.47	.05	2.17	.07	3.15	.12	95.10	91	.364
Tactics																
7	1.88 (.06)	-1.35	.05	-.29	.03	.24	.03	.81	.03	1.75	.05	3.19	.12	131.28	98	0.014
8	2.70 (.09)	-.77	.03	.29	.03	.86	.03	1.28	.04	2.18	.06	3.07	.11	98.13	81	.095
9	2.14 (.07)	-1.18	.04	-.04	.03	.45	.03	.85	.03	1.96	.06	3.22	.12	122.57	89	.011
10R	2.00 (.07)	-.88	.04	.50	.03	1.23	.04	1.93	.06	2.80	.09	3.82	.18	166.15	88	<.001
11R	2.14 (.07)	-1.46	.05	-.23	.03	.36	.03	.77	.03	1.54	.05	2.72	.09	160.29	94	<.001
12R	2.12 (.07)	-1.29	.04	-.02	.03	.61	.03	1.16	.04	1.98	.06	3.25	.12	105.27	89	.115

Note. Parameters estimated using a(θ - b). SE = Standard Error, α = N - 1 thresholds. $p < .001$ used as the standard for misfit under $S - \chi^2$.

Table D.3

TDMS Views and Tactics Expected Scores as a Function of θ Based on IRT

	Views		Tactics	
Latent trait estimate (θ)	Summed Subscale Score	Subscale Mean Score	Summed Subscale Score	Subscale Mean Score
-3	8.44	1.41	6.16	1.03
-2	11.39	1.90	7.01	1.17
-1	15.46	2.58	10.42	1.74
0	20.98	3.50	16.44	2.74
1	27.26	4.54	24.68	4.11
2	33.06	5.51	31.95	5.33
3	37.67	6.28	37.37	6.23

Note. Summed Subscale Score represents Σsubscale items. Subscale Mean Score represents Summed Subscale Score / 6.

Table D.4

SEM Fit Indices for Models in which Views and Tactics Predict External Variables

Scale/Subscale	Model Fit Indices							
	χ^2	df	p	CFI	SRMR	RMSEA	RMSEA lower CI	RMSEA upper CI
Sample 1A								
Sub Happy	26.587	24	.32	.998	.026	.016	.000	.045
SDO	26.789	24	.31	.998	.029	.017	.000	.046
BIDR	35.689	24	.06	.988	.032	.035	.000	.058
DI	27.664	24	.27	.997	.026	.020	.000	.048
Sample 1B								
Sub Happy	32.671	24	.11	.990	.029	.039	.000	.069
SDO	26.896	24	.31	.997	.030	.022	.000	.058
BIDR	34.376	24	.08	.985	.033	.042	.000	.071
DI	29.346	24	.21	.994	.027	.030	.000	.062
Sample 2								
Sub Happy	46.239	24	< .01	.994	.025	.035	.019	.050
Exploitativeness	50.964	24	< .01	.992	.022	.040	.025	.055
Misanthropy	43.864	24	.01	.994	.027	.032	.016	.047
Belief in Reciprocy	64.697	24	< .01	.985	.033	.047	.034	.061
Positive Reciprocy	28.692	24	.23	.998	.019	.016	.000	.036
Moral Dilemmas	23.877	24	.47	1.000	.019	.000	.000	.030

Note. Standardised root mean square residual (SRMR) values below .08 and root mean square error of approximation (RMSEA) values close to .06 represent acceptable fit (with lower values representing better fit); comparative fit index (CFI) represent acceptable fit and ≥ .95 represent good fit (< .90 indicates the model specification can likely be improved upon). Models were estimated using robust maximum likelihood (MLR) estimation given the positive skew of the Tactics subscale. SDO = Social Dominance Orientation, BIDR = Balanced Inventory of Desirable Responding, DI = Dysfunctional Impulsivity, Sub = subjective.

Table D.5

SEM Fit Indices for Criterion Validity Measures Continued.

Scale / Subscale	Model Fit Indices							
	χ^2	df	p	CFI	SRMR	RMSEA	RMSEA lower CI	RMSEA upper CI
Sample 4								
GSE	35.371	24	.06	.996	.024	.027	.000	.045
HH Sincerity	14.965	24	.92	1.000	.017	.000	.000	.011
Fairness	17.306	24	.84	1.000	.013	.000	.000	.019
Greed	13.022	17	.74	1.000	.014	.000	.000	.027
Modest	10.991	17	.86	1.000	.012	.000	.000	.020
Total	24.185	24	.45	1.000	.019	.003	.000	.032
EM Fearfulness	16.43	24	.87	1.000	.018	.000	.000	.016
Anxiety	8.497	17	.96	1.000	.012	.000	.000	.000
Dependence	12.286	17	.78	1.000	.013	.000	.000	.024
Sentiment	23.404	24	.50	1.000	.018	.000	.000	.031
Total	34.60	24	.08	.995	.027	.026	.000	.044
Ex Esteem	40.103	24	.02	.992	.029	.032	.013	.049
Bold	53.452	24	< .01	.986	.034	.043	.028	.059
Social	15.546	17	.56	1.000	.014	.000	.000	.032
Live	16.304	17	.50	1.000	.015	.000	.000	.034
Total	57.421	24	< .01	.985	.038	.046	.031	.062
Agr Forgive	15.574	17	.55	1.000	.017	.000	.000	.033
Gentle	31.297	24	.15	.996	.024	.022	.000	.041
Flex	26.809	24	.31	.998	.022	.013	.000	.036
Patience	22.798	17	.16	.997	.016	.023	.000	.045
Total	31.003	24	.15	.997	.022	.021	.000	.041
Con Organize	15.646	17	.55	1.000	.014	.000	.000	.032
Dill	7.459	17	.98	1.000	.011	.000	.000	.000
Perfect	33.256	24	.10	.995	.031	.024	.000	.043
Prudence	33.256	24	.10	.995	.031	.024	.000	.043
Total	27.656	24	.28	.998	.021	.015	.000	.037
Open Aesthetic	10.769	17	.87	1.000	.013	.000	.000	.019
Inquisitive	11.182	17	.85	1.000	.014	.000	.000	.020
Creative	19.907	24	.70	1.000	.019	.000	.000	.025
Uncon	30.644	24	.16	.996	.027	.021	.000	.040
Total	19.871	24	.70	1.000	.018	.000	.000	.025

Note. Standardised root mean square residual (SRMR) values below .08 and root mean square error of approximation (RMSEA) values close to .06 represent acceptable fit (with lower values represent better fit; comparative fit index (CFI) representing acceptable fit and ≥ .95 represent good fit (< .90 indicates the model specification can likely be improved upon). Models were estimated using robust maximum likelihood (MLR) estimation given the positive skew of the tactics subscale. HH = honesty/humility, Con = Conscientiousness, Open = Openess, Ex = Extraversion, and EM = Emotional Stability. GSE = Global Self-esteem.

Table D.6

SEM Fit Indices for Criterion Validity Measures Continued.

Scale / Subscale	Model Fit Indices							
	χ^2	*df*	*p*	CFI	SRMR	RMSEA	RMSEA lower CI	RMSEA upper CI
Sample 5								
Neuroticism	67.04	24	< .001	.954	.053	.098	.070	.126
Extraversion	39.00	24	.03	.985	.044	.055	.019	.085
Openess	33.26	24	.10	.987	.042	.044	.000	.078
Agreeable	43.00	24	.01	.981	.039	.064	.031	.095
Consc	54.15	24	< .001	.966	.052	.080	.052	.109
ELSRP Egocent	32.48	24	.12	.992	.034	.043	.000	.077
ELSRP Callous	42.40	24	.01	.977	.044	.063	.029	.093
ELSRP Anti-S	31.19	24	.15	.991	.039	.041	.000	.077
TriPM Bold	58.37	24	< .001	.962	.064	.085	.058	.113
Mean	31.23	24	.15	.993	.032	.039	.000	.074
Disinh	20.51	24	.67	1.000	.033	.000	.000	.049
HSNS	28.11	24	.26	.995	.034	.029	.000	.067
NARQ admiration	42.75	24	.01	.978	.049	.064	.031	.095
Rivalry	35.74	24	.06	.986	.051	.053	.000	.088

Note. Standardised root mean square residual (SRMR) values below .08 and root mean square error of approximation (RMSEA) values close to .06 represent acceptable fit (with lower values represent better fit; comparative fit index (CFI) > .90 represent acceptable fit and ≥ .95 represent good fit (< .90 indicates the model specification can likely be improved upon). Models were estimated using robust maximum likelihood (MLR) estimation given the positive skew of the tactics subscale. ELSRP = Extended Levenson Self-Report Psychopathy Scale, TriPM = Triarchic Psychopathy Measure, HSNS = Hypersensitive Narcissism Scale, NARQ = Narcissistic admiration and rivalry questionnaire. Five factor estimates from the IPIP-NEO. Although fit for the model predicting neuroticism was in the "mediocre" range (with higher associated χ^2), factor loadings were strong, and other fit indices were considered appropriate.

Table D.7

SEM Parameters for TDMS with HEXACO Facets from Sample 4

	Sub/Scale	TDMS	Views		Tactics	
		r	r	SEM Path	r	SEM Path
Sample 4						
HEXACO	Honesty/Humility	-.53***	-.29***	-.17***	-.55***	-.64***
	Sincerity	-.36***	-.20***	-.12	-.38***	-.50***
	Fairness	-.50***	-.24***	-.09*	-.54***	-.63***
	Greed avoid	-.26***	-.12***	-.06	-.28***	-.38***
	Modesty	-.38***	-.25***	-.22***	-.35***	-.40***
	Emotional Stability	-.22***	-.12**	-.05	-.23***	-.29***
	Fearfulness	-.09*	.02	.04	-.11**	-.16**
	Anxiety	-.10**	-.01	.06	-.15***	-.22**
	Dependence	-.16***	-.13***	-.12*	-.13***	-.12*
	Sentimentality	-.30***	-.18***	-.13*	-.30***	-.34***
	Extraversion	-.22***	-.24***	-.27***	-.11**	-.01
	Social Self-Esteem	-.20***	-.27***	-.37***	-.06	.05
	Social Bold	-.03	-.09*	-.13*	.03	.10*
	Social ability	-.16***	-.11**	-.11	-.14***	-.14*
	Liveliness	-.28***	-.28***	-.34***	-.18***	-.10*
	Agreeableness	-.37***	-.33***	-.38***	-.27***	-.22***
	Forgiveness	-.27***	-.23***	-.25***	-.21***	-.18***
	Gentleness	-.34***	-.29***	-.36***	-.25***	-.21***
	Flexibility	-.24***	-.22***	-.25**	-.16***	-.17**
	Patience	-.24***	-.23***	-.26***	-.16***	-.08
	Conscientiousness	-.26***	-.14***	-.10	-.26***	-.29***
	Organization	-.15***	.07	-.02	-.17***	-.21*
	Diligence	-.23***	-.15***	-.13*	-.23***	-.27**
	Perfection	-.16***	-.09*	-.09	-.16***	-.23***
	Prudence	-.22***	-.14***	-.09	-.21***	-.23***
	Openness	-.07	-.09*	-.10*	-.02	-.01
	Aesthetic	-.09*	-.06	-.04	-.09*	-.11*
	Inquisition	-.02	-.07	-.14	.03	.09
	Creativity	-.05	-.06	-.06	-.02	.00
	Unconventional	-.01	-.09*	-.20*	.06	.15*

Note. Estimates are from Sample 4 only.
* $p < .05$. ** $p < .01$. *** $p < .001$