Machiavellianism and Female Friendships: Investigating Behaviour through Self-Report and Observational Methods

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A thesis submitted in partial fulfilment for the requirements for the degree of Doctor of Philosophy at the University of Central Lancashire

September 2016

Declaration

I declare that while registered as a candidate for the research degree, I have not been a registered candidate or enrolled student for another award of the University or other academic or professional institution

I declare that no material contained in the thesis has been used in any other submission for an academic award and is solely my own work.

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There is a paucity of research investigating Machiavellianism and its influence on female behaviour, and specifically, female behaviour with same-sex friends. Furthermore, there is a lack of research investigating the subtle (manipulative) behaviour that may be associated with Machiavellianism. The current set of studies investigated Machiavellianism and behaviour in women's dyadic friendships and girl's peer relations. Study 1a and 1b used online self-report questionnaires and demonstrated women higher on Machiavellianism reported using emotional manipulation towards one specific close friend and reported to do that frequently. These women also perceived that their friend employed emotional manipulation towards them. The second study used observation methodology to record behaviour that women with higher Machiavellianism scores may engage in with a same-sex friend. This second study revealed that women with higher Machiavellianism scores asked their friend more elaboration questions whilst their partner looked at the environment more. This may suggest women higher in Machiavellianism seek information whilst their friend appears to show withdrawal from the interaction. The relationships between Machiavellianism and friendship functions were also investigated in those two studies. Women higher on Machiavellianism in study 1a and 1b reported their friendships to be lower in companionship, help, intimacy, and emotional security. Study 2 demonstrated differences with Machiavellianism and friendship functions with regards to the length of the friendship. Women with higher Machiavellianism scores who had been in the friendship for 12 months or less reported the friend to provide less companionship and emotional security. These two functions of friendship may be particularly salient in new friendships, especially recently established friendships in the new university environment. Study 3 also used observation methodology and investigated two components of Machiavellianism (Lack of Faith and Distrust) and girls' behaviour with same-sex peers on their school playground. This study showed that girls with higher

Distrust scores engaged in less social exclusion behaviour and girls with higher Lack of Faith scores or higher Distrust scores spent less time rejecting other children's bids to join their social group. Finally, an additional study is presented in this thesis which investigated the Big-Five (measured by the ten-item Big-Five TIPI) and Machiavellianism in women. Regression analyses were conducted with the Big-Five traits to explore how much variance (influence) the Big-Five accounted for in Machiavellianism. The three traits of Openness, Conscientiousness, and Agreeableness accounted for variance in Machiavellianism, although this variance was minimal. Strong conclusions could not be drawn from this study given the TIPI's poor reliability and inability to distinguish between further facets of the Big-Five. The first three studies in this thesis suggest females engage in subtle manipulation strategies directed towards same-sex friends. The two observation studies suggest a potential developmental pathway for females with higher Machiavellianism scores which includes avoiding detection from same-sex friends. These observation studies also indicated that these girls and women demonstrated behaviour that their friend or peers did not accept, although this specific behaviour requires further investigation. The studies presented in this thesis suggest further dyadic and longitudinal research is needed to (1) explore Machiavellianism and behaviour in female friendships and (2) investigate role of the Big-Five in the development of Machiavellianism.

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List of Publications from Thesis

Abell, L., Brewer, G., Qualter, P., & Austin, E. (2016). Machiavellianism, emotional manipulation, and friendship functions in women's friendships. *Personality and Individual Differences, 88,* 108-113.

Abell, L., Qualter, P., Brewer, G., Barlow, A., Stylianou, M., Henzi, P., & Barrett, L. (2015). Why Machiavellianism matters in childhood: The relationship between children's Machiavellian traits and their peer interactions in a natural setting. *Europe's Journal of Psychology, 11*, 484-493.

List of Additional Publications

Brewer, G., Hunt, D., James, G., & Abell, L. (2015). Dark Triad traits, infidelity and romantic revenge. *Personality and Individual Differences, 18*, 122-127.

Brewer, G., & Abell, L. (2015). Machiavellianism in long-term relationships: Competition, mate retention and sexual coercion. *Scandinavian Journal of Psychology, 56*, 357-62.

Brewer, G., & Abell, L. (2015). Machiavellianism and sexual behavior: Motivations, deception and infidelity. *Personality and Individual Differences, 74*, 186-191.

Abell, L., Lyons, M., & Brewer. G. (2014).The relationship between parental bonding, Machiavellianism and adult friendship quality. *Individual Differences Research, 12*, 191-197.

Abell, L., & Brewer, G. (2014). Machiavellianism, self-monitoring, self-promotion and relational aggression on Facebook. *Computers in Human Behavior, 36*, 258-262.

Brewer, G., Abell, L., & Lyons, M. (2014). Machiavellianism, self-disclosure and competition in friendships. *Individual Differences Research, 12*, 1-7.

Brewer, G., Abell, L., & Lyons, M. (2013). It's not just a man-thing: Testing sex as a moderator between peer attachment and Machiavellianism, competition and self-disclosure. *Individual Differences Research, 11,* 114-120.

Acknowledgements

There are a number of people I would like to thank for their support and patience over the last few years. Firstly, thank you to my primary supervisor, Dr. Gayle Brewer, for your on-going support, encouragement, and having the upmost confidence in my abilities. Thank you for the time you have invested in me. Thank you to Dr. Pamela Qualter for your academic guidance, your honesty, and encouragement. You have both provided an environment where I can be honest, think aloud, and you encouraged my (many) research thoughts and ideas. I would also like to thank Professor Elizabeth Austin for joining my supervisory team and providing constructive advice and guidance.

I would especially like to thank my close friend Beth for her constant belief in me and always being there to offer emotional support. Thank you to Tam, Dave, Jack, and Grace. You have all kept me smiling, never fail to make me laugh, and have shown a lot of patience and understanding.

Thank you to my new beautiful little niece, baby Maia. Your arrival gave me the extra motivation and the extra smiles I needed towards the end of writing this thesis.

Finally, I would like to thank the other PhD students I have met along the way and who have become some of my closest friends. You have provided so much emotional support as well as many laughs, and have reminded me of how determined we can all be.

1. Chapter One

Literature Review

Machiavellianism is characterised by a manipulative interpersonal style, emotional detachment, and a lack of concern with morality (Christie & Geis, 1970). Adults higher on Machiavellianism navigate through their social world with strategic planning, a cynical view, and suspicion of others (Christie & Geis, 1970). They demonstrate protective self-monitoring (Rauthmann, 2011), place greater importance on expressing agency (Locke & Christensen, 2006), and subsequently demonstrate a willingness to exploit others in order to achieve their own self-serving goal (Wilson, Near, & Miller, 1996).

The concept of Machiavellianism is derived from Niccolò Machiavelli's '*The Prince'* (Machiavelli 1532/1961). Machiavelli was a political figure in 16th century Florence, and after being exiled, Machiavelli described rules of how a new ruler should govern and lead his followers; such rules included the use of exploitation and manipulation. Machiavelli's advice for ruling reflected his cynical views and the distrust he had of others: '…but because men are wretched creatures who would not keep their word to you, you need not keep your word to them' (Machiavelli, pp.57). Such views may explain Machiavelli's stance that in order to maintain power, a ruler should be willing to deceive and act in immoral ways.

Richard Christie and colleagues, based on their interest in political behaviour, were interested in the characteristics that comprised an individual who manipulates others. Due to the manipulation, deception, and lack of morality that Machiavelli demonstrated in his writings, his work was used as a model through which to characterise an individual termed a 'manipulator' allowing this construct to be investigated further (see Christie & Geis, 1970). In order to investigate whether behaviour differed between individuals who agreed with statements congruent with

Machiavelli's ideas and those who did not, a Machiavellianism questionnaire was devised and experimental studies were undertaken by Richard Christie and colleagues.

Measurement of Machiavellianism

Richard Christie and Florence Geis designed and constructed the Mach IV. This construct encapsulated the behaviour that Machiavelli envisaged would make an effective ruler. The measure originally consisted of 71 items that were based on statements from *The Prince* or congruent with Machiavelli's ideas. In order to increase the efficiency of the administration of the questionnaire the final version of this scale was shortened to comprise 20 statements. These statements were chosen based on the discrimination power of defining between high scorers and low scorers based on median scores (Christie & Geis, 1970). With the use of an a priori rule, the 20 items represented three themes of a Machiavellian profile: nine items were classified as tactics; a further nine items were classified as Machiavellian views; with the remaining two items assessing abstract morality. Agreement on ten of these statements suggest endorsement of Machiavellian views and agreement of the remaining 10 statements suggest rejection of such views. Higher scores (following reverse coding) indicate higher endorsement of Machiavellian views and behaviour. Christie and Geis originally used this measure to differentiate between 'High Machs' and 'Low Machs', although most current research tends to investigate Machiavellianism on a continuum.

Although Christie and Geis discussed the three themes (tactics, abstract morality, views) that comprise the Mach IV, the majority of research does not regard these three themes as subscales when measuring levels of Machiavellianism. Some research has employed these themes as subscales e.g., Montañés Radaa, Taracenab, and Rodríguezc (2004) and Aïn, Carré, Fantini-Hauwel, Baudouin, and Besche-Richard (2013), however different factorial solutions have been demonstrated in the literature.

Christie and Lehman (1970) reported one factor; Corral and Calvete (2000) and Hunter, Gerbing and Boster (1982) reported two different four factor models of the Mach IV, whilst Ahmed and Stewart (1981) reported five factors. Additionally, Rauthmann (2012a) also reported different factors for men and women with three factors being reported for men and two for women. As demonstrated, the factor structure of the Mach IV remains unclear and some researchers have called for new multidimensional Machiavellianism measure to be devised (Rauthmann 2012a; Rauthmann & Will, 2011). The majority of research uses the unidimensional measure which stays true to the original construct of Machiavellianism as alluded to by Machiavelli himself (Furnham, Richards, & Paulhus, 2013).

The Mach IV was initially utilised in a variety of experiments, documented in the influential book 'Studies in Machiavellianism' (Christie & Geis, 1970) which includes a variety of studies investigating how 'high Machs' may behave differently from individuals classified as 'low Machs'. Highlighting just a number of these studies, they revealed that 'high Machs' were less likely to confess when they had cheated and were more likely to use direct eye contact in an attempt to suggest they had nothing to conceal (Exline, Thibaut, Hickey, & Gumpert, 1970); 'high Mach' males engaged in more manipulative behaviour, a greater variety of manipulative behaviour, and enjoyed employing such tactics (Geis, Christie, & Nelson, 1970), and were more successful in attaining points when playing a con game with their peers than 'low Mach' males (Geis, 1970). The studies in this book utilised 'optimum' conditions in which to investigate Machiavellian behaviour (such as the manipulation of competition) which may not reflect individuals (with higher Machiavellianism scores) real world behaviour. It has however provided an important base for future research investigating this behaviour profile.

Machiavellianism in the Evolutionary Literature

Machiavellianism may have adaptive advantages, as well as maladaptive characteristics and is often discussed within the context of Life History Theory. This theory attempts to explain the development and subsequent adaptive value of behaviour through the energy allocation trade-offs in different life tasks such as mating effort and parental investment (Kaplan & Gangstead, 2005). The energy allocation adopted depends on the stability and harshness of the environment (Ellis, Figueredo, Brumbach, & Schlomer, 2009; McDonald, Donnellan, Navarrete, 2012). Individuals that experience adequate environments adopt a slow life history strategy, produce fewer offspring, and invest a lot of energy into their care. In contrast, individuals that experience harsh environments adopt a fast life history strategy and mature early, produce more offspring but invest less in said offspring (McDonald et al., 2012). Machiavellianism is often associated with this fast life history and is viewed as a set of cognitions and systems to help achieve adaptive goals (Buss, 2009; Jonason & Tost, 2010; Jonason, Webster, Schmitt, Li, & Crysel, 2012; McDonald et al., 2012).

Development of Machiavellianism

Following the research investigating Machiavellianism and Life History Theory, studies have further explored the harsh environment that may contribute to the emergence of Machiavellianism and its associated behaviour. This research has been further facilitated by studies that suggest Machiavellianism is more attributable to environmental factors than heritability ones (Vernon, Villani, Vickers, & Harris, 2008; Veselka, Schermer, & Vernon, 2011). Recent research has started to focus on childhood experiences and Machiavellianism, often using Belsky, Steinberg, and Draper's (1991) theoretical pathway to explain individual differences in behaviour. This pathway

combines evolutionary and attachment principles and suggests that low stress childhood environments lead to trust and reciprocity whilst high stress childhood environments lead to distrust and opportunistic manipulation, that are characteristic of Machiavellianism. Subsequently, research has shown that low maternal care coupled with limited secure attachment (Jonason, Lyons, & Bethell, 2013) and low maternal care and paternal overprotection (Abell, Lyons, & Brewer, 2014) are associated with Machiavellianism in adulthood. Importantly, these attachment experiences and the relationship with Machiavellianism have been shown to differ between men and women. Birkás, Láng, and Bereczkei (2015) reported that a lack of perceived parental warmth was related to Machiavellianism in women whilst in men Machiavellianism was related to less paternal rejection and overprotection. Furthermore, early maladaptive schemas are related to Machiavellianism in adolescence and memories of parental neglect and a negative home atmosphere are associated with Machiavellianism in adults (Láng, 2015; Láng, & Lénárd, 2015).

The aforementioned research suggests that Machiavellianism may be an adaptation to aversive experiences in childhood. This supports research that shows Machiavellian behaviour to be learnt with only a small heritability factor (Vernon et al., 2008). A harsh environment may contribute to Machiavellian views and behaviour emerging in order for the individual to adapt to stressful environments. Viewing others with distrust and suspicion may help to reduce exploitation from others (Belsky et al., 1991). Engaging in manipulative self-serving behaviour may ensure these individuals' needs are satisfied, unlike in childhood when their attachment needs may not have been met by their caregivers. Engagement in emotionally detached and manipulative behaviour may therefore be a beneficial strategy to employ in order to ensure survival, even though this may be at the expense of others.

Additional Theories of the Development of Machiavellianism

Although it is not a widely explored area, the development of Machiavellianism is now starting to be investigated. In addition to the aforementioned stressful childhood experiences, other explanations have been proposed. Although these theories have received relatively little attention it is important to acknowledge them.

Kraut and Price (1976) discussed a modelling hypothesis for the development of Machiavellianism in children. Based on behaviour shown by children and their parents in an experimental game (the bluffing game) the researchers suggested that the children may successfully model their parents (in this study, their father's) Machiavellian behaviour without adopting the Machiavellian beliefs. Significant moderate correlations were found between parent's Machiavellian scores and their children's success in the bluffing game. However, children's Machiavellian beliefs (Kiddie Mach scores) were not associated with their success in the bluffing game. The researchers suggested the integration of the beliefs with the Machiavellian behaviour may occur later in the child's development.

However, in a study conducted by Braginsky (cited in Christie & Geis, 1970) it was demonstrated that parents with low levels of Machiavellianism had children who were more successful at manipulation and higher Machiavellianism scores in children were not associated with higher Machiavellian scores of their parents. Christie and Geis discussed a possible testable hypothesis (reciprocation hypothesis) for this, which has aspects that mirror evolutionary theories of behaviour. Young children manipulate their parents in to giving them care (through the use of behaviour such as crying etc). Parents with low levels of Machiavellianism may respond quicker and with more attention, the child's behaviour and the responses from the parents then become reinforced and part of the child's repertoire. The children may then be able to exploit their parent's responses

to manipulate them for other reasons aside from eliciting parental care for survival. Although there are no developmental studies investigating this, the child's manipulative behaviour may then became part of their behaviour in adulthood. These adults who are higher on Machiavellianism may then still exploit and manipulate their low scoring (on Machiavellianism) parents and other individuals within their social network.

Machiavellianism and Emotional Deficits

In the evolutionary literature, Machiavellianism is argued to be a personality trait with coherent strategies and clear cognitive systems that allow the individual to pursue and achieve adaptive goals (Buss, 2009; Jonason & Krause, 2013; Jonason et al., 2012). Such a system may be associated with emotional deficits, seen not as pathological (Jonason & Krause, 2013) but as part of an adapted strategy. A contrasting and less documented argument views individuals with higher Machiavellianism scores as having emotional deficits which are not viewed as adaptive or as part of an advantageous strategy, but viewed within a disordered framework (Aïn et al., 2013; Wastell & Booth, 2003). Consequently, research has investigated the associations between Machiavellianism and Theory of Mind (ToM), Empathy, Alexithymia, and Emotional Intelligence

Machiavellianism and Theory of Mind

Theory of Mind (ToM) is the capacity to infer mental states and processes such as emotions and intentions of others and the ability to predict their behaviour (Paal & Bereczkei, 2007; Slaughter & Repacholi, 2003). In evolutionary terms, it would be expected that individuals higher on Machiavellianism would have advanced ToM skills in order to manipulate others. This would enable the individual to be 'one step ahead' of their 'target', giving them an advantage in their manipulation attempt (Esperger & Bereczkei, 2012). However, given individuals higher on Machiavellianism have been

shown to be unconnected to their own and others emotions (Wastell & Booth, 2003) these individuals may not be able to infer other people's emotions and intentions. Instead, their broad negative view of others and belief that others are weak and susceptible to victimisation and manipulation may dictate their behaviour (Black, Woodworth, & Porter, 2014). It could be argued that for manipulation to be successful, individuals higher on Machiavellianism would need to assess which strategy to employ, if the individual is aware of the manipulation attempt, and how they may possibly react. This knowledge would contribute to the success of their manipulation and reduce the likelihood of getting caught. However, studies exploring Machiavellianism and ToM have demonstrated no significant correlation between Machiavellianism and ToM (Paal & Beczki, 2007) and a negative correlation with Machiavellianism and ToM has been reported in children and adults (Barlow, Qualter, & Stylianou, 2010; Lyons, Caldwell & Shultz, 2010). This research may suggest that manipulative behaviour is not facilitated by advanced ToM and individuals higher on Machiavellianism may have deficits in this aspect of social cognition.

Machiavellianism and Empathy

Empathy is characterised by not only knowing, but also feeling what another person is experiencing (Levenson & Rueff, 1992). It is crucial to moral development (Eisenberg, 2000) and, subsequently, is an important component of developing and maintaining social relationships. Given the characteristics of Machiavellianism (i.e., cynicism, manipulative interpersonal style, lack of concern for morality) it is not surprising that Machiavellianism has been demonstrated to be negatively associated with empathy (Wai & Tiliopoulos, 2012; Wastell & Booth, 2003). Research has suggested that empathy has at least two components: affective and cognitive empathy. Affective empathy is sharing the emotional state of another whilst cognitive empathy is

the understanding of the emotional state of another (Jolliffe & Farrington, 2004). Wai and Tiliopoulos (2012) reported Machiavellianism to be significantly negatively associated with affective empathy but not with cognitive empathy, despite individuals higher on Machiavellianism demonstrating a diminished ability to accurately identify happy and sad emotions. However, Lyons et al. (2010) reported Machiavellianism to be negatively correlated with both affective and cognitive empathy. Such empathy deficits would influence social relationships although they may also offer individuals an advantage in their ability to exploit others. The individuals higher on Machiavellianism may not be focusing on the potential harmful consequences for others but instead their attention will be focused on their own goal and what they can exploit from the environment around them.

Machiavellianism and Alexithymia

Furthermore, empathy is associated with the emotional deficit of Alexithymia (Swart, Kortekaas, & Aleman, 2009). Alexithymia describes the inability to connect to one's own or others emotions and has been associated with Machiavellianism (Wastell & Booth, 2003). In particular, Wastell and Booth (2003) reported that difficulty identifying feelings and externally oriented feeling (alexithymia subscales) predicted Machiavellianism along with shame proneness and guilt proneness (negative association) whilst Jonason and Krause (2013) reported that externally orientated thinking predicted Machiavellianism. Individuals higher on Machiavellianism appear to be unconnected to their own or others emotions and, thus, manipulation of others is due to this failure 'to recognise and use emotional processes as social cues' (Wastell & Booth pp. 732) and this lack of connection influences individuals behaviour and their social relationships with others. This may include facilitating the manipulation strategies and remaining emotionally detached from people they do exploit. Indeed,

Jonason and Krause (2013) argue that this external orientated thinking forms part of their exploitative cognitive strategy because the focus is on what these individuals can exploit from the social world, which can provide a competitive advantage.

Machiavellianism and Emotional Intelligence

Emotional intelligence (EI) refers to a set of skills in expression, recognition, and managing of emotions of oneself and the recognition and managing emotions of others (Salovey & Mayer, 1990). People with high EI may use such skills to manipulate others for their own benefit (Grieve & Panebianco, 2012). Given that Machiavellianism is characterised by a manipulative interpersonal style it would be reasonable to investigate whether Machiavellianism is associated with heightened EI or, given its association with empathy and alexithymia, demonstrate a negative relationship with EI. Research has revealed negative correlations between Machiavellianism and trait EI in children (Barlow et al., 2010), socio-emotional intelligence (Nagler, Reiter, Furtner, & Rauthmann, 2014), total self-report, performance EI, and interpersonal EI in adults (Austin, Farrelly, Black, & Moore, 2007). These findings suggest potential difficulties in managing personal relationships and a decreased ability to recognise emotions in others may help to facilitate manipulation. Individuals higher on Machiavellianism may not recognise emotions that show the other person is unhappy with their treatment and, therefore, may not change their behaviour accordingly.

Location in Personality Framework

The research discussed above shows how Machiavellianism may be related to emotional deficits. Machiavellianism is regarded as aversive but not a clinical construct and is classed as being within the normal range of functioning (Furnham et al., 2013). Subsequently, descriptive research has been conducted in an attempt to understand where Machiavellianism is located within existing personality frameworks.

Studies have been conducted with the Big-Five Factor model (John, Donahue, & Kentle, 1991; also see McCrae & John, 1992) that includes the five personality dimensions of Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism; the HEXACO model (Lee & Ashton, 2004) which measures the Big-Five domains as well as a sixth factor of Honesty-Humility, and the Supernumerary Personality Inventory (SPI**,** Paunonen, 2002) which measures ten traits outside of the realm of the Big-Five including Integrity and Risk-Taking. Although the strengths of the correlations vary, with regard to the Big-Five, Machiavellianism has been demonstrated to be negatively associated with Agreeableness and Conscientiousness (Austin et al., 2007; Jakobwitz & Egan, 2006; Lee & Ashton, 2005) and positively correlated with Neuroticism (Jakobwitz & Egan, 2006; Vernon et al., 2008). Furthermore, Machiavellianism has been reported to be strongly negatively correlated with the Honesty-Humility factor (Lee & Ashton, 2005) and there are a number of correlations with the facets of the SPI including positive correlations of Egotism and Risk-Taking (Veselka et al., 2011).

Since the publication of Paulhus and William's paper in 2002, Machiavellianism is often framed within the three cluster 'Dark Triad'. This consists of Machiavellianism, Psychopathy, and Narcissism. Psychopathy and Narcissism have roots in the clinical literature whilst Machiavellianism has a different etiology, stemming from the writings of a political figure. Machiavellianism, Psychopathy, and Narcissism are argued to be overlapping personality traits due to the generally moderate recurring correlations between them, however research is inconsistent with some studies reporting moderate correlations between Machiavellianism, Psychopathy, and Narcissism whilst other studies report weak or no correlations at all between these constructs (Jakobwitz & Egan, 2006; Jonason, Kaufmann, Webster, & Geher, 2013; Jonason, Lyons, & Bethell, 2013). Furnham, Richards, and Paulhus (2013) cite the importance of conducting

further analysis, and not just relying on correlations to conclude that the Dark Triad is a unified concept.

The three constructs forming the Dark Triad are distinctly different from each other (Furnham et al., 2013) and may simply share a common core such as Honesty-Humility (Lee & Ashton, 2005) or Disagreeableness (Paulhus & Williams, 2002). Furthermore, evidence from behavioural genetics shows that Narcissism and Psychopathy are largely accounted for by genetic factors and the non-shared environment (Jones & Paulhus, 2011). Machiavellianism, however, is unique from the other two Dark Triad constructs in that it can be modified by experience (Jones & Paulhus, 2011). Indeed, many studies that have investigated the Dark Triad have demonstrated different relationships with cognitions or behaviour and behavioural outcomes for the individual constructs. These studies include differences in attachment patterns (Jonason, Lyons, & Bethell, 2013), socio-emotional intelligence (Nagler et al., 2014), self-monitoring (Rauthmann, 2011), and emotional deficits (Jonason & Krause, 2013). Different outcomes in behaviour include infidelity patterns and relationship dissolution (Jones & Weiser, 2014), relationship choices (Jonason, Luevano, & Adams, 2012), friendship selection (Jonason & Schmitt, 2012), and different strengths of relationships with bullying (Baughman, Dearing, Giammarco, & Vernon, 2012). Therefore, this warrants the investigation of Machiavellianism as a unique construct and not just part of the Dark Triad index.

Machiavellianism and Behaviour in Social Relationships

Individuals higher on Machiavellianism demonstrate a unique way in which they manage their social interactions and personal relationships. This is demonstrated both in child and adult interactions. For example, Machiavellianism in children is associated with being less pro-social and more aggressive towards their peers (Slaughter &

Pritchard, 2000, cited in Repacholi, Slaughter, Pritchard, & Gibbs, 2003) and being categorised as both a bully and a victim of bullying (Andreou, 2004). In adults, self-report measures suggest individuals higher on Machiavellianism show confidence in their ability to deceive and, through the use of vignettes, have been reported to endorse lying for self-gain or to avoid conflict (Giammarco, Atkinson, Baughman, Veselka, & Vernon, 2013; McLeod & Genereux, 2008). Adults with higher levels of Machiavellianism demonstrate a tendency to worsen the moods of others and display inauthentic moods to elicit sympathy and guilt in others (Austin & O'Donnell, 2013), and engage in emotional manipulation (Austin et al., 2007; Nagler et al., 2014). Individuals higher on Machiavellianism may use the projection of intimacy as a manipulation strategy (Blumstein, 1973) with earlier research suggesting women engage in self-disclosure as a manipulation strategy (O'Connor & Simms, 1990); recent research found that Machiavellianism alone was not related to self-disclosure for men or women (Brewer, Abell, & Lyons, 2014). Indeed, individuals higher on Machiavellianism demonstrate a protean approach to the manipulation of family members, friends, and strangers, employing a variety of strategies such as coercion, silent treatment, and promising monetary reward (Jonason & Webster, 2012). Such strategies may be facilitated by the lack of hostility in their actions and seeking closeness in others, although they do this primarily to manipulate (Ináncsi, Láng, & Bereczkei, 2015; Jones & Neira, 2015).

Research investigating Machiavellianism and social relationships has in general demonstrated that Machiavellianism is associated with bullying, particularly verbal direct bullying in adults (Baughman, Dearing, Giammarco, & Vernon, 2012), with bullying and emotional blackmail with work colleagues (Chen, 2010; Linton & Power, 2013), and the tendency to engage in sexual harassment behaviour (Zeigler-Hill, Besser, Morag, & Campbell, 2016). In romantic relationships Machiavellianism has been shown

to be influential in a number of factors including infidelity, intersexual and intrasexual competition, sexual coercion and conflict communication (Brewer & Abell, 2015; Horana, Guinnb, & Banghart, 2015; Jones & Weiser, 2014). Importantly, with regards to this thesis, Machiavellianism also influences friend selection and friendship quality (Abell, Lyons, & Brewer, 2014; Jonason & Schmitt, 2012; Lyons & Aitken, 2010).

Machiavellianism and Friendship

As demonstrated above, Machiavellianism is influential in a variety of relationship contexts. Although research investigating the influence of Machiavellianism in social relationships is growing steadily, few studies have considered Machiavellianism as an individual difference in the context of friendship. Friendships are the most common form of social relationship (Blieszer & Adams, 1992) and may provide opportunities for individuals higher on Machiavellianism to use strategies to manipulate and exploit for their own self-serving goal.

The selection-manipulation-evocation framework (Buss, 1987) has been applied to Machiavellianism and friendship dynamics (Jonason & Schmitt, 2012). This framework describes three processes by which individuals interact with the environment. Selection refers to the individual's decision to enter or avoid a specific environment. Individuals higher on Machiavellianism may avoid environments (i.e., friendships) where they are unable to achieve the self-serving goal through manipulation or are likely to be detected. Friends that are easily manipulated or exploited would, therefore, be desirable. Evocation refers to individuals eliciting responses from the environment itself. Buss argues that such responses are most likely to be evoked unintentionally by the individual. However, for individuals higher on Machiavellianism, the majority of the responses they evoke from the environment are likely to be intentional, given their need for strategic planning and to avoid detection

(Christie & Geis 1970). The third social mechanism concerns the manipulation of the environment. Manipulation of others is essential for survival (i.e., such as the elicitation of parental care) and is the core of Machiavellianism. Subsequently, individuals higher on Machiavellianism may select friends with certain characteristics that make them more vulnerable to manipulation.

Research has demonstrated that adults high on Machiavellianism place little importance on friendships and have friendships of poor quality (Abell et al., 2014; Lyons & Aitken, 2010). This may suggest that these individuals place little importance on the 'traditional' qualities of friendship such as support and empathy. This view of friendship may be facilitated by individuals higher on Machiavellianism viewing others with distrust, suspicion, and the belief that others will exploit them (Christie & Geis, 1970). These views, coupled with the emotional detachment that characterises Machiavellianism, may explain why individuals higher on Machiavellianism may see no reason to feel connected to their friend as they expect to be exploited or manipulated by them. Given that Machiavellianism has been associated with poor attachment in childhood (Abell et al., 2014; Jonason, et al., 2013) the poor quality friendships they report in adulthood may be a reflection of that poor attachment experience.

Furthermore, individuals high on Machiavellianism see others as weak and vulnerable (Black, Woodworth, & Porter, 2014), seek closeness from others in order to manipulate them (Ináncsi et al., 2015) and select opposite sex-friends who are kind (Jonason & Schmitt, 2012). Individuals who are viewed as kind may be easier to (appear to) form a friendship with and exploit the kindness for their own self-serving goal. Indeed, Jonason and Webster (2012) demonstrated that adults high on Machiavellianism self-report employing a variety of social influence tactics towards their same-sex and opposite-sex friend including the use of coercion and silent treatment.

Machiavellianism and Female Friendships

Females are more likely to form same-sex friendships with girls demonstrating a preference for same-sex interactions from two years of age (Powlishta, Serbin, & Moller, 1993). In childhood, girls have been found to find it easier to resolve conflict, report more help and guidance and more intimate exchanges in their friendships (Parker & Asher, 1993), and show more enjoyment of dyadic interactions than boys' friendships (Benenson, 1993). In adolescence, compared to males, females report higher levels of intimacy and perspective taking (Updegaff, Helms, McHale, Crouter, Thayer, & Sales, 2004), report more openness, interaction, and supportiveness with their same-sex friend (Oswald, Clark, & Kelly, 2004), and avoid antipathetic friends (friendships defined by mutual dislike) (Card, 2007). In adulthood, women report high expectations for reciprocity and communion (Hall, 2011), have empathic and supportive friendships (Baron-Cohen & Wheelwright, 2003), form exclusive smaller friendship networks which tend to be dyadic in nature, and discuss personal feelings (Vigil, 2007).

The focus on intimacy, disclosure, and smaller friendship networks may provide unique opportunities for females with higher Machiavellianism scores to manipulate others. Machiavellianism is associated with seeking closeness in others in order to manipulate (Ináncsi et al., 2015) and female friendships may be the ideal context in which to employ that strategy. Indeed, research has suggested that individuals high on Machiavellianism may benefit from strategies that maintain a romantic relationships (Furnham et al., 2013) and these strategies may also be found in female friendships. Conforming to female friendship norms may help to avoid detection and, subsequently, avoid negative consequences such as social exclusion (Benenson, et al., 2013).

Maintaining female friendships ensures a constant target of manipulation to help with the individual's own self-serving goals as well as appearing to conform to female

friendship norms and avoid social exclusion. This may be particularly important to females given their tendency to engage in dyadic friendships with no substitute partners to replace their friend if the friendship breaks down. Friendship maintenance may also be important to women given their historical reliance on same-sex friends for help with adaptive problems such as child rearing (Benenson & Christakos, 2003; Silverman & Choi, 2005). Although Machiavellianism is associated with avoiding detection in general, the unique environment of female friendship may, specifically, influence the behaviour of females higher on Machiavellianism and may result in more subtle manipulation tactics.

However, the subtle behaviour females with higher Machiavellianism scores engage in with the same-sex friends and peers is unknown. In the context of manipulation strategies research has demonstrated Machiavellianism does not individually predict self-disclosure (Brewer, Abell, & Lyons, 2013) in female friendships. Self-disclosure is a projection of intimacy which conforms to female friendship norms. The use of self-disclosure may make their friend feel valued and trusted and thus easier to exploit. Therefore, it was expected to be reported to be used by women higher on Machiavellianism.

Additionally, it can be argued that indirect aggression (also referred to as relational aggression), which is a strategy preferred by females (Björkqvist, 1994), may be used by females higher on Machiavellianism. This form of aggression focuses on manipulation of social relationships and can allow the perpetrator, if detected, to deny meaning harm to the victim(s) (Björkqvist, Lagerspetz, & Kaukiainen, 1992). However, trust and support is required from peers to employ this strategy (Miller-Ott & Kelly, 2013). Given Machiavellianism is associated with agency, distrust, and suspicion of others (Christie & Geis, 1970; Locke & Christensen, 2006) indirect aggression may not be a compatible strategy for females higher on Machiavellianism. This warrants the

investigation of the strategies that are actually used by girls and women higher on Machiavellianism.

In addition to Machiavellianism and potential (subtle) manipulation behaviour in females, it is important to investigate naturalistic behaviour that may occur in everyday social interactions between female friends and peers. To the author's knowledge there is no research that has investigated Machiavellianism and naturalistic behaviour with observation techniques. Friendships are the most common form of social relationships (Blieszer & Adams, 1992) and investigating Machiavellianism in this relationship will provide a wealth of data about the behaviour displayed by females with higher Machiavellianism scores. Furthermore, there is no research investigating Machiavellianism and behaviour in girls' same-sex peer relationships. Girls' social relationships are also characterised by intimacy, support, and dyadic interactions. Therefore, these interactions also require a specific type of manipulation to avoid detection from peers or authority figures. Investigating Machiavellianism and behaviour in girls and women will help to provide initial findings of whether there is a developmental trajectory for Machiavellianism in females and their behaviour towards their same-sex friends and peers.

1.1 Aims of the Research

The research presented in this thesis has an overall broad aim as well as specific research aims. The overall aim was to investigate the more subtle behaviour that girls and women with higher Machiavellianism scores may engage in with same-sex friends and peers.

The first set of studies (study 1a and 1b) aimed to investigate whether women with higher Machiavellianism scores reported to engage in emotional manipulation

towards a friend and whether they perceived their friend to use emotional manipulation towards them. Previous research has demonstrated that Machiavellianism is associated with emotional manipulation in general (Austin et al., 2007) but has not placed this manipulation in a particular context, such as a same-sex female friendship.

Study 2 used observation methodology to investigate Machiavellianism and women's actual behaviour in a social interaction. This study aimed to investigate observable behaviour that may be associated with Machiavellianism, and placed this behaviour in an actual real-life context of a same-sex friendship. This study progressed from study 1 by allowing the investigation of more subtle behaviour that may occur in everyday interactions.

Study 3 also used observation methodology to investigate two components of Machiavellianism (Lack of Faith and Distrust) and girls' behaviour in the playground with same-sex peers. This study developed study 2 by investigating two components of Machiavellianism and behaviour in a different developmental stage, but still focused on behaviour that occurred in everyday social interactions. Furthermore, study 2 and study 3 allowed the first initial investigation of a potential developmental pathway for females with higher Machiavellianism scores.

Studies 1a, 1b, and 2 also aimed to investigate the relationship between Machiavellianism and friendship functions. Previous research has investigated Machiavellianism in relation to overall friendship quality (e.g., Abell, Lyons, & Brewer, 2014; Lyons & Aitken, 2010), but has not investigated specific qualities associated with friendship. Therefore, those studies also explored Machiavellianism in women and their perception of companionship, help, intimacy, reliable alliance, self-validation, and emotional security in their same-sex friendship.

Additionally, a supplementary chapter is provided investigating Machiavellianism and the Big-Five (as measured by the ten-item Big-Five) in women. This chapter aimed to highlight the need for more research investigating the relationship between Machiavellianism and personality traits and the influence this may have on research outcomes, including how the Big-Five could also influence women with higher Machiavellianism scores behaviour In particular, that chapter also aimed to highlight the need for research to focus on how personality in childhood (along with stressful family environments) may contribute to the development of Machiavellianism.

2. Chapter Two

Study 1A and 1B

Please note this study has been published: Abell, L., Brewer, G., Qualter, P., & Austin, E. (2016). Machiavellianism, emotional manipulation, and friendship functions in women's friendships. *Personality and Individual Differences, 88,* 108-113.

Machiavellianism, Emotional Manipulation, and Friendship Functions in Women's Friendships

Machiavellianism is associated with the use of emotional manipulation. The relationship between Machiavellianism and emotional manipulation has not, however, been investigated in the context of friendship. The current studies investigated Machiavellianism, emotional manipulation, and the perceived function of friendship in women's same-sex friendships. For study 1a, women (N = 221) completed the Mach IV, an emotional manipulation measure (with reference to their own behaviour and their friend's behaviour), mood worsening and use of inauthentic displays from the managing emotions of others scale, and the friendship functions measure. The friendship functions scale measures six functions of friendship: companionship; help; intimacy; reliable alliance; self-validation; and emotional security. Machiavellianism predicted the self-perceived ability to employ emotional manipulation towards a same-sex friend and perceiving their friend to use emotional manipulation towards them. Machiavellianism predicted lower scores on all six friendship functions. For study 1b, women (N = 186) completed the Mach IV, the modified emotional manipulation measure to assess frequency of emotional manipulation (with reference to their own behaviour and their friend's behaviour), and the friendship functions measure. Women high on Machiavellianism reported using emotional manipulation more frequently towards their same-sex friend and perceived their same-sex friend to frequently use emotional manipulation towards them. Machiavellianism predicted lower scores on five of the friendship functions, though for one friendship function (reliable alliance) the finding

only approached significance. In addition, no relationship was revealed for Machiavellianism and self-validation, warranting further research using the friendship functions measure. These studies demonstrated that women higher on Machiavellianism employed emotional manipulation in their same-sex friendships. Women with higher Machiavellianism scores also perceived that they themselves were manipulated by their friend. Study 1a and 1b highlight the use, and frequent use, of emotional manipulation by women higher on Machiavellianism, but also demonstrated these women perceived themselves as being targets of their friend's emotional manipulation. This is particularly important and highlights the vulnerabilities of women with higher Machiavellianism scores, and shows their negative view of others is also reflected in their feelings towards friends. Therefore, future research should investigate whether women with higher Machiavellianism scores are actually emotionally manipulated by their same-sex friend.

Introduction

Adults with high levels of Machiavellianism seek closeness from others in order to manipulate and exploit (Ináncsi, Láng, & Bereczkei, 2015). These individuals are low on empathy, not connected to their own or other peoples' emotions, and hold negative representations of others (Black, Woodworth, & Porter, 2014; Brankley & Rule, 2014; Ináncsi et al., 2015; Wai & Tiliopoulos, 2012; Wastell & Booth, 2003), which may facilitate the use of manipulation. Although individuals higher on Machiavellianism are distrustful and suspicious of others, view others as weak and have hostile views, they do not show hostility in their behaviour (Black et al., 2014; Chistie & Geis, 1970; Jones & Neira, 2015). This lack of hostility and seeking closeness in others may help women higher in Machiavellianism form same-sex friendships, particularly as intimacy and closeness are important features of women's friendships (Vigil, 2007). Importantly, as friendships are the most common form of social relationships (Blieszer & Adams, 1992) these relationship may present numerous opportunities for manipulation.

Machiavellianism is associated with more subtle, covert manipulation given their focus on not being detected by others (Austin, Farrelly, Black, & Moore, 2007; Christie & Geis, 1970). This may be particularly important for women's friendships as they tend to be dyadic in nature which do not allow for substitute partners if relationships break down (Benenson & Christakos, 2003; David-Barrett et al., 2015). Therefore, it is especially important for manipulation strategies in women's friendships to be covert due to the possibility of losing that friendship. There is the potential risk of reputation damage from a broken friendship including the possibility of being a victim of social exclusion, a tactic preferred by women (Benenson, Markovits, Hultgren, Nguyen, Bullock et al., 2013). Furthermore, it would be time consuming to build up intimacy and trust (or at least the appearance of intimacy and trust) in new friendships in order to use emotional manipulation tactics that their friend may then not detect or respond negatively to. The use of a covert manipulation tactic, such as emotional manipulation, would allow for repeated manipulation with fewer risks associated with this than direct tactics or tactics that require the support of others (i.e., relational aggression).

Adults with higher Machiavellianism scores engage in friendships, but report low friendship quality (Abell, Lyons, & Brewer, 2014; Aitken & Lyons, 2010). This is unsurprising given the high levels of suspicion, cynicism, and emotional detachment associated with Machiavellianism and the focus on agency rather than communion qualities (Christie & Geis, 1970; Rauthmann, 2012b). Research also demonstrates that adults with high Machiavellianism select opposite-sex friends who are kind (Jonason & Schmitt, 2012), which may indicate a preference for friends that can be easily exploited. Furthermore, Machiavellianism is associated with the self-reported manipulation of an opposite and same-sex friend through strategies, such as the use of 'silent-treatment' and coercion (Jonason & Webster, 2012).

Women's friendships, in particular, may provide opportunities to exploit and manipulate. Women report a greater focus on interpersonal relationships (Su, Rounds, & Armstrong, 2009), which may, in part, reflect a greater reliance on female friends when faced with adaptive problems such as finding a mate (Jonason & Schmitt, 2012; Silverman & Choi, 2005). Women spend more time discussing feelings and personal information and their friendships tend to be dyadic in nature, which does not allow for substitute partners if relationships break down (Benenson & Christakos, 2003; David-Barrett et al., 2015; Vigil, 2007). This focus on exclusive friendships characterised by information sharing may provide a context for specific types of manipulation to take place.

Women tend to use relational aggression as a manipulation strategy and, overall, women's manipulation is reported to require more subtle methods (Wilson, Near, & Miller, 1996). This may be due to the risks of engaging in physical aggression (Campbell, 1999), but, also, it may be seen as a socially acceptable way for women to relate to each other and to build relationships (Miller-Ott & Kelly, 2013). Relational aggression refers to behaviour that harms others through the manipulation of relationships using exclusion, gossip, and rumours (Archer & Coyne, 2005; Xie, Cairns & Cairns, 2005). Relational aggression requires support from peers and/or friends because it requires them to listen to the gossip, help spread rumours, and exclude the target individual(s) whilst also offering their own thoughts about the target (Miller-Ott & Kelley, 2013). Therefore, it requires trust from others to participate and trust that they will not betray them to the target.

Although relational aggression is more subtle and more strategic than direct aggression, it may be a problematic strategy for women with high levels of Machiavellianism to engage in. The use of relational aggression requires a level of trust and connection to others, and requires involvement from peers/friends.

Machiavellianism is, however, characterised by distrust, suspicion, and cynicism (Christie & Geis, 1970), making relational aggression incompatible with Machiavellianism. The greater number of individuals that engage in relational aggression may also increase the likelihood of getting caught, which individuals (particularly those with high levels of Machiavellianism) wish to avoid. Although Machiavellianism is related to women's use of relational aggression towards friends online (Abell & Brewer, 2014), this may reflect the absence of face-to-face contact and the decreased reliance on others when engaging in relational aggression in this context.

Women higher in Machiavellianism may find it more beneficial to employ subtle manipulation tactics towards a close friend rather than relying on others to help employ manipulation tactics. Individuals high on Machiavellianism are not impulsive (Jones & Paulhus, 2011) and, instead, are strategic, focusing on avoiding detection from others to reduce the likelihood of negative consequences (Christie & Geis, 1970; Cooper & Peter, 1980). Adults high on Machiavellianism are more likely to use the projection of intimacy as a manipulation strategy and women with higher levels of Machiavellianism have been reported to use self-disclosure to manipulate their close same-sex friend (Blumstein, 1973; Brown & Guy, 1983). However, recent research suggests that Machiavellianism alone is not an individual predictor for the use of self-disclosure in friendships for women (Brewer, Abell, & Lyons, 2014). Therefore, it is important to investigate other possible (indirect) manipulation tactics that women with higher levels of manipulation tactics may employ in their same-sex friendships.

One such tactic is emotional manipulation, which includes the use of strategies to manage the emotions of others (Austin, Farrelly, Black, & Moore, 2007; Austin & O'Donnell, 2013). Machiavellianism is associated with the use of emotional manipulation (Austin et al., 2007) and includes such tactics as strategically paying the other person a compliment and reassuring others so they will go along with what the

individual wants. Individuals higher on Machiavellianism have cynical views of the world and a negative representation of others (Black et al., 2014; Christie & Geis, 1970). This broad negative view, combined with their strategic interpersonal style and focus on avoiding detection that leads to cautiousness rather than impulsivity (Christie & Geis, 1970; Cooper & Peterson, 1980; Jones & Paulhus, 2011), may encourage the use of emotional manipulation. In addition, the use of emotional manipulation may also be further facilitated through the unique relationship between Machiavellianism and hostility (Jones & Neria, 2015). Machiavellian views were reported to be positively related to hostility whilst Machiavellian manipulation tactics were negatively associated with hostility. Individuals high on Machiavellianism may, therefore, have hostile views of others, but this may not be obvious from their actions. This then allows them to use strategic tactics such as emotional manipulation without being detected, or at least they believe they will not be detected due to the lack of overt hostility in their actions.

Machiavellianism may be associated with two particular strategies of emotional manipulation that are used when managing other people's emotions: worsening strategies (e.g. undermining another person's confidence, using criticism) and inauthentic strategies (e.g. eliciting sympathy, sulking to get own way). Emotional manipulation (including the use of emotion managing strategies of mood worsening and inauthentic strategies) only requires one target individual and the perpetrator, rather than the trust and connection of others that are needed during relational aggression; it is also covert, reducing the chance of detection both by the target and others. The use of emotional manipulation may reduce the likelihood of relationship breakdown, reputational damage, and the challenge of then finding a new same-sex friend.

In addition to women with higher Machiavellianism scores self-reporting the ability to use emotional manipulation, there may also be a relationship between Machiavellianism and women's perception that their friend uses emotional

manipulation directed towards them. For example, Machiavellianism is associated with viewing others as weak (e.g. Black et al., 2014). Therefore, women with higher levels of Machiavellianism may view others (in particular their same-sex friend) as incapable of employing manipulation towards them. However, Machiavellianism is also associated with distrust of others and the belief that people will try to exploit them (Christie & Geis, 1970). This may indicate that women higher on Machiavellianism will perceive their friend as trying to exploit them by employing emotional manipulation. There is at present, a paucity of research examining Machiavellianism and the perceptions of others, particularly regarding individuals close to them rather than just investigating their broad views of human nature. Therefore, this study attempts to address this gap by focusing on the perception of a particular behaviour (emotional manipulation) in the specific context of friendship.

Previous research suggests that emotional manipulation is likely to be deployed by women with higher Machiavellianism in their close friendships with other women. However, this has not been specifically investigated. Women's friendships provide an ideal context in which to employ emotional manipulation: they are dyadic in nature, focused on intimacy and personal information sharing, and have an ancestral history of reliance on each other to help with adaptive problems (Benenson & Chistakos, 2003; Silverman & Choi, 2005; Vigil, 2007). These female friendship norms of closeness and intimacy will facilitate the Machiavellian strategy of seeking closeness in order to manipulate another person (Ináncsi, Láng, & Bereczkei, 2015). This (apparent) closeness may allow women higher on Machiavellianism to emotionally manipulate without their friend being suspicious and reduces the likelihood of confrontation. The dyadic nature of the friendship may also be beneficial for women higher on Machiavellianism as the lack of substitute friends may limit friendship dissolution and potential reputational damage. This is particularly important given that individuals

higher on Machiavellianism do not want their strategies to be detected by others (Christie & Geis, 1970). This will allow them to continue to gain trust from others in order to manipulate the friend to their own advantage. Therefore, female dyadic friendships may provide an ideal context in which to use emotional manipulation strategies.

These women may also report that they are targeted in this way by their close female friends. Machiavellianism is associated with negative views of human nature and seeking closeness in others in order to manipulate (Ináncsi et al., 2015). However, research has not investigated specifically if women perceive they are being negatively treated by others, and in particular, a same-sex individual who they have formed a platonic relationship with. Women higher on Machiavellianism may perceive the same-sex friend as being weak and vulnerable and, thus, do not perceive them to use emotional manipulation. In contrast, the broad negative view associated with Machiavellianism may encourage the perception that their friend is also trying to employ emotional manipulation towards them. It is important to investigate how women perceive others and their behaviour towards them. These perceptions may be instrumental in understanding women who are higher on Machiavellianism, and their behaviour in social relationships; such work will be significant for future research investigating the development of the Machiavellian behaviour profile.

The relationship between Machiavellianism and emotional manipulation in friendship has not previously been investigated. Specifically, results are reported from two studies which investigate women's perceived ability to manipulate a close same-sex friend and the perception that they themselves are manipulated (Study 1a) and women's self-reported frequency of employing emotional manipulation and their perception of the frequency that emotional manipulation is used towards them (Study 1b).

2.1 Study 1A

Study 1a investigates whether Machiavellianism is associated with the use of emotional manipulation in friendship and the use of two specific emotional manipulation tactics (worsening and inauthentic strategies). Based on previous research (Austin et al., 2007; Austin & O'Donnell, 2013) and the potential benefits of using emotional manipulation (e.g., less reliance on others, reduced chance of getting caught), it is predicted that higher levels of Machiavellianism will be associated with the self-reported use of emotional manipulation (including the use of inauthentic and mood worsening strategies) towards a close female friend. In addition, this study explores the relationship between Machiavellianism and the perceived use of their friend's emotional manipulation towards them.

Previous research has shown that Machiavellianism is related to poor friendship quality (Abell et al., 2014; Lyons & Aitken, 2010), but has not explored how individuals with higher levels of Machiavellianism view the functions of friendship. Therefore, the relationship between Machiavellianism and six functions of friendship will be considered in the current study. The six functions are companionship, help, intimacy, reliable alliance, self-validation, and emotional security. Based on previous research it is anticipated that Machiavellianism will predict lower scores on all six friendship functions.

2.2 Study 1A Method

Participants

Participants were 221 women aged 18 to 69 (M_{age} = 27.55, *SD* = 11.17) with an average friendship length of 123.58 months (*SD* = 92.67). Women completed the questionnaires through online research websites and social networking sites and received no financial reward for participation. The study was approved by the University of Central Lancashire ethics committee (see appendix 2A).

Questionnaires

Mach IV (Christie & Geis, 1970). Machiavellianism was assessed with the 20-item Mach-IV scale, which measures morality, cynicism, and manipulative interpersonal style. Example items from the scale include "*The best way to handle people is to tell them what they want to hear"* and "*It is wise to flatter important people"*. Participants responded on a 7-point Likert scale (1 = *strongly disagree*; 7 = *strongly agree*). Ten items were reverse scored, such that higher scores represent higher Machiavellianism, with total standardised scores used in the analysis. The scale demonstrated good reliability α = .73.

Emotional Manipulation (Austin et al., 2007). Emotional manipulation was measured with the 10-item Emotional Manipulation measure that describes general emotional manipulation strategies. Items include "*I know how to embarrass someone to stop them behaving in a particular way*" and "*I can use my emotional skills to make others feel guilty*". Participants responded on a five-point Likert scale (1 = *strongly disagree*; 5 = *strongly agree*). In this study the statements were altered slightly to reflect emotional manipulation specifically towards a friend. For example "*I know how to embarrass my friend to stop them behaving in a particular way*". Items were then summed to generate an emotional manipulation score. The scale demonstrated excellent

reliability α = .87. Participants completed the scale for a second time with reference to their friend's manipulative behaviour towards them. For example "*My friend knows how to embarrass me to stop me behaving in a particular way*". The scale demonstrated excellent reliability α = .88.

Managing Emotions of Others (Austin & O'Donnell, 2013). Two subscales - mood worsening and use of inauthentic displays for self-serving purposes - from the Managing Emotions of Others Scale were utilised in this study. The original mood worsening subscale consisted of 13 statements that include the use of criticism and undermining confidence. In this study, four items were removed because they are also found in the Emotional Manipulation Scale (as mood worsening and emotional manipulation both involve managing others emotions). Items in the subscale include "*I sometimes try to undermine another person's confidence*" and "I *use displays of anger to motivate others*". The scale demonstrated excellent reliability α = .87. The original inauthentic moods subscale included 11 statements. They include statements that assess the use of flattery and inducing jealousy. One item was removed from the scale because it formed part of the Emotional Manipulation Scale. Emotional manipulation and using inauthentic moods both incorporate managing another person's emotions. Items include "*I sometimes sulk to get someone to change their behaviour*" and "*If I want someone to do something for me, I am especially nice to them before asking*". Participants responded on a five-point scale for both subscales (1 = *strongly disagree* and 5 = *strongly agree*). In this study statements were altered to specifically reflect behaviour with a friend, for example "*I sometimes sulk to get my friend to change their behaviour*". The scale demonstrated excellent reliability α = .88.

Friendship Functions (MFQ-FF; Mendelson & Aboud, 1999)**.** The McGill Friendship Functions short-form questionnaire was used to measure friendship Functions. This is a 30-item measure that assesses six functions of friendship:

stimulating companionship; help; intimacy; reliable alliance; self-validation; and emotional security. Totals were calculated for each subscale. Participants were asked to imagine that each statement referred to their close friend. Stimulating companionship refers to spending time with their friend that results in feelings of enjoyment e.g., "___ *is fun to sit and talk with*". Help refers to providing assistance and advice to meet the individual's needs and goals e.g., "___*helps me when I need it".* Intimacy refers to providing an environment where personal thoughts and feelings can be expressed safely e.g., *"___is easy to talk to about private things*". Reliable alliance refers to counting on the continuing loyalty of their friend: e.g., "___*would stay my friend even if we argued*". Self-validation refers to their friend as being encouraging and reassuring and helping to validate ones self-worth e.g., "___*makes me feel special".* Emotional security refers to the provision of comfort provided by the friend in novel and/or frightening situations e.g., "___*would make me feel better if I were worried"*. Participants respond on a 9-point scale (0 = *never*; 8 = *always*). The subscales demonstrated excellent reliability ranging from α = .89 to α = .92.

Analysis Plan

The means and standard deviations for Machiavellianism, emotional manipulation, mood worsening, inauthentic strategies, and the friendship functions (companionship, help, intimacy, reliable alliance, self-validation, and emotional security) are shown in table 2.1. Machiavellianism scores were standardised allowing them to be compared with other Machiavellianism focused studies. Missing data analysis revealed 4.21 percent of the data was missing. These missing data can largely be explained by 16 participants having incomplete friendship quality questionnaires; this was the final measure participants were asked to complete. In total 7.3% of participants were missing total scores for friendship quality. These participants were retained because their data also contained other fully completed questionnaires integral

to the research questions. The missing data were then coded as missing in the data file. Normality of the data were investigated and all found to be skewed and non-normal (see appendix 2B). These data were, therefore, analysed using bootstrapped regressions which account for non-normal data and is robust against outliers. This allowed the investigation of whether Machiavellianism predicted emotional manipulation (including mood worsening and inauthentic tactics), the perception of emotional manipulation from a friend, and friendship functions in women's friendships.

2.3 Study 1A Results

Correlations

Transformations of the data were unsuccessful. Therefore, the original raw data were utilised in the main analysis. The spearman's rho correlations are shown in table 2.1. Age significantly positively correlated with friendship length and was significantly negatively correlated with Machiavellianism, suggesting that Machiavellianism scores decreased with age. Age also demonstrated significant negative correlations with emotional manipulation, perceived emotional manipulation from a friend, mood worsening strategies, inauthentic strategies, and companionship. Friendship length significantly negatively correlated with mood worsening and inauthentic strategies suggesting women in longer friendships used these two strategies less frequently. Machiavellianism demonstrated significant negative correlations with all six friendships functions subscales (companionship, help, intimacy, reliable alliance, self-validation, and emotional security). Machiavellianism also significantly positively correlated with emotional manipulation, mood worsening strategies, inauthentic strategies, and perceiving emotional manipulation from a friend. This suggests that women with higher scores on Machiavellianism employed these manipulation strategies, but they also believed their friend employed emotional manipulation towards them. Emotional manipulation showed significant negative correlations with the friendships subscales;

help, intimacy, reliable alliance, and emotional security. Perceived emotional manipulation from a friend demonstrated significant negative correlations with intimacy, reliable alliance, self-validation, and emotional security.

Table 2.1 *Showing Means, Standard deviations (SD) and Correlations between the measures for study 1A*

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1.Age	27.55	11.12		.35**	-.19**	-.29**	-.21**	-.37**	-.31**	-.17*	-.10	-.02	-.05	-.02	-.02
2.Friendship Length	123.58	92.67			-.09	-.08	-.10	-.17*	-.22**	-.06	-.07	.02	.14	.07	.06
3.Mach	69.73	12.57				.31**	.24**	.40**	.38**	-.237**	-.26**	-.239**	-.31**	-.33**	-.26**
4.EM	25.64	8.63					.67**	.538**	.540**	-.04	-.14**	-.17*	-.15*	-.16	-.20**
5.EM from friend	24.78	9.21						.49**	.51**	-.07	-.13	-.19**	-.18**	-.19**	-.18*
6.Worsen	13.20	5.19							.69**	-.27**	-.334**	-.32**	-.306**	-.34**	-.35**
7.Inauthentic	19.89	7.61								-.25**	-.332**	-.30**	-.314**	-.32**	-.37**
8.Companionship	34.54	5.97									.71	.61**	.54**	.70**	.66**
9.Help	31.68	7.52										.63**	.59**	.763**	.760**
10.Intimacy	34.46	7.02											.61**	.60**	.68**
11.Reliable Alliance	36.71	5.41												.66**	.62**
12.Self-validation	32.25	6.57													.76**
13.Emotional Security	33.39	6.90													

Note **correlation is significant at the .01 level
*correlation is significant at the .05 level
[1] EM refers to emotional manipulation

Robust Regression Analysis

In order to account for the non-normal data, robust regressions were conducted with bootstrapping. Bootstrapping was set at 1000 samples, with a 95% bias corrected accelerated confidence interval. Hierarchical regressions were conducted to investigate whether Machiavellianism predicted the use of emotional manipulation, mood worsening tactics, and inauthentic tactics towards a close female friend. In addition, regression analysis was conducted to investigate whether Machiavellianism predicted perceived emotional manipulation from a close female friend. Finally, regression analysis was also conducted to investigate whether Machiavellianism predicted perceiving their friend to provide companionship, help, intimacy, as well as perceiving them to be a reliable ally and provide self-validation, and emotional security.

Machiavellianism and Emotional Manipulation

Step 1 (age and friendship length) explained 4.1 % of the variance in the use of emotional manipulation towards a friend. Machiavellianism was entered at Step 2, accounting for an additional 13.2% and this was significant, F change (1, 165) = 26.39, p <.001. The overall model was significant (F(3, 165) = 11.54, p < .001, accounting for 17.3% variance. Age was related to the use of emotional manipulation (β = -.17, t = -2.08, p = .022), suggesting that as age increased the use of emotional manipulation decreased. After controlling for age and friendship length, Machiavellianism influenced the use of emotional manipulation towards a friend (β = .37, t = 5.14, p = .001), indicating that as Machiavellianism scores increased the use of emotional manipulation towards a friend increased. Please see table 2.2 for the Bootstrapped regression for Machiavellianism and emotional manipulation.

Table 2.2 *Bootstrapped regression for Machiavellianism and Emotional Manipulation (Standard error beta and confidence intervals are based on bootstrapping).*

	B	SEB	β	*p*
Step 1				
Age	-.16	.07	-.20	.020
	(-0.29, -0.04)			
Friendship length	.00	.01	.00	.972
	(-0.01, 0.01)			
Step 2				
Age	-.14	.06	-.17	.022
	(-0.24, -0.03)			
Friendship	.00	.01	.04	.595
Length	(-0.01, 0.02)			
Machiavellianism	.25	.06	.37	.001
	(0.14, 0.35)			

Note $R^2 = .04$ for step 1 and $\Delta R^2 = .13$ for step 2

Machiavellianism and Mood Worsening

Step 1 (age and friendship length) explained 5.9 % of the variance in the use of mood worsening tactics towards a friend. At Step 2, Machiavellianism explained an additional 16.1% and this was significant, F change (1,163) = 33.74, $p < .001$. The final model was significant ($F(3, 163) = 15.35$, $p < .001$), accounting for 22% variance. Age and friendship length were not significantly related to mood worsening tactics. After controlling for age and friendship length, Machiavellianism was significantly related to the use of mood worsening tactics towards a friend ($\beta = .41$, $t = 5.81$, $p = .001$), as Machiavellianism scores increased women self-reported employing mood worsening tactics. Please see table 2.3 for the Bootstrapped regression for Machiavellianism and mood worsening tactics.

Table 2.3 *Bootstrapped regression for Machiavellianism and Mood Worsening (Standard error beta and confidence intervals are based on bootstrapping).*

	B	SEB	β	*p*
Step 1				
Age	-.09	.05	-.18	.077
	(-0.17, 0.01)			
Friendship length	-.01	.00	-.09	.221
	(-0.01, 0.00)			
Step 2				
Age	-.07	.04	-.14	.093
	(-0.15, 0.00)			
Friendship	-.00	.00	-.06	.410
Length	(-0.01, 0.00)			
Machiavellianism	.17	.04	.41	.001
	(0.09, 0.23)			

Note R^2 = .06 for step 1 and ΔR^2 = .16 for step 2

Machiavellianism and Inauthentic Strategies

Step 1 (age and friendship length) explained 9% of the variance in the self-reported use of inauthentic strategies towards a same-sex female friend. At Step 2, Machiavellianism accounted for an additional 9.7% variance, this was significant, F change (1, 162) = 19.36, $p < .001$. The final model was significant ($F(3, 162) = 12.46$, $p < .001$) and explained 18.7 % variance. Age significantly predicted the use of inauthentic strategies ($\beta = -.16$, $t = -2.00$, $p = .016$) suggesting that as age increased the use of inauthentic strategies towards a friend decreased. Friendship length was not significant. Machiavellianism was significantly related to the use of inauthentic strategies towards a same-sex friend ($\beta = .32$, $t = 4.40$, $p = .001$), suggesting higher levels of Machiavellianism increased self-reported use of inauthentic manipulation strategies towards a close female friend. Please see table 2.4 for the Bootstrapped regression for Machiavellianism and displaying inauthentic strategies.

Table 2.4 *Bootstrapped regression for Machiavellianism and Inauthentic Strategies (Standard error beta and confidence intervals are based on bootstrapping).*

	B	SEB	β	*p*
Step 1				
Age	-.14	.05	-.20	.016
	(-0.24, -0.04)			
Friendship	-.01	.01	-.15	.039
Length	(-0.02, -0.00)			
Step 2				
Age	-.12	.05	-.16	.016
	(-0.22, -0.02)			
Friendship length	-.01	.01	-.12	.064
	(-0.02, 0.00)			
Machiavellianism	.19	.04	.32	.001
	(0.11, 0.28)			

Note R^2 = .09 for step 1 and ΔR^2 = .19 for step 2

Machiavellianism and Perceived Emotional Manipulation from a Friend

Step 1 (age and friendship length) explained 5.5% of the variance in perceiving emotional manipulation from a friend and this was significant, F change (2, 155) = 4.54, p = .012. Machiavellianism was entered at Step 2 and accounted for an additional 5.8%, this was significant, F change (1, 154) = 9.99, p = .002. The overall model was significant (F(3, 154) = 6.53, p < .001) explaining 11.3% variance. Age predicted perceived emotional manipulation from a friend (β = -.22, t = -2.48, p = .003), suggesting that as age increased, perceiving emotional manipulation from a friend decreased. Machiavellianism was significantly related to perceiving emotional manipulation from a friend (β = .24, t = 3.16, p = .005), suggesting that women with higher Machiavellianism scores perceived their friend to use emotional manipulation towards them. Please see table 2.5 for the Bootstrapped regression for Machiavellianism and perceiving emotional manipulation from a same-sex friend.

Table 2.5 *Bootstrapped regression for Machiavellianism and perceiving Emotional Manipulation (Standard error beta and confidence intervals are based on bootstrapping)*

	B	SEB	β	*p*
Step 1				
Age	-.19	.06	-.24	.003
	(-0.30, -0.08)			
Friendship length	.00	.01	.00	1.000
	(-0.19, 0.18)			
Step 2				
Age	-.18	.06	-.24	.003
	(-0.29, -0.06)			
Friendship length	.00	.01	.03	.787
	(-0.02, 0.02)			
Machiavellianism	.18	.06	.24	.005
	(0.05, 0.30)			

Note R^2 = .06 for step 1 and ΔR^2 = .06 for step 2

Machiavellianism and Companionship

Step 1 (age and friendship length) explained 3.5% of the variance in perceiving their friend to provide companionship. This was not significant, F change (2, 152) = 2.75, $p = .067$. Machiavellianism was entered at Step 2 accounting for an additional 11.7% of variance. This was significant, F change (1, 151) = 20.84, $p < .001$. The overall model was significant ($F(3, 151) = 9.02$, $p < .001$) and accounted for 15.2% variance. Age influenced perceiving companionship from a friend ($\beta = -.19$, $t = -2.20$, $p = .047$), suggesting that as age increased participants viewed their friend as providing less companionship. Friendship length was not significant. Machiavellianism (after controlling for age and friendship length) negatively influenced perceiving their friend to provide companionship ($\beta = -.35$, $t = -4.57$, $p = .001$) demonstrating that women with higher levels of Machiavellianism reported their friend as providing less companionship. Please see table 2.6 for the Bootstrapped regression for Machiavellianism and companionship.

Table 2.6 *Bootstrapped regression for Machiavellianism and Companionship (Standard error beta and confidence intervals are based on bootstrapping)*

	B	SEB	β	*p*
Step 1				
Age	-.09	.06	-.16	.132
	(-0.21, 0.3)			
Friendship length	-.00	.01	-.04	.687
	(-0.02,0.01)			
Step 2				
Age	-.10	.05	-.19	.047
	(-0.20, 0.01)			
Friendship length	-.01	.01	-.07	.417
	(-0.02, 0.01)			
Machiavellianism	-.16	.04	-.35	.001
	(-0.25, -0.07)			

Note R^2 = .04 for step 1 and ΔR^2 = .12 for step 2

Machiavellianism and Help

Step 1 (age and friendship length) explained 1.7% of the variance in perceiving their friend to provide help. This was not significant, F change (2, 152) = 0.02, $p = .977$. Machiavellianism was entered at Step 2 and explained an additional 15.4 %. This was significant, F change (1, 151) = 28.07, $p < .001$. The overall model was significant ($F(6, 175) = 10.42$, $p < .001$) explaining 17.1% variance. Age and friendship length were not significant. Machiavellianism (after controlling for age and friendship length) was negatively related to perceiving their friend to provide help ($\beta = -.40$, $t = -5.30$, $p = .001$), indicating that women with higher levels of Machiavellianism perceived their friend to provide them with less help. Please see table 2.7 for the Bootstrapped regression for Machiavellianism and help.

Table 2.7 *Bootstrapped regression for Machiavellianism and Help (Standard error beta and confidence intervals are based on bootstrapping).*

	B	SEB	β	*p*
Step 1				
Age	-.06	.07	-.08	.442
	(-0.22, 0.08)			
Friendship length	-.01	.01	-.08	.462
	(-0.02, 0.01)			
Step 2				
Age	-.08	.06	-.11	.194
	(-0.21, 0.06)			
Friendship length	-.01	.01	-.11	.234
	(-0.03, 0.00)			
Machiavellianism	-.25	.05	-.40	.001
	(-0.35, -0.13)			

Note R^2 = .02 for step 1 and ΔR^2 = .15 for step 2

Machiavellianism and Intimacy

Step 1 (age and friendship length) explained no variance in perceiving their friend to provide intimacy. Machiavellianism was entered at Step 2 providing 10.5% variance, this was significant, F change (1, 151) = 17.65, $p < .001$. The overall model was significant ($F(3, 151) = 5.90$, $p < .001$) explaining 10.5% variance. Age and friendship length were not significant predictors. Machiavellianism (after controlling for age and friendship length) negatively influenced perceiving their friend to provide intimacy ($\beta = -.33$, $t = -4.20$, $p = .001$) suggesting that women with higher levels of Machiavellianism perceived their friend to provide them with less intimacy. Please see table 2.8 for the Bootstrapped regression for Machiavellianism and intimacy.

Table 2.8 *Bootstrapped regression for Machiavellianism and Intimacy (Standard error beta and confidence intervals are based on bootstrapping)*

	B	SEB	β	*p*
Step 1				
Age	.01	.06	.01	.872
	(-0.10, 0.12)			
Friendship length	.00	.01	.01	.952
	(-0.01, 0.01)			
Step 2				
Age	-.01	.05	-.01	.895
	(-0.11, 0.10)			
Friendship length	-.00	.01	-.03	.786
	(-0.02, 0.01)			
Machiavellianism	-.18	.05	-.33	.001
	(-0.28, -0.09)			

Note $R^2 = .00$ for step 1 and $\Delta R^2 = .11$ for step 2

Machiavellianism and Reliable Alliance

Step 1 (age and friendship length) explained 1.4% of the variance in perceiving their friend to be a reliable ally, this was not significant, F change (2, 152) = 1.06, p = .350. Machiavellianism was entered at Step 2 and explained an additional 10.9 %. This was significant, F change (1, 151) = 18.84, $p < .001$. The overall model was significant ($F(3, 151) = 7.07$, $p < .001$), accounting for 12.3% variance. Friendship length and age were not statistically significant predictors. Machiavellianism (after controlling for age and friendship length) was negatively related to perceiving their friend to be a reliable ally ($\beta = -.34$, $t = -4.34$, $p = .003$) showing that women with higher levels of Machiavellianism perceived their friend to be less of a reliable ally. Please see table 2.9 for the Bootstrapped regression for Machiavellianism and reliable alliance.

Table 2.9 *Bootstrapped regression for Machiavellianism and Reliable Alliance (Standard error beta and confidence intervals are based on bootstrapping)*

	B	SEB	β	*p*
Step 1				
Age	-.06	.05	-.13	.277
	(-0.18, 0.06)			
Friendship Length	.01	.01	.10	.420
	(-.01, 0.02)			
Step 2				
Age	-.07	.05	-.16	.150
	(-0.19, 0.05)			
Friendship length	.00	.01	.06	.572
	(-0.01, 0.01)			
Machiavellianism	-.13	.04	-.34	.003
	(-0.21, -0.06)			

Note $R^2 = .01$ for step 1 and $\Delta R^2 = .11$ for step 2

Machiavellianism and Self-Validation

Step 1 (age and friendship length) explained 0.1% of the variance in perceiving their friend to provide self-validation. This was not significant, F change (2, 152) = 0.60, p = .942. Machiavellianism was entered at Step 2 and explained an additional 15.5%. This was significant, F change (1, 151) = 27.68, p < .001). The overall model was significant (F(3, 151) = 9.28, p < .001) and accounted for 15.6% variance. Age and friendship length were not significant predictors. Machiavellianism (after controlling for age and friendship length) was significantly negatively associated with perceiving their friend to be a source of self-validation (β = -.40, t = -5.26, p = .001), indicating that women with higher levels of Machiavellianism perceived their friend to provide them with less self-validation. Please see table 2.10 for the Bootstrapped regression for Machiavellianism and self-validation.

Table 2.10 *Bootstrapped regression for Machiavellianism and Self-Validation (Standard error beta and confidence intervals are based on bootstrapping*

	B	SEB	β	*p*
Step 1				
Age	-.01	.06	-.01	.895
	(-0.14, 0.12)			
Friendship	-.00	.01	-.02	.888
Length	(-0.02, 0.01)			
Step 2				
Age	-.03	.06	-.05	.588
	(-0.14, 0.08)			
Friendship length	-.00	.01	-.06	.568
	(-0.02, 0.01)			
Machiavellianism	-.21.	.04	-.40	.001
	(-0.29, -0.12)			

Note R^2 = .00 for step 1 and ΔR^2 = .16 for step 2.

Machiavellianism and Emotional Security

Step 1 (age and friendship length) explained 0.1% of the variance in perceiving their friend to provide emotional security. This was not significant, F change (2, 152) = 0.10, p = .908. Machiavellianism was entered at Step 2 explaining an additional 8.6%. This was significant, F change (1, 151) = 14.18, p < .001). The overall model was significant (F(3, 151) = 4.80, p = .003) accounting for 8.7% variance. Age and friendship length were not statistically significant predictors. Machiavellianism (after controlling for age and friendship length) was significantly negatively related to perceiving their friend to be a source of emotional security (β = -.30, t = -3.77, p = .001), suggesting that women with higher levels of Machiavellianism viewed their friend as providing them with less emotional security. Please see table 2.11 for the Bootstrapped regression for Machiavellianism and emotional security.

Table 2.11 *Bootstrapped regression for Machiavellianism and Emotional Security (Standard error beta and confidence intervals are based on bootstrapping)*

	B	SEB	β	*p*
Step 1				
Age	-.00	.06	-.00	.985
	(-0.11, 0.13)			
Friendship length	.00	.01	.04	.724
	(-0.01, 0.01)			
Step 2				
Age	-.02	.06	-.03	.804
	(-0.13, 0.12)			
Friendship length	.00	.01	.01	.943
	(-0.01, 0.01)			
Machiavellianism	-.16	.04	-.30	.001
	(-0.25, -0.07)			

Note R^2 = .00 for step 1 and ΔR^2 = .09 for step 2

2.4 Discussion of study 1A

Study 1a demonstrated that women with higher levels of Machiavellianism report greater ability to employ emotional manipulation directed at a close same-sex friend than those with low Machiavellianism scores. This included tactics such as making their friend feel ashamed, embarrassed, and/or guilty. Furthermore, self-reported Machiavellianism was also associated with women's use of mood worsening tactics such as using anger and knowledge of their friend's emotional triggers to manipulate them, and the use of inauthentic strategies such as sulking and deliberately making their friend feel jealous. Women with higher Machiavellianism scores also perceived their friend to be more emotionally manipulative towards them than women with low Machiavellianism scores. This may stem from viewing others as distrustful, controlling and demanding, and showing sensitivity to unfair treatment (Christie & Geis, 1970; Schmitt, Gollwitzer, Maes, & Arbach, 2005; Sherry, Hewitt, Besser, Flett, & Klein, 2006).

Previous research has demonstrated that Machiavellianism is associated with poor friendship quality (Abell et al., 2014; Lyons & Aitken, 2010). This study further explored the influence of Machiavellianism in the context of friendship, with the inclusion of subscales measuring separate friendship functions. Machiavellianism was associated with lower scores on all of the six friendship-functions subscales. Although same-sex friendships are often labelled as being highly important to women and provide a variety of functions and resources (Jonason & Schmitt, 2012; Silverman & Choi, 2005; Vigil, 2007), women with higher levels of Machiavellianism may view such functions as unnecessary. Women with higher Machiavellianism scores may be more independent and self-reliant, given Machiavellianism is associated with agency rather than communion (Rauthmann, 2012b). It is not surprising that women with higher

levels of Machiavellianism have reported that their friend provides them with less companionship, help, intimacy, reliable alliance, self-validation, and emotional security than women with low levels of Machiavellianism. These six functions require a degree of emotional attachment and trust. Machiavellianism is associated with distrust, suspicion, and independence as well as viewing others as weak and potentially incapable of fulfilling these six friendship functions.

2.5 Study 1B

Study 1a investigated whether Machiavellianism was associated with the perceived ability to emotional manipulate a same-sex friend. Study 1b investigates whether Machiavellianism is associated with emotional manipulation frequency in women's friendships. It is predicted that higher levels of Machiavellianism will be associated with the greater self-reported use of emotional manipulation towards a close female friend. In addition, this study explores the relationship between Machiavellianism and the perception of emotional manipulation frequency from their friend.

2.6 Study 1B Method

Participants

Participants were 186 women aged 18 to 66 (M_{age} = 23.65, *SD* = 8.34) with an average friendship length of 112.59 months (*SD* = 84.36). Women completed the questionnaires via online research websites and social networking sites and received no financial reward for participation. The study was approved by University of Central Lancashire ethics committee (see appendix 2A)

Questionnaires

Study 1b also employed the Mach IV (α = .69) and the Friendship Functions short-form questionnaire (reliabilities ranged from α = .86 *to* α = .90) used in Study 1a. In addition, the modified Emotional Manipulation Measure (Hyde & Grieve, 2014) was utilised. This scale is a modified version of Austin et al.'s (2007) Emotional Manipulation Scale and measures the frequency of emotional manipulation. Hyde and Grieve (2014) conducted a factor analysis, which revealed a distinction between perceived ability to emotionally manipulate (Austin et al., 2007) as measured in study 1a and willingness (frequency) to emotionally manipulate (Hyde & Grieve, 2014), which is being investigated in study 1b. Questionnaire items include "*How often do you use your emotional skills to make your friend feel guilty*" and "*How often do you embarrass your friend to stop them behaving in a particular way*". Participants responded on a 5-point scale (1 = *never* to 5 = *daily*). As in Study 1a, participants completed this measure twice: first with reference to their own behaviour towards a close same-sex female friend (α = .81), and, second, with reference to their friend's behaviour (α = .86).

Analysis Plan

Missing data analysis revealed 0.51% of the data was missing. The missing data were then coded as missing in the data file. In order to account for the non-normal data (please see appendix 2C for data screening), robust regressions were conducted with bootstrapping. Bootstrapping was set at 1000 samples, with a 95% bias corrected accelerated confidence interval. Hierarchical regressions were conducted to investigate whether Machiavellianism predicted the frequency of emotional manipulation and perception of their friend's frequency to use manipulation towards them. In addition regression analyses were conducted to investigate whether Machiavellianism predicted

perceiving their friend to provide companionship, help, intimacy, as well as perceiving them to be a reliable ally and provide self-validation and emotional security.

2.7 Study 1B Results

Correlations

Spearman's rho correlations are shown in table 2.12. Age demonstrated a significant positive correlation with friendship length, intimacy, and emotional security. In addition, age also showed significant negative correlations with Machiavellianism, frequency of emotional manipulation, and perceived frequency of a friend's emotional manipulation. Friendship length demonstrated significant negative relationships with emotional manipulation frequency and perceived emotional manipulation frequency from a friend, suggesting that women in longer friendships were less likely to report that they or their friend used these strategies. Friendship length also demonstrated significant positive relationships with reliable alliance, self-validation, and emotional stability. Machiavellianism was significantly positively correlated with emotional manipulation frequency and perceived emotional manipulation frequency from their friend, and significantly negatively correlated with intimacy, reliable alliance, and emotional security. Emotional manipulation frequency showed significant negative correlations with five of the six friendship functions subscales. A negative (but not statistically significant) relationship was demonstrated between emotional manipulation frequency and self-validation. Perceived emotional manipulation from their friend was, not surprisingly, significantly negatively correlated to all six friendship functions subscales.

Table 2.12 *Showing Means, Standard Deviations (SD) and Correlations between the measures for study 2B*

			1	2	3	4	5	6	7	8	9	10	11
1.Age	25.65	8.34		.37**	-.10	-.31**	-.28**	.01	-.02	.20**	.10	.10	.16**
2.Friendship Length	112.59	84.36			-.11	-.21**	-.24**	.07	.05	.14	.31**	.20**	.17*
3.Machiavelliansim	68.82	12.09				.35**	.27**	-.14	-.14	-.19**	-.17*	-.12	-.22**
4.EM frequency	15.01	4.76					.74**	-.16*	-.15*	-.24**	-.24**	-.13	-.21**
5.EM Friend frequency	15.95	5.94						-.21**	-.239**	-.26**	-.35**	-.30**	-.38**
6.Companionship	34.06	6.18							.64**	.64**	.47**	.68**	.64**
7.Help	32.47	7.14								.66**	.54**	.67**	.68**
8.Intimacy	34.54	6.76									.62**	.62**	.69**
9.Reliable Alliance	35.53	5.46										.53**	.59**
10.Self-Validation	32.63	6.83											.76**
11.Emotionl Security	32.86	7.11											

Note **correlation is significant at the .01 level
*correlation is significant at the .05 level
[1] EM refers to emotional manipulation

Machiavellianism and Emotional Manipulation Frequency

Step 1 (age and friendship length) explained 6.4% of the variance in the frequency of emotional manipulation towards a friend. This was significant, F change (2, 167) = 5.66, p = .004. At Step 2 Machiavellianism accounted for an additional 10.1% variance, this was significant, F change (1, 166) = 20.16, p < .001. The overall model was significant (F(3, 166) = 10.93, p < .001) and accounted for 16.5% variance. Age significantly predicted greater frequency of emotional manipulation (β = -.15, t = 4.49, p = .012), suggesting that older participants reported using emotional manipulation less frequently. No significant relationship was found for friendship length. Machiavellianism was positively related to the frequency of using emotional manipulation towards a friend (β = .32, t = 4.49, p = .001), suggesting women with higher Machiavellianism scores used emotional manipulation towards their same-sex friend more frequently than those with low Machiavellianism scores. Please see table 2.13 for the Bootstrapped regression for Machiavellianism and emotional manipulation frequency.

Table 2.13 *Bootstrapped regression for Machiavellianism and Frequency of Emotional Manipulation (Standard error beta and confidence intervals are based on bootstrapping)*

	B	SEB	β	*p*
Step 1				
Age	-.09	.03	-.16	.009
	(-0.16, -0.03)			
Friendship length	-.01	.00	.01	.051
	(-0.02, 0.00)			
Step 2				
Age	-.08	.03	-.15	.012
	(-0.15, -0.03)			
Friendship length	-.01	.00	-.10	.118
	(-0.01, 0.00)			
Machiavellianism	.20	.04	.32	.001
	(0.12, 0.29)			

Note R^2 = .06 for step 1, ΔR^2 = .10 for step 2

Machiavellianism and Friend's Perceived Frequency of Emotional Manipulation

Step 1 (age and friendship length) explained 7.9% of the variance in perceiving their friend to frequently use emotional manipulation towards them. This was significant, F change (2, 167) = 7.20, p = .001. Machiavellianism was entered at Step 2, accounting for an additional 3.8% variance, this was significant, F change (1, 166) = 7.11, p = .008. The final model was significant (F(3, 166) = 7.35, p < .001) accounting for 11.7% variance. Age significantly predicted perceiving their friend's frequency of emotional manipulation (β = -.14, t = -1.69, p = .022), indicating as age increased women perceived their friend to employ emotional manipulation towards them less frequently. Additionally, women in longer friendships reported their friend to use emotional manipulation less frequently towards them (β = -.16, t = -1.92, p = .024). Machiavellianism was positively related to the perception of their friend's frequency to use emotional manipulation towards them (β = .20, t = 2.67, p = .007), suggesting that as levels of Machiavellianism increased the participants perceived their friend to use emotional manipulation towards them more frequently. Please see table 2.14 for the Bootstrapped regression for Machiavellianism and perception of their friend's frequency of using emotional manipulation.

Table 2.14 *Bootstrapped regression for Machiavellianism and perception of friend's Frequency to use Emotional Manipulation (Standard error beta and confidence intervals are based on bootstrapping)*

	B	SEB	β	*p*
Step 1				
Age	-.11	.05	-.15	.024
	(-0.20, 0.01)			
Friendship length	-.01	.01	-.18	.018
	(-0.02, -0.00)			
Step 2				
Age	-.10	.05	-.14	.022
	(-0.18, -0.00)			
Friendship length	-.01	.01	-.16	.024
	(-0.02, -0.00)			
Machiavellianism	.15	.06	.20	.007
	(0.05, 0.25)			

Note R^2 = .08 for step 1 and ΔR^2 = .04 for step 2

Machiavellianism and Companionship

Step 1 (age and friendship length) explained 2.2% of the variance in perceiving their friend to provide companionship. This was not significant, F change (2, 167) = 1.91, p = .152. At Step 2, Machiavellianism provided 2.3% variance, this was marginally significant, F change (1, 166) = 3.94, p = .049. The overall model just approached significance (F (3, 166) = 2.61, p = .054). Friendship length was significantly associated with receiving companionship from their friend (β = .15, t = 1.75, p = .032), suggesting that as friendship length increased the levels of companionship their friend provided also increased. Machiavellianism was significantly negatively related to viewing their friend to provide companionship (β = -.15, t = -1.98, p = .033), indicating that women with higher Machiavellianism scores viewed their friend as providing less companionship than those with low levels of Machiavellianism. Please see table 2.15 for the Bootstrapped regression for Machiavellianism and companionship.

Table 2.15 *Bootstrapped regression for Machiavellianism and Companionship (Standard error beta and confidence intervals are based on bootstrapping)*

	B	SEB	β	*p*
Step 1				
Age	-.08	.05	-.11	.104
	(-0.19, 0.01)			
Friendship length	.01	.01	.17	.025
	(0.00, 0.02)			
Step 2				
Age	-.08	.05	-.11	.076
	(-0.20, .00)			
Friendship length	.01	.01	.15	.032
	(0.00, 0.02)			
Machiavellianism	-.12	.06	-.15	.033
	(-0.23, -0.02)			

Note R^2 = .02 for step 1 and ΔR^2 = .02 for step 2

Machiavellianism and Help

Step 1 (age and friendship length) explained 5.6% of the variance in perceiving their friend to provide help. This was significant, F change (2, 167) = 4.92, p = .008. At Step 2, Machiavellianism explained an additional 3.2% variance, this was significant, F change (1, 166) = 5.76, p = .018. The overall model was significant (F(3, 166) = 5.29, p =. 002). Age was related to viewing their friend to provide help (β = -.26, t = -3.14, p = .015), suggesting that as age increased women viewed their friend as providing less help. Additionally, friendship length was associated with perceiving their friend to provide them with help (β =.17, t = 2.05, p = .025); women in longer friendships viewed their friend as providing more help. Machiavellianism was significantly negatively related to viewing their friend to provide help (β = -.18, t = -2.40, p = .022), indicating that women with higher Machiavellianism scores viewed their friend as providing less help than those with low levels of Machiavellianism. Please see table 2.16 for the Bootstrapped regression for Machiavellianism and help.

Table 2.16 *Bootstrapped regression for Machiavellianism and Help (Standard error beta and confidence intervals are based on bootstrapping)*

	B	SEB	β	*p*
Step 1				
Age	-.21	.09	-.26	.021
	(-0.42, -0.03)			
Friendship length	.02	.01	.19	.015
	(0.00, 0.03)			
Step 2				
Age	-.21	.09	-.26	.015
	(-0.42, -0.04)			
Friendship length	.01	.01	.17	.025
	(0.00, 0.03)			
Machiavellianism	-.16	.07	-.18	.022
	(-0.31, -0.01)			

Note R^2 = .06 for step 1 and ΔR^2 = .03 for step 2

Machiavellianism and Intimacy

Step 1 (age and friendship length) explained 2.2% of the variance in perceiving their friend to provide intimacy. This was not significant, F change (2, 167) = 1.90, p = .153. At step 2, Machiavellianism accounted for an additional 5.1 % variance to the model, this was significant, F change (1, 166) = 9.15, p = .003. The overall model was significant (F(3, 166) = 4.38, p = .005), providing 7.3% variance. Friendship length was significantly related to viewing their friend to provide intimacy (β = .15, t = 1.72, p = .043), suggesting that women in longer friendships perceived their friend to provide more intimacy. Machiavellianism was significantly negatively related to viewing their friend to provide them with intimacy (β = - .23, t = -3.03, p = .005), showing that women with higher Machiavellianism scores viewed their friend as providing them with less intimacy than those with low Machiavellianism. Please see table 2.17 for the Bootstrapped regression for Machiavellianism and intimacy.

Table 2.17 *Bootstrapped regression for Machiavellianism and Intimacy (Standard error beta and confidence intervals are based on bootstrapping)*

	B	SEB	β	*p*
Step 1				
Age	-.07	.08	-.08	.422
	(-0.25, 0.11)			
Friendship length	.01	.01	.17	.038
	(0.00, 0.03)			
Step 2				
Age	-.07	.08	-.10	.340
	(-0.24, 0.09)			
Friendship length	.01	.01	.15	.043
	(0.00, 0.02)			
Machiavellianism	-.19	.07	-.23	.005
	(-0.33, -0.06)			

Note R^2 = .02 for step 1 and ΔR^2 = .05 for step 2

Machiavellianism and Reliable Alliance

Step 1 (age and friendship length) explained 7.5 % of the variance in perceiving their friend to be a reliable ally. This was significant, F change (2, 167) = 6.75, p = .002. Machiavellianism was entered at Step 2 explaining an additional 2% variance, this was significant, F change (1, 166) = 3.95, p = .049. The overall model was significant (F(3, 166) = 5.89, p = .001) accounting for 9.6% variance. Friendship length was related to perceiving their friend to be a reliable ally (β = .29, t = 3.50, p = .002), suggesting women in longer friendships perceived their friend as being more of a reliable ally than women in shorter friendships. Machiavellianism and perceiving their friend to be a reliable ally approached significance (β = -.15, t = -1.99, p = .055), demonstrating that women with higher levels of Machiavellianism viewed their friend as being less of a reliable ally than those with low levels of Machiavellianism. Please see table 2.18 for the Bootstrapped regression for Machiavellianism and reliable alliance.

Table 2.18 *Bootstrapped regression for Machiavellianism and Reliable Alliance (Standard error beta and confidence intervals are based on bootstrapping)*

	B	SEB	β	*p*
Step 1				
Age	-.07	.08	-.08	.422
	(-0.25, 0.11)			
Friendship length	.01	.01	.17	.038
	(0.00, 0.03)			
Step 2				
Age	-.07	.08	-.10	.340
	(-0.24,0.09)			
Friendship length	.01	.01	.15	.043
	(0.00, 0.02)			
Machiavellianism	-.19	.07	-.15	.055
	(-0.33, -0.06)			

Note R^2 = .02 for step 1 and ΔR^2 = .05 for step 2

Machiavellianism and Self-Validation

Step 1 (age and friendship length) explained 3.9% of the variance in perceiving their friend to provide self-validation. This was significant, F change (2, 167) = 3.44, *p* = .037. Machiavellianism was entered at step 2, accounting for an additional 1.9% variance, this approached significance, F change (1, 166) = 3.44, *p* = .066. The overall model was significant (*F*(3, 166) = 3.41, *p* = .019), accounting for 5.8% variance. Friendship length predicted viewing their friend as providing more self-validation (*β* = .21, *t* = 2.40, *p* = .009), suggesting women in longer friendships viewed their friend as proving more self-validation. No significant relationship between Machiavellianism and perceiving their friend to provide self-validation was found (*β* = -.14, *t* = -1.85, *p* = .074). Please see table 2.19 for the Bootstrapped regression for Machiavellianism and self-validation.

Table 2.19 *Bootstrapped regression for Machiavellianism and Self-Validation (Standard error beta and confidence intervals are based on bootstrapping)*

	B	SEB	β	*p*
Step 1				
Age	-.06	.08	-.07	.415
	(-0.23, 0.07)			
Friendship length	.02	.01	.22	.010
	(0.00, 0.03)			
Step 2				
Age	-.06	.07	-.08	.365
	(-0.23, 0.06)			
Friendship length	.02	.01	.21	.009
	(0.00, 0.03)			
Machiavellianism	-.13	.07	-.14	.074
	(-0.27, 0.03)			

Note R^2 = *.04* for step 1 and ΔR^2 = .02 for step 2

Machiavellianism and Emotional Security

Step 1 (age and friendship length) explained 2.8% of the variance in perceiving their friend to provide emotional security. This was not significant, F change (2, 167) = 2.38, p = .096. At Step 2, Machiavellianism accounted for an additional 5.6 % variance to the model, this was significant, F change (1, 166) = 10.23, p = .002. The overall model was significant (F(3, 166) = 5.08, p = .002), explaining 8.4% variance. Friendship length approached significance in predicting perceiving their friend to provide emotional security (β = .14, t = 1.69, p = .051) suggesting women in longer friendships viewed their friend as providing more emotional security. Machiavellianism was significantly related to perceiving their friend to provide emotional security (β = -.24, t = -3.20, p = .002), indicating that women with higher Machiavellianism scores viewed their friend as providing less emotional security. Please see table 2.20 for the Bootstrapped regression for Machiavellianism and emotional security.

Table 2.20 *Bootstrapped regression for Machiavellianism and Emotional Security (Standard error beta and confidence intervals are based on bootstrapping)*

	B	SEB	β	*p*
Step 1				
Age	.00	.08	.00	.997
	(-0.18, 0.13)			
Friendship length	.01	.01	.17	.041
	(0.00, 0.03)			
Step 2				
Age	-.01	.08	-.01	.901
	(-0.19, 0.11)			
Friendship length	.01	.01	.14	.051
	(-0.00, 0.03)			
Machiavellianism	-.22	.07	-.24	.002
	(-0.36, -0.09)			

Note R^2 = .03 for step 2 and ΔR^2 = .06 for step 2

2.8 Discussion of Study 1B

Study 1b demonstrated that women with higher levels of self-reported Machiavellianism employed emotional manipulation towards a close same-sex friend more frequently than women with lower levels of Machiavellianism. This may be a tactic that is preferential when manipulating someone who is familiar. Although the women with higher Machiavellianism scores may not feel close or attached to their friend, the appearance of a friendship may provide an ideal context in which to use emotional manipulation. Emotional manipulation is covert, allowing women higher on Machiavellianism to feel more comfortable with this strategy because there is a reduced chance of detection. Women higher on Machiavellianism may use emotional manipulation tactics to a greater degree when it becomes apparent they can use these tactics without being detected. This supports the argument that Machiavellianism is based more on environmental than biological experience and that it may be a learnt behaviour (e.g. Veselka, Aitken, Schermer, & Vernon, 2011). Although not investigated here, these tactics may also be successful in helping them to achieve their goals. Therefore, future research should explore the success of emotional manipulation tactics and the likelihood of detection. Additionally, women with higher scores on Machiavellianism perceived their friend as frequently directing emotional manipulation towards them. Machiavellianism is associated with suspicion, distrust and sensitivity to unfair treatment (Christie & Geis, 1970; Schmitt et al., 2005; Sherry et al., 2006). These characteristics may influence the belief that their same-sex friend is not only using emotional manipulation towards them, but is frequently using such tactics.

Supporting the results from study 1a, higher levels of self-reported Machiavellianism in women were associated with viewing their friend as providing little companionship, help, intimacy, and providing little emotional security. Machiavellianism and reliable alliance approached significance, which, coupled with

the negative correlation revealed between these two constructs, suggest that women with higher Machiavellianism scores viewed their friend as being less of a reliable ally. In contrast to Study 1a, no relationship was found for Machiavellianism and self-validation. This finding suggests that women with higher Machiavellianism scores perceived their friend as not providing more or less encouragement and reassurance than those with low levels of Machiavellianism. It would be expected, given the cynicism and suspicion that characterises Machiavellianism that a negative relationship would be revealed between all of the friendship functions or, given the high emotional detachment associated with Machiavellianism, no relationship between Machiavellianism and all the functions would be revealed. This finding for Machiavellianism and self-validation is unexpected and could be specific to this particular sample. Future research should explore Machiavellianism and friendship functions further.

2.9 General Discussion for Study 1A and 1B

The current studies investigated the influence of self-reported Machiavellianism on women's reported use of, and frequency of, emotional manipulation directed at a close same-sex friend, and the perception that the participants themselves were a target of emotional manipulation. In addition, the studies considered the influence of Machiavellianism on six friendship functions. Previous research has established that Machiavellianism is associated with emotional manipulation and managing the emotions of others in general (Austin et al., 2007; Austin & O'Donnell, 2013), but the current studies extended that research by focusing on the use of these strategies in a specific context of women's same-sex friendships.

Findings indicate that women with higher Machiavellianism scores reported the ability to use emotional manipulation, mood worsening, and inauthentic strategies

directed towards a close same-sex friend. Furthermore, women with higher Machiavellianism scores more frequently used emotional manipulation towards their close same-sex friend. This use of emotional manipulation by women with higher Machiavellianism scores towards a same-set friend may stem from a negative home environment that may include difficult parental relationships and a childhood milieu lacking maternal warmth (Birkás et al., 2015). As suggested by Belsky, Steinberg and Draper (1991) stressful childhoods lead to opportunistic manipulation and distrust of others. Thus, emotional manipulation may be one such opportunistic strategy these women employ. The use of such manipulation may stem from the difficulties experienced in childhood or modelling their parents' behaviour.

The use of emotional manipulation by women in particular may be facilitated by women's greater interest in social interaction and the expression of personal feelings in friendship. Women with higher levels of Machiavellianism may exploit this norm of female friendship by seeking interactions and closeness in order to manipulate. Although the goal of this manipulation may not be obvious to observers, the characteristics of women's friendships, coupled with high Machiavellianism in one party may support the use of emotional manipulation strategies in order to achieve their self-serving goal (Ináncsi et al., 2015; Su et al., 2009; Vigil, 2007). Employing these strategies towards one person may be less risky for women higher on Machiavellianism than engaging in relational aggression, which requires the assistance of others.

Furthermore, the lack of connection to their own and their friend's emotions (Wastell & Booth, 2003) may facilitate the use of manipulation because they do not reflect on the negative consequences for their friend. Additionally, there may be a lack of hostility in their actions, even though their world view is hostile (Jones & Neria, 2015). This apparent lack of hostility and seeking closeness in others in order to manipulate (Ináncsi et al., 2015) may also assist their use of emotional manipulation and

their belief that the strategy is unlikely to be detected by their friend. The greater frequency of this tactic may stem from learning that their friend does not confront them when using this tactic; they believe these strategies are undetected and (potentially) successful.

Women with higher Machiavellianism scores were more likely than those with low Machiavellianism scores to report that their close same-sex friend directed emotional manipulation towards them and frequently employed this strategy. Machiavellianism is associated with an overall general negative representation of others, and believing other people cannot be trusted and will exploit them (Christie & Geis, 1970; Ináncsi et al., 2015). Therefore, viewing their friend as also using emotional manipulation provides evidence that they see others, including a same-sex friend, as manipulative and trying to exploit them for their own gain. However, this study only considered Machiavellianism scores and perception of emotional manipulation from one individual within the friendship dyad. The study did not examine the friend's Machiavellianism scores or whether the friend actually reported or employed emotional manipulation. The relationship between Machiavellianism and emotional manipulation in women's friendship dyads could be more complex when considering both members. This may highlight whether women with higher Machiavellianism scores have negative experiences in social relationships or they just perceive these negative experiences. Furthermore, there may be different relationships discovered when friends have similar or different Machiavellianism scores. It would be particularly interesting to investigate the relationship between a high scoring friend (on Machiavellianism) and her friend who scores low on the behaviour profile. This would be important in investigating whether emotional manipulation is detected by the low scoring Machiavellian friend. This study provides a starting point to investigate Machiavellianism and women's friendship dynamics and highlights further research needed in the detection and the

effectiveness of emotional manipulation strategies. Future research should therefore, measure Machiavellianism scores of both members of the friendship dyad and the perception and use of emotional manipulation as reported by both individuals.

In Study 1a and Study 1b, Machiavellianism was associated with perceiving less companionship, help, intimacy, and emotional security in their friendship. Those findings are consistent with previous research that demonstrated adults higher on Machiavellianism report low friendship quality (Abell et al., 2014; Lyons & Aitken, 2010). This is unsurprising given Machiavellianism is associated with emotional detachment and only seeking closeness in order to exploit another individual. High Machiavellianism scorers value independence and do not trust others (Christie & Geis, 1970; Ináncsi et al., 2015). Despite women's focus on social relationships, empathy, and support in friendships (Baron-Cohen & Wheelwright 2003; Su et al., 2009) having high levels of Machiavellianism reduces the need to feel emotionally close to another individual. Women with higher Machiavellianism scores may be skilled at appearing to provide this warm, close friendship context in order to maintain their relationship with their friend to ensure continual manipulation opportunities.

In study 1b, Machiavellianism and the relationship with reliable alliance in women's friendship only approached statistical significance. However, given the result approached significance and the negative correlation between Machiavellianism and reliable alliance (table 2.2), the results do suggest a negative relationship between Machiavellianism and reliable alliance. However, the author does note this finding should be interpreted with caution and further investigation on Machiavellianism and friendship functions is warranted. Furthermore, an inconsistency was revealed with the relationship between Machiavellianism and self-validation. Self-validation refers to perceiving their friend to provide encouragement and to validate oneself as a worthwhile individual (Mendelson & Aboud, 1999). This finding could be sample

specific, but requires more research to investigate Machiavellianism and how Machiavellian adults view their friendships.

It is important to note that studies 1a and 1b obtained data from one member of the friendship dyad only. In order to develop a greater understanding of Machiavellianism in women's friendships dynamics both members of the dyad should be considered. This may include investigating each friend's Machiavellianism scores and the use of emotional manipulation and the perception (i.e. detection) of that strategy. In addition, it is important for future research to investigate the success of using emotional manipulation. Study 1a and 1b and previous research (Austin et al., 2007) have shown that Machiavellianism is associated with the self-reported use of emotional manipulation but not whether that strategy is successful. Successful manipulation is associated with higher EI and ToM (Esperger & Bereczkei, 2012; Grieve & Panebianco, 2012). However, Machiavellianism is associated with low EI (e.g., Austin et al., 2007; Barlow et al., 2010) whilst findings are mixed for Machiavellianism and ToM (e.g., Lyons, Caldewll, & Shultz, 2010; Paal & Beczki, 2007). Investigating the success of the strategy may help to provide a clearer picture of the factors that may facilitate the manipulation. Furthermore, the success of the strategy may also influence the dynamics of the friendship. Women higher on Machiavellianism who are able to successfully manipulate their friend may appear to invest more time and effort in maintaining the friendship. Women whose strategies are unsuccessful may end the friendship and (strategically) form a new friendship that may offer them more rewards.

Due to the common variance in the study (discussed below) the perception of mood worsening and inauthentic strategies were not investigated. Therefore, this study only investigated the perception of general emotional manipulation being directed at the participants rather than also investigating the women's perception of two mood

managing techniques (mood worsening and inauthentic). There could be a difference in the perception of these strategies being used in comparison to the general emotional manipulation measure. Future research should look at these strategies, and the perception and detection of these strategies separately in a dyad study. As discussed before, considering both dyad members' Machiavellianism scores and their self-reported use of these strategies would give a much clearer image of the influence of Machiavellianism in women's friendship dyads. This is particularly important given women's preference for dyadic friendships (David-Barrett et al., 2015). Indeed, the next study in this thesis investigates friendship functions from both members of the dyad to also consider the perception of women whose same-sex friend scores higher on Machiavellianism. Furthermore, it should be noted that there is not a modified scale for worsening and inauthentic displays of emotion, therefore, currently the frequency of the use of these strategies cannot be investigated. Future research could develop a scale that investigates the frequency of the use of these strategies and this could also be implemented in a dyad study investigating Machiavellianism and the use of these strategies in friendship.

The present study is also limited by the use of self-report measures and participants' willingness to disclose socially undesirable behaviour (e.g. Grovle, et al., 2012; Holden, Wheeler, & Marjanovic, 2012), although research has demonstrated individuals are more willing to disclose undesirable behaviour in online studies (Booth-Kewley, Larson, & Miyoshi, 2007). In addition, it should be noted that there is common variance in each of the two studies because participants completed the emotional manipulation measure and the modified measure twice (first based on their own behaviour then perception of their friend's behaviour). As discussed earlier, based on this common variance it was decided not to also include measures of whether the

women also perceived their friend to use mood worsening and inauthentic strategies directed towards them.

Although this study provides insight into Machiavellianism and women's friendships it does not provide robust evidence for everyday observable behaviour. The majority of research investigating Machiavellianism utilises self-report methods or experimental game contexts. Although knowledge is growing with regard to Machiavellianism in experimental games and how individuals higher on Machiavellianism report their behaviour, there is a paucity of research investigating Machiavellianism and observable everyday behaviour. Research that investigates Machiavellianism in experimental games often focuses on the outcome for these individuals rather than the behavioural strategies which lead to the outcome. Research has not examined observable behaviour of individuals higher on Machiavellianism in social contexts rather than in experimental games. Social interaction is central to friendships, and the dyadic friendship is particularly important to women with focus on conversation and discussing personal feelings (Benenson & Christakos, 2003; David-Barrett et al., 2015; Vigil, 2007). Study 1a and 1b show that women higher on Machiavellianism exploit the norms of female friendships and use emotional manipulation directed at their close same-sex friend. However, they do not provide evidence identifying how they may actually behave with a friend. Therefore, the next study in this thesis uses observation methodology to investigate Machiavellianism and behaviour in social interaction in women's dyadic friendships. The Machiavellianism scores of each member of the friendship dyads will be recorded as well as each member's observable behaviour in an interaction. This next study will therefore provide a wealth of information about the body language and behaviour of women with higher scores in Machiavellianism and how individuals may act differently depending on their friend's Machiavellianism scores. This would allow for the detection of even more

subtle behaviour and manipulation techniques that women higher on Machiavellianism may employ.

To conclude, the present studies investigated Machiavellianism and emotional manipulation in women's friendships, including the perception of a same-sex friend using emotional manipulation directed towards them. Women higher on Machiavellianism reported the ability to use emotional manipulation, and to employ this strategy with greater frequency towards a close same-sex friend. They also perceived their friend to use, and frequently employ, emotional manipulation towards them. In addition, the study investigated the relationship between Machiavellianism and six friendship functions and found consistent results with four of the six functions, with women reporting lower scores on these four friendships functions. In study 1b the relationship between Machiavellianism and reliable alliance approached significance, suggesting women with higher Machiavellianism scores may have perceived their friend to be less of a reliable ally. However, caution is recommended with this finding given it did not reach statistical significance. Furthermore, inconsistency in the results was revealed for Machiavellianism and self-validation. This finding, coupled with the results for Machiavellianism and reliable alliance warrants further investigation. Friendship functions, is, therefore, again investigated in study two (chapter three) of the thesis with the inclusion of both members of the friendship dyad.

3. Chapter Three

Study 2

Machiavellianism and Behaviour in Women's Friendship Dyads

Observational methodology has not been used to study normative behaviour and Machiavellianism in adult friendship interactions. Study 1a and 1b provided some information on Machiavellianism and women's friendship dynamics; study 2 now progresses from that and investigates Machiavellianism and actual behaviour in women when interacting with a same-sex friend. Female dyads (N = 55) were filmed whilst interacting with a friend for 20 minutes. As in study 1a and 1b, the participants also completed measures of Machiavellianism and friendship functions. A number of behaviour were coded and the data were analysed using Actor-Partner Interdependence Models (APIMs). This allowed the investigation of the effects of the participant's own Machiavellianism scores on their own behaviour (actor effect) and the effect of the participant's Machiavellianism scores on their friend's behaviour (partner effect). The results suggest that women higher in Machiavellianism showed interest in what their friend was saying whilst their friend revealed more information about themselves and others. Women higher on Machiavellianism did not reveal information about themselves or others. This study was the first to utilise observational methodology to investigate Machiavellianism in women's social interaction and provided some initial insight into how Machiavellianism may manifest in actual behaviour in women's friendships.

Introduction

Studies investigating Machiavellianism initially focused on the use of experimental games. Research has since progressed to also investigate Machiavellianism in social relationships including the association between Machiavellianism, behaviour, and relationship dynamics. Although the number of studies investigating Machiavellianism and behaviour in relationships has increased, there is little research examining Machiavellianism and social relationships in normative contexts. Study 1a and 1b in this thesis investigated Machiavellianism and emotional manipulation in female friendships. Although that investigation provided more information about Machiavellianism and the dynamics of women's friendships it did not provide information on actual behaviour displayed. To date, there is no study investigating Machiavellianism and women's real world behaviour using observational techniques. Therefore, the current study examines directly observed behaviour that occurs in a 20 minute interaction in a female friendship dyad.

Machiavellianism in Artificial Experimental Contexts

Research that focuses on the use of experimental games is designed to capitalise on the manipulative strategies employed by individuals high on Machiavellianism and are often analysed by dividing participants into 'High Machs' and 'Low Machs'. Experimental laboratory studies have shown that individuals classed as 'High Machs' (i.e. those scoring highly on the Mach IV, usually one standard deviation above the median) gained more benefit, made more profit, reciprocated less, and made instant reward-orientated decisions rather than focusing on long-term success compared to 'low Machs' (Czibor, Vincze, & Bereckei, 2014; Gunnthorsdottir, McCabe & Smith, 2002; Spitzer, Fishbacher, Hernberger, Grön, & Fehr, 2007). Wilson, Near, and Miller (1998) state that the deceptive and manipulative nature of individuals high

on Machiavellianism becomes clear in short-term face-to-face interactions with strangers. Given the sensitivity to rewards that is demonstrated by adults with higher Machiavellianism scores (Birkás, Csathó, Gács, & Bereczkei, 2015) their apparent manipulative and self-serving behaviour may be further facilitated by experimental games (with strangers) that include potential rewards. Indeed, specific brain areas have shown to be activated in individuals with higher Machiavellianism scores during the decision making process in experimental games, suggesting that these individuals may employ specific cognitive heuristics to enable them to make decisions that will result in rewards (Bereczkei, Deak, Papp, Perlaki, & Orsi, 2013).

If the manipulative behaviour of individuals higher on Machiavellianism is more easily identifiable in short-term interactions with strangers, then more subtle methods are needed to detect the behaviour of these individuals in social interactions with someone familiar, such as a same-sex friend. Indeed, there is little research that has focused on the actual behaviour of individuals higher on Machiavellianism, particularly in social interactions with someone they know or know well. The limited research that has been conducted in this area has also focused on experimental games and artificial experiments. For instance, individuals scoring higher on Machiavellianism maintained eye contact for longer when they were accused of participating in an unethical act (Exline, Thibaut, Hickey, & Gumpert, 1970), but research has also reported that individuals higher on Machiavellianism did not differ in their body language, including eye contact duration, compared to those scoring lower on Machiavellianism (O'Hair, Cody, & McLaughlin, 1981). A recent study developed this experimental game research further and reported that individuals higher on Machiavellianism used fewer emotion verbs when they participated in an experimental game, suggesting that Machiavellianism can influence an individual's discourse in these contexts and not just experimental game outcomes (Czibor et al., 2014). Although that recent study offered a

different perspective by including analysis of narrative, this occurred during an experimental game and, therefore, does not inform us about Machiavellianism and normative behaviour.

Observation Research

The use of observation research investigating real world behaviour allows for a closer analysis of how Machiavellianism influences everyday social interactions. There is a wealth of questionnaire research demonstrating that personality and behaviour profiles influence social behaviour. However, there is little research examining how these individual differences manifest in actual behaviour. Machiavellianism has a unique character profile that is based more on subtle, strategic behaviour that decreases the chances of these individuals being detected. This strategic covert behaviour may be adaptations stemming from stressful childhoods (Abell, Lyons, & Brewer, 2014; Jonason, Lyons, & Bethell, 2014; Láng & Lénárd, 2015), and these experiences, coupled with their lack of empathy, lack of connection to their own and other people's emotions, and their focus on agency rather than communion (Ináncsi et al., 2015; Jones & Paulhus, 2010; Rauthman, 2012b; Wai & Tiliopoulos, 2012; Wastell & Booth, 2003) may uniquely influence their behaviour in social interactions with others, and, importantly, their friends.

In particular, there is paucity of naturalistic observation research investigating Machiavellianism and friendship. Friendships are the most common form of social relationships (Blieszer & Adams, 1992), and may provide an abundance of opportunities for manipulation and strategic subtle behaviour to occur. As we have seen in the first two studies of this thesis (studies 1a and 1b), women with higher Machiavellianism scores report the ability to use, and frequently employ, emotional manipulation towards a same-sex friend. Furthermore, previous literature has also provided some limited information about Machiavellianism and friendship dynamics.

Men and women scoring higher on Machiavellianism report low quality friendships compared to those lower on Machiavellianism and (self) report to select opposite-sex friends who are kind (Abell et al., 2014; Jonason & Schmitt, 2012; Lyons & Aitken, 2010).

Social interactions facilitate and maintain relationships (Heerey, 2015) and are central to friendships (Nelson, Thorne, & Shapiro, 2011). Social interactions and social relationships are, of course, influenced by individual differences. Previous questionnaire research (including study 1a and 1b in this thesis) shows that Machiavellianism influences social relationships. However, there is a paucity of research that investigates actual behaviour during observable social interaction and how that underpins these relationships. It is, thus, important to investigate Machiavellianism and women's actual observable behaviour in same-sex friendships to fill that gap in our knowledge.

Women place specific importance on dyadic friendships as opposed to group friendships (Benenson & Christakos, 2003; David-Barrett et al., 2015; Vigil, 2007). Dyadic friendships may facilitate the Machiavellian strategy of seeking closeness in order to manipulate Observing actual behaviour in dyadic interactions may provide more information on the behavioural strategies women higher on Machiavellianism may employ. Furthermore, given that social exclusion is a strategy favoured by females (Benenson, Markovits, Hultgren, Nguyen, Bullock et al., 2013), women higher on Machiavellianism scores may strategically use subtle behaviour to avoid social exclusion, but still achieve their own goals. Even though Machiavellianism is associated with hostility, Machiavellian tactics are not (Jones & Neria, 2015) and this may be due to the subtle behaviour displayed that is not perceived as negative by others. The use of more subtle behaviour would reduce the risk of social exclusion and the potential reputational damage that could make future friendship formation problematic. Behaving in a way that is not overtly hostile, and through engaging in subtle (but potentially

manipulative) behaviour that is less likely to be detected, would allow these women to appear as if they are conforming to the norm of female relationship behaviour while also allowing them to achieve their own self-serving goals.

The Present Study

This study aimed to investigate behavioural associations of Machiavellianism in an observed 20 minute social interaction between two female friends. Friendship dyads were recorded in a continuous interaction which included five minutes of free conversation followed by fifteen minutes discussing four questions (devised by the researcher) on friendship. There is a need for more observational research investigating social interaction (Heerey, 2015) and it was intended that this study started to address that gap, particularly in relation to the paucity of research investigating Machiavellianism using observational techniques. Through the use of a robust coding scheme a number of behaviours were investigated. In order to account for the influence of Machiavellianism scores on the participant's own behaviour and also on their friend's behaviour, results were analysed using Actor-Partner Interdependence Models (APIM's). This analysis was conducted first for all dyads within the sample, and then for dyads with a friendship length of 12 months and below, controlling for age in all analyses. This allowed the investigation of how Machiavellianism and friendship length may also influence women's behaviour in friendship.

Hypotheses

Behaviour that were of particular interested were coded from the Specific Affect Coding System **(**SPAFF; Coan & Gottman, 1995) and included interest and stonewalling. The facial expression pouting was also adapted from the SPAFF. Eye contact, talking, and interruptions were also coded and the coding schemes for these three categories of behaviour were devised by the researcher. Predictions were then made for these behaviour categories.

Eye contact: it is expected that women with higher Machiavellianism scores will spend more time engaging in direct eye contact with their friend. This would convey the appearance of interest in their friend and of conforming to women's friendship norms of warmth and information sharing (Vigil, 2007). Furthermore, conveying interest may encourage their friend to talk more which would potentially allow the woman with higher Machiavellianism scores to gather information that may be used manipulate or exploit their friend (or another individual) in the future. **Interest**: following on from eye contact, it was also expected that women with higher Machiavellianism scores would ask more questions (clarification and open-ended questions) to convey interest and collect information that may be beneficial to them. These women would also nod their head and 'uh huh' more to encourage their friend to speak. **Talking**: women with higher Machiavellianism scores would talk less about all topics and would also self-disclose less, particularly with regard to information that is more private and intimate. Women whose friend had higher Machiavellianism scores would then talk more, including gossip and self-disclosing personal information about themselves. This gives the friend with higher Machiavellianism scores information they can potentially use to their advantage, without putting them in a vulnerable situation by self-disclosing or gossiping themselves. **Stonewalling**: although it was expected that women with higher Machiavellianism scores would convey interest, it was expected that women with higher Machiavellianism scores would also indicate their lack of interest (where appropriate) to their friend. This may be done to encourage their friend to change discussion topics in the hope that the change will result in potentially interesting and beneficial information for the women higher on Machiavellianism. Finally, **interruptions** and the facial expression '**pouting**' were also coded. It was predicted that women with higher Machiavellianism scores would interrupt their friend more, and successfully do so (i.e. making their friend stop what they were saying).

Women with higher Machiavellianism scores have strategic self-serving goals, therefore when a friend is talking about a topic that does not interest them they may interrupt in order to show their disinterest. Women with higher Machiavellianism scores may also pout more when they do not agree with their friend or their friend disagrees with them. Given that women are more attuned to facial expressions (Hall & Matsumoto, 2004) their friend may perceive this as a signal to change their conversation topic or opinion.

Machiavellianism is associated with distrust, suspicion of others, and believing others will exploit them (Christie & Geis, 1970). The actions of adults high on Machiavellianism do not appear hostile (Jones & Neria, 2015) and they may, therefore, appear (superficially) warm in their actions. However, those individuals may remain detached from their social interaction partner which may be indicated by subtle behaviour. Therefore, given the complexities and the subtle nature of Machiavellianism, it may be better understood with the observation of actual behaviour with others, rather than just their self-reported behaviour.

3.1 Method Study 2

Participants

Female dyads were recruited from the campus of a British university through poster advertisements and from the university online psychology participation pool. The complete sample consisted of 110 women (55 dyads) with a mean age of 21.54 years (*SD* = 6.23) and a mean friendship length of 27.66 months (*SD* = 45.19). The friendship dyads who had been friends for 12 months or less (*n* = 72, 36 dyads) had a mean age of 21.11 years (*SD* = 6.09) and a mean friendship length of 7.69 months (*SD* = 3.44). All participants were rewarded with a £5 voucher for their time. Psychology students who took part through course requirements also received participation points. The study was approved by the University of Central Lancashire's ethics committee (see appendix 3A).

Questionnaires

Each member of the dyad completed a series of questionnaires relating to their experience of the social interaction with their friend, the Mach IV, and the Friendship Functions measure. Participants were allocated to different sides of the lab room and asked not to talk during this time. The questionnaires took 30 minute and were completed after the recorded interaction.

Mach IV (Christie & Geis, 1970). This 20-item questionnaire measures characteristics such as cynicism and lack of concern with morality. It includes statements such as "*Never tell anyone the real reason you did something unless it is useful to do so*" and "*It's hard to get ahead without cutting corners here and there*". Ten items were reverse scored with higher scores representing higher Machiavellianism. Total standardised scores were used in the analysis. Participants responded on a 5-point scale (1= str*ongly disagree*, 5= *strongly agree*). The Mach IV demonstrated acceptable reliability for the full sample of 55 dyads ($\alpha = .65$) and good reliability for the dyads with a friendship length of 12 months and under (36 dyads) ($\alpha = .70$).

Friendship Functions Questionnaire (MFQ-FF, Mendelson & Aboud, 1999). The MFQ-FF contains 30 items measuring how often their friend fulfils six functions of friendship in late adolescence and adulthood. These six functions are as follows: stimulating companionship; help; intimacy; reliable alliance; self-validation and emotional security. The participant was asked to imagine their friend's name (who took part with them in this study) before each statement. Stimulating companionship refers to feelings of excitement and joy for spending time with a friend ("__ *is exciting to talk to*") and help describes receiving guidance and assistance from a friend ("__*helps me when I need it*"). Intimacy refers to disclosure of personal feelings and the acceptance from their friend to do this ("__*is someone I can tell private things to*") and reliable alliance describes being able to count on their friend's loyalty ("__*would stay my friend*

even if other people criticised me". Self-validation refers to their friend helping them to maintain a positive, worthwhile self-image ("*__points out things that I am good at*") and emotional security refers to the comfort a friend provides during stressful and/or novel situations ("*__would make me feel better if I were worried*"). Respondents answered all items in relation to their dyad partner. Each questionnaire item included a blank space before the item for the participant to imagine their friend's name. This was intended to increase the salience of their friend with reference to the questionnaire items. Participants responded on a 9 point scale (0= *never*, 8= *always*). The subscales demonstrated excellent reliability ranging from $\alpha = .87$ to $\alpha = .93$ (see table 3.34) for the whole sample ($N = 55$ dyads) and $\alpha = .83$ to $\alpha = .93$ (see table 3.73) for the sub-sample ($n = 36$ dyads).

Post-Interaction Questionnaire: Measures were included to enable each individual from the friendship dyad to evaluate the interaction with their friend. The questionnaire included 11 statements from Berry and Sherman Hansen's (2000) study investigating behaviour and interaction quality in female dyads. Specifically, each participant indicated the extent to which they enjoyed the interaction, considered the interaction to be smooth, natural, and relaxed, would like to interact with their friend again, felt their friend had disclosed to them, felt they had disclosed to their friend, considered the interaction to be forced, strained, and awkward, felt they influenced the interaction, felt their friend influenced the interaction, considered the interaction to be intimate, felt the interaction was satisfying, and considered it to be pleasant. Participants responded on an 8-point scale ranging from 1 (*not at all*) to 8 (*very much*). These ratings were grouped into four categories (quality, disclosure, engagement, and intimacy) following Berry and Sherman Hansen's (2000) analysis. Due to severe skewness, disclosure and intimacy were not used in analysis. However, quality and engagement demonstrated excellent reliability, $\alpha = .85$ and $\alpha = .94$ for the whole sample and the sub-

sample of dyads. Participants then completed ratings of performance in the interaction. These four statements were adapted from Jones, Sanson, and Helm (1983) and considered four viewpoints. They were asked to rate their own performance (self view); their friend's performance; (view of other) their friend's rating of their own performance (others view) and how they thought their friend would rate her own performance (other self view). Interaction ratings were on a 9 point scale from 1 (*bad*) to 9 (*good*). These items were used individually in analyses.

Interaction Procedure

The study took place in a psychology research room. The friends were directed to two seats next to each other. The seats were angled so the participants were not directly facing each other or directly facing the camera. The researchers then informed the dyad that they would be filmed for five minutes whilst freely talking. They were instructed to talk as they would in an everyday conversation with each other. After five minutes the researcher returned with the set of discussion points on the topic of friendship for the dyad to discuss. The camera was not stopped between the free interaction and the discussion of the questions. The questions were ordered as follows:

1. How would you make friends with other people?
2. What would make people approach you as a potential friend?
3. What makes you a good friend?
4. If you are going on holiday with the friend you interacted with in this study, what would your holiday plan be?

The dyad was provided with a copy of these discussion points so they could refer back to them when needed. They were informed that they would be left to discuss these questions for 15 minutes. After 15 minutes the video recording was stopped, the researcher returned and the observational part of the study was complete.

Coding of Friendship Behaviour

Observations of the participants were coded in Observer XT 10.5 (Noldus, Netherlands) using continuous event sampling by three coders who were blind to the participants' Machiavellianism scores. Each member of the dyad was coded separately. Six behaviour categories were coded by the author and another Psychology PhD student. The remaining one behaviour category (interest) was coded by a Psychology Master's student.

Reliability

Cohen's Kappa assessed reliability between coders for the observed behaviour. The coders were required to reach an acceptable level of intra-rater and inter-rater reliability (Kappa > .75) for the 5 minutes observation and the 15 minutes observation. Kappa's were generated between two coders for six behaviour and all three coders for the remaining one behaviour. Reliability for the behaviour categories was checked at five time points to ensure there were no observer drift problems (Pellegrini, 1996). Initially, three videos were chosen at random for each coder and reliability was checked for the two segments (5 minutes and 15 minutes observation). This ensured stability over time for each coder (see table 3.1 for mean reliability for all behaviours for three coders). In order to ensure consistency over time for each individual behaviour and consistency between coders, 10% of the videos were coded by all three coders. This was conducted with every 10th video to ensure consistency over the planned recruitment of 50 friendship dyads. Please see table 3.2 for reliability of coding of all three coders, for all behaviour, over time.

Table 3.1 Mean reliabilities (Kappa) of the three coders for five minutes and fifteen minutes observations for three (randomly selected) dyads

	5 minutes	15 minutes
Kappa	.79	.77

Table 3.2 *Reliability between coders over time for 10 dyads. Each reliability for each time point was calculated after data collection and coding of 10 dyads*

	Eye contact	Interest	Talking	Domineering	Stonewalling
Time point one					
5 minutes	.84	.81	.80	No Kappa*	No Kappa*
15 minutes	.76	.78	.81	.92	.90
Time point two					
5 minutes	.78	.80	.79	.98	No Kappa*
15 minutes	.78	.80	.80	.93	No Kappa
Time point three					
5 Minutes	.81	.87	.79	.86	No Kappa*
15 minutes	.77	.80	.77	.75	.94
Time point four					
5 minutes	.85	.82	.81	No Kappa*	No Kappa*
15 minutes	.80	.83	.81	.86	No Kappa*
Time point five					
5 minutes	.81	.86	.81	.82	No Kappa*
15 minutes	.78	.85	.80	.78	No Kappa*

*No Kappa were calculated when the behaviour occurred fewer than 6 times. Although the coders did discuss these behaviour occurrences to ensure agreement. This also included the behaviour pouting as this occurred rarely (less than 6 times throughout the entire ten dyad sample).

Behaviour Coding Categories

Eye contact: This behaviour category assessed where the participant was looking during the interaction. This included four sub-categories: (1) direct eye contact with their friend, (2) looking at another part of their friend, (3) looking at the environment (the room they were in), and (4) looking at their self, for example looking at their lap. These four eye contact sub-categories were measured in seconds for the duration each one occurred.

Interest: This behaviour category was adapted from the Specific Affect Coding System (SPAFF; Coan & Gottman, 1995). As described in the SPAFF, "The function of this behavior is to communicate genuine interest in one's partner through active elaboration or clarification seeking*" (*p. 277*).* This construct is assessed by three measures. ***Nonverbal attention with positive affect*:** This was divided into *leaning forward* and using a *warm tone of voice.* Behaviour was coded when participants leant forward in their chair or used a warm tone of voice indicating engagement with what their friend was saying. Leaning forward was coded when the behaviour started and then when the behaviour stopped to generate the duration (in seconds) participants spent demonstrating this particular interest behaviour. Warm tone of voice was initially coded as a frequency. The coders agreed that the participants were continuously using a warm tone of voice to communicate to their friend therefore the coders removed it from the observation coding scheme. ***Elaboration and clarification seeking question*:** Participant asked their friend a question that required a specific response or confirmation. ***Open-ended questions*:** These questions allow their friend to express themselves and her opinion in as much detail as they would like. This question does not require a 'yes' or 'no' response. In addition, ***head nods*** and the exclamation of '***Uh Huh****'* were also coded to signal interest in the conversation partner. These four latter behaviours were coded each time they occurred i.e., frequency rather than duration.

Talking: This behaviour category incorporated topics of conversation, gossip, and the use of self-disclosure. ***Talking topics*:** This was divided into talking about the friend participating in the dyad and a general category which included the participant talking about topics such as their university course, family, and weekend plans. Not talking was also coded in this category. ***Gossip*:** this was coded if the participant discussed a third person who was not present in the filmed interaction. The information discussed could be positive or negative in nature as defined by Gottman and Mettetal (1986) and used in previous observational research such as Weimer, Kerns, and Oldenburg (2004). ***Self-Disclosure*:** This was coded when a personal, private fact was revealed (defined as descriptive intimacy, Morton, 1978). This was coded 1 to 5 following the same procedure as Leaper, Carson, Baker, Holliday, and Myers (1995). Self-disclosure was coded as 1 when information was expressed that was impersonal and public to 5 when highly personal facts about the self were expressed. The duration of talking for each category was coded in seconds.

Domineering: This behaviour category was adapted from the Specific Affect Coding System (SPAFF; Coan & Gottman, 1995) and is characterised by the individual demonstrating control over their friend and the conversation. This was measured with five behaviour, four from the SPAFF and one additional category added by the researcher. ***Invalidation*:** The participant deliberately contradicts their friend's point of view or their expressed feelings, an example of this is the individual saying "stop exaggerating". ***Lecturing and patronising:*** The participant attempts to belittle or disempower their friend or their friend's argument, quoting someone of authority or another person/friend to try and prove their friend wrong. ***Low balling*:** Involves asking questions that are manipulative, they may be rhetorical in nature, for example "you want me to do well, don't you?" ***Incessant speech*:** Refers to forcing dominance over the conversation by repeating and summarising and ignoring the other person's point of

view. ***Interruptions*:** This was added to the domineering category by the researcher. An attempt is made by the participant to interrupt their friend's speech with their own thoughts or conversation topic. This was coded as successful if their friend stopped speaking to allow the participant to continue with their own interrupted speech. It was coded unsuccessful if their friend continued talking despite the attempt made by the participant. The behaviours in this category were coded each time they occurred.

Stonewalling: This behaviour category was adapted from the Specific Affect Coding System (SPAFF; Coan & Gottman, 1995). This behaviour suggests the individual does not want to listen or respond to their conversation partner. This category was measured with two behaviours. ***Active away behaviour****:* The individual focuses on another object or activity (e.g., playing with hair) to avoid engaging with their conversation partner. ***No back channels:*** The individual does not respond at all to what their conversation partner has just said communicating a lack of interest. The two behaviours were coded each time they occurred.

Pouting*:* This behaviour category was adapted from the Specific Affect Coding System (SPAFF; Coan & Gottman, 1995). This is a facial expression which participants may display when not getting their own way or in response to their partner contradicting or disagreeing with them. This behaviour was coded each time it occurred.

It should be noted that all eye contact, leaning forward and talking categories are reported in seconds per minutes. Stonewalling categories, head nods, uh huhs, elaboration questions, open-ended questions, and pouting are recorded in frequency per minute.

Procedure

Upon arrival, the participants received an information sheet informing them of the premise of the study and their right to withdraw at any point until they left the study room. Participants were informed the study was on personality and friendships and were not informed that Machiavellianism was the research focus until after the study was completed. Importantly, the information sheet highlighted that only one individual from the dyad would need to express their wish to withdraw for the researcher to stop the study. Each participant was assigned with a unique code. This allowed them to be matched with their friend and corresponded to their questionnaire data. Participants were informed about how their data would be stored, used, and who would have access to the footage. Written consent was obtained from all participants. Participants were videotaped for a total of 20 minutes. All participants were first filmed for five minutes of free interaction followed by 15 minutes whereby they discussed the friendship questions. The researcher briefly entered the filming room to give the participants these questions, the participants did not have access to them before the 15 minutes. Filming of these two stages was continuous. The participants then completed all questionnaire measures. Participants received a debriefing sheet at the end of the study and were invited to ask any questions about their participation.

Analysis Plan

Missing data analysis revealed .42% of the data for Machiavellianism (Mach IV), the post-interaction measures, and the friendship functions measure were missing for the complete sample of dyads (N = 55 dyads). Missing data were coded as missing in the data file. Normality of the questionnaire data (post-interaction measures and friendship functions) and the observed behaviours were investigated and all found to be skewed and non-normal. The questionnaire data were successfully transformed and skewness fell within the limits suggested by Doane and Seward (2011). Two post-

interaction items (Disclosure and Intimacy) were severely skewed and, therefore, removed from analysis (see appendix 3H and 3N). Transformations were conducted on the observation data resulting in more normally skewed data, although not all data were transformed successfully (see appendix 3B and 3C). However, as this behaviour was directly observed with high coding reliability and was largely expected to be skewed it was decided that the transformed data would be used in analysis. In order to account for friendship length, analyses were conducted with the entire sample and then with dyads that had a friendship length of 12 months and under. Due to a small sample size analysis could not be conducted with dyads with a friendship length of 13 months and over (17 dyads-two dyads were missing friendship length information). Analysis was initially conducted including age and friendship length in the model, but the model would not run correctly, potentially due to the sample size not being large enough for the number of paths in the model. Therefore, Actor-Partner Interdependence Models were conducted with the entire sample and for dyads with a friendship length of 12 months and below, controlling for age in both samples (please see appendix 3D, 3E, 3F and 3G for the results for age). This 12 month cut of point was adopted as it allowed for the investigation of behaviour in friendships that had recently formed. Furthermore, due to the university sample of the participants this 12 month cut off point corresponds to students' participating in the study in the first year of university. There may be something different about these friendships than those that have lasted longer than the novelty of the first year experience at university. Ideally, future research should investigate friendship length on a continuum or incorporate a mixture of friendship lengths to clearly look at the differences in behaviour associated with friendship length. Missing data analysis revealed .51% of the questionnaire data (Machiavellianism, post-interaction, and friendship functions) was missing for friendship dyads with a friendship length of 12 months and below (n = 36 dyads). Data was coded as missing in the data

file. As before, the observed behaviour, post-interaction measures, and friendship functions data was skewed and transformations conducted (see appendix 3R, 3S, 3N, 3P). The post interaction measures of disclosure and intimacy were severely skewed and not used in the analysis.

The observation consisted of one continual 20 minute interaction, with five minutes free interaction and 15 minutes discussing four questions. As the interaction consisted of two parts, unstructured interaction and a more structured interaction, analysis for five minutes and 15 minutes was conducted separately. It should also be noted that one dyad did not complete the 15 minute interaction due to technical problems with the camera, so the analysis for the 15 minute interaction for the whole sample was conducted with 54 dyads. That dyad has a friendship length greater than 12 months so this did not affect the analysis for the 15 minutes interaction for the 12 months and under sample.

Actor-Partner Interdependence Models

Actor-Partner Interdependence Models (APIMS; Kashy & Kenny, 2000) were conducted to analyse Machiavellianism and the directly observed behaviour for the friendship dyads. Actor-Partner Interdependence Models use individual data, but also view the data as being nested within a dyad. Thus, the dyad is the unit of analysis. Friendships are dyadic in nature and the observations and characteristics between the two friends are linked. APIMS allow for the investigation of an individual's Machiavellianism scores and how this affects their own behaviour (actor effect), but also how an individual's Machiavellianism scores affects their friend's behaviour (partner effects). The correlation between each individual friend's Machiavellianism scores allows for actor effects to be estimated whist controlling for partner effects and partner effects to be estimated whilst controlling for actor effects (Cook & Kenny,

2005). Age was also included as a control variable in this study. Please see Figure 3.1 for the model used in the APIM analysis for this study.

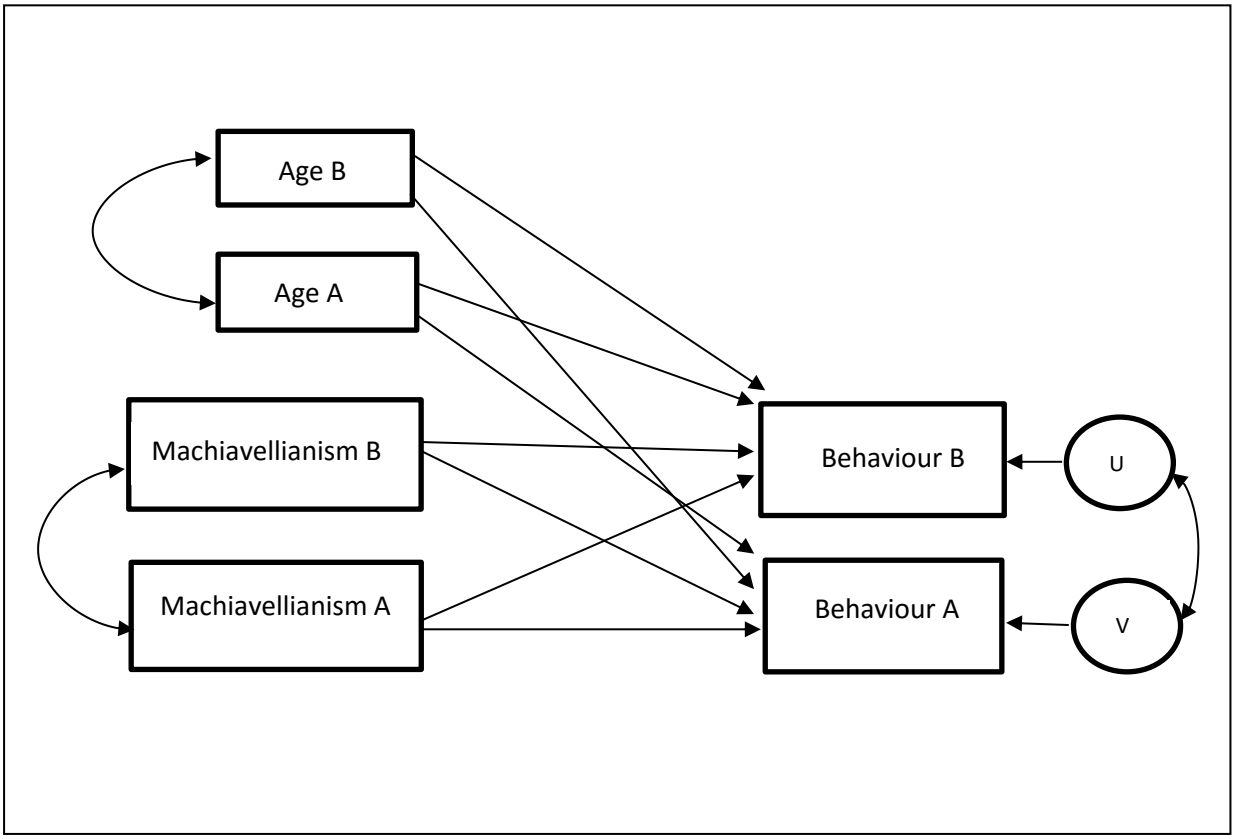

Figure 3.1 Actor-Partner Interdependence Model controlling for age. Please note friendship functions and post-interaction scores were also used as outcome variables and analysed with this model.

Exclusion of Observed Behaviour in the Actor-Partner Interdependence Models

Four categories of domineering behaviour (invalidation, lecturing and patronising, low balling, and incessant speech) were not included for the APIM analysis due to the low frequency of this behaviour. Lecturing and patronising, low balling, and incessant speech were not observed at all in the five minute or fifteen minute observations. Invalidation was only coded a total of four times in the 15 minute observation for two individuals (separate friendship dyads). Therefore, after taking the very low frequency of these four behaviours into account, the domineering category was

reduced to include successful and unsuccessful interruptions only. In addition no self-disclosure at rating 5 was observed, therefore no analysis was performed with this behaviour.

3.2 Study 2 Results

Five Minute Interaction Results for All Dyads (*N* = 55 dyads)

Actor-Partner Interdependence Models were first conducted for the behaviour coded in the first five minutes of in the interaction. The mean and standard deviation (SD) for the behaviour (and Machiavellianism) can be seen in table 3.3.

Table 3.3 *means, standard deviation (SD) for Machiavellianism and the observed behaviour for the five minute observation for the whole sample (N = 55 dyads)*

	Mean	*SD*
Mach IV	52.46	7.90
Eye Contact		
Looking at friend's face	38.04	9.48
Looking at friend non-face	1.24	1.78
Looking at self	3.25	3.85
Looking at environment	13.79	6.96
Interest		
Head nods	1.59	1.26
Uh huhs	.28	.46
Leaning forward	2.24	4.67
Elaboration question	1.21	.94
Open-ended question	.08	.18
Talking		
Not talking	27.46	9.48
General	17.79	9.55
Friend	.80	1.37
Gossip	4.71	6.40
Laughing	4.23	3.40
Self-disclosure one	3.20	4.19
Self-disclosure two	1.22	2.11
Self-disclosure three	.78	3.22
Self-disclosure four	3.20	4.19
Domineering		
Successful interruption	.37	.34
Unsuccessful interruption	.12	.19
Stonewalling		
No back channels	.06	.19
Active away behaviour	.03	.09
Pouting	.14	.29

Notes: All eye contact, leaning forward and talking categories are reported in seconds per minutes. Stonewalling categories, head nods, uh huhs, elaboration questions, open-ended questions and pouting are recorded in frequency per minute.

Correlations between Machiavellianism and the Behaviour Variables for the Five Minute Observation

The Spearmans rho correlations indicate that Machiavellianism significantly correlated with two interest behaviours. Machiavellianism negatively and positively correlated with head nods and elaboration questions respectively (see table 3.5), suggesting women with higher Machiavellianism scores nodded their head less, but asked their friend more elaboration questions i.e., asked more questions which elaborated on information previously revealed by their friend, than those with low Machiavellianism. Machiavellianism also demonstrated a significant negative relationship with pouting (see table 3.9), suggesting women with higher Machiavellianism scores pouted less in the five minute interaction than those with low Machiavellianism. Machiavellianism did not significantly correlate with any of the eye contact behaviour, stonewalling, interruptions or talking behaviour.

Table 3.4 *Correlations for Age, Friendship length, Machiavellianism and Eye Contact for the whole sample five minute interaction (N =55 dyads)*

	Age	Friendship length	Machiavellianism	Face	Non-face	Self	Environment
Age		.19	-.16	.04	-.02	-.04	-.10
Friendship length			-.09	.03	-.10	-.13	-.06
Machiavellianism				-.12	.06	.10	-.02
Face					-.07	-.28**	-.61**
Non-face						.30**	-.16
Self							-.12
Environment							

** Significant at the .01 level
* Significant at the .05 level

Table 3.5 *Correlations for Age, Friendship length, Machiavellianism and Interest for the whole sample five minute interaction (N = 55 dyads)*

	Age	Friendship length	Machiavellianism	Head nods	Uh Huhs	Learning forward	Elaboration questions	Open-ended question
Age		.19	-.16	.28**	.16	-.02	-.14	.06
Friendship length			-.09	.06	-.14	.14	.27*	.20*
Machiavellianism				-.21*	-.14	-.07	.21*	-02
Head nods					.16	-.04	-.14	-.17
Uh Huhs						-.14	-12	.05
Leaning forward							.14	.14
Elaboration question								.10
Open-ended question								

** Significant at the .01 level
* Significant at the .05 level

Table 3.6 *Correlations for Age, Friendship length, Machiavellianism and Talking for the whole sample five minute interaction (N = 55 dyads)*

	Age	Friendship length	Machiavellianism	Not talking	General	Friend	Gossip	Laughing	Self-disclosure one	Self-disclosure two	Self-disclosure three
Age		.19	-.16	-.15	.16	-.02	-.21*	-.004	-.18	.13	.25**
Friendship length			-.09	.07	-.01	.00	-.06	.05	-.19*	.02	.08
Machiavellianism				.12	-.02	-.02	.09	-.11	-.06	-.12	-.11
Not talking					-.57*	-.12	-.14	-.01	-.06	-.22*	-.10
General						.03	-.33**	-.20*	-.12	-.09	-.22*
Friend							-.09	.16	-.03	.20*	.13
Gossip								-.02	-.04	.13	.02
Laughing									.10	.00	-.15
Self-disclosure one										.00	-.15
Self-disclosure two											.37**
Self-disclosure three											

** Significant at the .01 level
* Significant at the .05 level

Table 3.7 *Correlations for Age, Friendship length, Machiavellianism and Interruptions (Domineering) for the whole sample five minute interaction (N = 55 dyads)*

	Age	Friendship length	Machiavellianism	Successful interruptions	Unsuccessful interruptions
Age		.19	-.16	-.05	.11
Friendship length			-.09	.15	.15
Machiavellianism				-.02	-.14
Successful interruptions					.37**
Unsuccessful interruptions					

** Significant at the .01 level
* Significant at the .05 level

Table 3.8 *Correlations for Age, Friendship length, Machiavellianism and Stonewalling for the whole sample five minute interaction (N = 55 dyads)*

	Age	Friendship length	Machiavellianism	Active-away behaviour	No back channels
Age		.19	-.16	.10	.17
Friendship length			-.09	-.12	.01
Machiavellianism				-.03	-.01
Active-away behaviour					.16
No back channels					

** Significant at the .01 level
* Significant at the .05 level

Table 3.9 *Correlations for Age, Friendship length, Machiavellianism and Pouting for the whole sample five minute interaction (N = 55 dyads)*

	Age	Friendship length	Machiavellianism	Pouting
Age		.19	-.16	.00
Friendship length			-.09	.15
Machiavellianism				-.21*
Pouting				

** Significant at the .01 level
* Significant at the .05 level

Actor-Partner Interdependence Models for the Five Minute Observation for All Dyads

Actor-Partner Interdependence Models were conducted for Machiavellianism (controlling for age) and all behaviour variables for 55 dyads for the five minute observation. ***Eye contact*:** After controlling for age, a significant negative partner effect was revealed for looking at their friend's face. This suggested that as the actor's Machiavellianism scores increased their partner looked less at their friend's (the actor's) face. A significant positive partner effect was revealed for Machiavellianism and looking at the environment indicating that as the actor's Machiavellianism scores increased, their partner looked at the environment more. The correlation between the actor's and partner's behaviour for looking at their friend's face, non-face, and self were significant suggesting the friends were similar in these three sub-categories of eye contact behaviour (see table 3.10). ***Interest*:** A negative actor effect was revealed for head nods and a positive actor effect for asking elaboration questions. Women with higher Machiavellianism scores nodded their head less than those with lower Machiavellianism scores, but asked their partner more elaboration questions. The correlation between the actor and partner's head nod behaviour was significant suggesting the friends were similar in the amount of head nods they demonstrated (see table 3.11). ***Talking*:** A positive partner effect was found for talking about general

topics and self-disclosure three suggesting as the actor's Machiavellianism scores increased their partner talked more about general topics, but also they disclosed more personal information about themselves. In contrast, a negative actor effect was revealed for Machiavellianism and self-disclosure one suggesting women with higher Machiavellianism scores disclosed less public information about themselves than women with lower Machiavellianism scores. All correlations between the actor and partner's talking behaviour were significant suggesting similarity between friends in this behaviour (see table 3.12). ***Pouting*:** Finally, a negative actor effect was revealed for pouting indicating that women with higher Machiavellianism scores pouted less in the five minute observation than those with lower scores (see table 3.15). No significant actor or partner effects were revealed for no back channels and active away behaviour (stonewalling) and interruptions (domineering) (see tables 3.13 and 3.14).

Table 3.10 *Standardised Estimates from APIM of Machiavellianism and Eye Contact for the five minute observation (N = 55 dyads)*

	Actor	Partner	C2
Face	-.003 (p = .968)	-.16* (p = .010)	.57***
Non-Face[3]	-.05 (p = .449)	-.02 (p = .747)	.31** (p = .002)
Self [2]	.09 (p = .170)	.00 (p =.975)	.31** (p = .002)
Environment[2]	-.13 (p = .058)	.21** (p = .003)	.11 (p = .259)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level
[2]Log10 transformation
[3]Inverse transformation

Notes: c1 = .37*** (p < .001) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own behaviour; partner = influence of one participant's Machiavellianism scores on their friend's behaviour; c2 = concurrent correlation between the actor and partner's behaviour.

Table 3.11 *Standardised Estimates from APIM of Machiavellianism and Interest for the five minute observation (N = 55 dyads)*

	Actor	Partner	C2
Head Nods[1]	-.16* (*p* = .015)	-.03 (*p* = .601)	.20* (*p* = .042)
Uh Huhs[1]	-.10 (*p* = .140)	-.02 (*p* = .797)	.12 (*p* = .202)
Leaning forward[3]	.09 (*p* = .217)	.01 (*p* = .859)	.18 (*p* = .069)
Elaboration`[1]	.24***	-.08 (*p* = .263)	.19 (*p* = .053)
Open ended[1]	-.01 (*p* = .892)	-.01 (*p* = .857)	.14 (*p* = .145)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Log10 transformation
[3]Inverse transformation

Notes: c1 = .37*** (*p* < .001) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own behaviour; partner = influence of one participant's Machiavellianism scores on their friend's behaviour; c2 = concurrent correlation between the actor and partner's behaviour.

Table 3.12 *Standardised Estimates from APIM of Machiavellianism and Talking for five minute observation (N = 55 dyads)*

	Actor	Partner	C2
Not talking	.12 (p = .127)	-.11 (p = .168)	-.54***
General[1]	.03 (p = .626)	.15* (p = .024)	.30** (p = .003)
Friend[3]	.00 (p = 1.000)	.07 (p = .329)	.19(p = .058)
Gossip[2]	.00 (p = .988)	.14*(p = .023)	.59***
Laughing[1]	-.08 (p = .203)	.01 (p = .933)	.65***
Self-disclosure one[2]	-.13* (p = .033)	.00 (p = .985)	.57***
Self-disclosure two[3]	.01 (p = .833)	.10 (p = .125)	.57***
Self-disclosure three[3]	.03 (p = .574)	.19** (p = .002)	.66***

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level
[1]Square root transformation
[2]Log10 transformation
[3]Inverse transformation

Notes: c1 = .37*** (p < .001) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own talking behaviour; partner = influence of one participant's Machiavellianism scores on their friend's talking behaviour; c2 = concurrent correlation between the actor and partner's talking behaviour.

Table 3.13 *Standardised Estimates from APIM of Machiavellianism and Interruptions (Domineering) for five minute observation (N = 55 dyads)*

	Actor	Partner	C2
Successful interruption[3]	.02 (p = .762)	.06 (p = .414)	.22* (p = .024)
Unsuccessful interruption[3]	.07 (p = .320)	.04 (p = .602)	.03 (p = .721)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level
[3]Inverse transformation

Notes: c1 = .37*** (p < .001) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own interruption behaviour; partner = influence of one participant's Machiavellianism scores on their friend's interruption behaviour; c2 = concurrent correlation between the actor and partner's interruption behaviour.

Table 3.14 *Standardised Estimates from APIM of Machiavellianism and Stonewalling for five minute observation (N = 55 dyads)*

	Actor	Partner	C2
No back channels [1]	-.03 (p = .861)	.01 (p = .658)	-.11 (p = .256)
Active away behaviour[1]	.05 (p = .465)	-.06 (p = .379)	-.07 (p = .495)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level
[1]Square root transformation

Notes: c1 = .37*** (p < .001) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own stonewalling behaviour; partner = influence of one participant's Machiavellianism scores on their friend's stonewalling behaviour; c2 = concurrent correlation between the actor and partner's stonewalling behaviour.

Table 3.15 *Standardised Estimates from APIM of Machiavellianism and Pouting for five minute observation (N = 55 dyads)*

	Actor	Partner	C2
Pouting [1]	-.19* (*p* = .010)	-.05 (*p* = .522)	-.10 (*p* = .289)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level
[1]Square root transformation

Notes: c1 = .37*** (*p* < .001) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own pouting behaviour; partner = influence of one participant's Machiavellianism scores on their friend's pouting behaviour; c2 = concurrent correlation between the actor and partner's pouting behaviour.

15 Minute Interaction Observation Results for All Dyads (*N* = 54 dyads)

Actor-Partner Interdependence Models were then conducted for the behaviour in the 15 minute observation with the complete sample of dyads (*N* = 54). The Means and Standard Deviations for the behaviour can be seen in table 3.16.

Table 3.16 *Means and Standard Deviations (SD) for the observed behaviour (per minute) for 15 minute observation (n = 54 dyads)*

	Mean	*SD*
Eye contact		
Looking at friend's face	36.17	8.26
Looking at friend non-face	.64	1.15
Looking at self	1.80	2.54
Looking at environment	12.06	6.95
Interest		
Head nods	1.80	1.16
Uh huhs	.39	.47
Leaning forward	2.14	3.64
Elaboration question	.87	.61
Open-ended question	.12	.13
Talking		
Not talking	27.42	7.41
General	6.80	4.33
Friend	1.64	1.64
Self-disclosure one	2.20	2.06
Self-disclosure two	5.05	3.06
Self-disclosure three	2.44	2.94
Self-disclosure four	.25	1.02
Discussing question one to three	3.09	3.22
Discussing question four	3.59	3.38
Domineering		
Successful interruption	.27	.24
Unsuccessful interruption	.09	.11
Stonewalling		
No back channels	.05	.09
Active away behaviour	.03	.09
Pouting	.12	.18

Notes: All eye contact, leaning forward and all talking categories are reported in seconds per minutes. Stonewalling categories, head nods, uh huhs, elaboration questions, open-ended questions and pouting are recorded in frequency per minute.

Correlations Between Machiavellianism and the Behaviour Variables for the Fifteen Minute Observation

The Spearmans rho correlations (see tables 3.17 to 3.23) demonstrate that Machiavellianism significantly positively correlated with elaboration questions (see table 3.18), suggesting that women with higher Machiavellianism scores asked their friend more elaboration questions in the fifteen minute observation than those with lower Machiavellianism scores. Machiavellianism did not significantly correlate with any other interest behaviour or any of the eye contact behaviour, stonewalling, interruptions, talking behaviour or pouting.

Table 3.17 *Correlations between Age, Friendship length, Machiavellianism and Eye Contact 15 minute observation (n = 54 dyads)*

	Age	Friendship length	Machiavelli-anism	Face	Non-face	Self	Environment
Age		.11	-.13	-.06	-.11	.04	-.18
Friendship length			-.08	-.01	.07	.15	-.01
Machiavellianism				.06	-.03	.05	.10
Face					.09	-.25**	-.47**
Non-face						.07	.05
Self							.10
Environment							

** Significant at the .01 level
* Significant at the .05 level

Table 3.18 *Correlations between Age, Friendship length, Machiavellianism and Interest 15 minute observation (n = 54 dyads)*

	Age	Friendship length	Machiavellianism	Head nods	Uh Huhs	Learning forward	Elaboration question	Open-ended question
Age		.11	-.13	.20*	.16	.07	-.13	.07
Friendship length			-.08	.05	.10	.12	-.07	-.15
Machiavellianism				-.11	.02	-.08	.20*	.04
Head nods					.14	.15	-.24*	-.18
Uh Huhs						.04	.09	.00
Leaning forward							.03	.02
Elaboration question								.28**
Open-ended question								

** Significant at the .01 level
* Significant at the .05 level

Table 3.19 *Correlations between Age, Friendship length, Machiavellianism and Talking 15 minute observation (n = 54 dyads)*

	Age	Friendship length	Machiavellianism	Not talking	General	Friend	Gossip	Laughing
Age		.11	-.13	-.04	.07	.01	-.07	-.12
Friendship length			-.08	-.01	-.02	.04	.-.13	.09
Machiavellianism				.08	-.02	.00	-.02	-.15
Not talking					-.30**	-.24	-.10	-.14
General						-.08	.10	-.10
Friend							-.21*	.14
Gossip								-.24*
Laughing								

** Significant at the .01 level
* Significant at the .05 level

Table 3.20 *Correlations between Age, Friendship length, Machiavellianism and Talking 15 minutes minute observation (continued) (n = 54 dyads)*

	Self-disclosure one	Self-disclosure two	Self-disclosure three	Self-disclosure four	Discussing question one-three	Discussing question four
Age	-.23*	.04	.24*	.25**	.02	-.01
Friendship length	-.17	-.06	.18	.03	-.15	.05
Machiavellianism	-.01	-.09	-.10	-.04	-.10	-.04
Not talking	-.07	-.34**	-.14	-.04	-.36**	-.44**
General	.33**	-.05	-.14	-.27**	-.16	-.11
Friend	-.05	.16	.26**	.07	.17	.20**
Gossip	-.09	-.16	-.19	-.04	.03	-.30**
Laughing	.11	.02	-.18	-.10	.19	-.01
Self-disclosure one		.09	-.45**	-.23**	-.22*	-.05
Self-disclosure two			.36**	-.04	-.10	.10
Self-disclosure three				.31**	-.05	.10
Self-disclosure four					.08	-.14
Discussing question one-three						.48**
Discussing question four						

** Significant at the .01 level
* Significant at the .05 level

Table 3.21 *Correlations between Age, Friendship length, Machiavellianism and Interruptions (Domineering) 15 minute observation (n = 54 dyads)*

	Age	Friendship length	Machiavellianism	Successful interruptions	Unsuccessful interruptions
Age		.11	-.13	-.18	.07
Friendship length			-.08	.15	.16
Machiavellianism				.08	.09
Successful interruptions					.41**
Unsuccessful interruptions					

** Significant at the .01 level
* Significant at the .05 level

Table 3.22 *Correlations between Age, Friendship length, Machiavellianism and Stonewalling 15 minute observation (n = 54 dyads)*

	Age	Friendship length	Machiavellianism	No back channels	Active away behaviour
Age		.11	-.13	-.09	-.07
Friendship length			-.08	-.08	.02
Machiavellianism				.03	.04
No back channels					.16
Active away behaviour					

** Significant at the .01 level
* Significant at the .05 level

Table 3.23 *Correlations between Age, Friendship length, Machiavellianism and Pouting 15 minute observation (n = 54 dyads)*

	Age	Friendship length	Machiavellianism	Pouting
Age		.11	-.13	-.10
Friendship length			-.08	.02
Machiavellianism				.16
Pouting				

** Significant at the .01 level
* Significant at the .05 level

Actor-Partner Interdependence Models for Observed Behaviour in the Fifteen Minute Interaction (*n* = 54 dyads)

Actor-Partner Interdependence Models were conducted for Machiavellianism (controlling for age) and all behaviour variables for 54 dyads for the fifteen minute observation (see tables 3.24 to 3.29). ***Eye contact:*** A significant positive partner effect was revealed for Machiavellianism and looking at the environment suggesting as the actor's Machiavellianism scores increased their partner looked at the environment more. The correlation between the actor and partner's looking at friend's face behaviour was significant suggesting similarity in this behaviour (see table 3.24). ***Interest:*** As with the five minute observation a significant positive actor effect was found for asking elaborating questions suggesting women with higher Machiavellianism scores asked more elaboration questions than women with low Machiavellianism scores (see table 3.25). No other significant actor or partner effects were revealed. ***Talking:*** A negative actor effect was revealed for laughing suggesting women with higher Machiavellianism scores laughed less whilst a significant negative partner effect was revealed for discussing questions one to three and question four. This suggests that as the actor's Machiavellianism scores increased their partner spent less time talking about the questions they were asked to discuss as part of the observation. The correlations between the actor and partner's behaviour for all taking categories were significant (see table 3.26). ***Interruptions:*** A significant positive partner effect was revealed for unsuccessful interruptions suggesting that as the actor's Machiavellianism scores increased their partner was less successful in interrupting them in conversations (see table 3.27). No other significant actor or partner effects were revealed.

Table 3.24 *Standardised Estimates from APIM of Machiavellianism and Eye Contact for the fifteen minute observation (n = 54 dyads)*

	Actor	Partner	C2
Face[1](Nb. used reflection)	-.03 (.03) (p = .664)	-.03 (.03) (p = .683)	.24* (p = .018)
Non-Face[3]	.02 (p = .795)	-.003 (p = .966)	.06 (p = .522)
Self [3]	-.07 (p = .324)	.02 (p = .788)	.05 (p = .592)
Environment[2]	-.03 (p = .631)	.15* (p = .027)	.09 (p = .360)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level
[1]Sqaure root transformation
[2]Log10 transformation
[3]Inverse transformation

Notes: c1 = .37*** (p < .001) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own eye contact behaviour; partner = influence of one participant's Machiavellianism scores on their friend's eye contact behaviour; c2 = concurrent correlation between the actor and partner's eye contact behaviour.

Please note reflection was used before transforming the data for looking at friends face, therefore it is a positive relationship for Machiavellianism and looking at friends face (as shown in the brackets in table 3.24).

Table 3.25 *Standardised Estimates from APIM of Machiavellianism and Interest for the fifteen minute observation (n = 54 dyads)*

	Actor	Partner	C2
Head Nods [1]	-.04 (p = .565)	.00 (p = .999)	.21* (p =. 032)
Uh Huhs [1]	.06 (p = .445)	.00 (p = .970)	.00 (p = .984)
Leaning forward[3]	.09 (p = .193)	.05 (p = .493)	.48***
Elaboration [1]	.20** (p = .002)	.00 (p = .950)	.55***
Open ended[1]	.06 (p = .407)	.02 (p = .769)	.06 (p = .566)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level
[1]Square root transformation
[3]Inverse transformation

Notes: c1 = .37*** (p < .001) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own interest behaviour; partner = influence of one participant's Machiavellianism scores on their friend's interest behaviour; c2 = concurrent correlation between the actor and partner's interest behaviour.

Table 3.26 *Standardised Estimates from APIM of Machiavellianism and Talking for the fifteen minute observation (n = 54 dyads)*

	Actor	Partner	C2
Not talking	.03 (*p* = .724)	.06 (*p* = .447)	-.24* (*p* = .017)
General[1]	-.04 (*p* = .553)	.07 (*p* = .287)	.53***
Friend[1]	.02 (*p* = .769)	.00 (*p* = .998)	.29** (*p* = .004)
Gossip[1]	-.04 (*p* = .575)	.09 (*p* = .173)	.74**
Laughing[1]	-.19** (*p* = .003)	.00 (*p* = .994)	.52***
Self-disclosure one[1]	-.05 (*p* = .405)	-.01 (*p* = .912)	.50***
Self-disclosure two[1]	.03 (*p* = .681)	-.03 (*p* = .715)	.30**(*p* = .003)
Self-disclosure three[2]	-.04 (*p* = .531)	.02 (*p* = .784)	.43***
Self-disclosure four[3]	-.02 (*p* = .736)	-.03 (*p* = .621)	.43***
Discussing questions 1-3[2]	.06 (*p* = .383)	-.15* (*p* = .020)	.44***
Discussing question 4[2]	.01 (*p* = .850)	-.14* (*p* = .030)	.65***

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation
[2]Log10 transformation
[3]Inverse transformation

Notes: c1 = .37*** (*p* < .001) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own talking behaviour; partner = influence of one participant's Machiavellianism scores on their friend's talking behaviour; c2 = concurrent correlation between the actor and partner's talking behaviour.

Table 3.27 *Standardised Estimates from APIM of Machiavellianism and Interruptions (Domineering) for the fifteen minute observation (n = 54 dyads)*

	Actor	Partner	C2
Successful interruption[1]	.01 (p = .873)	.11 (p = .117)	.20* (p = .045)
Unsuccessful interruption[1]	.03 (p = .695)	.17* (p = .016)	-.02 (p = .837)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level
[1]Square root transformation

Notes: c1 = .37*** (p < .001) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own interruption behaviour; partner = influence of one participant's Machiavellianism scores on their friend's interruption behaviour; c2 = concurrent correlation between the actor and partner's interruption behaviour.

Table 3.28 *Standardised Estimates from APIM of Machiavellianism and Stonewalling for the fifteen minute observation (n = 54 dyads)*

	Actor	Partner	C2
No back channels [1]	.01 (p = .893)	.04 (p = .566)	.15 (p = .119)
Active away behaviour [1]	.01 (p = .939)	-.02 (p = .783)	.11 (p = .266)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level
[1]Square root transformation

Notes: c1 = .37*** (p < .001) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own stonewalling behaviour; partner = influence of one participant's Machiavellianism scores on their friend's stonewalling behaviour; c2 = concurrent correlation between the actor and partner's stonewalling behaviour.

Table 3.29 *Standardised Estimates from APIM of Machiavellianism and Pouting for the fifteen minute observation (n= 54 dyads)*

	Actor	Partner	C2
Pouting [1]	.09 (p = .214)	.10 (p = .155)	-.02 (p = .848)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation

Notes: c1 = .37*** (p < .001) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own pouting behaviour; partner = influence of one participant's Machiavellianism scores on their friend's pouting behaviour; c2 = concurrent correlation between the actor and partner's pouting behaviour.

Machiavellianism and Post-Interaction Measures for All Dyads (*N* = 55 dyads)

Means and standard deviations for six of the post-interaction measures are shown in table 3.64. Two post interaction categories (disclosure and intimacy) were not included in analysis due to severe skewness of this data, including after transformations were conducted (please see appendix 3H). The interaction quality and engagement scale demonstrated excellent reliability $\alpha = .87$ and $\alpha = .94$ respectively. Alphas were not calculated for the next four interaction measures as they each contained one item.

Correlations Between Machiavellianism and the Post-Interaction Measures for All Dyads

The spearmans rho correlations for Machiavellianism, interaction quality, interaction engagement, and the four performance ratings are shown in table 3.1. Machiavellianism demonstrates significant negative relationships with interaction quality, view of other, and others self view. This suggests as Machiavellianism scores increased women reported the interaction as being poorer quality, felt their friend performed poorly, and perceived their friend as also viewing that they performed poorly in the interaction.

Table 3.30 *Means and Standard Deviations (SD) for the six Post-Interaction measures (N = 55 dyads)*

	Mean	*SD*
Interaction Quality	7.00	.95
Interaction Engagement	4.77	1.92
Self view	7.18	1.66
View of other	7.49	1.54
Others view	7.42	1.50
Others self view	7.29	1.58

Table 3.31 *Correlations between Age, Friendship length, Machiavellianism and the six Post-Interaction measurers (N = 55 dyads)*

	Age	Friendship length	Machiavellianism	Interaction Quality	Interaction Engagement	Self view	View of other	Others view	Others self view
Age		.19	-.16	.05	-.21*	.03	.05	-.05	-.06
Friendship length			-.09	.09	-.01	.11	.20*	.11	.06
Machiavellianism				-.31**	.17	-.19	-.27**	-.14	-.25**
Interaction Quality					-.07	.56**	.66**	.61**	.60**
Interaction Engagement						.01	-.01	-.09	-.02
Self view							.83**	.84**	.80**
View of other								.79**	.82**
Others view									.77**
Others self view									

**Significant at the .01 level
* Significant at the .05 level

Actor-Partner Interdependence Models for Interaction Quality and Engagement for All Dyads (*N* = 55 dyads)

Actor-Partner Interdependence Models were conducted for Machiavellianism (controlling for age- see appendix 3I) and quality and engagement post-interaction measures for 55 dyads. Quality and engagement were both originally negatively skewed and data were reflected before transformations (see appendix 3H). **Quality:** A significant negative actor effect was revealed for quality suggesting women with higher Machiavellianism scores reported the interaction to be of low quality. No other significant actor or partner effects were revealed. The correlations between each individual's quality and engagement rating were significant suggesting the friends were similar in the ratings they reported for the quality and their engagement in the interaction (see table 3.32).

Table 3.32 *Standardised Estimates from APIM of Machiavellianism and interaction Quality and Engagement for complete sample (N = 55 dyads)*

	Actor	Partner	C2
Quality[2]	.32 (-.32)***	.10 (-.10) (*p* = .078)	.67***
Engagement[1]	-.09 (.09) (*p* = .156)	-.09 (.09) (*p* = .159)	.41***

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation
[2]Log10 transformation

Notes: c1 = .37*** (*p* < .001) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own interaction quality; partner = influence of one participant's Machiavellianism scores on their friend's interaction quality; c2 = concurrent correlation between the actor and partner's interaction quality rating.

Due to the use of reflection before transformations the results are interpreted in the opposite direction. The correct relationship direction between Machiavellianism and quality and engagement are shown in brackets in table 3.32

Actor-Partner Interdependence Models for the Performance Ratings for the Post-Interaction Measures for the Whole Sample (*N* = 55 dyads)

Actor-Partner Interdependence Models were conducted for Machiavellianism (controlling for age- see appendix 3J) and the four post-interaction performance rating measures for 55 dyads. Participant's rating of their own performance (self view), their rating for their friend's performance (view of other), and what they believed their friend would report for their own performance (others self view) were negatively skewed therefore these data were reflected before transformations (see appendix 3H).

Performance ratings: A significant negative actor effect was revealed for rating their own performance, their partner's performance, and how the actor believed their partner would report their own performance. This indicates women with higher Machiavellianism scores reported their own performance to be poor, and their friend's performance as poor. It also suggests that these women thought their friend would rate their own performance as poor also. Interestingly, a positive actor effect was revealed for how the participants felt their friend would rate their performance (others view), suggesting women with higher Machiavellianism scores felt their friend would give them a good rating (see table 3.33). The correlations between each individual's performance ratings are significant suggesting the friends were similar in their performance ratings. No other significant actor or partner effects were revealed.

Table 3.33 *Standardised Estimates from APIM of Machiavellianism and interaction performance ratings for the complete sample (N = 55 dyads)*

	Actor	Partner	C2
Self view[1]	.20 (-.20) ** (p = .004)	.05 (-.05) (p = .464)	.22* (p = .025)
View of other[1]	.23 (-.23) ***	.12 (-.12) (p = .066)	.42***
Others view	.15* (p = .020)	.11 (p = .086)	.46***
Others self view[1]	.27 (-.27) ***	.10 (-.10) (p = .128)	.45***

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation

Notes: c1 = .37*** (p < .001) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on the performance ratings; partner = influence of one participant's Machiavellianism scores on the performance ratings; c2 = concurrent correlation between the actor and partner's performance rating.

Please note, due to the use of reflection before transformations the results are interpreted in the opposite direction. The correct relationship direction between Machiavellianism and performance ratings are shown in brackets in table 3.33.

Machiavellianism and Friendship Functions

The Means, Standard Deviations (*SD*), and reliability for the friendship functions (and Machiavellianism) are shown in table 3.34. The six friendship functions subscales demonstrated excellent reliability.

Correlations between Machiavellianism and Friendship Functions

The Spearmans rho correlations between Machiavellianism and the friendship functions subscales (N = 55 dyads) are shown in table 3.35. Machiavellianism was significantly negatively related to all six friendship functions subscales; companionship, help, intimacy, reliable alliance, self-validation and emotional security. Friendship length was positively related to all these subscales suggesting longer friendships were more likely to fulfil the six friendship functions identified.

Table 3.34 *Means, Standard Deviations (SD) and reliabilities for Machiavellianism and Friendship Functions (N = 55 dyads)*

	Mean	*SD*	α
Machiavellianism	52.46	7.90	.65
Companionship	35.61	5.33	.92
Help	34.12	6.05	.87
Intimacy	34.88	6.44	.92
Reliable Alliance	35.33	5.43	.88
Self-Validation	33.09	7.40	.92
Emotional Security	33.97	5.96	.82

Table 3.35 *Correlations for Age, Friendship length, Machiavellianism and the six Friendship Functions for all dyads (N = 55 dyads)*

	Age	Friendship Length	Machiavellianism	Companionship	Help	Intimacy	Reliable alliance	Self-validation	Emotional security
Age		.19	-.16	-.07	-.02	.03	.02	.08	.05
Friendship length			-.09	.20*	.24*	.28**	.34**	.28**	.21*
Machiavellianism				-.22*	-.22*	-.19*	-.27**	-.27**	-.35**
Companionship					.75**	.73**	.74**	.76**	.71**
Help						.75**	.69**	.78**	.71**
Intimacy							.731**	.734**	.71**
Reliable-alliance								.72**	.68**
Self-validation									.72**
Emotional Security									

** Significant at the .01 level
* Significant at the .05 level

Actor-Partner Interdependence Models for Friendship Functions

Actor-Partner Interdependence Models were conducted for Machiavellianism (controlling for age - see appendix 3L) and the six friendship functions (companionship, help, intimacy, reliable alliance, self-validation, and emotional security) for 55 dyads. All six friendship function subscales were all originally negatively skewed and data were reflected before transformations (see appendix 3K). Significant negative actor effects were revealed for all six friendship functions suggesting as women's Machiavellianism scores increased they rated their friend as providing less companionship, help, intimacy, being less of a reliable ally, and providing less self-validation and emotional security. In addition, a significant negative partner effect was revealed for help, reliable alliance and emotional security, suggesting as the actor's Machiavellianism scores increased the partner rated their friend as providing them with less help, were less of a reliable ally, and provided less emotional security in the friendship (see table 3.36).

Table 3.36 *Standardised Estimates from APIM of Machiavellianism and the six Friendship Functions for all dyads (N = 55 dyads)*

	Actor	Partner	C2
Companionship[2]	.21 (-.21)***	.06 (-.06) (p = .363)	.66***
Help[2]	.16 (-16)* (p = .011)	.15 (-.15)* (p = .017)	.47***
Intimacy[2]	.13 (-.13)* (p = .045)	.05 (-.05) (p = .429)	.51***
Reliable alliance[2]	.21 (-.21)***	.14 (-.14)* (p = .023)	.57***
Self-validation[2]	.24 (-.24)***	.02 (-.02) (p = .762)	.65***
Emotional security[2]	.25 (-.25)***	.16 (-.16)** (p = .009)	.62***

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[2]Log10 transformation

Notes: c1 = .37*** (p < .001) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own friendship functions rating; partner = influence of one participant's Machiavellianism scores on their friend's friendship functions rating; c2 = concurrent correlation between the actor and partner's friendship functions ratings.

Please note due to the use of reflection before transformations the results are interpreted in the opposite direction. The correct relationship direction between Machiavellianism and the friendship-functions are shown in brackets in table 3.36.

Results for Dyads with a Friendship Length of 12 months and under for the Five Minute Observation

The means and standard deviations for Machiavellianism and the observed behaviour for dyads with a friendship length of 12 months and below are shown in table 3.37.

Table 3.37 *Means and Standard Deviation (SD) for Machiavellianism and the observed behaviour for the five minute observation for friendship dyads with a friendship length of 12 months and below (n = 36 dyads)*

	Mean	SD
Machiavellianism	53.43	7.82
Eye contact		
Looking at friend's face	38.91	8.30
Looking at friend non-face	1.38	1.95
Looking at self	3.21	3.58
Looking at environment	13.89	6.36
Interest		
Head nods	1.51	1.07
Uh huhs	.31	.50
Leaning forward	1.77	3.66
Elaboration question	1.17	.94
Open ended question	.06	.19
Talking		
Not talking	27.14	17.89
General	17.89	9.07
Friend	.82	1.59
Gossip	4.61	5.28
Laughing	4.09	3.22
Self-disclosure one	3.73	4.73
Self-disclosure two	1.26	2.08
Self-disclosure three	.66	3.50
Domineering		
Successful interruption	.33	.28
Unsuccessful interruption	.11	.19
Stonewalling		
No Back channels	.05	.13
Active away behaviour	.03	.08
Pouting	.12	.21

Notes: All eye contact, leaning forward and all talking categories are reported in seconds per minutes. Stonewalling categories, head nods, uh huhs, elaboration questions, open-ended questions and pouting are recorded in frequency per minute.

Correlations between Machiavellianism and the Behaviour Variables for the Five Minute Observation for Dyads with a Friendship Length of 12 months and Under

The correlations are shown in tables 3.38 to 3.43. Machiavellianism significantly positively correlated with asking elaborating questions, suggesting as Machiavellianism scores increased participants asked their friend more elaboration questions (see table 3.39). No other significant correlations for Machiavellianism and the behaviour were revealed.

Table 3.38 *Correlations for Age, Friendship length, Machiavellianism and Eye Contact for dyads with a friendship length of 12 months and under five minute observation (n = 36 dyads)*

	Age	Friendship length	Machiavellianism	Face	Non-face	Self	Environment
Age		.21	-.12	.28*	-.05	-.23	-.15
Friendship length			.12	.13	-.12	-.22	.03
Machiavellianism				-.12	.11	.15	-.02
Face					-.21	-.40**	-.61**
Non-face						.29*	-.21
Self							-.09
Environment							

** Significant at the .01 level
* Significant at the .05 level

Table 3.39 *Correlations for Age, Friendship length, Machiavellianism and Interest for dyads with a friendship length of 12 months and under five minute observation (n = 36 dyads)*

	Age	Friendship length	Machiavellianism	Head nods	Uh Huhs	Learning forward	Elaboration question	Open-ended question
Age		.21	-.12	.31**	-.15	.03	-.10	-.05
Friendship length			.12	.15	-.13	.02	.29*	.04
Machiavellianism				-.11	-.14	.01	.33**	.07
Head nods					.13	.03	-.19	-.19
Uh Huhs						-.16	-.05	.06
Leaning forward							.11	.07
Elaboration question								.18
Open-ended question								

** Significant at the .01 level
* Significant at the .05 level

Table 3.40 *Correlations for Age, Friendship length, Machiavellianism and Talking for dyads with a friendship length of 12 months and under five minute observation (n = 36 dyads)*

	Age	Friendship length	Machiavellianism	Not talking	General	Friend	Gossip	Laughing	Self-disclosure one	Self-disclosure two	Self-disclosure three
Age		.21	-.12	-.21	.34**	.08	-.23	-.03	-.15	.22	.03
Friendship length			.12	.08	-.03	-.11	.13	-.09	-.04	.20	-.002
Machiavellianism				.07	-.04	-.14	.12	-.05	-.18	-.20	-.09
Not talking					-.64**	-.17	-.20	.04	.00	-.29**	-.09
General						-.01	-.12	-.28**	-.30*	-.01	-.09
Friend							-.02	.21	.00	.21	.19
Gossip								-.01	-.07	.10	-.12
Laughing									.08	.06	-.12
Self-disclosure one										-.03	-.25*
Self-disclosure two											.41**
Self-disclosure three											

** Significant at the .01 level
* Significant at the .05 level

Table 3.41 *Correlations for Age, Friendship length, Machiavellianism and Interrupting (Domineering) for dyads with a friendship length of 12 months and under five minute observation (n = 36 dyads)*

	Age	Friendship length	Machiavellianism	Successful interruptions	Unsuccessful interruptions
Age		.21	-.12	-.05	.06
Friendship length			.12	.16	.22
Machiavellianism				.08	-.13
Successful interruptions					.35**
Unsuccessful interruptions					

** Significant at the .01 level
* Significant at the .05 level

Table 3.42 *Correlations for Age, Friendship length, Machiavellianism and Stonewalling for dyads with a friendship length of 12 months and under five minute observation (n = 36 dyads)*

	Age	Friendship length	Machiavellianism	No back channels	Active away behaviour
Age		.21	-.12	-.16	.14
Friendship length			.12	-.24*	.03
Machiavellianism				.07	-.003
No back Channels					.16
Active away behaviour					

** Significant at the .01 level
* Significant at the .05 level

Table 3.43 *Correlations for Age, Friendship length, Machiavellianism and Pouting for dyads with a friendship length of 12 months and under five minute observation (n = 36 dyads)*

	Age	Friendship length	Machiavellianism	Pouting
Age		.21	-.12	.03
Friendship length			.12	.16
Machiavellianism				-.18
Pouting				

** Significant at the .01 level
* Significant at the .05 level

Actor-Partner Interdependence Models for Behaviour in the Five Minute Observations for Dyads with a Friendship Length of 12 Months and Under

Eye Contact: A significant negative partner effect was revealed for looking at friend's face suggesting that when Machiavellianism scores increased in the actor their partner engaged in less direct eye contact. ***Interest*****:** A significant negative partner effect was revealed for 'uh huhs' suggesting that when the Machiavellianism scores of the actor increased their partner 'uh huh'ed' less. The correlation for this behaviour between the actor and partner was significant suggesting similarity in this behaviour. In addition, a significant positive actor effect was revealed for elaboration questions suggesting women with higher Machiavellianism scores asked their friend more elaboration questions i.e., asking their friend to expand/clarify on something they had previously said (see table 3.45). ***Talking*****:** Finally, a significant positive partner effect was revealed for gossip, self-disclosure three and a significant negative actor effect revealed for self-disclosure one. This suggests that when the Machiavellianism scores of the actor increased their partner gossiped more and self-disclosed more private information (see table 3.46) and when Machiavellianism scores increased women (the actor) disclosed less public information. The correlation between the actor and partner's talking behaviour for all taking sub-categories (apart from general and friend) were significant suggesting the friends were similar in this behaviour. ***Pouting***: A significant negative actor effect was revealed for pouting suggesting as Machiavellianism scores increased women pouted less. No other significant actor or partner effects were revealed.

Table 3.44 *Standardised Estimates from APIM of Machiavellianism and Eye Contact for the five minute observation for dyads with a friendship length of 12 months and under (n = 36 dyads)*

	Actor	Partner	C2
Face	-.07 (*p* = .372)	-.17* (*p* = .031)	.29* (*p* = .018)
Non-Face[3]	-.12 (*p* = .120)	.19 (*p* = .783)	.31* (*p* = .012)
Self[1]	.13 (*p* = .102)	.01 (*p* = .938)	.17 (*p* = .153)
Environment	-.04 (*p* = .647)	.13 (*p* = .127)	.01 (*p* = .924)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation
[3]Inverse transformation

Notes: c1 = .30* (*p* = .015) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own eye contact behaviour; partner = influence of one participant's Machiavellianism scores on their friend's eye contact behaviour; c2 = concurrent correlation between the actor and partner's eye contact behaviour.

Table 3.45 *Standardised Estimates from APIM of Machiavellianism and Interest for the five minute observation for dyads with a friendship length of 12 months and under (n = 36 dyads)*

	Actor	Partner	C2
Head Nods[1]	-.08 (*p* = .295)	-.01 (*p* = .940)	.06 (*p* =. 611)
Uh Huhs[1]	-.07 (*p* = .356)	-.22** (*p* = .006)	.27* (*p* = .026)
Leaning forward[3]	-.02 (*p* = .789)	-.02 (*p* = .861)	.17 (*p* = .151)
Elaboration [1]	.40***	-.07 (*p* = .362)	.06 (*p* = .619)
Open ended[3]	-.03 (*p* = .718)	.03 (*p* = .778)	-.01 (*p* = .951)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation
[3]Inverse transformation

Notes: c1 = .30* (*p* = .015) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own interest behaviour; partner = influence of one participant's Machiavellianism scores on their friend's interest behaviour; c2 = concurrent correlation between the actor and partner's interest behaviour.

Table 3.46 *Standardised Estimates from APIM of Machiavellianism and talking for the five minute observation for dyads with a friendship length of 12 months and under (n = 36 dyads)*

	Actor	Partner	C2
Not talking	.09 (*p* = .331)	-.06 (*p* = .513)	-.49***
General[1]	.00 (*p* = .985)	.12 (*p* = .173)	.09 (*p* = .472)
Friend[3]	.14 (*p* = .094)	.07 (*p* = .391)	.23 (*p* = .063)
Gossip[1]	.04 (*p* = .623)	.21** (*p* = .006)	.50***
Laughing[1]	-.02 (*p* = .798)	-.04 (*p* = .592)	.57***
Self-disclosure one[2]	-.19* (*p* = .010)	-.09 (*p* = .234)	.63***
Self-disclosure two[3]	.09 (*p* = .260)	.14 (*p* = .074)	.56***
Self-disclosure three[3]	.04 (*p* = .572)	.19* (*p* = .011)	.81***

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation
[2]Log10 transformation
[3]Inverse transformation

Notes: c1 = .30* (*p* = .015) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own talking behaviour; partner = influence of one participant's Machiavellianism scores on their friend's talking behaviour; c2 = concurrent correlation between the actor and partner's talking behaviour.

Table 3.47 *Standardised Estimates from APIM of Machiavellianism and Interruptions (Domineering) for the five minute observation for dyads with a friendship length of 12 months and under (n = 36 dyads)*

	Actor	Partner	C2
Successful interruption[2]	.07 (*p* = .411)	-.09 (*p* = .295)	.16 (*p* = .196)
Unsuccessful interruption[3]	.08 (*p* = .344)	.09 (*p* = .304)	-.12 (*p* = .308)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[2]Log10 transformation
[3]Inverse transformation

Notes: c1 = .30* (*p* = .015) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own interruption behaviour; partner = influence of one participant's Machiavellianism scores on their friend's interruption behaviour; c2 = concurrent correlation between the actor and partner's interruption behaviour.

Table 3.48 *Standardised Estimates from APIM of Machiavellianism and Stonewalling for the five minute observation for dyads with a friendship length of 12 months and under (n=36 dyads)*

	Actor	Partner	C2
No back channels [1]	.05 (*p* = .577)	-.03 (*p* = .766)	-.09 (*p* = .444)
Active away behaviour [1]	.04 (*p* = .629)	-.08 (*p* = .327)	-.07 (*p* = .577)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation

Notes: c1 = .30* (*p* = .015) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own stonewalling behaviour; partner = influence of one participant's Machiavellianism scores on their friend's stonewalling behaviour; c2 = concurrent correlation between the actor and partner's stonewalling behaviour.

Table 3.49 *Standardised Estimates from APIM of Machiavellianism and Pouting for the five minute observation for dyads with a friendship length of 12 months and under (n = 36 dyads)*

	Actor	Partner	C2
Pouting[1]	-.19* (*p* = .028)	.04 (*p* = .636)	.07 (*p* = .538)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level
[1]Square root transformation

Notes: c1 = .30* (*p* = .015) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own pouting behaviour; partner = influence of one participant's Machiavellianism scores on their friend's pouting behaviour; c2 = concurrent correlation between the actor and partner's pouting behaviour.

Results for Dyads with a Friendship Length of 12 months and under for the 15 Minute Observation

The means and standard deviations for Machiavellianism and the observed behaviour for the 15 minute interaction for dyads with a friendship length of 12 months and below are shown in table 3.50.

Table 3.50 *Means and Standard Deviations (SD) for the observed behaviour (per minute) for 15 minute observation for friendship dyads with a friendship length of 12 months and below (n= 36 dyads)*

	Mean	SD
Eye Contact		
Looking at friend's face	35.48	8.02
Looking at friend non-face	.77	1.33
Looking at self	1.89	2.57
Looking at environment	12.39	6.98
Interest		
Head nods	.39	.47
Uh huhs	1.66	1.11
Leaning forward	2.15	3.81
Elaboration question	.96	.61
Open ended question	.11	.13
Talking		
Not talking	27.93	8.48
General	7.46	4.54
Friend	1.41	1.46
Gossip	3.53	3.81
Laughing	3.41	2.25
Self-disclosure two	4.72	3.27
Self-disclosure three	1.88	2.46
Self-disclosure four	.26	1.10
Discussing question one to three	3.02	2.86
Discussion question four	3.42	3.73
Domineering		
Successful interruption	.24	.23
Unsuccessful interruption	.07	.10
Stonewalling		
No Back channels	.06	.09
Active away behaviour	.03	.10
Pouting	.11	.16

Notes: All eye contact, leaning forward and all talking categories are reported in seconds per minutes. Stonewalling categories, head nods, uh huhs, elaboration questions, open-ended questions and pouting are recorded in frequency per minute.

Correlations between Machiavellianism and the Behaviour variables for the Fifteen Minute Observation for Dyads with a Friendship Length of 12 months and Under

The correlations are shown in tables 3.51 to 3.57. Age significantly negatively correlated with looking at the environment and self-disclosure one suggesting that as age increased women looked at the environment less and self-disclosed less public information. No significant relationships for Machiavellianism and the behaviour variables were revealed.

Table 3.51 *Correlations for Age, Friendship length, Machiavellianism and Eye Contact for dyads with a friendship length of 12 months and under fifteen minute observation (n = 36 dyads)*

	Age	Friendship length	Machiavellianism	Face	Non-face	Self	Environment
Age		.21	-.12	.19	-.11	.02	-.27*
Friendship length			.12	.03	.30*	.24*	.11
Machiavellianism				-.06	.065	.15	.15
Face					.067	-.32**	-.62**
Non-face						-.03	.06
Self							.24*
Environment							

** Significant at the .01 level
* Significant at the .05 level

Table 3.52 *Correlations for Age, Friendship length, Machiavellianism and Interest for dyads with a friendship length of 12 months and under fifteen minute observation (n = 36 dyads)*

	Age	Friendship length	Machiavellianism	Head nods	Uh Huhs	Learning forward	Elaboration questions	Open-ended question
Age		.21	-.12	.15	.04	.14	-.15	-.02
Friendship length			.12	.03	.15	.17	.13	-.12
Machiavellianism				-.17	-.08	-.03	.23	.01
Head nods					.13	.14	-.13	-.21
Uh Huhs						.12	.18	.02
Leaning forward							-.01	-.03
Elaboration question								.20
Open-ended question								

** Significant at the .01 level
* Significant at the .05 level

Table 3.53 *Correlations for Age, Friendship length, Machiavellianism and Talking for dyads with a friendship length of 12 months and under fifteen minute observation (n = 36 dyads)*

	Age	Friendship length	Machiavellianism	Not talking	General	Friend	Gossip	Laughing
Age		.21	-.12	-.04	.11	.05	-.04	-.19
Friendship length			.12	.11	.26*	-.17	.08	-.21
Machiavellianism				.00	.03	-.01	-.12	.01
Not talking					-.39**	-.32**	-.13	-.106
General						-.002	.15	-.18
Friend							-.10	.110
Gossip								-.22
Laughing								

** Significant at the .01 level
* Significant at the .05 level

Table 3.54 *Correlations for Age, Friendship length, Machiavellianism and Talking for dyads with a friendship length of 12 months and under fifteen minute observation (n = 36 dyads) (continued)*

	Age	Friendship length	Machiavellianism	Self-disclosure one	Self-disclosure two	Self-disclosure three	Self-disclosure four	Discussing question one-three	Discussing question four
Age		.21	-.12	-.27*	-.05	.16	.17	.18	.04
Friendship length			.12	-.19	-.26*	.10	-.05	-.20	-.17
Machiavellianism				-.01	-.09	.04	-.03	-.07	-.02
Not talking				-.09	-.39**	-.15	-.07	-.41**	-.56**
General				.28*	-.01	-.106	-.33**	-.13	.01
Friend				-.15	.13	.29*	.23*	.26*	.19
Gossip				-.07	-.109	-.10	-.19	.07	-.22
Laughing				.107	-.03	-.21	-.105	.18	.02
Self-disclosure one					.15	-.45**	-.28*	-.29*	.01
Self-disclosure two						.390**	-.06	-.04	.17
Self-disclosure three							.388**	.06	-.04
Self-disclosure four								.19	-.06
Discussing question one-three									.51**
Discussing question four									

** Significant at the .01 level

* Significant at the .05 level

Table 3.55 *Correlations for Age, Friendship length, Machiavellianism and Interruptions (Domineering) for dyads with a friendship length of 12 months and under fifteen minute observation (n = 36 dyads)*

	Age	Friendship length	Machiavellianism	Successful interruptions	Unsuccessful interruptions
Age		.21	-.12	-.17	.03
Friendship length			.12	.19	.18
Machiavellianism				.20	.10
Successful interruptions					.40**
Unsuccessful interruptions					

** Significant at the .01 level
* Significant at the .05 level

Table 3.56 *Correlations for Age, Friendship length, Machiavellianism and Stonewalling for dyads with a friendship length of 12 months and under fifteen minute observation (n = 36 dyads)*

	Age	Friendship length	Machiavellianism	No back channels	Active away behaviour
Age		.21	-.12	-.14	-.09
Friendship length			.12	-.06	.06
Machiavellianism				-.01	-.09
No back channels					.16
Active away behaviour					

** Significant at the .01 level
* Significant at the .05 level

Table 3.57 *Correlations for Age, Friendship length, Machiavellianism and Pouting for dyads with a friendship length of 12 months and under fifteen minute observation (n = 36 dyads)*

	Age	Friendship length	Machiavellianism	Pouting
Age		.21	-.12	-.11
Friendship length			.12	.26*
Machiavellianism				.07
Pouting				

** Significant at the .01 level
* Significant at the .05 level

Actor-Partner Interdependence Models Fifteen Minute Observation for Dyads with a Friendship Length of 12 Months and Under

Actor-Partner Interdependence Models were conducted for Machiavellianism (controlling for age) and all behaviour variables for 36 dyads with a friendship length of 12 months or below for the fifteen minute observation (see tables 3.58 to 3.63). ***Eye contact*:** A significant negative actor effect was revealed for looking at self and a significant positive partner effect for looking at the environment. This suggests that women with higher Machiavellianism scores looked at themselves less often than those with low Machiavellianism scores and when the actor's Machiavellianism scores were higher their partner looked at the environment more (see table 3.58). Please note a reflection transformation was used for looking at friends face therefore the relationship is negative. ***Interest*:** A significant positive relationship was found for elaboration questions where women with higher Machiavellianism scores asked their friend more elaboration questions. The correlation between the actor and partner's behaviour was significant suggesting similarity in this behaviour (see table 3.59). ***Talking*:** A

significant negative partner effect was revealed for discussing questions one to three; when actor's had higher Machiavellianism scores their partner spent less time discussing the questions focused on friendships (see table 3.60). ***Interruptions*:** A significant positive partner effect was revealed for unsuccessful interruptions showing that when actors had higher Machiavellianism scores their partner had more unsuccessful interruptions (see table 3.61). ***Stonewalling:*** A significant negative partner effect was revealed for active away behaviour. This suggests that as the actor's Machiavellianism scores increased their partner engaged in less active away behaviour. No other significant actor or partner effects were revealed.

Table 3.58 *Standardised Estimates from APIM of Machiavellianism and Eye Contact for the fifteen minute observation for dyads with a friendship length of 12 months and under (n = 36 dyads)*

	Actor	Partner	C2
Face[1]	.09 (-.09) (p = .317)	-.03 (.03) (p = .764)	.00 (p = .979)
Non-Face[3]	.01 (p = .933)	-.01 (p = .946)	-.06 (p = .617)
Self [3]	-.19* (p = .020)	.09 (p = .265)	-.03 (p = .798)
Environment[1]	.03 (p = .738)	.26** (p = .001)	.01 (p = .919)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level
[1]Square root transformation
[3]Inverse transformation

Notes: c1 = .29* (p = .020) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own eye contact behaviour; partner = influence of one participant's Machiavellianism scores on their friend's eye contact behaviour; c2 = concurrent correlation between the actor and partner's eye contact behaviour.

Please note reflection was used before transforming the data for looking at friends face, therefore it is a negative relationship for Machiavellianism and looking at friends face (as shown in the brackets in table 3.58).

Table 3.59 *Standardised Estimates from APIM of Machiavellianism and Interest for the fifteen minute observation for dyads with a friendship length of 12 months and under(n = 36 dyads)*

	Actor	Partner	C2
Head Nods [1]	-.12 (*p* = .145)	.00 (*p* = .988)	.12 (*p* =. 304)
Uh Huhs [1]	-.05 (*p* = .549)	-.03 (*p* = .696)	.09 (*p* = .466)
Leaning forward[3]	.04 (*p* = .617)	-.02 (*p* = .814)	.40** (*p* = .002)
Elaboration[1]	.21** (*p* = .005)	.01 (*p* = .923)	.57***
Open ended[1]	.08 (*p* = .372)	-.03 (*p* = .712)	-.26* (*p* = .033)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level
[1]Square root transformation
[3]Inverse transformation

Notes: c1 = .29* (*p* = .020) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own behaviour; partner = influence of one participant's Machiavellianism scores on their friend's behaviour; c2 = concurrent correlation between the actor and partner's behaviour.

Table 3.60 *Standardised Estimates from APIM of Machiavellianism and Talking for the fifteen minute observation for dyads with a friendship length of 12 months and under (n = 36 dyads)*

	Actor	Partner	C2
Not talking	-.05 (*p* = .551)	.10 (*p* = .283)	-.22 (*p* = .075)
General	-.01 (*p* = .868)	.09 (*p* = .285)	.33** (*p* = .009)
Friend[1]	.05 (*p* = .530)	.10 (*p* = .209)	.11 (*p* = .375)
Gossip[1]	-.07 (*p* = .350)	-.03 (*p* = .708)	.73***
Laughing[1]	-.05 (*p* = .505)	.07 (*p* = .364)	.41** (*p* = .001)
Self-disclosure one[1]	-.04 (*p* = .544)	-.07 (*p* = .307)	.51***
Self-disclosure two[1]	.05 (*p* = .566)	-.01 (*p* = .920)	.26* (*p* = .035)
Self-disclosure three[3]	-.07 (*p* = .363)	-.13 (*p* = .109)	.30* (*p* = .015)
Self-disclosure four[3]	.01 (*p* = .934)	-.01 (*p* = .902)	.38** (*p* = .003)
Discussing questions 1-3[2]	.08 (*p* = .316)	-.18* (*p* = .017)	.39** (*p* = .002)
Discussing question 4[2]	.06 (*p* = .463)	-.13 (*p* = .110)	.60***

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level
[1]Square root transformation
[2]Log10 transformation

Notes: c1 = .29* (*p* = .020) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own talking behaviour; partner = influence of one participant's Machiavellianism scores on their friend's talking behaviour; c2 = concurrent correlation between the actor and partner's talking behaviour.

Table 3.61 *Standardised Estimates from APIM of Machiavellianism and Interruptions (Domineering) for the fifteen minute observation for dyads with a friendship length of 12 months and under (n = 36 dyads)*

	Actor	Partner	C2
Successful interruption[1]	.14 (*p* = .087)	.08 (*p* = .325)	.15 (*p* = .211)
Unsuccessful interruption[1]	.01 (*p* = .882)	.21* (*p* = .015)	-.16 (*p* = .189)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level
[1] Square root transformation

Notes: c1 = .29* (*p* = .020) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own interruption behaviour; partner = influence of one participant's Machiavellianism scores on their friend's interruption behaviour; c2 = concurrent correlation between the actor and partner's interruption behaviour.

Table 3.62 *Standardised Estimates from APIM of Machiavellianism and Stonewalling for the fifteen minute observation for dyads with a friendship length of 12 months and under(n = 36 dyads)*

	Actor	Partner	C2
No back channels[1]	-.04 (*p* = .605)	.02 (*p* = .844)	.14 (*p* = .232)
Active away behaviour [1]	-.05 (*p* = .577)	-.20* (*p* = .019)	.05 (*p* = .680)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level
[1]Square root transformation

Notes: c1 = .29* (*p* = .020) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own stonewalling behaviour; partner = influence of one participant's Machiavellianism scores on their friend's stonewalling behaviour; c2 = concurrent correlation between the actor and partner's stonewalling behaviour.

Table 3.63 *Standardised Estimates from APIM of Machiavellianism and pouting for the fifteen minute observation for dyads with a friendship length of 12 months and under(n = 36 dyads)*

	Actor	Partner	C2
Pouting [2]	.05 (p = .568)	.11 (p = .185)	.09 (p = .431)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level
[2]Log10 transformation

Notes: c1 = .29* (p = .020) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own pouting behaviour; partner = influence of one participant's Machiavellianism scores on their friend's pouting behaviour; c2 = concurrent correlation between the actor and partner's pouting behaviour.

Machiavellianism and Post-Interaction Measures for Dyads with a Friendship Length of 12 Months and Under (*n* = 36 dyads)

Machiavellianism and Post-Interaction Measures

Means and standard deviations for six of the post-interaction measures are shown in table 3.64. Two post interaction categories (disclosure and intimacy) were not included in the analysis due to severe skewness of this data, this severe skewness remained even after transformations were conducted (please see appendix 3N). The interaction quality and engagement scale demonstrated excellent reliability α = .85 and α = .94 respectively. Alphas were not calculated for the next four interaction measures as they each contained one item.

Correlations between Machiavellianism and the Post-Interaction Measures for Dyads with a Friendship Length of 12 Months and Under

The correlations are shown in table 3.65. Machiavellianism negatively correlated with interaction quality and others self view performance rating. Machiavellianism interaction engagement, and the four performance ratings. Machiavellianism did not significantly correlate with engagement, self view, view of friend's performance, and perception of their friend's view of their own performance.

Table 3.64 *Means and Standard Deviations (SD) for the six post interaction measures for dyads with a friendship length of 12 months and below (n = 36 dyads)*

	Mean	*SD*
Interaction Quality	6.95	.99
Interaction Engagement	4.84	1.86
Self view	7.14	1.61
View of other	7.38	1.53
Others view	7.35	1.42
Others self view	7.29	1.51

Table 3.65 *Correlations between Age, Friendship length, Machiavellianism and the six Post-Interaction measures for dyads with a friendship length of 12 months and below (n = 36 dyads)*

	Age	Friendship length	Machiavellianism	Quality	Engagement	Self view	View of other	Others view	Others self view
Age		.21	-.12	.01	-.10	-.01	.00	-.08	-.04
Friendship length			.12	.13	.15	.15	.17	.06	.10
Machiavellianism				-.24*	.15	-.13	-.17	-.07	-.26*
Interaction Quality					-.06	.58**	.64**	.68**	.63**
Interaction Engagement						-.14	-.002	-.18	-.14
Self view							.87**	.853**	.83**
View of other								.850**	.88**
Others view									.84**
Others self view									

** Significant at the .01 level
* Significant at the .05 level

Actor-Partner Interdependence Models for Interaction Quality and Engagement Post-Interaction measures for Dyads with a Friendship Length of 12 Months and Under

Actor-Partner Interdependence Models were conducted for Machiavellianism (controlling for age - see appendix 3M) and the interaction quality and engagement measures for 36 dyads. Quality and engagement were both originally negatively skewed and data were reflected before transformations (see appendix 3N). **Quality:** A significant negative actor effect was revealed for interaction quality suggesting women with higher Machiavellianism scores reported the interaction to be of low quality. The correlations between each individual's quality and engagement rating were significant suggesting the friends were similar in the ratings they reported for the quality and their engagement in the interaction. No other significant actor or partner effects were revealed.

Table 3.66 *Standardised Estimates from APIM of Machiavellianism and interaction Quality and Engagement for dyads with a friendship length of 12 months and below (n = 36 dyads)*

	Actor	Partner	C2
Quality[2]	.24 (-.24)** (p = .001)	.11 (-.11) (p = .138)	.69***
Engagement[1]	-.11 (.11) (p = .193)	-.04 (.04) (p = .667)	.30* (p = .015)

***Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level
[1]Square root transformation
[2]Log10 transformation

Notes: c1 = .33** (p = .008) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own quality and engagement rating; partner = influence of one participant's Machiavellianism scores on their friend's quality and engagement rating; c2 = concurrent correlation between the actor and partner's quality and engagement ratings.

Please note, due to the use of reflection before transformations the results are interpreted in the opposite direction. The correct relationship direction between Machiavellianism and quality and engagement are shown in brackets in table 3.66

Actor-Partner Interdependence Models for the Performance Ratings for the Post-Interaction Measures for Dyads with a Friendship Length of 12 Months and Under (*n* = 36 dyads)

Actor-Partner Interdependence Models were conducted for Machiavellianism (controlling for age - see appendix 3O) and the four performance ratings post-interaction measures for 36 dyads. As before, participant's rating of their own performance, the friend's performance, and what they believed their friend would report for their own performance were negatively skewed, so these data were reflected before transformations (see appendix 3N). **Performance ratings:** A significant negative actor effect was revealed for rating their partner's performance and how the actor believed their partner would report their own performance. This indicates women with higher Machiavellianism scores reported their friend's performance as poor and these women thought their friend would rate their own performance as poor too. The correlations

between each individual's performance ratings were significant suggesting the friends were similar in their performance ratings they reported (see table 3.67). No other significant actor or partner effects were revealed.

Table 3.67 *Standardised Estimates from APIM of Machiavellianism and interaction performance ratings for dyads with a friendship length of 12 months and below (n= 36 dyads)*

	Actor	Partner	C2
Self view[1]	.12 (-.12) (p = .130)	.10 (-.10) (p = .209)	.32* (p = .010)
View of other[1]	.17 (-.17)* (p = .040)	.11 (-.11) (p = .189)	.34** (p = .007)
Others view[1]	.08(-.08) (p = .338)	.08 (-.08) (p = .326)	.37** (p = .004)
Others self view[1]	.27 (-.27)***	.10 (-.10) (p = .201)	.39** (p = .002)

*** Significant at the .001 level [1]Square root transformation
** Significant at the .01 level
* Significant at the .05 level

Notes: c1 = .33** (p = .008) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores performance ratings; partner = influence of one participant's Machiavellianism scores on their friend's performance ratings; c2 = concurrent correlation between the actor and partner's performance ratings.

Please note, due to the use of reflection before transformations the results are interpreted in the opposite direction. The correct relationship direction between Machiavellianism and performance ratings are shown in brackets in table 3.67

Machiavellianism and Friendship Functions for Dyads with a Friendship Length of 12 Months and Under

Correlations between Machiavellianism and Friendship Functions

The means and standard deviations for the friendship functions are shown in table 3.68. The Spearmans rho correlations between Machiavellianism and the friendship functions subscales (n = 36 dyads) are shown in table 3.69. Machiavellianism

demonstrated negative relationships with the remaining the six friendship functions; companionship, help, intimacy, reliable alliance, self-validation, and emotional security. Only Machiavellianism and emotional security was statistically significant.

Table 3.68 *Means, standard Deviation (SD) and reliability for the six Friendship Functions for dyads with friendship lengths of 12 months or under (n = 36 dyads)*

	Mean	*SD*	α
Machiavellianism	53.43	7.82	.70
Companionship	34.88	5.71	.93
Help	33.38	6.51	.89
Intimacy	33.86	7.02	.93
Reliable Alliance	34.25	5.61	.87
Self-Validation	32.15	7.74	.91
Emotional Security	33.40	5.91	.83

Table 3.69 *Correlations for Age, Friendship length, Machiavellianism and the six Friendship Functions for dyads with a friendship length of 12 months or under (n = 36 dyads)*

	Age	Friendship Length	Machiavellianism	Companionship	Help	Intimacy	Reliable alliance	Self-validation	Emotional security
Age		.21	-.12	-.20	-.06	.07	-.05	-.06	.02
Friendship length			.12	.00	.20	.17	.04	.11	.11
Machiavellianism				-.19	-.16	-.158	-.20	-.16	-.28*
Companionship					.77**	.74**	.74**	.78**	.70**
Help						.80*	.78**	.84**	.79**
Intimacy							.75**	.83**	.76**
Reliable-alliance								.77**	.71**
Self-validation									.80**
Emotional Security									

** Significant at the .01 level
* Significant at the .05 level

Actor-Partner Interdependence Models for Friendship Functions for Dyads with a Friendship Length of 12 Months or Under

Actor-Partner Interdependence Models were conducted for Machiavellianism (controlling for age - see appendix 3Q) and the six friendship functions (companionship, help, intimacy, reliable alliance, self-validation, and emotional security) for 36 dyads. All six friendship functions were originally negatively skewed and data were reflected before transformations (see appendix 3P). A significant negative actor effect was revealed for companionship and emotional security suggesting as women's Machiavellianism scores increased they rated their friend as providing less companionship and less emotional security. The correlations between the friendship function ratings were significant suggesting that both members of the dyads were similar in the ratings of their friendship (see table 3.70). No other significant actor or partner effects were revealed.

Table 3.70 *Standardised Estimates from APIM of Machiavellianism and the six Friendship Functions for dyads with a friendship length of 12 months and below (n = 36 dyads)*

	Actor	Partner	C2
Companionship[2]	.17 (-.17)* (*p* = .031)	.04 (-.04) (*p* = .629)	.63***
Help[1]	.11 (-.11) (*p* = .153)	.11(-.11) (*p* = .182)	.47***
Intimacy[2]	.09 (-.09) (*p* = .257)	.04 (-.04) (*p* = .650)	.59***
Reliable alliance[1]	.16 (-.16) (*p* = .050)	.11(-.11) (*p* = .160)	.47***
Self-validation[1]	.12 (-.12) (*p* = .135)	.05 (-.05) (*p* = .551)	.63***
Emotional security[1]	.26 (-.26)***	.08 (-.08) (*p* = .291)	.54***

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation
[2]Log10 transformation

Notes: c1 = .37** (*p* = .008) concurrent correlation between participant 1's Machiavellianism score and participants 2's Machiavellianism score; actor = influence of participant's own Machiavellianism scores on their own friendship functions rating; partner = influence of one participant's Machiavellianism scores on their friend's friendship functions rating; c2 = concurrent correlation between the actor and partner's interaction friendship functions ratings.

Please note, due to the use of reflection before transformations the results are interpreted in the opposite direction. The correct relationship direction between Machiavellianism and friendship functions for dyads with a friendship length of 12 months and below are shown in brackets in table 3.70

Tables of Observed Behaviour Results

Below are tables showing the results for Machiavellianism and the observed behaviour for the whole sample and the dyads with a friendship length of 12 months and under. They are **coded** to show where consistent results have been found in each behaviour category. Please note there is no table for stonewalling as no significant actor or partner effects were revealed across the samples.

Table 3.71 *showing APIM Eye Contact results for both study samples*

	Face	Non face	Self	Environment
5 minute interaction				
Whole sample (*N* = 55 dyads)	Negative partner effect			**Positive partner effect**
Friendship length 12 months and below (*n* = 36 dyads)	Negative partner effect			
15 minute interaction				
Whole sample (*N* = 54 dyads)				**Positive partner effect**
Friendship length 12 months and below (*n* = 36 dyads)			Negative actor effect	**Positive partner effect**

Table 3.72 *showing APIM results for Interest for both study samples*

	Head nods	Uh huhs	Leaning forward	Elaboration question	Open ended question
5 minute interaction					
Whole sample (*N* = 55 dyads)	Negative actor effect			**Positive actor effect**	
Friendship length 12 months and below (*n* = 36)		Negative partner effect		**Positive actor effect**	
15 minute interaction					
Whole sample (*N* = 54 dyads)				**Positive actor effect**	
Friendship length 12 months and below (*n* = 36 dyads)				**Positive actor effect**	

Table 3.73 *showing APIM Talking results for both study samples*

	Not talking	Friend	General	Gossip	Laughing
5 minute interaction					
Whole sample (*N* = 55 dyads)		Positive partner effect			
Friendship length 12 months and below (*n* = 36 dyads)				Positive partner effect	
15 minute interaction					
Whole sample (*N* = 54 dyads)					Negative actor effect
Friendship length 12 months and below (*n* = 36 dyads)					

Table 3.74 *showing APIM Talking (self-disclosure) results for both study samples*

	SD1	SD2	SD3	SD4
5 minute interaction				
Whole sample (*N* = 55 dyads)	**Negative actor effect**		**Positive partner effect**	
Friendship length 12 months and below (*n* = 36 dyads)	**Negative actor effect**		**Positive partner effect**	
15 minute interaction				
Whole sample (*N* = 54 dyads)				
Friendship length 12 months and below (*n* = 36 dyads)				

Table 3.75 *showing APIM Talking (Discussing questions) results for both study samples*

	Discussing questions 1 to 3	Discussing question 4
15 minute interaction		
Whole sample (*N* = 54 dyads)	**Negative partner effect**	Negative partner effect
Friendship length 12 months and below (*n* = 36 dyads)	**Negative partner effect**	

Table 3.76 *showing APIM Interruption (Domineering) results for both study samples*

	Successful interruption	Unsuccessful interruption
5 minute interaction		
Whole sample (*N* = 55 dyads)		
Friendship length 12 months and below (*n* = 36 dyads)		
15 minute interaction		
Whole sample (*N* = 54 dyads)		**Positive partner effect**
Friendship length 12 months and below (*n* = 36 dyads)		**Positive partner effect**

Table 3.77 *showing APIM Pouting results for both study samples*

	Pouting
5 minute interaction	
Whole sample (*N* = 55 dyads)	Negative actor effect
Friendship length 12 months and below (*n* = 36 dyads)	
15 minute interaction	
Whole sample (*N* = 54 dyads)	
Friendship length 12 months and below (*n* = 36 dyads)	

Table 3.78 *showing APIM Interaction Quality and Engagement results for both study samples*

	Quality	Engagement
Whole sample (*N* = 55 dyads)	**Negative actor effect**	
Friendship length 12 months and below (*n* = 36 dyads)	**Negative actor effect**	

Table 3.79 *showing APIM Performance Rating results for both study samples*

	Performance rating 1	Performance rating 2	Performance rating 3	Performance rating 4
Whole sample (*N* = 55 dyads)	Negative actor effect	**Negative actor effect**	Positive actor effect	**Negative actor effect**
Friendship length 12 months and below (*n* = 36 dyads)		**Negative actor effect**		**Negative actor effect**

Table 3.80 *showing APIM Friendship Functions results for both study samples*

	Companionship	Help	Intimacy	Reliable alliance	Self-validation	Emotional security
Whole sample (*N* = 55 dyads)	**Negative actor effect**	Negative actor and partner effect	Negative actor effect	Negative actor and partner effect	Negative actor effect	**Negative actor** and partner effect
Friendship length 12 months and below (*n* = 36 dyads)	**Negative actor effect**					**Negative actor effect**

3.3 Study 2

Discussion

The Actor-Partner Interdependence Models identified a number of behaviour that were associated with Machiavellianism in an observed dyadic interaction with a same-sex female friend. Some behaviour were consistently associated with Machiavellianism in friendship dyads of the whole sample and friendship dyads with a friendship length of 12 months and below. Machiavellianism was associated with less disclosure of public information (self-disclosure one) in the five minute interaction. Machiavellianism was also associated with asking more elaboration questions in both the five minute and fifteen minute interaction. The partners of women with higher Machiavellianism scores looked at the environment more, had more unsuccessful interruptions, and spent less time discussing the three questions on friendship.

A number of additional results that differed across the observations and friendship lengths of the dyads were also revealed. In the five minute interaction for all friendship lengths when the actor was higher on Machiavellianism, their partner looked at their friend's face less. In addition, in the sample of all dyads in the five minute interaction, women with higher Machiavellianism scores nodded their head less, pouted less, and their partner talked about their friend (the actor) more and self-disclosed more personal information (self-disclosure three). In the five minute observation for friendship dyads with a friendship length of 12 months or under, when the actor's Machiavellianism scores were higher their partner demonstrated less of the verbal interest indication 'uh huh' and spent more time gossiping. For fifteen minutes for dyads in the whole study sample, women with higher Machiavellianism scores laughed less and their friend spent less time discussing the 4th question (holiday plans with a friend). Finally, women with higher Machiavellianism scores in friendships of 12 months or less spent less time looking at themselves in the fifteen minute interaction.

Five Minute Interaction

Women with higher Machiavellianism scores directed more elaboration questions toward their friend than those with low Machiavellianism scores. This result was found for the whole sample and the dyads with a friendship length of 12 months and below. The results also revealed their partner self-disclosed more personal information (self-disclosure three) when their friend was higher in Machiavellianism for the whole study sample. In contrast, in the sample containing dyads with a friendship length of 12 months and below the partner spent more time gossiping when their friend was higher in Machiavellianism.

The women, particularly those scoring lower on Machiavellianism and at the start of the experiment, may be feeling vulnerable due to the novel situation and the presence of the video camera. Given that Machiavellianism is associated with viewing others as weak and vulnerable (Black et al., 2014), women with higher Machiavellianism scores may use their friend's increased feelings of vulnerability to their own advantage. Machiavellianism is associated with seeking closeness to others in order to exploit them (Ináncsi et al., 2015). Given that Machiavellianism in women is associated with a lack of maternal warmth in childhood (Birkás et al., 2015), these women may not know how to demonstrate true warmth to another same-sex individual in order to engage in a close intimate relationship. Indeed, coupled with the norm of information sharing and intimacy that characterises women's friendships (Vigil, 2007), this friendship context may be an ideal opportunity to elicit potentially profitable information from their friend (such as gossip).

The women with higher Machiavellianism scores may have asked their friend more elaboration questions to obtain potential information that could be used in a manipulation attempt at another time. This may be a form of strategic, yet opportunistic, manipulation that is a result of a stressful childhood (Belsky, Steinberg & Draper,

1991). For example, using something personal they said here at a later time to make them feel vulnerable, or ashamed, or embarrassed. As seen in study 1a and 1b, Machiavellianism is associated with emotional manipulation in women's same-sex friendships and the gathering of personal information and feelings would help to facilitate this use of manipulation. Asking an open ended question may seem like a very direct strategy and could be viewed as risky for these women higher on Machiavellianism. Their friend may become suspicious if many open ended questions are used and be reluctant to share any more information. Asking elaboration questions is a more indirect approach and asking their friend to elaborate on what they have previously said gives the impression of interest in what their friend is saying and that their friend is in control of the conversation. In addition, individuals with high Machiavellianism are focused on ensuring the strategies go undetected and, by ensuring focus is on their friend (through the use of elaboration questions) in the unstructured observation, they are allowed to assess the situation, plan potential strategies, and gain information about their friend whilst also ensuring a positive image of themselves.

Furthermore, women with higher Machiavellianism scores disclosed less public information in the five minute interaction. This occurred for friendship dyads in the whole sample and in the group of friendship lengths of 12 months and under. At the start of the interaction, given the novelty of the situation it would be expected for public information to be discussed whilst the participants get accustomed to the environment and the study procedure. Women with higher Machiavellianism scores may disclose less public information in this section of the interaction in order to take a less active role in the conversation and potentially extract information from their partner. Furthermore, it was expected that women with higher Machiavellianism scores would disclose less intimate information rather than less public information. However, given that they are quite distrustful and suspicious of others, these women may see revealing any

information about themselves, particularly when being filmed, as putting them at risk of being manipulated or exploited themselves.

The partner's talking behaviour may highlight the strategies adopted by their friend high on Machiavellianism to obtain information. In the results for the entire sample the partner self-disclosed more personal information and talked more about their friend, when their friend was higher in Machiavellianism. Women may feel encouraged to self-disclose when their partner is high on Machiavellianism as their partner demonstrated interest in their comments. Alternatively, these women may have recognised that their partner (when scoring high on Machiavellianism) did not talk much and attempted to encourage their friend to talk more by actually discussing their friend (or subjects they could find interesting) themselves. This was not found in the dyads with a friendship length of 12 months or below which could suggest women in shorter friendships may not recognise the lack of talking by their (high scoring on Machiavellianism) friend or may not feel comfortable enough to focus the topic on them.

In dyads with friendship lengths of 12 months and below, partners of women with higher Machiavellianism scores spent more time gossiping. This was also coupled with the consistent finding that women higher on Machiavellianism asked more elaboration questions. These shorter friendships may not have established the intimacy, or at least the appearance of intimacy, that longer friendships have and may be based on shared activities and/or a shared environment. Therefore, instead of sharing personal information about oneself, their friend shared information about others. Indeed, gossip is associated with social bonding, can strengthen friendships, and is associated with enhanced status (Bosson, Johnson, Niederhoffer, & Swann, 2006; Dunbar, 2004; McAndrew, Bell, & Garcia, 2007; McDonald Putallaz, Grimes, Kupersmidt, & Coie, 2007). A relationship norm of personal information sharing may have not been

established but gossip may help to strengthen the relationship. The partner may be looking to seek a close friendship with their friend (who is high on Machiavellianism) and may see gossip as a tool to achieve this. Gossip is also utilised to provide amusement and satisfaction (Beersma & Van Kleef, 2012). If their high scoring (on Machiavellianism) friend appears to be interested in the gossip (as demonstrated through the use of elaboration questions) then their friend may continue to provide information about others due to visible social rewards they are experiencing from their friend. Furthermore, if gossip is used as an initial strategy to bond in early friendships the women higher on Machiavellianism may need to adhere to this norm. Seeking personal information about their friend without this established personal-information sharing friendship norm in place could be costly to these women. Indeed, women higher on Machiavellianism may need to adapt their strategy and seek information about other individuals. They therefore gain potentially valuable information about other individuals (notably their peers). Machiavellianism has been described as a set of cognitions and systems to achieve adaptive goals (Buss, 2009; Jonason & Tost, 2010; Webster, Schmitt, Li & Crysel, 2012). Gathering information about others could be one such adaptive cognitive strategy that these women use in order to facilitate the future manipulation attempts and to potentially increase their resources. It is important to note that no actor effects were found for Machiavellianism and gossip; as Machiavellianism scores increased women did not gossip more or less. Gossip may be a risky strategy for women higher on Machiavellianism to engage in. The use of gossip requires trust that the other individual will not reveal them as the source of the gossip or betray them to the target (Miller-Ott & Kelley, 2013). This could be damaging to other friendships and to their social status (Farley, 2011), potentially preventing future friendships from developing. Therefore, encouraging someone else to gossip would be more advantageous.

In addition, in the whole sample women with higher Machiavellianism scores looked at the environment less whilst their partner spent less time looking directly at their face. Although it may be expected that women with higher Machiavellianism scores would look at the environment less, it would also be anticipated that this result would be coupled with looking at their friend more as well as looking at themselves more, to monitor their own non-verbal behaviour. Eye contact activates the approach-avoidance response and is integral to social interaction (Hietanen, Leppänen, Peltola, Linna-aho, & Ruuhiala, 2008). More eye contact with their friend would give their appearance of engaging with them and encouraging them to talk. Therefore, women would potentially gain valuable information and, by monitoring their own non-verbal behaviour, not put themselves, or any of their potential manipulative behaviour on display (which could be risky) as the focus would be on their friend.

Women whose partner had higher Machiavellianism scores averted from engaging in direct eye contact with their friend. This could indicate lack of interest or avoidance. These women were self-disclosing moderately private information and being asked to elaborate on this by their high scoring on Machiavellianism friend. This could be a non-verbal indication they are uncomfortable with the amount of questions and information they are disclosing. They may have felt unable to express this verbally or been unable to change the dynamics of the interaction. Given that Machiavellianism is associated with empathy deficits, inappropriate responses to others emotions and a lack of connection to one's own and others emotions, women with higher Machiavellianism scores may not have registered this non-verbal cue (Ali, Amorim & Chamorro-Premuzic, 2009; Wai & Tiliopoulos, 2012; Wastell & Booth, 2003).

Fifteen Minute Interaction

As Machiavellianism scores increased in the actor, their partner looked at the environment more These results were demonstrated in the complete sample of dyads

and dyads who had a friendship length of 12 months and under. As noted earlier, averting direct eye contact and looking at the environment more could indicate wanting to withdraw from the (higher scoring on Machiavellianism) friend they were interacting with. This tendency to spend more time looking at the environment coupled with unsuccessful interruptions could suggest they are more submissive and their higher scoring (on Machiavellianism) friend was more dominant in the interaction. The increased monitoring of the environment could also indicate looking for an 'escape' from the interaction or attempting to refocus their thoughts on something more neutral. The repeated unsuccessful interruptions may feel quite dismissive and have a negative effect on that individual. Therefore averting eye contact from the potentially emotional situation to a neutral stimulus, such as the plain lab room environment they were in may help to regulate the negative emotions resulting from their partner's behaviour in the interaction. It may be that after repeatedly and unsuccessfully trying to interrupt their higher scoring friend, they started to disengage from the interaction by focusing on the environment more. However, the relationship between these two types of behaviour was not explicitly investigated. Furthermore, the type of information the individual was trying to interrupt with was not coded. Therefore, it would be beneficial if future coding schemes investigated whether the individual was trying to interrupt with their own point of view/experiences or offering feedback or agreement on what their (higher Machiavellianism scoring) friend was saying. There may have been differences in whether the friend who was higher in Machiavellianism would have permitted the interruption if the information being offered was of some benefit to them.

Women spent less time discussing the three questions that focused on friendship dynamics when their friend was higher on Machiavellianism. This finding was consistent for the entire group of dyads and the dyads with a friendship length of 12 months and under. Given that Machiavellianism is associated with emotional

detachment and lack of connection to their own and others feelings, their partner may feel that the topic of friendship is too intimate to discuss. Adults have knowledge of their friend's 'if-then' trigger profile (Friesen & Kammrath, 2011), this profile describes how a person may characteristically respond to a situation. Therefore, the partner may have experienced that discussing this topic had not resulted in positive social rewards with this particular friend previously so attempted to keep discussion of this to a minimum.

Women in the full sample of dyads also spent less time discussing question four (holiday plans with their friend) when their partner had higher Machiavellianism scores. This result was not found for dyads with a friendship length of 12 months and under. Although women in the shorter friendships did not talk more about this topic, the fact that they did not talk less could suggest they did not feel this was too personal to talk about with their higher scoring (on Machiavellianism) friend. Furthermore, the discussion of a (possible) future holiday together could indicate commitment to the friendship. It may be that these women would be uncomfortable in this context with their friend, given the time would be spent with only this person, and, therefore, avoid talking about this topic. However, future research should investigate in more detail the topics of conversation in social interactions and the participant's experiences of these conversations i.e., how comfortable they are with the topics being discussed, in relation to Machiavellianism and friendship satisfaction.

Alexithymia Hypothesis

As well as discussing the possible manipulative intent facilitating the behaviour displayed by women with higher Machiavellianism scores it is also important to consider the social deficits that may be influencing the observed behaviour recorded in this study. Machiavellianism is related to Alexithymia, defined by lack of connection to own and others feelings (Wastell & Booth 2003), as well as deficits in empathy (Wai &

Tiliopoulos, 2012) and Emotional Intelligence (Austin, Farrelly, Black, & Moore, 2007). These social deficits may be related to the lack of parental warmth that women with higher Machiavellianism scores report experiencing in their childhood (Birkás, Láng, & Bereczkei, 2015). Women with higher Machiavellianism scores may not know how to connect to others and engage in intimate exchanges. Thus, they keep the focus on their interaction partner to avoid focus on their social deficits.

Furthermore, recent research has suggested that Machiavellianism is associated with anxiety, including anxiety concerning social rejection (Birkás, Láng, Martin, & Kálla, 2016; Neria, Vizcaino, & Jones, 2016). This fear of rejection may be linked to the women in this study focusing on asking their partner more elaboration questions. This behaviour demonstrates interest in their friend and these women may believe that through this behaviour they will ensure acceptance from their friend. However, such behaviour may have the opposite effect. For example, the partners of women with higher Machiavellianism scores did spend less time engaging in direct eye contact with their friend. This behaviour could indicate rejection of their friend's behaviour (who scores higher on Machiavellianism). Therefore, future observation research should investigate Machiavellianism in relation to Alexithymia, anxiety and empathy, and how these relationships may influence actual observable behaviour.

Post-Interaction Results

Women higher on Machiavellianism rated the interaction as being of poor quality. This was found for the entire sample and dyads with a friendship length of 12 months and below. This is unsurprising given Machiavellianism is associated with negative representation of others and high levels of cynicism (Christie & Geis, 1970; Ináncsi et al., 2015). Furthermore, in both samples, women with higher Machiavellianism scores rated their friend's performance as poor and rated their friend

as also rating their own performance as poor. Machiavellianism is associated with a negative representation of others (Black et al., 2014) and low quality friendship (Abell et al., 2014, Lyons & Aitken, 2010) including perceiving less companionship, help, intimacy, and emotional security in their friendship, as shown in studies 1a and 1b in this thesis. Women higher on Machiavellianism scores may not feel the need to conform to friendship norms of providing loyalty and giving their friend positive ratings, irrespective of how long they have been friends.

It must also be noted that in the whole sample women with higher Machiavellianism scores reported their performance in the interaction as poor. It was also expected for this to be found for the dyads with a friendship length of 12 months and under, although this was not the case. Machiavellianism is associated with low self-esteem (McCain, Jonason, Foster, & Campbell, 2015), which may influence their negative performance rating of themselves. Furthermore, Machiavellianism is associated with reward sensitivity (Bereczkei et al., 2013; Birkás et al., 2015) and the lack of an explicit reward in this study, unlike in experimental game studies, may influence their performance. Women with higher Machiavellianism scores may have rated their performance as poor because they may have felt that they did not need to 'perform' through the use of strategies and exploitation of their friend to gain explicit (material) rewards. This rating may also link to the number of partner effects that were found for the directly observed behaviour. The partner effects indicated that friends of women with higher Machiavellianism scores were engaging in more submissive behaviour. However, significant actor effects were not revealed for these behaviour suggesting that women with higher Machiavellianism scores were not explicitly engaging in dominant behaviour. The lack of overt dominant behaviour from the women higher on Machiavellianism may link to their poor performance rating. Without

an explicit reward or goal these women may have found this observation less stimulating, which may lead them to them 'performing' less hence the low rating.

Friendship Functions

Women higher in Machiavellianism rated their friend as providing less companionship and less emotional security. This was found for the whole sample and for the women in a friendship length of 12 months and below. Significant actor effects were expected for all six functions, irrespective of friendship length. Given Machiavellianism is associated with agency, distrusting others, cynicism, viewing others as negative, and poor friendship quality (Abell et al., 2014; Black et al., 2014; Christie & Geis, 1970; Rauthman, 2012b) it was expected that women higher on Machiavellianism would report their friend to provide less companionship, help, be less of a reliable ally, provide less self-validation, and less emotional security than those with low Machiavellianism. Furthermore, in study 1a and 1b, women with higher Machiavellianism scores reported their friend to provide them with less companionship, help, intimacy, and emotional security. Therefore, these findings were also expected in this observation study.

The consistent finding with companionship and emotional security (in this observation study) may be due to these functions of friendship being both salient in new friendships and a stable feature of established friendships. Companionship refers to engaging in activities together and emotional security is providing comfort in novel/threatening situations, both particularly important in new friendships and new university experiences. The act of taking part in the study itself could indicate companionship and emotional security. Women with higher Machiavellianism scores may be particularly aware of these two behaviour from their friend, but due to their emotional detachment and independence may feel that they do not need to be provided with companionship or emotional security.

In addition, no significant partner effects were revealed for dyads with a friendship length of 12 months and below. This may indicate that their partner of the higher scoring (on Machiavellianism) friend has not particularly noticed a lack of any of the six friendship functions in their friendship. Given the relatively short duration of these friendships these results are not surprising. Unless there are direct hostile acts, which Machiavellianism is not associated with (Jones & Neira, 2015), it may be the case that women in the friendship are waiting for these friendship functions to develop over time as the friendship progresses. As the friendship develops it may become more apparent to their partner that their friend is not providing the desired friendship needs. This could be investigated by future research that uses multiple time points to focus on how friendship functions may change and develop. This research could investigate how these functions relate to the formation of a friendship, to the maintenance and potentially the dissolution of that friendship.

Summary of Results Depending on Friendship Length

Important similarities and differences were revealed between the whole sample of women in this study and the women who had been in the friendship 12 months or less. Women higher in Machiavellianism asked more elaboration questions than those lower in Machiavellianism. This was found in the five minute and 15 minute interaction for the whole sample and for those women who had been in friendships of 12 months or less. This could be a social interaction strategy that women higher on Machiavellianism employ irrespective of the length of that relationship. Elaboration questions ensure focus is on their interaction partner and may be a way of seeking information. This information may then be beneficial for manipulation in the future.

Although the use of elaboration questions was a consistent finding the information that was revealed by their partner differed depending on length of friendship. Women who were in friendships of 12 months or less gossiped more. This was not found for the

entire sample of women. Gossip is a social bonding tool (Bosson et al., 2006; Dunbar, 2004; Niederhoffer & Swann, 2006) and women in the shorter friendships may not feel the intimacy that longer friendships have, and, thus, be more likely to reveal information about others rather than themselves. Furthermore, women with higher Machiavellianism scores may be aware of the lack of trust that their friend (in this shorter friendship) feels so focus more on seeking information about others rather than trying to exploit the women's friendship norm of intimacy and personal information sharing (Vigil, 2007). Women with higher Machiavellianism scores in the whole sample and those women in friendships of 12 months or less rated their friend as performing poorly in the interaction and reported their partner would also rate themselves as performing poorly in the interaction. This poor rating may be related to the broad negative view of others (Christie & Geis, 1970) viewing others as weak (Black et al., 2014) and low friendship quality (Abell et al., 2014) including perceiving less companionship and emotional security in friendship (study 2), that characterises Machiavellianism. Women higher in Machiavellianism may not feel the loyalty to provide their partner with a positive rating, irrespective of their length of friendship. However, unlike women (with higher Machiavellianism scores) in the whole sample, women with higher Machiavellianism sores in friendships of 12 months or less only reported less companionship and emotional security in their friendship. The participants in this study were university students and may have recently established friendships (first year students) or for 2nd/3rd year students have longer more established friendships. Engaging in activities together (companionship) and providing comfort in novel situations (emotional security) are two aspects of friendship that may be particularly salient in new friendships, but also established friendships, particularly in the university context. Therefore, women with higher Machiavellianism scores may have recognised these functions occurring in the friendships, but view them as unnecessary and

potentially as a threat to their independence. Future research should focus on when and how the perceptions of friendship functions changes during the friendship.

The results from this study show that friendship length needs to be considered when investigating Machiavellianism in friendship dynamics and friendship quality. Women higher in Machiavellianism may change their perceptions of the friendship, their behaviour, and the strategies they use dependent on how long they have known their friend. Some strategies or behaviour such as asking elaboration questions may be a consistent strategy these women use in order to gain information. However, the results suggest women with higher Machiavellianism scores had different views regarding the functions of friendship depending on the friendship length. Future research should further investigate Machiavellianism, observed behaviour, and perceived friendship functions over time in order to build a clearer picture of how friendship length may influence these factors.

Limitations

This study used observation techniques to investigate Machiavellianism and women's friendship. Although the use of observation data allows the detection of subtle behaviour and for actual manifestations of Machiavellianism to be observed, there are, of course, limitations. In the current study, the interaction took place in a university room with a camera, and, therefore, may not be a particularly naturalistic environment. Although all participants were university students so were familiar with the university environment, the presence of a recording camera may have influenced behaviour. This may be particularly true for those women with higher Machiavellianism scores who are focused on engaging in more subtle behaviour that is less detectable by others. In the future, extra time could be added at the start of the study for the participants to adjust to the presence of the camera and feel more accustomed to the environment. In addition, although this was asked verbally, no data were collected on how comfortable

participants felt with the camera and how they felt it influenced their behaviour. These data could be collected in future observational studies to provide some guidance on the validity of behaviour observed during the study.

There are also some limitations with the coding scheme utilised in the study. For instance, gossip can be both a positive and negative activity, although this was not distinguished in the study. Gossip can be used to share information with group members, and, may be beneficial for group protection, but it can also take the form of malice and rumours in order to isolate and exclude others (Beersma & Van Kleef, 2012; Feinberg, Willer, Stellar, & Keltner, 2012; McAndrew, 2014). Although it has been discussed in this thesis that gossip may not be a compatible strategy with Machiavellianism, Lyons and Hughes (2015) in a questionnaire study reported Machiavellianism to be associated with negative influence gossip, which is a type of gossip intended to damage other people's reputations. Therefore, in order to further clarify the relationship between Machiavellianism and gossip, future observation research should categorise gossip into relevant functions, incorporating both positive and negative aspects of the gossip. This research should, then, investigate whether Machiavellianism is associated with the actual use of a particular type of gossip (such as negative influence gossip) and/or eliciting this behaviour in others, through directly observing behaviour. In addition, recent research has shown that Machiavellianism is associated with defensive strategies such as passive aggression which may be expressed through sarcasm (Richardson & Boag, 2016). Therefore, as well as investigating Machiavellianism and different categories of gossip, research should also investigate sarcastic communication using observation techniques.

Furthermore, there are limitations with the coding of interruptions. The intention of the interruption was not coded. For instance, an individual could interrupt to change the topic or divert the attention on to themselves. However, they could also interrupt to

find out more information about the individual, or to clarify a piece of information. Therefore, the purpose of the interruption may convey different information about the dyad and the actor's intentions in that social interaction. Therefore, future research should code the purpose of the interruption, rather than just the interruption itself.

The results from this research are from one given 20 minute interaction, and as no two interactions are identical (Heerey, 2015) future research should focus on obtaining observation data and friendship data over a number of time points. This would provide more robust data about the behaviour of women with higher Machiavellianism scores and how this may change during a friendship. This study indicates that women with higher Machiavellianism scores seek information from their friend whilst not revealing information themselves. This may just be one behavioural strategy that these women utilise and more time points would allow investigation of whether this is a consistent behaviour or whether this may change as their friendship develops. As noted previously, obtaining friendship function information over several time points could also show whether friends of women scoring higher on Machiavellianism report low friendship functions as the friendship progresses.

Finally, this study focused only on an adult sample. Therefore, other developmental ages need to be investigated. The next study of this thesis investigates Machiavellianism in girls aged 9-11 years as they interact with their peers on the playground. There is no research that has considered Machiavellianism in normative observable behaviour with peers in children. It is hoped that the following study will help to build a clear and more detailed picture of the potential developmental pathway of Machiavellianism and behaviour in females.

Conclusion

The current study investigated Machiavellianism in women's friendship by observing behaviour in a social interaction with a friend. The results suggest that

women higher on Machiavellianism act in subtle (but potentially manipulative) ways by showing interest in their friend, to encourage their friend to talk and reveal information, although they do not reveal information themselves. The results also suggest that friendship length is an important consideration in Machiavellianism and friendship functions, and, in particular the function of companionship and emotional security. Women with higher Machiavellianism scores reported lower amounts of these two functions in both study samples, suggesting further longitudinal research is needed. This study was the first study to consider Machiavellianism and women's normative observable behaviour. It is hoped this will encourage future observation research to investigate the subtle behaviour manifestations that individuals higher on Machiavellianism demonstrate in everyday social interactions.

4. Chapter Four

Study 3

Please note this study is published as: Abell, L., Qualter, P., Brewer, G., Barlow, A., Stylianou, M., Henzi, P., & Barrett, L. (2015). Why Machiavellianism matters in childhood: The relationship between children's Machiavellian traits and their peer interactions in a natural setting**.** *Europe's Journal of Psychology, 11*, 484-493.

Machiavellianism and Girls' Interactions in the Playground

There is a paucity of research investigating Machiavellianism in children, and in particular, Machiavellianism and actual observed behaviour. The previous chapter investigated Machiavellianism and women's actual observable behaviour. This study develops that subject further by investigating the relationship between two components of Machiavellianism (Lack of Faith and Distrust) and girls' normative behaviour with their peers on the playground. Girls (N = 17) completed the Kiddie Mach at the start of the school year and then were observed over a full school year on the playground. Spearmans rho correlations revealed associations between Lack of Faith and Distrust and a number of social interaction behaviour. Girls with high Lack of Faith scores spent less time rejecting other children's bids to join their own social group and spent less time watching other children who were not part of their own social group. Girls with high Distrust scores spent less time engaging in social exclusion behaviour (indirect aggression) and less time being accepted by other children. Finally, girls with higher Distrust scores spent less time rejecting other children's bid to join their own social group. This study highlights the utility of observation research for investigating Machiavellianism in girl's normative behaviour. It is hoped that future research will continue to investigate Machiavellianism (and components of Machiavellianism) and children's normative behaviour in natural environments.

Introduction

Research is starting to investigate the development of Machiavellianism (e.g., Abell, Lyons, & Brewer, 2014; Láng & Birkás, 2015; Láng & Lénárd, 2015) through retrospective questionnaires in adults. There is, however, a lack of research focusing on Machiavellianism in children, specifically on the relationship between Machiavellianism and children's directly observed behaviour with their peers. The limited research on Machiavellianism in children has mainly focused on experimental settings with the intention of manipulation (e.g., Braginsky, 1970), or in the context of bullying (e.g., Andreou, 2000; Sutton & Keogh, 2001). Questionnaire based studies have also been conducted, indicating that children higher on Machiavellianism are more likely to engage in indirect aggression and are less pro-social towards their peers (Kerig & Stellwagen, 2010; Slaughter & Pritchard, 2000, cited in Repacholi, Slaughter, Pritchard, & Gibbs, 2003). However, these studies did not examine children's actual normative behaviour with peers and, instead, relied on self and other report questionnaires. The current study addresses that limitation by investigating the association between Machiavellianism and girls' behaviour in a naturalistic playground environment over the course of a full school year. It is intended that by using observation methodology, the normative behaviour of girls with higher scores on two of the Kiddie Mach subscales (Lack of Faith and Distrust) can be accurately recorded.

Machiavellianism in Adults

Previous experimental research demonstrates that adults higher on Machiavellianism are more likely to be believed when lying, exploit others, and are less likely to reciprocate trust (Geis & Moon, 1981; Gunnthorsdottir, McCabe, & Smith, 2002; Harrell & Hartnagel, 1976). They are particularly skilled in deception and manipulation in competitive environments (Czibor & Bereczkei, 2012). A high level of

Machiavellianism is also associated with a strong sense of detachment from others (termed the 'cool syndrome' by Christie & Geis, 1970). This detachment is fuelled by cynicism, distrust, and suspicion of others (Christie & Geis, 1970). Adults with higher levels of Machiavellianism are low on empathy (Wai & Tiliopoulos, 2012) and Machiavellianism has been compared to Alexithymia (Wastell & Booth, 2003). Adults high on Machiavellianism are not connected to their own emotions, have difficulty in expressing emotions, and, coupled with their distrust and suspicion, they cannot attune to other people's emotions (Szijjarto & Bereczkei, 2014; Wastell & Booth, 2003). Furthermore, individuals higher on this behaviour profile show a dismissing-avoidant attachment style, seeking closeness only to exploit others (Ináncsi, Láng, & Bereczkei, 2015). In consequence, research has demonstrated that Machiavellianism influences a variety of adult relationships including adult friendships (e.g., Brewer & Abell, 2015; Lyons & Aiken, 2010). Indeed, study 1a, 1b and study 2 in this thesis have demonstrated how Machiavellianism influences the use of emotional manipulation in women's friendships (study 1a and 1b) and how Machiavellianism affects actual behaviour in women's friendships (study 2). That research provides a clearer picture of the relationship between Machiavellianism in women's social interactions, but, it is also important to investigate the role of Machiavellianism at other stages of development. This is particularly vital for Machiavellianism and children's behaviour, where the role of Machiavellianism in normative friendship behaviour is unclear.

Machiavellianism and Children's Peer Relationships

Although more is being learnt about the influence of Machiavellianism in adult interpersonal relationships, very little is known about Machiavellianism in childhood. Machiavellianism in children is generally measured from the age of nine years and above through self-report using the Kiddie Mach (Christie & Geis, 1970), although

Machiavellianism can also be measured in children under nine years of age (Repacholi, Slaughter, Pritchard, & Gibbs, 2003) through teacher ratings. Most research, however, utilises the Kiddie Mach self-report measure as children tend to develop the fundamental Machiavellian view of perceiving others as untrustworthy at around the age of eight or nine years of age (Damon, 1988).

Relatively few studies have investigated Machiavellianism in children, and no studies to date have examined actual observed behaviour in a normative context. This is surprising given that children manipulate peers in order to manage their relationships and understand social roles (Pellegrini & Long, 2002). Given the manipulative interpersonal style that characterises Machiavellianism this behaviour may be more prominent with children who are higher on Machiavellianism. The few experimental studies that exist have demonstrated that Machiavellianism in childhood is associated with the manipulative interpersonal behaviour, ability to distinguish between lies and truth, and deception that also characterises adult behaviour (Braginsky, 1970; Nachamie, 1969, cited in Christie & Geis, 1970).

With regard to peer relationships in children, Machiavellianism has been investigated, albeit in a limited manner, with the use of self-report measures. Research focusing on Machiavellianism and bullying (in schools) revealed that children categorised as bullies were more likely to have high Machiavellianism scores. These children also demonstrated less concern for victims of bullying (Sutton & Keogh, 2001) which parallels findings in adults higher on Machiavellianism who show a lack of connection to others feelings (Wastell & Booth, 2003). Research has also demonstrated, through self-report questionnaires, that children with higher Machiavellianism scores were classified as both a bully and a victim (Andreou, 2000), suggesting that these children not only manipulated their peers, but were also a target of manipulation.

It is important to consider Machiavellianism in normative behaviour (i.e., non bullying) with peers, following adult research that is now investigating Machiavellianism in closer, personal relationships (Ináncsi et al., 2015). The second study in this thesis focused on Machiavellianism and observed behaviour in women's friendship interactions and it is important to follow this path and investigate normative behaviour in children's (girls') social relationships as well. The investigation of Machiavellianism at a closer level, such as observation in close relationships, will provide a wealth of information indicating how Machiavellianism influences everyday behaviour and how this behaviour profile actually manifests in social interactions.

Previous studies have focused on the behaviour and popularity of children with higher Machiavellianism scores. Self-report and teacher reports have revealed that children with higher levels of Machiavellianism are more concerned with social success, are less pro-social, and more aggressive towards their peers than children with lower levels of Machiavellianism (Slaughter & Pritchard, 2000, cited in Repacholi, Slaughter, Pritchard, & Gibbs, 2003; Sutton & Keogh, 2000). However, peer ratings of Machiavellianism in children have been inconsistent, with researchers reporting that children with higher levels of Machiavellianism are both popular (Hawley, 2003) and less well liked by their peers (Palmen, 2009). Such inconsistencies may be partly explained by the use of both pro-social and coercive strategies by children higher on Machiavellianism (Hawley, 2003) that extends to the use of cooperative and competitive strategies in adulthood (Wilson, Near, & Miller, 1996). Peer-ratings show Machiavellianism is associated with indirect aggression and proactive aggression, but not physical aggression (Kerig & Stellwagen, 2010), reflecting the preference for more covert manipulation observed in adult samples (Austin, Farrelly, Black, & Moore, 2007). The lower scores on 'hot' empathy (i.e., spontaneous emotional response) obtained by children with higher Machiavellianism scores (Barnett & Thompson, 1985)

may assist this form of indirect manipulation. Instead of responding immediately with an emotional reaction, children with higher Machiavellianism scores may plan forms of indirect aggression such as exclusion or gossip. The use of this particular form of aggression also brings less attention to the perpetrator, fulfilling the need to manipulate, but to not get caught; these patterns are observed in adult behaviour (Christie & Geis, 1970; Kerig & Sink, 2010).

Machiavellianism and Girl's Behaviour with Peers

Research often focuses on girls' greater use of indirect aggression (i.e., social exclusion behaviour, gossip, and spreading rumours). Explanations for this include girls having lower physical strength than boys (Björkqvist, 1994) and socialisation from parents that discourages directly aggressive behaviour in girls (Underwood, 2003). Further, the more intimate peer networks that characterise girls' peer relationships would make the use of indirect aggression more hurtful, and thus, a more successful strategy (Galen & Underwood, 1997; Rotenberg, MacDonald, & King, 2004). However, the findings for girls and increased use of indirect aggression are not completely robust; a meta-analysis conducted by Card, Stucky, Sawalani, and Little (2008) reports a small significant relationship (these authors labelled the finding as 'trivial') with girls and indirect aggression suggesting girls engage in more indirect aggression than boys. Furthermore, a meta-analysis conducted by Archer (2004) highlighted the importance of the methodology utilised, showing that girls demonstrate more indirect aggression when observational methods (and teacher reports) are used.

Given the associations with Machiavellianism, strategic planning, and need to go undetected by others, indirect aggression may be an attractive strategy, particularly for school age girls where indirect aggression becomes more prevalent at the age of 11 (Bjorkqvist, Osterman, & Lagerspetz, 1994). Indirect aggression reduces the likelihood

of getting caught (Kerrig & Sink, 2010) which is an important element of the Machiavellian strategy (Christie & Geis, 1970), and can ensure that others do not view these girls in a negative way (by only displaying overtly social acceptable behaviour).

However, as discussed in chapter two, Machiavellianism and indirect aggression may not be a compatible coercion strategy. This particular type of aggression requires the perpetrator to trust other peers, as it requires other children to engage in this activity (i.e., through also excluding the target person from social interaction, passing on rumours/gossip) in order for the strategy to be successful (Miller-Ott & Kelley, 2013). Furthermore, their peers must also be relied on not to reveal the perpetrator to the target child or authority figure and not to socially exclude them instead. Therefore, trusting others (to a certain extent) is paramount to this particular form of aggression.

However, Machiavellianism is associated with distrust, suspicion of others, believing others will exploit them (Christie & Geis, 1970), and seeking closeness in others, but doing so primarily to manipulate them (Ináncsi et al., 2015). Furthermore, trust is more important to girls' peer relationships than boys (Rotenberg, Qualter, Holt, Harris, Henzi et al., 2014) because girls strive for intimacy and closeness in their peer relationships (Rose & Rudolph, 2006). This makes the relationship between Machiavellianism and girl's behaviour, including the use of indirect aggression, more complex. It could be argued that girls who are not trusting of others (such as those girls who are higher on Machiavellianism) are less likely to seek, and have, close intimate peer relationships. Therefore, without this degree of trust in (at least some) peers they may be less likely to use indirect aggression as a strategy. Without this trust, these girls may not want to risk the potential consequences if the strategy was unsuccessful. However, as stated earlier, Machiavellianism in adults is associated with seeking closeness (Ináncsi et al., 2015) (at least the appearance of closeness) in order to manipulate that person. This may also be found at other developmental ages. Girls with

higher Machiavellianism scores may appear to show trust to conform to friendship norms and then use this (appearance of) trust to manipulate their peers.

The potentially complex relationship between Machiavellianism and indirect aggression in girls may be found in their normative playground interactions. Girls higher on Machiavellianism, who do not strive for actual intimacy and are distrustful of others, may behave differently from those who do. For instance, Roternberg et al. (2014) reported that girls who did not trust their peers were rejected more by their peers, spent less time interacting in groups, gained less peer acceptance, and engaged in more indirect aggression. Girls with higher levels of Machiavellianism are distrusting of others and may, therefore, act in similar way with their same-sex peers. However, in contrast, these girls may actually appear to behave similarly to girls with lower Machiavellianism scores in order to conform to girls friendship norms but also ensure the support of allies on the playground. In adults, Machiavellianism is associated with hostile views, but not hostile actions (Jones & Neira, 2015) which could also be a feature of children's behaviour. Therefore, girls with higher Machiavellianism scores, may, through (strategically) seeking closeness in others coupled with a lack of overt hostile behaviour, be accepted by their peers on the playground.

Although the majority of research has not explicitly investigated Machiavellianism and gender differences in children, of particular importance to this thesis is the influence of Machiavellianism on girls' behaviour. The experimental study conducted by Braginsky (1970) revealed important information about Machiavellianism and girls' behaviour. In that study, children (aged 10-11 years) were asked to convince another child to eat an ill-tasting cracker. Girls with higher Machiavellianism scores employed omissive lying (withholding information) as a manipulation tactic. By not directly lying, there is less chance of getting caught. Furthermore, these girls were more likely to be successful when using the money-split bribe technique. This technique

involved manipulating the target child by offering to share her reward with them (if the target child eats the cracker). This strategy creates a positive impression of themselves towards their target, and, as Braginsky suggests wins their friendship. This supports research in the adult literature indicating adults higher on Machiavellianism seek closeness in order to exploit others (Ináncsi et al., 2015). This also highlights that impression management may be important to girls with higher Machiavellianism scores and that appearing positive to their peers may help to disguise their manipulation attempts. However, Braginsky's study did not focus on normative behaviour, but deliberately set out a task that required tactics of manipulation to be employed. It is important to understand how Machiavellianism influences normative behaviour and not restrict the focus to negative contexts such as experiments of manipulation (Braginsky, 1970) or bullying (e.g., Andreou, 2004).

Although previous studies argue that Machiavellianism influences children's peer relationships, their reliance on self-report (and other-report) measures of behaviour is a serious limitation. Such methods require retrospective reporting and may reflect an adult agenda. Peer reports may also result in the 'labelling' of children, which may impact their future peer interactions (Child & Nind, 2012; Ostrov & Keating, 2004). To overcome these limitations, in this current study, girls' naturalistic playground interactions were observed. The playground is an environment that is less structured by the presence of adult authority, which provides children with the opportunity to display their interpersonal skills and manage interactions with their peers. During childhood, individuals learn to negotiate social interactions and adapt their behaviour to obtain peer acceptance (Palmen, 2009). Children frequently interact with peers (Rubin, Bukowski, & Parker, 2006) and the school environment (and the playground in particular) features all forms of social engagement from competition and conflict to pro-social behaviour and cooperation. Consequently, the naturalistic observation of the playground

environment provides important opportunities to observe the process of negotiation and adaptation, the impact of personality traits and behaviour profiles on such processes, and the development and maintenance of social relationships.

The Current Study

The present study used an observational design to examine whether Machiavellianism was associated with social behaviour in girls over the course of a year. Machiavellianism in children is measured through the use of the Kiddie Mach from the age of nine years and above (Christie & Geis, 1970), and, as stated previously, children tend to develop the fundamental Machiavellian view of perceiving others as untrustworthy at around the age or eight or nine years of age (Damon, 1988). Therefore, due to the required age for this measure and research suggesting Machiavellian views develop around this age it was decided that this was a suitable age to observe Machiavellianism in relation to children's naturalistic behaviour. These girls were part of a larger study cohort, the Lancashire Longitudinal Study of Social and Emotional Development. Through the use of the Kiddie Mach subscales, two aspects of Machiavellianism were investigated: Lack of Faith and Distrust. Observing naturalistic behaviour of these girls will allow for a more informative understanding of the behaviour associated with Machiavellianism in childhood and the implications for social relationships during development. Observing behaviour may be particularly beneficial in terms of social and personal relationship interventions in schools, given that social interactions underpin social relationships (Heerey, 2015). Indeed, focusing on behaviour other than bullying (i.e. Andreou, 2009) may help to reduce the negativity that is associated with Machiavellianism. Understanding these children's everyday behaviour may help future research to improve theses children's personal and social relationships.

Previous research has highlighted a complex relationship between Machiavellianism, behaviour, and social interactions. Furthermore, there is very limited information about the two Kiddie Mach subscales (Lack of Faith and Distrust) investigated in this study, therefore, this study was exploratory with no specific predictions made for three categories of behaviour investigated in this study; peer acceptance, rejection, and indirect aggression. Indeed, it could be hypothesised that girls with higher levels of Distrust would reject others. Additionally, they could also engage in indirect aggression and be rejected themselves. For instance, Roternberg et al. (2014) reported that girls who did not trust their peers gained less peer acceptance and engaged in more indirect aggression. However, given the relationship with Machiavellianism and manipulation and their need to be undetected, the lack of hostility in their actions and seeking closeness in order to manipulate (Christie & Geis, 1970;Ináncsi et al., 2015; Jones & Neira, 2015), it could also be hypothesised that these girls are accepted more by their peers and, due to their lack of trust in others, spend less time engaging in indirect aggression. Additionally, girls with high Lack of Faith scores may be rejected more, and reject others more due to their negative view of others. However, this negative view of others may also mean that these girls see others as being easily manipulated or exploited. Therefore, they may appear to seek closeness in others in order to then manipulate them for their own needs. This seeking closeness may result in initial socially acceptable behaviour such as accepting other peers and being accepted themselves by their peers which may prevent detection from their peers and school authority figures.

Although no specific predictions have been made regarding peer rejection, acceptance, and indirect aggression, it is expected that girls with higher levels of Lack of Faith scores and Distrust will engage in less direct aggression. Direct aggression is a risky strategy as it is overt and would easily be noticed by peers. Machiavellianism is

associated with strategic planning (Christie & Geis, 1970) and in children is not associated with immediate emotional responses such as direct aggression (Barnett & Thompson, 1985; Kerig & Stellwagen, 2010).

In addition, the relationship between Machiavellianism and social monitoring was also investigated. The literature suggests adults higher on Machiavellianism engage in protective self-monitoring (Rauthmann, 2011) and monitor their partners in experimental games (Czibor & Bereczkei, 2012). However, little is known about the role of monitoring others in normative social situations. This may be particularly important to children in playground settings that involve varied social engagement, from competition and conflict to pro-social behaviour and cooperation. Such monitoring may influence a child's decision to interact. In this study, social monitoring of peers outside the target child's group was therefore investigated. Machiavellianism is characterised by suspicion of others and distrust (Christie & Geis, 1970), and in children is associated with anxiety due to increased vigilance of manipulation from others (Poderico, 1987). It was, therefore, expected that higher levels of Distrust would be associated with monitoring those outside the immediate group. Non-group members may be viewed as a threat to the child's social position and their social success which is important to children higher in Machiavellianism (Sutton & Keogh, 2001). Furthermore, monitoring may reduce the likelihood of being a target of manipulation or exploitation by another child, particularly a child outside their social group who may be viewed as a greater threat.

4.1 Study 3 Method

Participants

Girls aged 9 to 11 years from The Lancashire Longitudinal Study of Social and Emotional Development participated. Mean ages at the start and end of the study were 9

years-9 months (*SD* = 4 months) and 10 years-7 months (*SD* = 4 months) respectively. Children came from five schools, representative of those across the UK according to the Government Index of Multiple Deprivation. Participation was secured by active parental consent. Children who did not take part in the study were often observed in interaction with children in the study. The parents of such children were informed that their child's behaviour would be recorded, but not coded. All parents were told that the recordings would be destroyed at the end of the study. The study was approved by the University of Central Lancashire's ethics committee (see appendix 4A).

Questionnaire Measure

Children completed the 20 item Kiddie Mach (Christie & Geis, 1970) at the beginning of the school year, using a five point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). Items include: "*It is never right to tell a lie"* and "*Most people won't work hard unless you make them do it*". Ten items were reverse scored such that higher scores represent higher Machiavellianism. The full scale demonstrated extremely poor reliability α = .09. Therefore, three subscales were calculated based on the subscales identified by Sutton and Keogh (2001). These factors were Lack of Faith (five items), Dishonesty (three items), and Distrust (three items). Lack of Faith corresponds to belief in viewing human nature as positive. Four of these items were reverse coded with higher scores showing a lack of belief that human nature is largely positive (*"Most people are good and kind"*). Therefore, this subscale refers to having a general negative view of others. This subscale demonstrated acceptable reliability α = .67. Dishonesty refers to attitudes towards telling a lie. All three items were reverse coded demonstrating positive attitudes towards lying ("*It is never right to tell a lie"*). However, a negative Cronbach's alpha was revealed for this scale (-.44) despite items being appropriately scored and reverse coded. The alpha value suggests that the children

were not responding consistently to the three items for this subscale. Therefore, as this subscale did not generate acceptable reliability it was not used in the subsequent analysis. Distrust refers to general attitudes towards trusting others ("*Anyone who completely trusts anyone else is asking for trouble"*) with high scores showing high levels of distrust in others. This subscale demonstrated acceptable reliability α = .58

Observation Procedure

Cameras were placed unobtrusively at vantage points from which the playgrounds were visible and children were videotaped during recess. These vantage points meant that sound could not be recorded, but allowed a full view of the playground without the children knowing they were being filmed. Camera operators utilized a table of random numbers that represented participant IDs, selected at random from all participants in the school. Children identified by the numbers were videoed on that day and video operators followed the child for as long as possible at that time. Videoing would stop for that child when she was no longer visible and videoing of the next child on the table of random numbers would begin.

Each target participant was observed in 39 recesses, which equated to one observation for each week of the school year; each period of observation lasted on average 18 minutes. If the child was away from school in any given week, an additional observation was collected the following week. Whilst it was ensured that all data for a given child were collected within the same school year, data collection for the full sample took place over four years. No children joined or left the study. All observations of a target participant were coded in Observer XT 9 (Noldus, Netherlands) by coders who were blind to the Machiavellianism scores. Observation coding was undertaken by a total of sixteen trained undergraduate and postgraduate students and four members of staff who were required to reach an acceptable level of inter-rater reliability with

practice videotapes (Intra-Class Correlations >.80) before they were able to code data. Assessments of reliability were conducted throughout the study to avoid observer drift (Pellegrini, 1996).

Within Observer XT, the data were coded across time using continuous event sampling. In the current study, data represent the percentage of observation time engaged in specific behaviour. For social monitoring, data represent the percentage of observed time in social groups when the child was seen to be observing peers outside of their immediate social group. Reliability between observers was assessed using Intra-Class Correlations (ICC) across 5% of the observations. Reliability was moderate to high for the observed variables in the current study and exact details are noted below for each behavioural code. A high number of interactions (95%) were same-gender as found in previous research (e.g., Blatchford et al., 2003). The following are the categories of behaviour observed.

Direct or indirect aggression: Direct aggression was categorised as the target engaging in physically aggressive acts against another child (ICC = .81). Indirect aggression was categorised as the target deliberately engaged in ignoring another person(s) during active conversation or ostracizing them from interaction while engaged within the group (ICC = .76).

Peer acceptance: this was assessed with target-initiated acceptance and other-initiated acceptance. Target-initiated acceptance was coded when the target child made a social overture that another child accepted (ICC = .84). Other-initiated acceptance was coded when another child who had been alone or in another group made a social overture that the target child responded positively to (ICC = .78). That social overture might have been a tap on the shoulder, speaking to the other person, or trying to get their attention another way (e.g., starts play).

Peer rejection: this was measured by target-initiated rejection and other-initiated rejection. Target-initiated rejection was coded when the target child made a social overture that another child ignored (e.g., turning their back on the target child) (ICC = .92). Other-initiated rejection was coded when another child initiated interaction that was rejected by the target child, as demonstrated by the target child turning their back on them or walking away from them (ICC = .95).

Social monitoring: this was categorised when the target participant was watching another person or group outside of their immediate social group (ICC = .81). Data represent percentage of time monitoring others when only engaged in social groups and not the total observed time.

Analysis Plan

The small number of participants does not permit examination of whether behaviour elicited in peer relationships changed over the school year or whether Machiavellianism scores predicted that change using latent growth curve modelling (LGCM) techniques. However, an analysis of behavioural change was conducted on the larger sample of participants observed as part of the Lancashire Longitudinal Study of Social and Emotional Development. Findings, using LGCM in Mplus (Muthén & Muthén, 1998-2007), for the larger cohort of 149 children showed behaviour were stable over time, with individual differences only in the starting point for girls: CFI $\geq$.943, TLI $\geq$.946, SRMR $\geq$.050). Variances showed that the intercepts for each behaviour were significant for the girls ($\beta_0 \geq .314$, $p < .001$), but the slopes were not ($\beta 1 \leq .027$ $p \geq .183$). Thus, employing proportion of time for each behaviour across the full school year is appropriate because there were no significant changes in any given behaviour over the school year. Such findings have been demonstrated before (Blatchford et al., 2003).

Missing data analysis revealed no missing data for the Kiddie Mach data although the data for the 17 girls in the current study were skewed and non-normal. Transformations were conducted on the data, but these failed to produce an acceptable normal distribution (please see appendix 4B for data transformation information). Therefore, Spearman's rank correlations were conducted to account for this. Due to the skewed data and small sample size further analyses were not conducted. A larger sample size would have allowed for multiple regression to be conducted to investigate whether Lack of Faith and Distrust predicted each behaviour observed. In addition, with a larger sample size latent growth curve modelling (LGCM) may have shown differences in behaviour over the period of data collection. If so, then path analysis would have been conducted, allowing the relationship between the Kiddie Mach subscales and behaviour to be analysed at different time points.

4.2 Study 3 Results

Behavioural Measure Correlations

Due to the small sample size the relationships between the two subscales (Lack of Faith and Distrust) and the behaviour were explored rather than focusing on the *p* value produced for each correlation relationship. The small sample size results in a less stable *p* value (Schönbrodt & Perugini, 2013) and, therefore, a much larger sample size would be needed to focus on the significance of relationships. Negative relationships were revealed for Lack of Faith and other-initiated rejection and watching children outside their own social group. This indicates that girls who hold a negative view of human nature spent less time rejecting other children on the playground and spent less time watching other children outside of their social group. A strong significant negative relationship was revealed for Distrust and target-initiated acceptance. This suggests that girls with higher levels of distrust spent less time being accepted by other children

(predominantly girls) in to other social groups than those with low levels of distrust. Negative relationships were also identified between Distrust and indirect aggression and other-initiated rejection, suggesting that girls with higher Distrust scores spent less time engaging in indirect aggression and spent less time rejecting other children when they attempted to join their social group than those with lower levels of distrust. Please see table 4.1 for means, standard deviations and correlations.

Table 4.1 *Means, Standard Deviations (SD) and Spearmans correlations for Lack of Faith, Distrust and the observed behaviour*

	Mean	SD	Age	Lack of Faith	Distrust	DA	IDA	TIA	TIR	OIA	OIR	WCOG
Age (years)	9.90	4.00		-.15	-.60*	.27	.11	.51*	-.11	.23	.50*	.01
Lack of Faith	12.65	3.30			.05	.02	-.13	.14	-.16	-.04	-.36	-.37
Distrust	8.76	2.97				.06	-.34	-.62**	.05	-.15	-.36	.23
Direct aggression (DA)	0.90	1.28					.28	.45	-.11	.63**	.08	.51*
Indirect aggression (IDA)	0.65	1.24						.44	.02	.36	.19	.31
Target-initiated acceptance(TIA)	2.79	1.33							-.28	.30	.22	.22
Target-initiated rejection (TIR)	0.35	0.37								-.04	-.06	.16
Other-initiated acceptance (OIA)	2.74	3.45									.23	.18
Other-initiated rejection (OIR)	0.99	1.23										.06
Watching children outside group (WCOG)	53.15	13.77										

Note: * Correlation significant at the .05 level
** Correlation significant at the .001 level

4.3 Study 3 Discussion

This study showed that two key components of Machiavellianism (Lack of Faith and Distrust) were related to girl's interactions with their peers in a naturalistic environment. Girls who viewed human nature negatively spent less time rejecting other children's bids to join their own social group. These girls also spent less time watching other children who were not part of their own social group. Girls who believed they could not trust other people spent less time engaging in social exclusion behaviour (indirect aggression) and less time being accepted by other children. Finally, girls with higher Distrust scores spent less time rejecting other children into their own social group.

Indirect Aggression

Girls with higher scores of Distrust on the Kiddie Mach scale displayed fewer social exclusion behaviour (e.g., turning their back on their peer) towards children who were part of their own social group. Social exclusion is a form of indirect aggression and requires trust and support from peers (Miller-Ott & Kelly, 2013). For indirect aggression to be effective it requires all (or the majority of) children in the social group to also engage in this behaviour. With regard to social exclusion, all (or the majority of) children in the social group would be required to deny access to their group for it to be an effective strategy. Girls who distrust others may not view members of their own social group as being reliable or trustworthy to carry out this social exclusion strategy. They may believe these girls would betray them to the target as the instigator of the behaviour, or to an authority figure, which could result in negative consequences for these girls. It could also be speculated that girls with high levels of Distrust (on the Kiddie Mach) will appear to overtly conform to group friendship norms, and not engage in hostile behaviour, as is also shown in adult Machiavellian behaviour (Jones & Neria, 2015).

Although questionnaire research has demonstrated that Machiavellianism in children is associated with indirect aggression (Kerig & Stellwagen, 2010) focusing on Distrust scores on the Kiddie Mach and indirect aggression in girls highlights the complexity of this relationship. Given how important trust in peers is to engaging in indirect aggression, having particularly low levels of trust could result in less indirect aggression as evidenced in this study. Previous research has demonstrated that Machiavellianism is associated with online relational aggression directed towards one (female) friend (Abell & Brewer, 2014), and, in study 1a and 1b in this thesis, women reported using emotional manipulation towards one same-sex friend. Similarly, girls with higher Distrust scores may focus their manipulation strategies on one person, to reduce risk of betrayal, being detected, and potentially increasing the effectiveness of this strategy as their target does not have a group of peers to support them. Furthermore, as sound was not recorded in this study the discourse could not be analysed. Girls higher on Machiavellianism have been shown to use omissive lying (Braginsky, 1970) and Machiavellianism is also associated with the use of negative gossip in adults (Lyons & Hughes, 2015) therefore future research should focus on the discourse used as well as analysing group and dyadic interactions.

Machiavellianism is associated with having a negative view of others (Ináncsi et al., 2015) and may correspond to girls with higher Lack of Faith scores. A very weak association was demonstrated for Lack of Faith scores and indirect aggression. Given this negative view of others, it may have been expected that these girls would engage in social exclusion behaviour as they may not want to engage with others that are not already part of their existing social group. Additionally, if these girls socially exclude others then other children do not have the power to socially exclude them. As stated before, these findings warrant further research investigating Lack of Faith and Distrust in others, and, indirect aggression, with more forms of indirect aggression analysed. It

should also be noted that indirect aggression becomes more prevalent in girls around the age of 11 (Bjorkqvist et al., 1994) and girls in the present study (aged 9-11 years) may not have developed the skills to employ social exclusion tactics. Furthermore, the Machiavellianism subscales in girls at this developmental stage may not be positively related to these particular forms of socially exclusive behaviour (i.e., turning their back on another child, deliberately ignoring another child) but could be associated with other forms of indirect aggression.

For example, Sutton and Keogh (2000) suggest Machiavellianism in children may be linked to the use of gossip. Machiavellianism may not be compatible with gossip as a strategy given the level of trust it requires from peers (Miller-Ott & Kelley, 2013) and was not found to be related to gossip in the observation study of women's friendships in this thesis. Machiavellianism has however been associated with self-reported use of negative influence gossip (i.e., gossiping to damage another individual's reputation) in an adult sample (Lyons & Hughes, 2015). This has yet to be investigated in children. Braginsky (1970) also reported that girls with higher Machiavellianism scores withheld information (omissive lying) as a manipulation strategy. Although this was identified in an experimental setting, girls with higher Machiavellianism scores may display this in normative contexts. Deliberately withholding information is a covert manipulation strategy which reduces the chance of being detected. It may be that omissive lying is associated with Machiavellianism in children (and potentially adults) given this strategy is independent of others and does not require support from peers. Future research should investigate Machiavellianism (and Machiavellianism components) with a broader category of indirect aggression which should include girls' use of gossip and omissive lying as well as social exclusion behaviour. The inclusion of more categories of indirect aggression behaviour will help to clarify these complex

relationships between Machiavellianism (and Machiavellianism components) and girl's indirect aggression behaviour.

Peer Acceptance

Girls with higher Distrust scores spent less time having their bids to join other groups accepted by their peers. Rotenberg et al. (2014) reported that girls with low trust beliefs engaged in less group interaction. This may be similar for girls with high levels of Distrust on the Kiddie Mach Scale. These girls may not actively engage with other peers and, thus, do not overtly offer any benefits to the group. They may not engage with others and appear withdrawn in a group. Girls' peer networks are characterised by intimacy and therefore require a degree of interaction with others. The girls who are distrustful of others may not be willing to engage in intimacy or close relationships and therefore do not conform to the norms of girls' peer networks. Although not coded in this study, girls with higher levels of Distrust (on the Kiddie Mach) may also display behaviour and body language that may appear closed and negative, for example, they cross their arms, avoid eye contact, and stand on the outer circle of the group. This behaviour is of no benefit to the group and suggests a lack of willingness to interact. Future research should expand on peer acceptance and rejection investigated in this study and focus on behaviour that may lead to acceptance or rejection from peers.

Peer Rejection

Girls with higher levels of Lack of Faith and Distrust spent less time rejecting peers in to their own social group. Rotenberg et al. (2014) reported girls with low levels of trust display less group acceptance and interaction. Rejecting another child may require a degree of confidence and is relatively direct behaviour to engage in. Although girls with higher Lack of Faith and Distrust scores view others negatively and do not trust other children they may be fearful of the child's reaction if they overtly reject

another child's attempt to join the group. Similarly, these girls may be concerned about the reactions of other group members, who may want particular children to join and may potentially reject the peer who tried to deny access to these children. Although not investigated in this study, it is possible that these girls with high levels of Distrust on the Kiddie Mach Scale may be quite submissive and prefer other group members to make decisions about acceptance and rejection of peers. By allowing other children to make these decisions these girls could avoid potentially negative consequences from their peers. Furthermore, by not overtly rejecting others, they are displaying more socially acceptable behaviour and do not draw attention to themselves. These girls may find it more beneficial to have a less dominant presence in group interactions. This may allow them to focus on their own goals without fear of being detected or attention falling on to them.

Social Monitoring

Machiavellianism is characterised by suspicion and distrust of others (Christie & Geis, 1970), monitoring of partners in adults (Czibor & Bereczkei, 2012), and increased anxiety in children due to monitoring others actions for signs of manipulation (Poderico, 1987). Social monitoring may inform decisions relating to whether an individual is a threat or not as well as whether they are a potential target of manipulation. Girls with higher Lack of Faith scores, i.e., girls who have a very negative view of others, spent less time watching children outside their own social group. This may indicate that girls with higher Lack of Faith scores on the Kiddie Mach Scale focus on their peers within their own social group rather than children outside of their social circle. In adults, Machiavellianism is associated with holding views that others are weak and vulnerable due to perceiving them to be anxious, depressed, and neurotic (Black, Woodworth, & Porter, 2014). If children (particularly girls) also held this view they may monitor

outside group members to seek potential vulnerabilities in others. Perceiving others (particularly girls outside their own social circle) as vulnerable or as possessing certain weaknesses, will provide them with information about others that they can exploit for their own gain. However, this view, that others are vulnerable, as well as being a potential threat may occur at a later developmental stage. Furthermore, it may be that these girls are focusing their attention on their peers within their social circle as a threat from within their social group could be more salient than a potential threat from outside their social group. Additionally, these girls may need to keep their focus on their group's interaction to appear engaged within the group and to not display unwanted or withdrawn behaviour which may exclude them from group membership.

Limitations

This study is a preliminary study and is limited by the small number of children participating. Future research should include larger samples across different age ranges, together with additional measures of personality. Total Machiavellianism scores have been found to correlate with Psychoticism and Neuroticism (Sutton & Keogh, 2001) and, in girls only, trait Emotional Intelligence (Barlow et al., 2010). Future work should include (additional) personality measures, such as the Junior Eysenck Personality Questionnaire (JEPQ-S, Francis & Pearson, 1988) and, particularly for girls, a trait Emotional Intelligence measure such as the TEIQue-CF (Mavroveli, Petrides, Shove, & Whitehead, 2008) to further investigate the relationship with Machiavellianism and (other) personality traits and to act as potential controls.

This study also used a narrow range of behaviour for indirect aggression; only social exclusion behaviour (i.e., turning their back on another child) were coded. It has been demonstrated that Machiavellianism is associated with withholding information in girls (Braginsky, 1970) and it has been speculated that Machiavellianism in children

may be linked to manipulative verbal behaviour such as gossip (Sutton & Keogh, 2000). This would corroborate research with adults that reports that Machiavellianism is associated with gossip (Lyons & Hughes, 2015), emotional manipulation (Austin et al., 2007), and relational aggression online (Abell & Brewer, 2014). The use of gossip may enhance their position within their own social group increasing the likelihood of successfully manipulating other group members and prevent other (unwanted) children from joining the group. It may also be used as emotional blackmail; by threatening to gossip or spread rumours about the target child they are attempting to manipulate. However, as discussed earlier, such indirect aggression behaviour does require trust from peers and therefore may not be a compatible strategy for children higher on Machiavellianism, or in particular the Distrust component. The analysis of discourse would allow for investigation of how girls with high Lack of Faith and Distrust communicate with their peers, including members of their own social group and children that approach them from other social groups. Investigating total Machiavellianism scores, the Machiavellianism components and a broader range of indirect aggression behaviour may provide clearer information about children's roles within their social group, how they behave with peers, and how this links to peer acceptance and rejection.

It is, of course, important to note that the Cronbach's alpha for the Distrust subscale is also lower than desired, although this is higher than the Distrust reliability reported by Sutton and Keogh (2011). Therefore, caution is suggested when interpreting the findings. The relatively low Cronbach's for this study may be explained by Kraut and Price (1976), who suggest that Machiavellian views and behaviour develop separately. The views and behaviour then connect at a later stage in development. Children who may be classified as having Machiavellianism scores may not have not fully developed these Machiavellian views at this particular developmental age, or the

Kiddie Mach may not be sensitive enough to detect these views at this particular age. This may explain the inconsistencies of the girl's responding at this time. It would be beneficial for future research to examine further the reliability of the Kiddie Mach and potentially explore developing an improved measure. In addition, only two Kiddie Mach subscales were utilised in this study, due to problems with the reliability of the children's responses. Future research with a larger sample could hopefully use all three subscales as well as the total Machiavellianism score. Investigating all three subscales and total Machiavellianism would hopefully provide a clearer picture of the components of Machiavellianism and behaviour. This may be particularly important for researchers investigating the relationship between Machiavellianism and indirect aggression. Importantly, future research could focus on constructing and using a more reliable measure of Machiavellianism, and its components in children, and use this measure to investigate children's behaviour.

Furthermore, it must be noted that girls are more concerned with social desirability than boys (Repacholi, Slaughter, Pritchard, & Gibbs, 2003). Although the children were not aware their behaviour was being recorded they may have given more socially desirable answers on the Kiddie Mach measure. Previous work has reported that girls are less willing to agree with explicit Machiavellian statements on the Kiddie Mach than boys and score higher on socially desirable responding (Sutton & Keogh, 2001). The Kiddie Mach format requires children to overcome these social desirability biases, however girls between the ages of nine to eleven may not yet have fully developed this reflective thinking. Future research with children should incorporate a range of (additional) other-report measures of Machiavellianism, such as the Mach rating scale for children (Repacholi, Slaughter, Pritchard, & Gibbs, 2003) which can be completed by teachers (although this is intended for children under nine years of age) along with the Kiddie Mach. Research could also incorporate the use of an a priori rule

for Machiavellian behaviour with these other report measures. Hawley (2003) described Machiavellian tendencies in children to be characterised by both prosocial and coercive strategies. This has yet to be validated against the Kiddie Mach but may be useful to combine this strategy with the Kiddie Mach and other measures.

Conclusion

To conclude, the current research is a preliminary study that highlights the utility of the observational method for Machiavellianism research in children. This study shows that two factors of Machiavellianism, Lack of Faith and Distrust, are associated with girl's actual social relationships with peers in a naturalistic environment. In contrast to previous research investigating Machiavellianism and aggression, girls with high Distrust scores engaged in less social exclusion behaviour (indirect aggression). This supports the suggestion that this form of aggression requires support from peers to be effective. Therefore, girls who distrust others may view this as an undesirable strategy and may engage in other manipulative behaviour (that was not coded in this study). In addition, girls with higher Lack of Faith scores and higher Distrust scores spend less time rejecting peers into their group. It is speculated that these girls may be fearful of the reactions of the peers, either those attempting to join their group or the group members, if they reject bids. In addition, rejecting another child is quite a direct behaviour to engage in and may draw attention to them and potentially have negative consequences. Based on the findings from the current study, future research should attempt to establish a profile of Machiavellianism through the continued use of observation methodology, but with a larger sample of children with observations at different stages of development, and the collection of additional behaviour and social discourse data.

5. Chapter Five

Machiavellianism and the Big-Five Personality Traits in Women

The relationship between Machiavellianism and the Big-Five personality traits is unclear. The Big-Five may account for variance in Machiavellianism and may influence behaviour associated with Machiavellianism. This has important implications for research design and outcomes, including whether to include Big-Five traits as controls. Although this chapter does not attempt to fully answer this question, it is hoped that it brings more attention to that issue. Women (N = 623) from the first three studies in this thesis (n = 517) and from an ongoing study on women's friendship dynamics (n = 106) completed the Mach IV and the ten-item Big-Five measure (TIPI). Regression analyses were conducted with the Big-Five traits to explore how much variance they accounted for in Machiavellianism in this new sample of women. Openness explained 1.8% variance in Machiavellianism scores followed by Conscientiousness (1.2% variance). Finally, Agreeableness explained only .9% variance in Machiavellianism scores. Extraversion and Emotional Stability accounted for no variance in Machiavellianism in this sample. This may suggest that the Big-Five traits do not need to be controlled for (with women) when investigating Machiavellianism. However, this study only utilised the 10-item Big-Five measure which does not account for all facets of the Big Five and has poor reliability due to the use of only two items for each Big-Five trait. Therefore, a strong conclusion on the variance the Big-Five may account for in Machiavellianism and the influence on associated behaviour cannot be drawn. However, it is hoped that the current study highlights the need for more research investigating Machiavellianism and its relationship to personality traits. This includes their (potential) role in the development of Machiavellianism, and the influence (other) personality traits may exert on behaviour that are (reportedly) only associated with Machiavellianism.

Introduction

The concept of Machiavellianism is derived from Niccolo Machiavelli's political writing and was developed in to an individual difference construct by Christie and Geis (1970). Although the history of Machiavellianism in psychological research is known, there is still little information on Machiavellianism as a construct in relation to personality traits. This has clear implications for individual differences research with regards to the inclusion of other personality variables and controls in research studies. If certain personality traits are not controlled for how do researchers know they are not involved in the outcome measures? Similarly, if (other) personality traits are controlled for, what part of the main construct (i.e., Machiavellianism) is left and what is actually being measured? Although the thorough investigation of that important question is beyond this additional thesis chapter, the current study investigates the variance that the Big-Five accounts for in Machiavellianism in 623 women. Regression analyses were conducted to investigate the variance that these Big-Five traits, as measured by the TIPI, accounted for in Machiavellianism scores. Such an examination is intended to highlight the importance of future research investigating Machiavellianism and its relationship to personality traits.

The Big-Five model of personality comprises of five traits; Agreeableness, Extraversion, Emotional Stability, Conscientiousness, and Openness. These are argued to explain all individual differences in personality (Goldberg, 1981). Furnham, Richards, Rangel, and Jones (2014) state that most individual differences researchers feel compelled to discuss individual differences and personality in relation to the Big-Five model. However, given that the majority of previous research investigating Machiavellianism and the Big-Five is correlational there is still limited information about what components of the Big-Five may account for variance in Machiavellianism.

The majority of research investigating Machiavellianism and models of personality has largely focused on 'The Dark Triad' (Narcissism, Machiavellianism, and Psychopathy). However, it can be disputed whether 'The Dark Triad' is a personality model of its own. Although the purpose of this chapter is not to discuss the place of Machiavellianism within this three-cluster model, previous 'Dark Triad' research does highlight the need to investigate these constructs individually with other hierarchal personality models before confirming its (supposed) place within this 'Dark Triad' model of personality. This is particularly important given that research investigating the relationship between these three constructs is mixed, with some reporting moderate correlations between Machiavellianism, Psychopathy, and Narcissism whilst other studies report weak or no correlations at all between these constructs including Machiavellianism and Narcissism (Jakobwitz & Egan, 2006; Jonason, Kaufmann, Webster, & Geher, 2013; Jonason, Lyons, & Bethell, 2013). Such results suggest each construct has its own independent variance. Importantly, it has been argued that research should stop relying on the use of correlation measures to supposedly show overlap between these three measures and instead use regression analysis to determine their independent influence (Furnham, Richards, & Paulhus, 2013).

Before placing Machiavellianism within other models of personality as discussed above, it is important to understand this construct on its own in relation to the Big-Five. It is argued that the Big-Five is at the top of the hierarchy of personality models, and, explains all individual differences in personality (Goldberg, 1981). Machiavellianism is regarded as a set of beliefs involving viewing others with distrust, cynicism, and suspicion (Christie & Geis, 1970), and, unlike Psychopathy and Narcissism, it does not have its history in clinical literature. Research has demonstrated that Machiavellianism is more of a learnt behaviour than due to heritability factors, and as such, may be an adaptation to stressful environments in childhood (Abell, Lyons, &

Brewer, 2014; Láng & Lénárd, 2015; Veselka, Aitken, Schermier, & Vernon, 2011). Importantly, Machiavellianism has been demonstrated to be associated with eEarly Maladaptive Schemas and these schemas are a result of interactions between temperament, culture, and stressful family environments (Láng, 2015). In consequence, Machiavellianism may have unique relationships with the Big-Five and certain Big-Five traits may be influential in the development of Machiavellianism. Although this study does not explore the Big-Five in relation to the development of Machiavellianism, it is hoped that results from the current study will provide important information for discussion in the research field and for future research to explore.

A review of 100 studies demonstrated significant negative correlations between Machiavellianism and the Big-Five traits of Agreeableness and Conscientiousness (Furhnam et al., 2014), suggesting that individuals higher on Machiavellianism are lower in Agreeableness and Conscientiousness. However, these studies were focused on the Dark Triad and a range of different measurements of Machiavellianism were used, including sub-scales of the Dark Triad measures, which have been questioned with regards to their reliability (e.g., Carter, Campbell, Muncer, & Carter, 2015; Lee, Ashton, Wiltshire, Bourdage, Visser, & Gallucci, 2013; Miller, Few, Seibert, Watts, Zeichner et al., 2012). Therefore, these results may not be truly consistent or comparable. Austin, Farrelly, Black, and Moore (2007) investigated Machiavellianism alone and its relationship to the Big-Five using the Mach IV (Christie & Geis, 1970) and the International Personality Item Pool (IPIP; Goldberg et al., 2006) (along with Emotional Intelligence and Emotional Manipulation). These authors also reported significant negative correlations between Machiavellianism and Agreeableness and Machiavellianism and Conscientiousness. Furthermore, a small significant positive correlation was revealed for Machiavellianism and Neuroticism (Emotional Stability), suggesting individuals with higher levels of Machiavellianism are lower in

Agreeableness and Conscientiousness and higher in Neuroticism. However, there is little research exploring Machiavellianism alone and its relationship to the Big-Five, particularly using statistical methods other than correlations. As suggested with the investigation of the Dark Triad, regression analysis would be useful in exploring the unique variance that each Big-Five trait independently accounts for in Machiavellianism.

Therefore, the current study employs regression analysis to investigate the variance that each of the Big-Five traits may account for in this sample of women. This current study investigates the variance that these traits account for in Machiavellianism scores. Given the characteristics of Machiavellianism and previous correlational research (Austin et al., 2007; Furhnam et al., 2014) it is predicted that Agreeableness and Conscientiousness will account for the most variance in Machiavellianism.

5.1 Study 4 Method

Participants

The participants were 623 women who volunteered to take part in a number of separate studies investigating women's friendship dynamics. The data for this study comes from four studies. Three of this studies are presented in this thesis; Machiavellianism and Emotional Manipulation in Women's Friendships (study 1a, n = 221 and 1b, n = 186) and Machiavellianism and Behaviour in Women's Friendship Dyads (study 2, n = 110). In addition, this study also contains data from an ongoing study that is not part of the present thesis, but is intended for a future publication: Machiavellianism, Competition, and Schadenfreude in Women's Friendships (n = 106). Participants for thesis study 1a and study 1b and the additional study (Machiavellianism, Competition, and Schadenfreude in Friendships) volunteered through online research websites and social networking sites and received no reward for

participating. Women who participated in the 2nd thesis study (Machiavellianism and Behaviour in Women's Friendship Dyads) received a £5 shopping voucher and Psychology students also received participation points. The mean age was 25.38 years, standard deviation was 10.09 years.

Questionnaires

Mach IV: Machiavellianism was assessed with the 20-item Mach-IV scale (Christie & Geis, 1970), which measures morality, cynicism, and manipulative interpersonal style. Example items from the scale include "*The best way to handle people is to tell them what they want to hear"* and "*It is wise to flatter important people"*. Participants responded on a 7-point Likert scale (1 = *strongly disagree*; 7 = *strongly agree*). Ten items were reverse scored, such that higher scores represent higher Machiavellianism, with total standardised scores used in the analysis. The scale demonstrated good reliability α = .76.

TIPI: The Big-Five was assessed with the TIPI (Gosling, Rentfrow, & Swann, 2003). This is a ten-item measure of the Big-Five Personality Domains (Openness, Conscientiousness, Extraversion, Agreeableness, and Emotional Stability). This measure is intended for researchers who have limited time (it can be completed in around one minute) but want to include measures of the Big-Five. There are two items for each trait with one item in each pair reverse coded. For example, items for Extraversion include '*Extraverted, enthusiastic*' and '*Reserved, quiet'* (reversed coded). Participants respond on a 7-point scale (1 = *disagree strongly*, 7 = *agree strongly*). Extraversion, Conscientiousness, and Emotional Stability demonstrated acceptable reliability (α = .68, α = .52, α = .64 respectively). Agreeableness and Openness however, demonstrated poor reliability (α = .33, α = .37).

Analysis Plan

This supplementary study aimed to investigate the relationship between Machiavellianism and the Big-Five in women. The studies in this thesis (and the additional Machiavellianism and Schadenfreude study) contained a number of questionnaires and the interaction study also included a 20 minute observational aspect. Therefore, it was decided that the 10-item measure of the Big-Five would be included, rather than longer alternative questionnaires (i.e., the NEO Personality Inventory Revised, Costa, & McCrae, 1992) which may result in participant fatigue or withdrawal. Because data have been utilised from other studies, all missing data were already coded as missing. In this data set containing 623 participants .39% of data was missing. The skewness of Machiavellianism was investigated (Skewness = .248, Kurtosis = -.068) showing a slight skewness. However, this raw data were used (with Machiavellianism standardised as with the previous thesis studies) due to the large sample size and the robust regression analysis being conducted.

5.2 Study 4 Results

Correlations

The means, standard deviations (*SD*), and correlations for Machiavellianism and the Big-Five traits are shown in Table 5.1. Machiavellianism demonstrates negative relationships with Agreeableness, Conscientiousness, and Emotional Stability. This suggests that as levels of Agreeableness, Conscientiousness, and Emotional Stability decreased Machiavellianism scores increased. In addition, a significant negative (albeit weak) relationship was revealed for Machiavellianism and Openness and indicated that as Openness increased Machiavellianism scores decreased.

Table 5.1 *Means, Standard Deviations for Age, Machiavellianism, and the TIPI traits*

	Mean	*SD*	Age	Machiavellianism	Agreeableness	Extraversion	Emotional Stability	Conscientiousness	Openness
Age	25.31	10.10		-.14**	.17**	-.03	.02	.03	.09*
Machiavellianism	66.21	13.55			-.22**	-.05	-.13**	-.19**	-.09*
Agreeableness	5.84	2.41				.28**	.41**	.49**	.462**
Extraversion	5.01	2.56					.39**	.35**	.459**
Emotional Stability	4.92	2.36						.44**	.38**
Conscientiousness	6.11	2.56							.44**
Openness	6.30	2.51							

Notes

*correlation is significant at the .05 level

**correlation is significant at the .01 level

Robust Regression Analysis

Regressions with bootstrapping were conducted with bootstrapping set at 1000 samples, with a 95% bias corrected accelerated confidence interval. Hierarchical regressions were conducted to investigate the variance that each of the Big-Five traits accounted for in Machiavellianism in this particular sample of women.

Regression Analysis

Machiavellianism and Agreeableness

Step 1 (age) explained 1.8% variance in Machiavellianism scores and this was significant *F* change (1, 609) = 10.90, *p* = .001. Extraversion, Emotional Stability, Conscientiousness, and Openness were entered at Step 2 and explained 3.5% variance, this was significant, *F* change (4, 605) = 5.53, $p < .001$. Agreeableness was entered at Step 3 and explained .9% variance in Machiavellianism scores. This was significant, *F* change (1, 604) = 5.55, *p* = .019. The overall model was significant ($F(6, 604) = 6.53$, $p < .001$) and explained 6.1% variance. Age influenced Machiavellianism scores (β = -.11, *t* = -2.81, *p* =.012) suggesting as age increased Machiavellianism scores decreased. After controlling for Age, Extraversion (β = -.03, *t* = -.53, *p* = .614), and Emotional Stability (β = -.04, *t* = -.76, *p* = .512) were not individually related to Machiavellianism scores. Conscientiousness (β =- .16, *t* = -2.75, *p* = .013) and Openness (β = .23, *t* = 3.39, *p* = .006) did influence Machiavellianism scores. This indicated as Conscientiousness scores decreased Machiavellianism scores increased and as Openness scores increased Machiavellianism scores increased. Finally, after controlling for Age, Extraversion, Emotional Stability, Conscientiousness, and Openness, Agreeableness was entered at Step three and was related to Machiavellianism scores (β = -.16, *t* = -2.36, *p* = .034), suggesting as Agreeableness scores decreased Machiavellianism scores increased. Please see table 5.2 for the regression for Agreeableness and Machiavellianism.

Table 5.2 *Hierarchical Regression Analysis for Agreeableness and Machiavellianism*

	Machiavellianism		
	R^2	Change	F change
Step 1	.02	.02	10.90**
Age			
Step 2	.05	.04	5.53***
Age			
Extraversion			
Emotional Stability			
Conscientiousness			
Openness			
Step 3	.06	.01	5.55*
Agreeableness			

***$p < .001$
** $p < .01$
* $p < .05$

Machiavellianism and Extraversion

Step 1 (age) explained 1.8% variance in Machiavellianism scores, *F* change (1, 609) = 10.90, *p* = .001. Agreeableness, Emotional Stability, Conscientiousness, and Openness were entered at Step 2 and explained 4.3% variance. This was significant, *F* change (4, 605) = 6.90, *p* < .001. After controlling for Age, Agreeableness, Emotional Stability, Conscientiousness, and Openness, Extraversion was entered at Step 3 and explained 0% variance in Machiavellianism scores and this was not significant, *F* change (1, 604) =.28, *p* = .595. The overall model was significant (*F*(6, 604) = 6.53, *p* < .001) and explained 6.1% in variance. Age was related to Machiavellianism scores (*β* = -.11, *t* = -2.81, *p* = .008) indicating as age increased Machiavellianism scores decreased. After controlling for Age, Agreeableness (*β* = -.16, *t* = -2.36, *p* = .045), and Conscientiousness (*β* = -.16, *t* = -2.75, *p* = .010) were associated with Machiavellianism scores suggesting as levels of Agreeableness and Conscientiousness decreased Machiavellianism scores increased. Openness also influenced Machiavellianism scores (*β* = .23, *t* = 3.39, *p* = .006) suggesting as Openness increased Machiavellianism scores increased. Emotional Stability (*β* = -.04, *t* = -.76, *p* = .472) was not related to Machiavellianism scores. Finally, after controlling for Age, Agreeableness, Emotional Stability, Conscientiousness, and Openness, Extraversion was entered at Step three but did not influence Machiavellianism scores (*β* = -.03, *t*= -.53, *p* = .622). Please see table 5.3 for the regression for Extraversion and Machiavellianism.

Table 5.3 *Hierarchical Regression Analysis for Extraversion and Machiavellianism*

	Machiavellianism		
	R^2	Change	F change
Step 1	.02	.02	10.90**
Age			
Step 2	.06	.04	6.90***
Age			
Agreeableness			
Emotional Stability			
Conscientiousness			
Openness			
Step 3	.06	.00	.28
Extraversion			

***$p < .001$
** $p < .01$
* $p < .05$

Machiavellianism and Emotional Stability

Step 1 (age) explained 1.8% variance in Machiavellianism scores, *F* change (1, 609) = 10.90, *p* = .001. Agreeableness, Extraversion, Conscientiousness, and Openness were entered at Step 2 and explained 4.2% variance, and was significant, *F* change (4, 605) = 6.68, *p* < .001. After controlling for Age, Agreeableness, Extraversion, Conscientiousness, Openness, Emotional Stability was entered at Step 3 and explained 0% variance in Machiavellianism and was not significant, F change (1, 604) = .58, *p* = .447. The overall model was significant (*F*(6, 604) = 6.53, *p* < .001) and explained 6.1% in variance. Age did influence Machiavellianism scores (β = -.11, *t* = -2.81, *p* = .009) indicating as age increased Machiavellianism scores decreased. After controlling for Age, Agreeableness (β = -.16, *t* = -.36, *p* = .033) and Conscientiousness (β = -.16, *t* = -2.75, *p* = .009) were related to Machiavellianism scores suggesting as levels of Agreeableness and Conscientiousness decreased Machiavellianism scores increased. Openness (β = .23, *t* =3.39, *p* = .005) influenced Machiavellianism scores indicating as Openness scores increased Machiavellianism scores increased. Extraversion (β = -.03, *t* = -.53, *p* = .623) was not related to Machiavellianism scores. Finally, after controlling for Age, Agreeableness, Extraversion, Conscientiousness, and Openness, Emotional Stability was entered at step three but was not related to Machiavellianism scores (β = -.04, *t* = -.76, *p* = .500). Please see table 5.4 for the regression for Emotional Stability and Machiavellianism.

Table 5.4 *Hierarchical Regression Analysis for Emotional Stability and Machiavellianism*

	Machiavellianism		
	R^2	Change	F change
Step 1	.02	.02	10.90**
Age			
Step 2	.06	.04	6.82***
Age			
Agreeableness			
Extraversion			
Conscientiousness			
Openness			
Step 3	.06	.00	.58
Emotional Stability			

***$p < .001$
** $p < .01$
* $p < .05$

Machiavellianism and Conscientiousness

Step 1 (age) explained 1.8% variance in Machiavellianism scores, *F* change (1, 609) = 10.90, *p* = .001. Agreeableness, Extraversion, Emotional Stability, and Openness were entered at Step 2 and explained 4.9% variance. This was significant, *F* change (4, 605) = 5.02, *p* = .001. After controlling for Age, Agreeableness, Extraversion, Emotional stability, and Openness, Conscientiousness was entered at Step 3 and explained 1.2% variance in Machiavellianism scores, this was significant, *F* change (1, 604) = 7.54, *p* = .006. The overall model was significant (*F*(6, 604) = 6.53, *p* < .001) and explained 6.1% in variance. Age influenced Machiavellianism scores (β = -.11, *t* = -2.81, *p* = .013). After controlling for Age, Agreeableness was related to Machiavellianism scores (β = -.16, *t* = -2.36, *p* = .040) whereas Extraversion (β = -.03, *t* = -.53, *p* = .634) and Emotional Stability (β = -.04, *t* = -.76, *p* = .481) did not influence Machiavellianism scores. Openness was related to Machiavellianism scores (β = .23, *t* = 3.39, *p* = .006) suggesting as Openness scores increased Machiavellianism scores increased. Finally, after controlling for Age, Agreeableness, Extraversion, Emotional Stability, and Openness, Conscientiousness was entered at Step three and influenced Machiavellianism scores (β = -.16, *t* = -2.75, *p* = .015) indicating as Conscientiousness scores decreased Machiavellianism scores increased. Please see table 5.5 for the regression for Conscientiousness and Machiavellianism.

Table 5.5 *Hierarchical Regression Analysis for Conscientiousness and Machiavellianism*

	Machiavellianism		
	R^2	Change	F change
Step 1	.02	.02	10.90**
Age			
Step 2	.05	.03	5.02**
Age			
Agreeableness			
Extraversion			
Emotional Stability			
Openness			
Step 3	.06	.01	7.54**
Conscientiousness			

***$p < .001$
** $p < .01$
* $p < .05$

Machiavellianism and Openness

Step 1 (age) explained 1.8% variance in Machiavellianism scores, *F* change (1, 609) = 10.90, *p* = .001. Agreeableness, Extraversion, Emotional Stability, and Conscientiousness were entered at Step 2 and explained 2.5% variance, and was significant, *F* change (4, 605) = 4.02, *p* = .003. After controlling for Age, Agreeableness, Extraversion, Emotional Stability, and Conscientiousness, Openness was entered at Step 3 and explained 1.8% variance in Machiavellianism scores. This was significant, *F* change (1, 604) = 11.48, *p* = .001. The overall model was significant (*F*(6, 604) = 6.53, $p < .001$) and explained 6.1% in variance. Age was related to Machiavellianism scores (β = -.11, *t* = -2.81, *p* = .013). After controlling for Age, Agreeableness (β = -.16, *t* = -2.36, *p* = .037) and Conscientiousness (β = -.16, *t* = -2.75, *p* = .013) influenced Machiavellianism scores indicating as Agreeableness scores and Conscientiousness scores decreased Machiavellianism scores increased. Extraversion (β = -.03, *t* = -.53, *p* = .601) and Emotional stability (β = -.04, *t* = -.76, *p* = .493) did not influence Machiavellianism scores. Finally, after controlling for Age, Agreeableness, Extraversion, Conscientiousness, and Emotional Stability, Openness was entered at Step 3 and was related to Machiavellianism scores (β = .23, *t* = 3.39, *p* = .007) suggesting as Openness scores increased Machiavellianism scores increased. Please see table 5.6 for the regression for Openness and Machiavellianism.

Table 5.6 *Hierarchical Regression Analysis for Openness and Machiavellianism*

	Machiavellianism		
	R^2	Change	F change
Step 1	.02	.02	10.90**
Age			
Step 2	.04	.03	4.02**
Age			
Agreeableness			
Extraversion			
Emotional stability			
Conscientiousness			
Step 3	.06	.02	11.48**
Openness			

***$p < .001$
** $p < .01$
* $p < .05$

5.3 Study 4 Discussion

This study set out to investigate how much variance each of the Big-Five traits, as measured by the TIPI, accounted for in Machiavellianism in women. Openness explained the most variance in Machiavellianism scores (1.8%), followed by Conscientiousness (1.2%), and finally Agreeableness (.9%). The variance accounted for by those three traits was minimal although still statistically significant. However the variance accounted for needs to be interpreted with caution due to the low internal reliability for TIPI subscales. Also two items are not sufficient to cover a broad trait construct. Finally, Extraversion and Emotional Stability accounted for no variance in Machiavellianism scores for this sample of women.

The results indicated that higher levels of Openness were associated with higher levels of Machiavellianism in women. However, there are issues with low internal reliability thus the result needs to be interpreted with caution. The positive relationship between Machiavellianism and Openness is unexpected and has not been found in previous research investigating Machiavellianism with the Mach IV with men and women (e.g., Austin et al., 2007; Jakobwitz & Egan, 2006; Lee & Aston, 2005; Paulhus & Williams, 2002). Openness is associated with curiosity and being imaginative, which has benefits such as flexibility and social attractiveness (Furnham, 2011; McCrae & John, 1992). Openness in women with higher Machiavellianism scores may help to facilitate their friendships given Openness is related to social attractiveness. This social attractiveness may help in same-sex friendship formation and friendship maintenance. Appearing socially attractive to other women may help to hide their manipulative behaviour, or may be seen by other women as a positive social reward, despite the other negative characteristics these women may display. Openness may help women with higher Machiavellianism scores to appear as if they will engage in personal information sharing and intimacy which are important characteristics of female friendships (Vigil,

2007). Openness may increase the appearance of trust and suggest that these women have nothing to hide or no hidden (self-serving) motive for their friendships with other women. Indeed, Openness may be vital in first forming friendships with other women and gaining their trust. This then creates a context in which to manipulate another person, as they are in a position of vulnerability.

Importantly, Openness is associated with curiosity. This curiosity, in women with higher Machiavellianism scores, may further facilitate attainment of their self-serving goal. This curiosity may be based on gathering information to aid future manipulation strategies. For example, in the observation study with female friendship dyads in this thesis, women with higher Machiavellianism scores asked their friend more elaboration questions. In that chapter it was discussed how this behaviour demonstrated interest to their friend (which could indicate social attractiveness) but also could act as a strategy to gather information for future manipulation attempts. This (manipulative) behaviour may have been further facilitated by being more curious about others. Although given the very small variance openness accounted for in Machiavellianism scores it is unlikely that this trait influenced behaviour to a large degree.

The results also indicated that lower levels of Conscientiousness and Agreeableness were associated with higher levels of Machiavellianism. This is consistent with previous research (Austin et al., 2007; Furnham et al., 2014). However, it was expected that Agreeableness would account for more variance in Machiavellianism scores. Given the characteristics of Machiavellianism, it can be seen why these individuals may be lower on Agreeableness given individuals lower on Agreeableness are described as charming, selfish, and hard-hearted (Costa & McCrae, 1992). Conscientiousness is a more complex matter given that it is associated with being efficient, organised, and delaying gratification (Furnham, 2011; McCrae & John,

1992). These characteristics are similar to the strategic planning associated with Machiavellianism and their lack of impulsivity (Christie & Geis, 1970; Jones & Paulhus, 2011). Therefore, it may be suggested that higher Conscientiousness could be associated with higher Machiavellianism scores. However, Conscientiousness is also associated with behaving ethically and not being self-indulgent (Furnham, 2011; McCrae & John, 1992), this is in contrast to Machiavellianism given its association with self-serving behaviour (Wilson, Near, & Miller, 1996). In the TIPI, Conscientiousness is measured through the trait pairs of 'dependable, self-disciplined' and 'disorganised, careless', given the studies were conducted in the context of friendships it may be that the traits 'dependable' and 'careless' were more salient to women given their importance to friendships. These women may not view themselves as dependable and view themselves as careless given their emotional detachment and use of manipulation towards their friends. Although Machiavellianism is also associated with strategic planning (Christie & Geis, 1970) and thus, self-discipline, this may have been less salient given the friendship context of the study.

This supplementary study aimed to investigate how the Big-Five traits related to Machiavellianism in women in order to highlight the need to investigate how higher order traits may interact and influence Machiavellianism, and associated behaviour. Recent research has started to investigate how the Big-Five is related to vulnerability to victimisation by those individuals high in Dark Triad Traits, including Machiavellianism (Chung & Charles, 2016). However, there is a lack of clarity regarding the relationship between the Big-Five and Machiavellianism, including how the Big-Five may facilitate behaviour associated with Machiavellianism. This study and previous research investigating the relationship between Machiavellianism and the Big-Five highlights the complexity of this area. There is a need for research to investigate further the relationship between Machiavellianism and the Big-Five, and examine how

this relationship may influence behaviour. The current chapter also highlights the need to research how other personality traits may also influence the behaviour of women and men scoring higher on Machiavellianism. As this study shows, for women, Openness may facilitate some behaviour of women who are higher in Machiavellianism. In men, it may be that extroversion has a more important role in those scoring higher on Machiavellianism given that men are more focused than women on group friendships and group activities (Benenson & Christakos, 2003). It is important to consider how these high order traits interact with Machiavellianism and how they may facilitate behaviour associated with Machiavellianism. This will provide a much clearer and more in depth understanding of how and why individuals scoring higher on Machiavellianism behave as they do.

There are some inconsistencies in the relationships revealed and these relationships may differ depending on how Machiavellianism and the Big-Five are measured. There are many different behaviour that are associated with each Big-Five trait, some of which may be more prevalent amongst individuals higher on Machiavellianism. However, the simplicity of the shorter TIPI measure does not allow the investigation of the relationship between Machiavellianism and specific facets associated with each trait. Therefore, how much influence specific aspects of each trait may exert on behaviour when investigating Machiavellianism, and indeed, how much overlap there may be, is unknown. For example, the characterisation of being hard-hearted is attributed to low levels of Agreeableness but may also overlap with emotional detachment in Machiavellianism. This further raises the question of whether controlling for Agreeableness (particularly with the use of more complex Big-Five measures) in analysis would reduce the influence of Machiavellianism on emotional detachment. This suggests that future research should investigate the components of Machiavellianism (i.e., emotional detachment, cynicism, manipulation) and how these

dimensions relate to the Big-Five traits; such studies should use more complex measures and examine men and women separately.

This chapter, rather than answering questions, has highlighted more issues and avenues for future research to investigate. Firstly, it has shown a positive relationship between Machiavellianism and Openness in women. This may be sample specific but could also suggest that Openness is related to Machiavellianism in women. Openness may be particularly important to women with higher Machiavellianism scores through further facilitating the manipulation of female friends. Appearing open to others, particularly female friends would help these women to appear to conform to women's friendships norms of intimacy and closeness (Vigil, 2007). This may be beneficial in avoiding detection and encouraging their friend to share information that may be useful in future manipulation attempts.

Importantly, this chapter has also highlighted the importance of future research investigating the Big-Five at a more complex level as different facets of each trait may be differently related to Machiavellianism. Although the variance accounted for by the Big-Five in this study does not suggest the Big-Five needs to be controlled for (as measured by the TIPI), it does highlight the potential complexity of these relationships between Machiavellianism and the Big-Five in women. When investigating Machiavellianism, for example, how can researchers be sure that some of the outcomes measured are not due to the ability to delay gratification in Conscientiousness or hard-heartedness (for example) that is attributed to low levels of Agreeableness. But, if controlled for will this impact on the Mach IV measure and also control for all (or some) of the strategic planning or emotional detachment that characterises Machiavellianism? Then this raises uncertainty about the construct actually being measured. Furthermore, with research now starting to investigate the development of Machiavellianism, findings from the current study highlight the importance of research

investigating the role of the Big-Five in this developmental trajectory. Stressful childhood family experiences, such as poor attachment and neglect, may be involved in the development of Machiavellianism (Abell et al., 2014; Láng & Lénárd, 2015) as a way of adapting to a harsh environment. Individuals may develop a Machiavellian behaviour profile to protect themselves from becoming exploited and maltreated. Importantly, the levels of Big-Five these individuals possess during childhood may influence the (potential) development of Machiavellianism, for instance a child who is higher on Agreeableness may be less likely to adopt this behaviour profile. This is an important avenue for future research to explore.

Limitations

It is important to note the low reliability of the Agreeableness and Openness traits. Although some researchers have suggested that the alphas themselves may not be reliable for small scales (Kline, 2000; Wood & Hampson, 2005), caution is advised for the Agreeableness and Openness results. Therefore, a strong conclusion cannot be made for the variance they account for in this sample of women and the possible influence these traits may exert on Machiavellian behaviour. Although this is problematic, it is hoped that this does not detract from the importance of the investigation of Machiavellianism in relation to personality traits and the variance these may explain.

This study utilised the ten-item Big-Five measure which is aimed at researchers who have time constraints and whose main focus is on another individual difference (i.e., Machiavellianism in these thesis studies) but still want to include the Big-Five. However, reliability has shown to be lower than the longer measures and future research should incorporate longer measures of the Big-Five, and investigate these measures and their relationship with Machiavellianism. For example, research could investigate Machiavellianism and the Big-Five with the NEO Personality Inventory Revised (Costa & McCrae, 1992) that measures both the Big-Five and specific facets for each trait. This

may provide a clearer picture of what personality facets account for variance in Machiavellianism scores and their influence on Machiavellian behaviour. Additionally, as suggested by Furnham et al. (2013) (with regard to the Dark Triad) future research should also explore the Big-Five and Machiavellianism with methods other than correlations. Correlations may help to provide information on the relationship between Machiavellianism and the Big-Five but do not provide information on how much influence they may have on behaviour of individuals higher on Machiavellianism. Therefore, using analysis that investigates such relationships will help to further clarify the relationship between Machiavellianism and the Big-Five.

The current study only investigated Machiavellianism and the ten-item Big-Five in a sample of women, most of whom were in young adulthood. This, along with the poor reliability for Agreeableness and Openness, means the results cannot be generalised and strong conclusions cannot be drawn. Therefore, future research should explore how much influence the Big-Five has on behaviour associated with higher Machiavellianism scores in a much larger sample of men and women across different age ranges. This research may indicate gender and age differences on the influence of the Big-Five traits on behaviour associated with higher Machiavellianism scores.

Furthermore, it has been argued that the Big-Five does not account for a full model of personality (Veselka, Schermer, & Vernon, 2012) and there are other personality models that may account for variance in Machiavellianism. For example, the HEXACO model includes a sixth factor called Honesty-Humility and is characterised by traits such as conceit and greed (Ashton, Lee, Perugini, Szaratoa, De Vries, Di Blas, et al., 2004). This model is thought to improve upon the Big-Five model by including the more negative side of human nature (e.g., entitlement) (Lee & Aston, 2005). Lee, Ashton, Wiltshire, Bourdage, and Visser et al. (2013) used a 12 item SD3 measure (this was later shortened to 9 items) (Jones & Paulhus, 2014) which measured

Machiavellianism with 12 items, and reported Machiavellianism to significantly correlate negatively with the Honesty-Humility Factor as well as HEXACO Agreeableness and HEXACO Extraversion. Using the subscale from the Dirty Dozen Measure (Jonason & Webster, 2010), which measures Machiavellianism with four items, Machiavellianism also demonstrated a significant negative correlation with HEXACO Conscientiousness (Lee et al., 2013). This may suggest that Honesty-Humility accounts for some variance in Machiavellianism, although this should be investigated further.

Additionally, these studies also show that differences in measuring Machiavellianism may influence the study results. Therefore, future research should include different measurements of Machiavellianism and personality models including the Big-Five. This will help to present a clearer picture of how different measurements may impact on the relationship between Machiavellianism and the Big-Five. Furthermore, it would be particularly beneficial for future research to conduct a meta-analysis focusing on Machiavellianism and the relationship with the Big-Five. This may help to highlight any consistent relationships between Machiavellianism and the Big-Five and differences that may emerge based on the measures being utilised in the studies. Such research may also be helpful in providing information on how specific facets of the Big-Five traits may influence behaviour that has only previously been associated with Machiavellianism alone.

Conclusion

This study revealed that three of the Big-Five traits, as measured by the TIPI, accounted for variance in Machiavellianism. Openness, Agreeableness, and Conscientiousness explained variance in Machiavellianism scores, although this variance was minimal, ranging from 1.8% to .9%. This may suggest that the Big-Five traits have little influence over behaviour in women with higher Machiavellianism

scores. However, the study also highlighted the need to investigate Machiavellianism and the Big-Five using more complex measures that account for specific facets of each trait. These particular facets may have different relationships with Machiavellianism and may therefore influence behaviour. This chapter demonstrates the need for future research to further investigate Machiavellianism and the variance the Big-Five traits may account for in a much larger sample, using longer more complex measures, and ideally, conducted over time.

6. Chapter 6

General Discussion

The current set of studies investigated Machiavellianism and behaviour in women's dyadic friendships and girl's peer groups. Specifically, this thesis aimed to investigate Machiavellianism and the more subtle (manipulative) behaviour that may occur in women's and girl's social interactions with their same-sex friends. The studies became increasingly focused on the more subtle aspects of Machiavellianism in females by progressing from self-report to observation studies. Furthermore, this thesis included a developmental aspect by exploring Machiavellianism in women's observed behaviour and in girls' (aged 9-11 years) observed behaviour.

The first two studies (study 1a and1b) showed that women with higher Machiavellianism scores self-reported to frequently employ emotional manipulation towards their friend and perceived their friend to direct emotional manipulation towards them. The friendship dyads observation study (study 2) revealed more subtle behaviour that women with higher Machiavellianism scores may engage in with their same-sex friend. This included asking more elaboration questions, whilst their partner looked at the environment more, suggesting withdrawal or aversion to the interaction. Finally, the playground observation study (study 3) showed that girls with higher Distrust scores (on the Kiddie-Mach) engaged in less indirect aggression (specifically, social exclusion behaviour) and girls with higher Lack of Faith scores or higher Distrust scores spent less time rejecting other children's bids to join their social group. These studies suggest that females engage in subtle manipulation strategies directed towards same-sex friends and peers. Furthermore, the two observation studies suggest a potential developmental pathway for females with higher Machiavellianism scores which includes subtle manipulative behaviour to reduce detection from their peers. Although, results did

indicate that these girls and women displayed behaviour that their friend or peers did not accept, further research is needed to explore this behaviour.

Machiavellianism and Manipulation in Women's Friendship

Machiavellianism is characterised by interpersonal manipulation (Christie & Geis, 1970) and individuals higher on Machiavellianism have been shown to employ a number of manipulation tactics including employing 'silent treatment' and 'coercion' (Jonason & Webster, 2012). The first two studies focused on one particular type of manipulation, emotional manipulation. Emotional manipulation focuses on the manipulation of another individual's emotions, either to make them feel a certain way about (1) themselves or (2) the person employing the tactic, or in order to make them behave in a particular way. The target of the manipulation strategy may feel negatively about themselves, making them vulnerable to exploitation and more likely to succumb to the request. Additionally, emotional manipulation can also make the target feel positively about their friend if their friend uses such tactics as flattery. Therefore, the individual may feel more inclined to behave in a way that their friend wants because that person makes them feel good about themselves. The first two studies in this PhD demonstrated that women with higher Machiavellianism scores self-reported to use emotional manipulation towards a same-sex friend and reported using that type of manipulation strategy frequently. Furthermore, women with higher Machiavellianism scores reported to also use mood worsening tactics to criticise and undermine their friend's confidence as well as using inauthentic strategies such as inducing jealousy and/or using flattery directed at their friend.

The use of emotional manipulation tactics may be preferential for women with higher Machiavellianism scores given women's greater interest in social interaction, intimacy, and focus on discussing personal feelings (Baron-Cohen & Wheelwright, 2003; Su, Rounds, & Armstrong, 2009; Vigil, 2007). Individuals higher on

Machiavellianism seek closeness in others in order to manipulate them (Ináncsi, Láng, & Bereczkei, 2015). Women with higher Machiavellianism scores may seek closeness in order to make their friend feel as if they are in a close, intimate friendship, therefore giving them opportunities to manipulate their friend's feelings. Machiavellianism is also associated with hostile views, but not hostile actions (Jones & Neira, 2015) and this lack of hostility in their actions may further enhance the appearance of warm behaviour. As discussed later in this chapter, following the findings of the observation study with women's friendship dyads, this may occur by showing interest in their friend through such behaviour as asking elaboration questions. Gaining their friend's trust would make it easier to employ emotional manipulation tactics towards their friend. Their friend may feel less suspicious and less likely to detect such behaviour, or view their behaviour as manipulative.

Given individuals higher on Machiavellianism are distrustful of others and are focused on not being detected (Christie & Geis, 1970), employing manipulation tactics directed towards one person may be seen as less of a risk. Avoiding detection may be particularly important if the target person views themselves as a friend and displays trusting behaviour. Machiavellianism is associated with viewing others as weak (Black, Woodworth, & Porter, 2014) and women with higher Machiavellianism scores may see this trusting behaviour as a weakness and a characteristic that can be exploited for their own gain. Furthermore, this may be additionally advantageous to women given their tendency to have dyadic friendships over group friendships (Benenson & Christakos, 2003; David-Barrett et al., 2015). Unlike group friendships, dyadic friendships are fragile because there may not be a substitute partner to take their friend's place if the friendship breaks down. However, the absence of a friendship group reduces the chance of being detected. This is a particularly important benefit given women tend to use social exclusion as an interpersonal tactic with others (Benenson, et al., 2013). If

women higher on Machiavellianism are detected by their friend, or other women in their peer group, they may risk social exclusion from their friend and potentially their peers. This could result in reputational damage, making it harder for them to form friendships (or at least the appearance of friendships) in the future. Their behaviour may be closely monitored by other women, and, given women's tendency to gossip and its role in social bonding and group protection (Beersma & Van Kleef, 2012; Bosson et al., 2006; Dunbar, 2004; Feinberg, Willer, Stellar, & Keltner, 2012; McAndrew et al., 2007; McDonald et al., 2007) their same-sex peers may engage in gossip about this individual, further facilitating their social exclusion and hindering their success at any future manipulation attempts.

Furthermore, the use of emotional manipulation may be more advantageous to women with higher Machiavellianism scores compared to other strategies often used by women, such as indirect aggression. Unlike emotional manipulation, indirect aggression requires assistance from peers (Miller-Ott & Kelly, 2013). Therefore, this requires a degree of trust in others that is not characteristic of Machiavellianism. Machiavellianism is associated with distrust and independency (Christie & Geis, 1970; Ináncsi et al., 2015) and, thus, the higher level of Machiavellianism may reduce the tendency for women to engage in strategies that require trust and assistance from others, and, instead focus on strategies they can employ by themselves. Trusting others to participate in manipulation tactics, such as indirect aggression, and for others to stay loyal by not betraying them to the target, may be a behaviour that these women cannot engage in. Their core beliefs that others are to be distrusted may facilitate their tendency to focus on their own goals and rely purely on themselves to achieve them.

After focusing on Machiavellianism and emotional manipulation in women's friendship with self-report questionnaires, the thesis then progressed to using observational methodology. The observation study allowed for more detailed analysis of

Machiavellianism and behaviour in women's friendships, including the more subtle behaviour that may occur. To the author's knowledge this is the first study that has analysed naturalistic behaviour in relation to Machiavellianism as opposed to experimental task-based studies. This study revealed some very important findings about how Machiavellianism influences women's behaviour with a same-sex friend. The main core finding was that women with higher Machiavellianism scores showed more interest in their friend during the interaction. This behaviour may be a form of manipulation that results in outcomes that benefit these women, such as collecting information, either about their friend or their peers.

In the first observational study, women who were higher on Machiavellianism asked their friend more elaboration questions. This was found both in the five minute and fifteen minute interaction for all dyads as well as dyads with a friendship length of 12 months and under. Asking elaboration questions is a behaviour that forms part of the interest category of behavioural coding and signifies showing interest in their friend. This finding was coupled with their partner spending more time gossiping in the five minute interaction for dyads with a friendship length of 12 months and below. Asking their friend elaboration questions could be a (manipulative) interpersonal strategy for women with higher Machiavellianism scores. Asking elaboration questions could convey interest in their friend whilst conforming to female friendship norms of intimacy, warmth, and support (Vigil, 2007). Furthermore, asking elaboration questions helps to keep attention on their friend, rather than themselves. Appearing to conform to female friendship social norms and displaying (seemingly) positive social interaction behaviour (by showing interest in what their partner is saying) could help create a positive impression of themselves to the friend, and, possibly the researchers observing the footage. This creation of a positive impression, along with keeping the focus of the interaction more on their friend, may be highly important to women with higher

Machiavellianism scores given the focus on not being detected by others. Indeed, this may be behavioural evidence for Machiavellianism not being associated with hostile behaviour (Jones & Neira, 2015), but still demonstrating behaviour that benefits them.

Furthermore, these women higher on Machiavellianism may ask elaboration questions to potentially gather information. Given Machiavellianism is associated with strategic planning (Christie & Geis, 1970), the information could be of some benefit for future interactions both with their present friend, and other people who their friend may be talking about. Indeed, obtaining information about their friend and others may help to facilitate future manipulation attempts, including the use of emotional manipulation. For instance, obtaining information about others that may show their vulnerabilities or information that can be used to make them feel embarrassed or ashamed (as in emotional manipulation) may help women with higher Machiavellianism scores to strategize future manipulation behaviour. Interestingly, no relationship was found for Machiavellianism and asking open-ended questions. Asking open-ended questions may seem like a very direct strategy, unlike elaboration questions, which are based on obtaining more information about what their friend has previously said. Therefore, open-ended questions could be viewed as risky as it could raise suspicion from the friend, particularly if open-ended questions were asked frequently.

There is some evidence to suggest that asking elaboration questions may have encouraged their friend to discuss personal information and gossip. Additionally, the information their friend discussed may have been influenced by the length of the friendship. Women who had been in the friendship for 12 months or under gossiped more when their partner was higher in Machiavellianism in the five minute interaction. This was not found for the complete sample of dyads. In the complete sample of dyads it was found that women self-disclosed more personal information when their friend was higher in Machiavellianism (in the five minute interaction). Gossip helps with

social bonding, strengthening friendship, enhancing status, and can provide amusement and satisfaction (Beersma & Van Kleef, 2012; Feinberg et al., 2012; McAndrew, 2014). The use of gossip may, therefore, be particularly beneficial in friendships that may not have the intimacy (or appearance of intimacy) and shared history that longer friendships have. A friendship norm of sharing personal information may have not yet been established in the friendship. Gossip may therefore be a less risky option and may help to increase intimacy (or appearance of) which may then lead to personal information sharing. Furthermore, if the friend scoring highly on Machiavellianism appears interested in the gossip (through the use of elaboration questions) this may encourage them to provide more information about others as they are experiencing social rewards from the interaction. The use of gossip may therefore be beneficial to both members of the friendship dyad. The friend with higher Machiavellianism scores is provided with information about others while keeping the focus on their friend. They do not reveal much information about themselves, which may suggest that self-disclosure is not a strategy they engage in, supporting previous questionnaire research (Brewer, Abell, & Lyons, 2014). Their friend is also receiving social rewards through being asked (elaboration) questions, and subsequently through the disclosure of gossip, they may also feel their social status with their friend is increasing.

In addition, the first observation study demonstrated that women whose friend was higher on Machiavellianism looked at the environment more. This was found in the five minute interaction for all dyads and the five and fifteen minute interaction for dyads with a friendship length of 12 months and under. Given the importance of eye contact to social interaction (Hietanen, Leppänen, Peltola, Linna-aho, & Ruuhiala, 2008), this avoidance of direct contact with their high scoring (on Machiavellianism) friend could indicate they felt uncomfortable in the interaction with their friend. These women may

have felt direct eye-contact with their (high scoring) friend was too intense, particularly as their friend was also asking them (elaboration) questions, focusing attention on them.

Furthermore, in the fifteen minute interaction for all dyads and dyads with a friendship length of 12 months and below, women whose friend was higher on Machiavellianism had more unsuccessful interruptions. The focus on the environment, avoidance of eye contact, and more unsuccessful interruptions, could indicate a more submissive behaviour profile for these women. The more unsuccessful interruptions could indicate that the women with higher Machiavellianism scores took control (although more subtle control) over the topic of conversation. These women may not have liked the direction that the attempted interruption from their friend would take the conversation. This behaviour could indicate a difference in social status between the two friends and demonstrate a (subtle) dominance from the women higher in Machiavellianism.

Machiavellianism and Women's Perceived Vulnerability to Manipulation

In addition to women with higher Machiavellianism scores self-reporting using emotional manipulation, these women also perceived their friend as employing emotional manipulation towards them. It could be argued that women with higher Machiavellianism scores view others (including their same-sex friend) as weak and as being vulnerable to victimisation (Black et al., 2014), they may perceive others as unable to use manipulation tactics including emotional manipulation. However, the women in study 1a and 1b perceived their friend to use emotional manipulation towards them, and to use that strategy frequently. This highlights their negative and suspicious view of others. This suspicion of others may be more prominent than viewing others as weak, and, therefore incapable of manipulation.

It is important to note that study 1a and 1b only investigated Machiavellianism and the respondent's perception of their friend to employ emotional manipulation

towards them, and not whether their friend actually directed emotional manipulation towards them. The findings do, however, highlight the complexity of Machiavellianism and perceptions of their friend. Women with higher Machiavellianism scores may view their friend as being weak, thus likely to be susceptible to manipulation and potentially less likely to detect it. As demonstrated by the increased use of emotional manipulation (study 1b) and the behaviour observed (i.e., use of elaboration questions) in the observation study. However, these women also perceived their same-sex friend as employing emotional manipulation tactics towards them and using these tactics more frequently. This is inconsistent with our current understanding of the Machiavellian view of perceiving others as weak. Instead, perceiving their friend as employing emotional manipulation towards them may be fuelled by their suspicion and broad negative view of others, believing others intend to exploit them. Therefore, this perception of their friend may be linked to their broad negative view of others rather than an indication of how they perceive that specific friend and their behaviour. This potentially complex perception that women with higher Machiavellianism scores have of others, including their same-sex friend, is an important avenue for future research. These ideas should be explored within a dyadic context to investigate both members of the friendship dyad's Machiavellianism scores, use of emotional manipulation, and their perceptions of the friend's use of emotional manipulation.

Machiavellianism and Friendship Functions in Women's Friendships

In study 1a and 1b women with higher Machiavellianism scores reported that their friend provided them with less companionship, help, intimacy, and emotional security. In study 2, women with higher Machiavellianism scores (in the complete sample of dyads) reported their friend to provide them with less companionship, help, intimacy, emotional security as well as less self-validation and perceived their friend to be less of a reliable ally. These results are unsurprising given that Machiavellianism is

associated with viewing others with distrust, suspicion, and likely to exploit them (Christie & Geis, 1970). Individuals higher on Machiavellianism have a broad negative view of others and regard others as weak (Black et al., 2014; Christie & Geis, 1970). Despite these views, individuals higher on Machiavellianism do engage in friendships, or at least appear to engage in friendships. Given friendships are the most common form of social relationships (Blieszer & Adams, 1992) and the importance of manipulative behaviour being undetected by others for individuals higher on Machiavellianism (Christie & Geis, 1970), engaging in friendships may help these individuals appear to conform to social norms and not raise suspicion from others. Research indicates that Machiavellianism is associated with seeking closeness from others in order to manipulate (Ináncsi et al., 2015) and this strategy may be particularly beneficial for women given women's friendships are centred on intimacy and information sharing (Vigil, 2007). Therefore, appearing to seek closeness from their friend would not raise suspicion. Indeed, women scoring higher on Machiavellianism may appear to seek closeness from their same-sex friend through behaviour such as asking elaboration questions, as demonstrated in study 2.

Women with higher Machiavellianism scores may seek friendships for their own self-serving purpose as they do not believe anyone is worth trusting. Due to their emotional detachment these women may not recognise behaviour from their friend that shows one of the six friendship functions measured in three of these studies. Indeed, even if they view this behaviour from their friend they may see it as unnecessary or intrusive. Additionally, given individuals with higher Machiavellianism scores view others with suspicion and distrust, even if they experience positive behaviour from their friend they may not believe it to be authentic and suspect an ulterior motive.

Study 2 showed important differences with friendship functions between the sample of all dyads and dyads with a shorter friendship length (12 months and under).

In the whole sample, women with higher Machiavellianism scores reported lower levels of all six friendship functions. In contrast, women with higher Machiavellianism scores who had been in the friendship for 12 months or less only reported their friend as providing less companionship and emotional security. It was expected that women with higher Machiavellianism scores would report lower scores on all friendship functions, irrespective of friendship length, given these individuals are emotionally detached, cynical, distrustful, and view others negatively (Black et al., 2014; Christie & Geis, 1970). The functions of companionship and emotional security may be more salient in new friendships, particularly for friendships at university. Companionship refers to engaging in activities together and emotional security refers to providing comfort in novel/threatening situations. Both of these functions are especially important in new friendships along with new university experiences. Indeed, the act of taking part in this observation study could be one of the first new experiences these two friends have taken part in together. Therefore, behaviour demonstrating companionship and emotional security may be the first to emerge. Women with higher Machiavellianism scores may detect this behaviour and feel that it is unnecessary to them, given their independence and focus on agency (Ináncsi et al., 2015; Rauthman, 2012). Furthermore, given their cynicism and suspicion, these women may feel there is an ulterior motive behind this seemingly positive behaviour, thus resulting in reduced scores for these two functions.

Research should conduct longitudinal studies in order to achieve a clearer picture of Machiavellianism and friendship functions. It would be particularly beneficial to explore friendship functions at the start of friendships and over several time points during the progression of the friendship. Furthermore, this should be done for both members of the friendship dyad. This would be beneficial because it allows the investigation of whether each individual's perception of the friendship changes over

time and, with the inclusion of observational methodology, what behaviour these perceptions may be associated with.

Machiavellianism and Girls' Behaviour

This thesis also investigated two components of the Kiddie Mach (Lack of Faith and Distrust) and girls' (aged 9 - 11 years) behaviour in the school playground with their peers. In contrast to previous research that used questionnaire measures and suggested Machiavellianism is associated with indirect aggression in children (Kerig & Stellwagen, 2010) this observation study found that girls with higher levels of Distrust on the Kiddie Mach scale engaged in less social exclusion behaviour (a form of indirect aggression) on the playground. As detailed on page 199 of the thesis, indirect aggression requires trust from their peers for the strategy to be successful (Miller-Ott & Kelly, 2013) and, therefore, is not a strategy suitable for females with higher Machiavellianism scores to engage in. Socially excluding another child from the group would require their peers in the group to also behave in a socially excluding way. If their peers did not also socially exclude the target child then this strategy may not be successful. Indeed, if other group members did not want to engage in this behaviour this could result in their own social exclusion from the group. Trusting peers is not compatible with high Distrust scores on the Kiddie Mach and, thus, these girls may avoid using (manipulative) interpersonal strategies on the playground that require help from others. Importantly, this highlights the complexity of the relationship between Machiavellianism and indirect aggression in children. Previous research has suggested that Machiavellianism is associated with indirect aggression, whilst this study, focusing on Distrust scores (on the Kiddie Mach) in girls found the opposite relationship with social exclusion behaviour. This could indicate that actually, given how important trust is to engaging in indirect aggression, having low levels of trust could result in less social exclusion behaviour. This highlights the need to investigate components of

Machiavellianism, as well as overall scores, in relation to children's and adults behaviour (see page 24-25 and 250-252 or discussion of women with higher Machiavellianism scores and the problems with engaging in indirect aggression such as gossip), including indirect aggression.

The playground observation study also showed that girls with higher Lack of Faith scores and girls with higher Distrust scores (on the Kiddie Mach) spent less time rejecting peer's bids into their social group than those with lower scores. Rejecting another child may be seen as quite a direct and risky strategy to engage in. Although girls with higher Lack of Faith scores and Distrust scores view others negatively and do not trust others, they could be more focused on engaging in behaviour that does not raise attention or suspicion. Rejecting another child could result in a negative reaction from that peer, or from the peer group itself, particularly if the group was welcoming of new members. This could result in betrayal of their social group and potentially social exclusion. Girls who think negatively of others and distrust others may focus on the potential negative behaviour from others and the consequences of this behaviour for themselves. Therefore, these girls may engage in behaviour that they perceive will result in reduced negative outcomes for themselves, particular when it concerns attracting (negative) attention from others. Indeed, potentially allowing other members of the group to make decisions about rejecting peer's bids (rather them themselves doing the actual rejecting) keeps the focus off themselves. Additionally, not rejecting peers may help others to think positively of them and, thus less likely to detect any engagement in negative, and potentially manipulative behaviour.

Developmental Pathway of Machiavellianism and Female Behaviour in Friendship

This thesis considered both Machiavellianism in women and two components of Machiavellianism in girls. Two of these studies investigated normative behaviour with the use of observational methodology. For girls, the results suggested a more

submissive behaviour profile (from the behaviour that was measured). Specifically, these girls appeared to be more covert, and not directly hostile, in their behaviour. They did not actively engage in social exclusion behaviour - in fact they engaged in this behaviour less. Furthermore, they did not reject their peer's bids to join their group. These girls did not engage in behaviour that would attract the attention, particularly negative attention, of their peers. It would be beneficial for future observation research to also investigate Machiavellianism and prosocial behaviour as Machiavellianism is associated with prosocial and coercive behaviour in children (Hawley, 2003).

This more subtle behaviour was also demonstrated in women with higher Machiavellianism scores (in study 2). Women with high Machiavellianism scores in the dyad observation study did not engage in any overtly dominant or hostile behaviour. Instead, they demonstrated (seemingly) positive social behaviour by showing interest in their friend by asking more elaboration questions. However, they may have engaged in this behaviour to gather information whilst also keeping the focus on their friend.

Examination of their friend's behaviour in study 2 revealed that women interacting with a friend with high Machiavellianism scores looked at the environment more. This may suggest these women were uncomfortable and/or attempting to withdraw from the interaction. Similarly, in the playground observation study (study 3), girls with higher Lack of Faith scores and Distrust scores (on the Kiddie Mach) spent more time having their bids to join other groups rejected by their peers. Evidently, these girls and women are displaying some type of behaviour that makes their friend or peers not want to engage with them. For women, the amount of elaboration questions asked may have contributed (in part) to their friend's withdrawal, but for girls it is not clear which behaviour may have led to increased rejection. Therefore, even though girls and women are not displaying overt hostile behaviour they are displaying a behaviour that is not deemed positive by friends and peers. It is, therefore, important for future research

to investigate what other subtle (manipulative) behaviour girls and women may engage in that may result in withdrawal or rejection from their peers.

Importantly, this lack of overt dominance by girls and women higher on Machiavellianism may indicate a behavioural strategy that is adopted at different developmental ages. Girls and women seem to be more subtle in their actions and do not overtly engage in negative behaviour. This could help them to avoid detection by their friends and peers by appearing to conform to social norms - both in friendships and in playground norms with peers. In order to investigate what behaviour in particular may lead to rejection from peers or a friend's withdrawal from a social interaction, future research should investigate a greater range of behaviour that girls and women with higher Machiavellianism scores (and/or components of) may engage in when with friends and peers.

Machiavellianism and the Big-Five in Women

In addition to the studies investigating Machiavellianism and female behaviour a 5th chapter was also included in this thesis discussing Machiavellianism and the Big-Five in women. This chapter aimed to highlight the issue of whether to control for other individual differences, such as the Big-Five, when investigating Machiavellianism. Controlling for other constructs raises the issue of what part of the main construct (Machiavellianism) is actually being measured, given some variance from another trait is being accounted for. However, if other traits are not controlled, this raises uncertainty in their involvement in the outcome measures. Furthermore, it was hoped that the chapter would highlight the need for more research to investigate Machiavellianism in relation to personality traits including how personality traits may influence the development of Machiavellianism.

This additional study found that Openness (measured with the TIPI) accounted for the most variance in Machiavellianism, followed by Conscientiousness, and then

Agreeableness. Although these three traits only accounted for a small amount of variance, thus may not need to be controlled for when investigating Machiavellianism (in women), there still may be overlap and influence exerted on study outcomes. Openness is associated with curiosity and may facilitate Machiavellian self-serving behaviour. The characteristic of being hard-hearted is attributed to low Agreeableness (Costa & McCrae, 1992) but may overlap with the emotional detachment that characterises Machiavellianism. The number of facets associated with each Big-Five trait suggests that research needs to explore these facets with Machiavellianism and components of Machiavellianism to build a clearer picture of the relationships between these constructs.

This supplementary chapter raised more questions and avenues for future research concerning Machiavellianism and the relationship with personality traits and individual differences. Importantly, given that Machiavellianism is more of a learnt behaviour than a genetically inherited trait (Veselka, Aitken, Schermier, & Vernon, 2011) and is associated with stressful childhood environments (Abell et al., 2014; Láng & Lénárd, 2015) and Early Maladaptive Schemas (Láng, 2015) research should focus on the development of Machiavellianism and how personality traits may influence this development. A wealth of information may be gained by using longitudinal methodology to explore whether the development of Machiavellianism is associated with an interaction between stressful family environments and, for instance, the Big-Five traits. For example, it could be hypothesised that children with low levels of Agreeableness who experience a stressful family environment may be more likely to develop the Machiavellian behaviour profile. As well as exploring Machiavellianism and its relationship to personality traits and individual differences in adults, research should also investigate how personality traits are associated with the development of Machiavellianism and how these relationships may change over time.

Machiavellianism and Vulnerability

The studies in this thesis have highlighted a more vulnerable aspect of Machiavellianism that is often overlooked within the literature. Study one demonstrates how women perceive that they are also a victim of emotional manipulation. This shows that the negative representation that individuals with higher Machiavellianism scores have of others applies to relationships with same-sex friends. Perceiving emotional manipulation from their friend may suggest that these women are also victims to emotional manipulation, this is similar to research that has suggested Machiavellianism in children is associated with both being a bully and being a victim of bullying (Andreou, 2000). Research that focuses on how individuals with higher Machiavellianism scores are treated by others as well as investigating their own behaviour would be beneficial for interventions that focus on social relationships and wellbeing. There may be a relationship between how individuals with higher Machiavellianism scores are treated by others and their views and behaviour towards others. Negative treatment from others may reinforce their negative thinking style that stems from stressful childhood experiences.

Furthermore, the two observation studies demonstrated vulnerability in the actual behaviour of these girls and women with higher Machiavellianism (or components of Machiavellianism) scores. Women with higher Machiavellianism scores kept the focus of the conversation off themselves and instead focused on their partner. This suggests a potential defensive strategy to avoid revealing any personal information about themselves. Machiavellianism is associated with negative self-esteem (McCain, Jonason, Foster, & Campbell, 2015), Alexithymia (Wastell & Booth, 2003) and Low Emotional Intelligence (Austin et al., 2007). Therefore, these women may also have ensured focus is on their partner to conceal their low self-esteem and other social deficits that may make them more vulnerable to manipulation or exploitation.

Additionally, girls with higher Distrust scores spent less time being accepted by their peers. This rejection from peers may place these girls in a vulnerable social situation. These girls may be more likely to be victimised or further excluded from social relationships and activities. Therefore, future research should examine the role of vulnerability in individuals' with higher Machiavellianism scores behaviour and social relationships. Investigating Machiavellianism as a defensive strategy as a consequence of stressful childhood experiences and the vulnerability that may be associated this would allow for a greater understanding of this behaviour profile. Social interventions may then target their strategies at these vulnerabilities to help improve social relationships and well being of children and adults.

Strengths and Limitations

This thesis employed a mixed-methods approach to investigate Machiavellianism, including the use of observation methodology to investigate normative behaviour. This thesis focused on Machiavellianism in females as there is a paucity of research that investigates how Machiavellianism influences female behaviour. Machiavellianism is associated with strategic planning and a focus on not being detected by others (Christie & Geis, 1970) while women tend to engage in subtle (manipulative) behaviour (Wilson, Near, & Miller, 1996). This combination may influence behaviour in subtle, unique ways. Furthermore, there is very little research investigating the dynamics of Machiavellianism and friendships, and in particular, female friendships. Given Machiavellianism is associated with seeking closeness in others in order to manipulate and female friendships are characterised by intimacy and closeness (Vigil, 2007) this particular relationship seems like an ideal context in which to use subtle manipulation techniques. Furthermore, although previous research demonstrates that Machiavellianism is associated with emotional manipulation (Austin, Farrelly, Black, & Moore, 2010) this thesis places that use of emotional manipulation in

a particular context, allowing greater knowledge about the dynamics of Machiavellianism and female friendship.

Importantly, there is a need for more observational research investigating social interaction (Heerey, 2015) especially when exploring Machiavellianism. There is a wealth of research investigating Machiavellianism and behaviour in experimental games and tasks. However, until the two observation studies presented in this thesis, there was no research investigating Machiavellianism and normative behaviour with observational techniques. The observation studies presented in this thesis have shown females with higher Machiavellianism scores are subtle in their (manipulative) behaviour and appear to place importance on acceptance from their friends and peers. They have also highlighted that these girls and women demonstrate behaviour that leads to aversion or rejection from their friend/peers and the need for future research to specifically investigate the behaviour that leads to this response. The use of observation research allows for the detection of more subtle behaviour and behaviour that occurs in everyday social interactions. The important inclusion of observation research has also been strengthened by including two developmental ages – adult women and girls (aged 9-11 years). This has hopefully highlighted the need for research to explore the potential developmental pathway for Machiavellianism and girl's interactions with their peers.

There are, of course, limitations to note, and these have been discussed in more detail throughout the previous chapters. The first studies (1a and 1b) only obtained data from one individual from each friendship and, therefore, only investigated the perception of a friend's emotionally manipulative behaviour from the view of the participant. The results regarding the perception of their friend employing emotional manipulation is further complicated by individuals with higher Machiavellianism scores having a broad, negative view of others. Therefore, those two studies could be measuring that broad negative view rather than specifically measuring the participant's

perception of their friend's emotional manipulation behaviour. This is an avenue for future research to explore (discussed below).

In the observation study investigating women's friendship dyads there were some limitations with the coding scheme employed. In particular, the coding of gossip was a problem. Gossip has a variety of functions including providing satisfaction, sharing information with group members (which may have benefits for the protection of group or dyads members), as well as taking the form of malice and rumours (Beersma & Van Kleef, 2012; Feinberg et al., 2012; McAndrew, 2014). Therefore, in order to further investigate the relationship with Machiavellianism and gossip future research should categorise gossip according to both positive and negative functions.

The observation study investigating Machiavellianism and girl's normative behaviour on the playground had a very small sample size and only investigated two components of Machiavellianism (Lack of Faith and Distrust). Furthermore, the Cronbach's alpha for the Distrust scale was lower than desired. The problems with the reporting of Dishonesty and the low Cronbach's for the Distrust scale could be explained by the suggestion that Machiavellian views and behaviour develop separately (Kraut & Price, 1976). Children may not have developed these views at this time or the Kiddie Mach may not be sensitive enough to detect them. Future research should, therefore, focus on constructing a more reliable measure of Machiavellianism in children. Furthermore, this future research should also use a much larger sample of children, with a wider age range and investigate total Machiavellianism scores as well as Machiavellianism components to hopefully provide a clearer picture of Machiavellianism and behaviour.

Finally, there were some limitations with the additional study investigating Machiavellianism and the Big-Five in women. This chapter was included to highlight issues and important avenues for future research. The reliabilities for the TIPI were

generally quite poor. Therefore, it is important to further explore the relationship of Machiavellianism and the Big-Five with more reliable measures and with better item coverage of each of the Big-Five dimensions, including Machiavellianism and the Big-Five with the NEO Personality Inventory Revised (Costa & McCrae, 1992) which measures both the Big-Five and specific facets for each trait. This could be investigated with a large sample of men and women across a wide age range to investigate further sub-facets of personality that may account for variance in the Big-Five.

Future Research

Importantly, future research should investigate Machiavellianism and behaviour using longitudinal methods. Machiavellianism and emotional manipulation in friendship dyads should be investigated over multiple time points, include responses from both members of the dyad, and investigate the detection of emotional manipulation. This would allow the investigation of whether 1) Machiavellianism levels in their friend influences the respondent's use of emotional manipulation 2) the perception of emotional manipulation is actually related to the friend's (emotional manipulation) behaviour 3) emotional manipulation is detected, and 4) these relationships change over time.

Furthermore, future observation studies should also collect dyadic data over multiple time points in a number of different developmental ages and investigate a wider range of behaviour. Machiavellianism and friendship interactions should be observed in childhood, adolescence and adulthood (young and late adulthood). This would allow for the investigation of whether Machiavellianism is associated with different behaviour at different developmental stages, and whether this changes across time. This may show that behaviour becomes more strategic as age increases or becomes particularly strategic with adolescents as they spend more time observing their friend's behaviour (Crockett, Losoff, & Petersen, 1984). Therefore, this increased

monitoring from friends may result in (even) more subtle behaviour to avoid detection. Furthermore, dyadic longitudinal observation research will also allow the investigation of whether their friend behaves differently over time. This could include whether there are differences in behaviour depending on the friend's Machiavellianism levels and whether they may detect their (high scoring on Machiavellianism) friend's strategies and the impact this may have on the friendship.

Application of Findings for Interventions and Researchers

This research has shown that Machiavellianism can influence social behaviour and the dynamics of girls and women's friendships. This is particularly important for potential interventions focusing on social relationships and mental health. Interventions such as the 'FRIENDS' trial (www.isrctn.com) incorporate social and mental health measures. Future school-based interventions could also incorporate personality measures and behaviour measures. Study 2 in this thesis demonstrated that girls with high levels of distrust spent less time getting accepted by other children on the playground. This distrust and lack of acceptance from their peers can have negative implications for these children's psychosocial adjustment (i.e., Rotenberg, Qualter, Holt, Harris, Henzi et al., 2006). Therefore, school based social interventions should also focus on Machiavellianism and components of Machiavellianism such as distrust and negative view of others. Working with children to improve their trust in others would be beneficial for their peer relationships and their overall wellbeing and adjustment.

This thesis highlighted aspects of vulnerability that may be associated with Machiavellianism. This is important as often research focuses on the negative behaviour and negative consequences associated with individuals higher on Machiavellianism. Research rarely emphasises that individuals higher on Machiavellianism are not trusting

of others and feel like they will also be a target of exploitation. Study 1A and 1B shows that women perceived their friend to be use emotional manipulation towards them. Practitioners could investigate this further to see whether helping to change how these individuals perceive others would change their negative behaviour. This would be particularly beneficial for schools and the workplace given that Machiavellianism has been associated with bullying behaviour and also being a victim of this behaviour in both these contexts (Andreou, 2000; Linton & Power, 2013)

Finally, this research may be beneficial for researchers and practitioners when conducting assessments and research with regard to using observational methodology. The use of observational methodology may be beneficial in identifying more subtle behaviour that suggests vulnerability which questionnaire measures may not be sensitive enough to detect. The actual social interaction behaviour displayed by individuals with higher Machiavellianism scores or those with higher components of Machiavellianism such as distrust may indicate some maladjustment is occurring. Furthermore, the behaviour of the partner during the interaction may provide more information about the (potential) maladjusted behaviour from the individual of interest. As the second study in this thesis showed, the partner of the woman with higher Machiavellianism scores demonstrated behaviour that indicated feeling uncomfortable and wanting to withdraw from the interaction. This could be used as an intervention 'tool' to help show how individuals' social interaction styles could be improved to help develop healthier social relationships.

Overall Conclusion

The studies in this thesis investigated Machiavellianism and behaviour in women's interactions with a same-sex friend and girls' interactions with same-sex

peers. A mixed-methods approach was utilised with the inclusion of both self-report and observation methodology. Importantly, this thesis also included a developmental aspect by observing both women's and girl's normative behaviour. Study 1a and 1b revealed that women with higher Machiavellianism scores self-reported using emotional manipulation towards a friend and engaged in that strategy frequently. These women also perceived their friend as directing emotional manipulation towards them. In the observation studies, women with higher levels of Machiavellianism asked their friend more elaboration questions and their friend spent more time looking at the environment. Girls with higher Distrust scores (on the Kiddie Mach) spent less time engaging in indirect aggression and rejecting peer's bids to join their group. Both girls and women with higher Machiavellianism (or components of Machiavellianism) appeared to engage in subtle behaviour that was not overtly hostile nor attracted negative attention from their peers. However, they did engage in subtle behaviour that resulted in withdrawal from the interaction with their friend (women) or rejection from peers in other social groups (girls). Future research should continue to investigate Machiavellianism and female behaviour using longitudinal observation methods and with a wider range of behaviour recorded. This will allow researchers to explore whether Machiavellianism and associated behaviour is consistent from childhood through to adulthood or changes throughout developmental stages.

7. References

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Appendix 2A

3 March 2014

Gayle Brewer / Loren
Abell School of
Psychology
University of Central Lancashire

Dear Gayle / Loren

Re: PSYSOC Ethics Committee Application
Unique Reference Number: **PSYSOC 052_6th Phase**

The PSYSOC ethics committee has granted approval of your proposal application '**Machiavellianism and manipulation in female friendships**'.

Please note that approval is granted up to the end of project date or for 5 years, whichever is the longer. This is on the assumption that the project does not significantly change, in which case, you should check whether further ethical clearance is required

We shall e-mail you a copy of the end-of-project report form to complete within a month of the anticipated date of project completion you specified on your application form. This should be completed, within 3 months, to complete the ethics governance procedures or, alternatively, an amended end-of-project date forwarded to roffice@uclan.ac.uk quoting your unique reference number.

Yours sincerely

PSYSOC Ethics Committee

21 July 2014

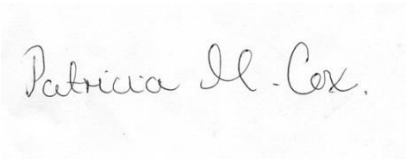
Gayle Brewer /
Loren Abel
School of
Psychology
University of Central Lancashire

Dear Gayle / Loren

Re: PSYSOC Ethics Committee Application
Unique Reference Number: **PSYSOC 052_6th phase_amendment**

The PSYSOC Ethics Committee has approved your proposed amendment - an additional measure/questionnaire - to your application '**Machiavellianism and manipulation in female friendships**'.

Yours sincerely



Pat Cox
Joint Chair – Social Work
PSYSOC Ethics Committee

Appendix 2B

Skewness of Variables for Data in Study 1A: Emotional Manipulation in Women's Friendships

Tests of normality were conducted on the dependent variables before the planned regression analysis could be conducted. This revealed the data were largely non-normal and not normally distributed (table B1). Skewness and kurtosis values that deviate from 0 suggest non-normal data. Specifically, skewness values above .281 or below -.281 for a sample size of around 200 suggest non-normal data (Doanne & Seward, 2011). Using this rule, the skewness for emotional manipulation and emotional manipulation from friend is acceptable. The remaining variables are severely skewed and transformations were conducted (table B2). As suggested by Tabachnick and Fidell (2001) square root transformations were conducted first, followed by log transformation and inverse transformations if the data were still not within the acceptable skewness range.

Table B1 *Skewness for Emotional Manipulation and Friendship Functions measures*

	Skewness	Kurtosis	Shapiro-Wilk
Emotional Manipulation	-.003	-.300	.002
Mood worsening	1.208	.808	.000
Inauthentic	.504	-.462	.000
Emotional Manipulation from friend	-.093	-.805	.000
Companionship	-1.393	1.829	.000
Help	-1.013	.398	.000
Intimacy	-1.555	2.067	.000
Reliable Alliance	-2.236	5.227	.000
Self-Validation	-1.026	.536	.000
Emotional Security	-3.320	1.414	.000

Table B2 *Transformations for Emotional Manipulation and Friendship Functions measures*

	Skewness	Kurtosis	Shapiro-Wilk
Mood worsening			
Square root	.931	-.121	.000
Log10	.705	-.733	.000
Inverse	-.369	-1.348	.000
Inauthentic			
Square root	.184	-.882	.000
Log10	-.110	-1.035	.000
Inverse	.622	-.796	.000
Emotional Manipulation from friend			
Square root	-.419	-.820	.000
Log10	-.715	-.623	.000
Inverse	1.201	.155	.000
Companionship			
Square root	.593	-.491	.000
Log10	-.068	-1.248	.000
Inverse	.859	-.905	.000
Help			
Square root	.240	-.717	.000
Log10	-.565	-.726	.000
Inverse	1.486	.522	.000
Intimacy			
Square root	.815	-.325	.000
Log10	.175	-1.310	.000
Inverse	.506	-1.550	.000
Reliable Alliance	1.344	1.080	.000
Square root	.717	-.887	.000
Log10	-.230	-1.832	.000
Inverse			
Self-Validation			
Square root	.299	-.864	.000
Log10	-.351	-1.168	.000
Inverse	1.051	-.677	.000
Emotional Security			
Square root	.507	-.533	.000
Log10	-.236	-1.114	.000
Inverse	1.071	-.556	.000

Appendix 2C

Skewness of Variables for Data in Study 1B: Emotional Manipulation Frequency in Women's Friendships

Tests of normality were conducted on the dependent variables before the planned regression analysis could be conducted. This revealed the data were largely non-normal and not normally distributed. As stated in appendix 2B, skewness values above .281 or below -.281 for a sample size of around 200 suggest non-normal data (Doanne & Seward, 2011). As suggested by Tabachnick and Fidell (2001) square root transformations were conducted first, followed by log transformation and inverse transformations if the data were still not within the acceptable skewness range. The skewness levels as shown in table C1 show that that data were skewed and non-normal and transformations are shown in table C2.

Table C1 *Skewness for Emotional Manipulation Frequency and Friendship Functions measures*

	Skewness	Kurtosis	Shapiro-Wilk
Emotional Manipulation-Frequency	1.775	4.246	.000
Emotional Manipulation Frequency from friend	1.274	1.534	.000
Companionship	-1.229	1.014	.000
Help	-1.414	2.789	.000
Intimacy	-1.520	2.129	.000
Reliable Alliance	-2.062	4.565	.000
Self-Validation	-1.206	1.148	.000
Emotional Security	-1.009	.118	.000

Table C2 *Transformations for Emotional Manipulation Frequency and Friendship Functions measures*

	Skewness	Kurtosis	Shapiro-Wilk
Emotional Manipulation Frequency			
Square root	1.282	1.989	.000
Log10	.866	.625	.000
Inverse	-.204	-.560	.000
Emotional Manipulation Frequency from Friend			
Square root	.877	.323	.000
Log10	.531	-.445	.000
Inverse	.022	-1.058	.000
Companionship			
Square root	.487	-.654	.000
Log10	-.186	-1.190	.000
Inverse	.990	-.700	.000
Help			
Square root	.344	-.336	.000
Log10	-.487	-.863	.000
Inverse	1.341	.119	.000
Intimacy			
Square root	.735	-.426	.000
Log10	.132	-1.409	.000
Inverse	.450	-1.627	.000
Reliable Alliance			
Square root	1.196	.574	.000
Log10	.648	-1.089	.000
Inverse	-.228	-1.844	.000
Self-validation			
Square root	.359	-.499	.000
Log10	-.474	-.740	.000
Inverse	1.499	.696	.000
Emotional Security			
Square root	.404	-.918	.000
Log10	-.251	-1.112	.000
Inverse	1.225	-.061	.000

Appendix 3A

22 November 2013

Gayle Brewer / Pam Qualter / Loren Abell / Jingqi Yang
School of Psychology
University of Central Lancashire

Dear Gayle / Pam / Loren / Jingqi

Re: PSYSOC Ethics Committee Application
Unique Reference Number: **PSYSOC 052_4th phase**

The PSYSOC ethics committee has granted approval of your proposal application '**Study One: An Observational Study of individual differences and Social Interaction within Stranger Dyads / Study Two: An Observational Study of Individual differences and Social Interaction within Friendship Dyads**'.

Please note that approval is granted up to the end of project date or for 5 years, whichever is the longer. This is on the assumption that the project does not significantly change, in which case, you should check whether further ethical clearance is required

We shall e-mail you a copy of the end-of-project report form to complete within a month of the anticipated date of project completion you specified on your application form. This should be completed, within 3 months, to complete the ethics governance procedures or, alternatively, an amended end-of-project date forwarded to roffice@uclan.ac.uk quoting your unique reference number.

Yours sincerely

Cath Sullivan
Chair
PSYSOC Ethics Committee

NB - Ethical approval is contingent on any health and safety checklists having been completed, and necessary approvals as a result of gained.

8 May 2014

Gayle Brewer / Pam Qualter / Loren Abell / Jingqi Yang School of Psychology

University of Central Lancashire

Dear Gayle / Pam / Loren / Jingqi

Re: PSYSOC Ethics Committee Application

Unique Reference Number: PSYSOC 052_4th phase_amendment

The PSYSOC Ethics Committee has approved your proposed amendment to your application '**Study One: An Observational Study of individual differences and Social Interaction within Stranger Dyads**

/ Study Two: An Observational Study of Individual differences and Social Interaction within Friendship Dyads'.

Yours sincerely

C Sullivan

Cath
Sullivan
Chair

PSYSOC Ethics Committee

Appendix 3B

Observed Behaviour Skewness for all Dyads for Five Minute Observation (*N* = 55 dyads)

The sample size is 110 (55 dyads) and suggested acceptable skewness is -.391 to .391 (Doane & Seward, 2011). As suggested by Tabachnick and Fidell (2001) square root transformations were conducted first, followed by log transformation and inverse transformations if the data were still not within the acceptable skewness range.

Table B1 *Eye contact skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Face	-.384	-.262	.086
Non-face	2.037	4.327	.000
Self	1.781	3.419	.000
Environment	.637	1.484	.010

Table B2 *Eye contact transformations*

	Skewness	Kurtosis	Shapiro-Wilk
Non face			
Square root	.755	-.199	.000
Log 10	.912	-.231	.000
Inverse	-.260	-1.382	.000
Self			
Square root	.466	-.361	.001
Log 10	.303	-.970	.000
inverse	.601	-.978	.000
Environment			
Square root	-.289	.180	.184

Table B3 *Interest skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Head nods	1.248	1.503	.000
Uh Huhs	2.650	8.903	.000
Leaning forward	3.443	13.556	.000
Elaboration question	.989	0.747	.000
Open-ended question	4.440	28.271	.000

Table B4 *Interest transformations*

	Skewness	Kurtosis	Shapiro-Wilk
Head nods			
Square root	.278	-.193	.134
Uh huhs			
Square root	.945	0.114	.000
Log 10	1.662	2.587	.000
inverse	-1.095	0.192	.000
Leaning forward			
Square root	1.564	2.407	.000
Log 10	1.296	0.874	.000
inverse	-.404	-1.428	.000
Elaboration question	-.257	-.080	.018
Square root			
Open ended question	1.612	2.199	.000
Square root	3.002	13.071	.000
Log 10	-2.150	5.623	.000
inverse			

Table B5 *Talking skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Not talking	.195	-.411	.766
General	.522	-.327	.009
Friend	3.173	12.570	.000
Gossip	1.904	4.060	.000
Laughing	1.349	1.875	.000
Self-disclosure one	2.388	7.526	.000
Self-disclosure two	2.083	4.095	.000
Self-disclosure three	5.327	30.501	.000

Table B6 *Talking transformations*

	Skewness	Kurtosis	Shapiro-Wilk
General			
Square root	-.270	.051	.209
Friend			
Square root	1.017	.747	.000
Log 10	1.290	1.340	.000
Inverse	-0.499	-1.205	.000
Gossip			
Square root	.592	-.529	.000
Log 10	.326	-1.182	.000
Laughing			
Square root	.124	.114	.406
Self-disclosure one			
Square root	.582	.052	.000
Log10	.346	-.812	.000
Self-disclosure two			
Square root	1.052	-.140	.000
Log 10	1.114	-.093	.000
Inverse	.658	-1.333	.000
Self-disclosure three			
Square root	3.700	14.147	.000
Log 10	3.491	11.940	.000
Inverse	-2.650	5.643	.000

Table B7 *Interruptions skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Successful interruptions	1.181	2.200	.000
Unsuccessful interruptions	1.819	3.233	.000

Table B8 *Interruptions transformations*

	Skewness	Kurtosis	Shapiro-Wilk
Successful interruptions			.000
Square root	-.223	-.928	.000
Log 10	.490	-.160	.000
Inverse	-.038	-1.006	
Unsuccessful interruptions			
Square root	.810	-.782	.000
Log 10	.995	-.201	.000
Inverse	-.627	-1.372	.000

Table B9 *Stonewalling skewness*

	Skewness	Kurtosis	Shapiro-Wilk
No back channels	5.859	43.466	.000
Active away behaviour	3.942	17.507	.000

Table B10 *Stonewalling transformations*

	Skewness	Kurtosis	Shapiro-Wilk
No back channels			
Square root	2.611	7.7522	.000
Log 10	4.256	23.609	.000
Inverse	-3.198	12.324	.000
Active away behaviour			
Square root	2.869	7.208	.000
Log 10	3.590	13.858	.000
Inverse	-3.318	11.184	.000

Table B11 *Pouting skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Pouting	3.477	16.444	.000

Table B12 *Pouting transformations*

	Skewness	Kurtosis	Shapiro-Wilk
Pouting			
Square root	1.340	1.196	.000
Log 10	2.327	6.480	.000
Inverse	-1.689	2.415	.000

Appendix 3C

Observed Behaviour Skewness for all Dyads for 15 Minute Observation (*n* = 54 dyads)

The sample size is 108 (54 dyads) with a suggested acceptable skewness of -.391 to .391. (Doane & Seward, 2011). As suggested by Tabachnick and Fidell (2001) square root transformations were conducted first, followed by log transformation and inverse transformations if the data were still not within the acceptable skewness range.

Table C1 *Eye contact skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Face	-.596	-.186	.003
Non-face	3.540	15.317	.000
Self	2.445	6.464	.000
Environment	1.369	2.821	.000

Table C2 *Eye contact transformations*

	Skewness	Kurtosis	Shapiro-Wilk
Face			
Square root	-.041	-.190	.378
Non face			
Square root	1.295	1.935	.000
Log 10	1.668	2.756	.000
Inverse	-.811	-.489	.000
Self			
Square root	1.064	.932	.000
Log 10	.991	.243	.000
Inverse	-.007	-1.129	.000
Environment			
Square root	.326	.708	.291
Log 10	-1.359	5.220	.000
Inverse	9.107	89.602	.000

Table C3 *Interest skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Head nods	.672	-.368	.000
Uh huhs	1.599	2.126	.000
Leaning forward	2.581	7.059	.000
Elaboration question	.736	.094	.000
Open-ended question	1.241	1.059	.000

Table C4 *Interest transformations*

	Skewness	Kurtosis	Shapiro-Wilk
Head Nods			
Square root	.031	-.675	.345
Uh Huhs			
Square root	.473	-.525	.000
Log 10	1.084	.247	.000
Inverse	-.674	-0.693	.000
Leaning forward			
Square root	1.186	.894	.000
Log 10	1.063	.089	.000
Inverse	-.240	-1.406	.000
Elaboration question	-.099	-.565	.379
Square root	.119	-.793	.033
Log10	.405	-.812	.001
Inverse			
Open ended question	.076	-1.006	.000
Square root	1.024	.377	.000
Log 10	-.828	-.143	.000
Inverse			

Table C5 *Talking skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Not talking	.048	-.389	.373
General	.470	.697	.001
Friend	1.502	2.101	.000
Gossip	1.797	3.317	.000
Laughing	1.399	2.596	.000
Self-disclosure one	1.789	4.731	.000
Self-disclosure two	1.578	5.077	.000
Self-disclosure three	2.094	5.760	.000
Self-disclosure four	4.736	23.349	.000
Self-disclosure total	1.059	1.853	.000
Discussing question one-three	2.870	9.856	.000
Discussing question four	1.965	4.984	.000

Table C6 *Talking transformations*

	Skewness	Kurtosis	Shapiro-Wilk
General			
Square root	-.233	-.575	.111
Friend			
Square root	.399	-.273	.062
Gossip			
Square root	.443	-.333	.001
Log 10	.234	-.934	.000
Inverse	.728	-.880	.000
Laughing			
Square root	.207	.494	.481
Self-disclosure one			
Square root	.219	.149	.129
Self-disclosure two			
Square root	.322	.753	.132
Log10	-.738	.663	.002
Inverse	3.222	13.621	.000
Self-disclosure three	.412	-.246	.000
Square root	.335	-.824	.000
Log 10	.493	-1.227	.000
Inverse			
Self-disclosure four			
Square root	3.793	13.818	.000
Log 10	3.900	14.598	.000
Inverse	-3.463	10.678	.000
Discussing question one to three			
Square root	1.400	2.811	.000
Log 10	-.006	-.024	.653
Discussing question four			
Square root	.653	.503	.011
Log10	.207	-.538	.147

Table C7 *Interruptions skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Successful interruption	.992	.828	.000
Unsuccessful interruption	1.437	1.980	.000

Table C8 *Interruptions transformations*

	Skewness	Kurtosis	Shapiro-Wilk
Successful interruption			
Square root	-.259	-.589	.000
Log 10	.591	-.256	.000
Inverse	-.259	-.793	.001
Unsuccessful interruption			
Square root	.341	-1.196	.000
Log 10	1.206	1.020	.000
Inverse	-1.010	.300	.000

Table C9 *Stonewalling skewness*

	Skewness	Kurtosis	Shapiro-Wilk
No back channels	2.443	6.641	.000
Active away behaviour	4.931	30.025	.000

Table C10 *Stonewalling transformations*

	Skewness	Kurtosis	Shapiro-Wilk
No back channels			
Square root	1.122	.132	.000
Log 10	2.166	4.911	.000
Inverse	-1.928	3.549	.000
Active away behaviour			
Square root	2.598	6.860	.000
Log 10	4.284	22.259	.000
Inverse	-3.773	16.625	.000

Table C11 *Pouting skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Pouting	1.909	2.930	.000

Table C12 *Pouting transformations*

	Skewness	Kurtosis	Shapiro-Wilk
Pouting			
Square root	.682	-.455	.000
Log10	1.653	1.999	.000
Inverse	1.400	1.169	.000

Appendix 3D

Age and Observed Behaviour for all Dyads 5 Minute Observation (*N* = 55 dyads)

Eye contact*:** A significant partner effect was revealed for looking at friend's face suggesting when the actor's age increased their partner looks directly at their face less. This relationship is based on the use of reflection due to negative skewness. The actual relationship is in brackets. The concurrent correlation between the actor and partner's eye contact behaviour for self, face and non-face was significant suggesting their friends were similar in this behaviour (see table D1). ***Interest: Significant positive partner effects were found for head nods and 'uh huhs' suggesting as the actor's age increased their partner nodded their head more and verbalised more 'uh huh' behaviour. The concurrent correlation between the actor and partner's head nod behaviour was significant suggesting similarity in this particular behaviour (See table D2). ***Talking:*** A significant negative actor effect was revealed for gossip suggesting as age increased women gossiped less. A significant positive partner effect was revealed for laughing suggesting as the actor's age increased their partner laughed more. A significant negative partner effect was revealed for self-disclosure one indicating as the actor's age increased the partner disclosed less public information. Finally a significant actor effect was revealed for self-disclosure three suggesting as age increased women disclosed less private information. The concurrent correlation between these behaviour categories were significant suggesting similarity in the friends behaviour (see table D3). ***Interruptions:*** A significant positive partner effect was revealed for successful interruptions and a negative partner effect was revealed for unsuccessful interruptions. As age increased in the actor, their partner successfully interrupted more and had fewer unsuccessful interruptions (see table D4). ***Stonewalling:*** A significant positive actor effect was revealed for active away behaviour suggesting that as age increased women

engaged in more active away behaviour (see table D5). Additionally a significant negative partner effect was shown for active away behaviour showing that as age increased in the actor their partner engaged less in this type of behaviour. No other significant actor or partners effects were found.

Table D1 *Standardised Estimates from APIM of Age and Eye Contact for all dyads five minute observation* (*N* = 55 dyads)

	Actor	Partner	C2
Face	-.03(.03) (p = .721)	.23**(-.23**) (p = .004)	.57***
Non-Face[3]	.08 (p = .289)	.09 (p = .237)	.31** (p = .002)
Self[2]	.07(p = .384)	-.13 (p = .104)	31** (p = .002)
Environment[2]	-.01 (p = .909)	-.14 (p = .094)	.11 (p = .259)

*** Significant at .001 level
** Significant at the 0.01 level
* Significant at the .05 level

[2]Log10 transformation
[3]Inverse transformation

Notes: c1 = .65*** (p < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own behaviour; partner = influence of one participant's age on their friend's behaviour; c2 = concurrent correlation between the actor and partner's eye contact behaviour.

Table D2 *Standardised Estimates from APIM of Age and Interest for all dyads five minute observation (N = 55 dyads)*

	Actor	Partner	C2
Head nods[1]	.13 (*p* = .097)	.22**(*p* = .005)	.20* (*p* = .042)
Uh huhs[1]	-.15 (*p* = .073)	.26**(*p* = .002)	.12 (*p* = .202)
Leaning forward[3]	-.02 (*p* = .788)	.12 (*p* = .156)	.18 (*p* = .069)
Elaboration question[1]	-.12(*p* = .127)	-.004 (*p* = .964)	.19 (*p* = .053)
Open ended question[1]	-.10 (*p* = .247)	.07 (*p* = .389)	.14 (*p* = .145)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation
[3]Inverse transformation

Notes: c1 = .65*** (*p* < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own behaviour; partner = influence of one participant's age on their friend's behaviour; c2 = concurrent correlation between the actor and partner's interest behaviour.

Table D3 *Standardised Estimates from APIM of Age and Talking for all dyads five minute observation (N = 55 dyads)*

	Actor	Partner	C2
Not talking	-12 (p = .242)	-.03 (p = .749)	-.54***
General[1]	.18 (p = .020)	-.04 (p = .601)	.30** (p = .003)
Friend[3]	-.11 (p = .180)	.08 (p = .890)	.19 (p = .058)
Gossip[2]	-.18*(p = .010)	-.004 (p = .948)	.59***
Laughing	-.07 (p = .266)	.19** (p = .004)	.65***
Self-disclosure one[2]	-.07 (p = .333)	-.20**(p = .003)	.57***
Self-disclosure two[3]	-.07 (p = .289)	-.12 (p = .076)	.57***
Self-disclosure three[3]	-.18 ** (p = .005)	.08 (p = .213)	.66***

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation
[2]Log10 transformation
[3]Inverse transformation

Notes: c1 = .65*** (p < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own behaviour; partner = influence of one participant's age on their friend's behaviour; c2 = concurrent correlation between the actor and partner's talking behaviour.

Table D4 *Standardised Estimates from APIM of Age and Interruptions (Domineering) for all dyads (N = 55 dyads) five minute observation*

	Actor	Partner	C2
Successful interruption[3]	-.11 (p = .186)	.23** (p = .004)	.22* (p = .024)
Unsuccessful interruption[3]	.11 (p = .209)	-.23** (p = .008)	.03 (p = .721)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[3]Inverse transformation

Notes: c1 = .65*** (p < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own behaviour; partner = influence of one participant's age on their friend's behaviour; c2 = concurrent correlation between the actor and partner's interruptions.

Table D5 *Standardised Estimates from APIM of Age and Stonewalling for all dyads (N = 55 dyads) five minute observation*

	Actor	Partner	C2
No back channels[1]	-.08 (p = .392)	-.10 (p = .925)	-.11 (p = .256)
Active away behaviour[1]	.34***	-.24**(p = .006)	-.07 (p = .495)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation

Notes: c1 = .65*** (p < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own behaviour; partner = influence of one participant's age on their friend's behaviour; c2 = concurrent correlation between the actor and partner's stonewalling behaviour.

Table D6 *Standardised Estimates from APIM of Age and Pouting for all dyads five minute observation (N = 55 dyads)*

	Actor	Partner	C2
Pouting[1]	-.05 (p = .576)	-.10 (p = .275)	-.10 (p = .289)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation

Notes: c1 = .65*** ($p < .001$) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own behaviour; partner = influence of one participant's age on their friend's behaviour; c2 = concurrent correlation between the actor and partner's pouting behaviour.

Appendix 3E

Actor-Partner Interdependence Models for Age and Observed Behaviour for all dyads 15 minute observation *(N* = 54)

Eye contact*:** A significant positive actor effect was revealed for looking at friend's non-face indicating as age increased women looked at parts of their friend other than their face during the 15 minute interaction. In addition, a significant partner effect was revealed for looking at the environment, suggesting as age increased in the actor the partner looked at the environment less. Please note reflection was used for the data looking at friend's face before transformation therefore the actual relationship is in brackets (see table E1). ***Interest: Significant positive partner effects were found for head nods and 'uh huhs' showing as age increased in the actor their partner nodded their head and 'uh huhed' more. A significant negative partner effect was revealed for elaboration questions showing as age increased in the actor their partner asked less elaboration questions (see table E2). ***Talking:*** A significant positive actor effect was revealed for talking about their friend suggesting as age increased women talked about their friend more. A significant negative actor effect and a significant positive partner effect was found for laughing. This suggests as age increased women laughed less but as the actor's age increased their partner laughed more. A negative partner effect was revealed for self-disclosure one and self-disclosure four suggesting as age increased women disclosed less public information but also disclosed less very private information. Finally, significant actor and partner effects were revealed for self-disclosure three suggesting as age increased women self-disclosed more personal information and as the actor's age increased their partner also disclosed more personal information. The concurrent correlations between the actor and partner's talking behaviour were significant suggesting similarity in this behaviour (see table E3). No other significant actor or partner effects were revealed.

Table E1 *Standardised Estimates from APIM of Age and Eye Contact for all dyads fifteen minute observation (n = 54 dyads)*

	Actor	Partner	C2
Face[1] (Nb. Used reflection)	.09 (p = .263)	-.15 (p = .099)	.24* (p = .018)
Non-face[3]	.23** (p = .008)	-.08 (p = .337)	.06 (p = .522)
Self[3]	-.02 (p = .808)	.14 (p = .119)	.05 (p = .592)
Environment[1]	-.05 (p = .556)	-.20* (p = .021)	.09 (p = .360)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation
[3]Inverse transformation

Notes: c1 = .63*** (p < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own eye contact behaviour; partner = influence of one participant's age on their friend's eye contact behavior; c2 = concurrent correlation between the actor and partner's eye contact behaviour

Table E2 *Standardised Estimates from APIM of Age and Interest for all dyads fifteen minute observation(n = 54 dyads)*

	Actor	Partner	C2
Head nods [1]	.13 (p = .097)	.21** (p = .007)	.21* (p = .032)
Uh huhs[1]	.03 (p = .772)	.19* (p = .030)	.00 (p = .984)
Leaning forward[3]	.10 (p = .198)	-.09 (p = .228)	.48***
Elaboration[1]	.03 (p = .662)	-.18* (p = .012)	.55***
Open ended[1]	.06 (p = .526)	-.10 (p = .240)	.06 (p = .566)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation
[3]Inverse transformation

Notes: c1 = .63*** (p < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own interest behaviour; partner = influence of one participant's age on their friend's interest behaviour; c2 = concurrent correlation between the actor and partner's interest behavior.

Table E3 *Standardised Estimates from APIM of Age and Talking for all dyads fifteen minute observation (n = 54 dyads)*

	Actor	Partner	C2
Not talking	-.01 (*p* = .903)	-.11 (*p* = .263)	-.24* (*p* = .017)
General[1]	-.02 (*p* = .800)	-.09 (*p* = .213)	.53**
Friend[1]	.27 ***	-.11 (*p* = .161)	.29** (*p* = .004)
Gossip[2]	-.06 (*p* = .354)	-.06 (*p* = .386)	.74**
Laughing[1]	-.17* (*p* = .016)	.14* (*p* = .046)	.52***
Self-disclosure one[1]	-.148 (*p* = .043)	-.30 ***	.50***
Self-disclosure two[1]	-.03 (*p* = .740)	.07 (*p* = .390)	.30**(*p* = .003)
Self-disclosure three[2]	.23** (*p* = .001)	.20** (*p* = .005)	.43***
Self-disclosure four[3]	.10 (*p* = .127)	-.63 ***	.43***
Discussing questions 1-3[2]	.02 (*p* = .788)	.14(*p* = .060)	.44***
Age discussing question 4[2]	.07 (*p* = .333)	-.17 (*p* = .010)	.65***

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation
[2]Log10 transformation
[3]Inverse transformation

Notes: c1 = .63*** (*p* < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own talking behaviour; partner = influence of one participant's age on their friend's talking behaviour; c2 = concurrent correlation between the actor and partner's talking behaviour.

Table E4 *Standardised Estimates from APIM of Age and Interruptions (Domineering) for all dyads) fifteen minute observation (n = 54 dyads)*

	Actor	Partner	C2
Successful interruption[1]	-.11 (*p* = .168)	-.04 (*p* = .653)	.20* (*p* = .045)
Unsuccessful interruption[1]	-.09 (*p* = .289)	.13 (*p* = .141)	-.02 (*p* = .837)

*** Significant at the 0.001 level
** Significant at the 0.01 level
* Significant at the 0.05 level

[1]Square root transformation

Notes: c1 = .63*** (*p* < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own interruptions; partner = influence of one participant's age on their friend's interruptions; c2 = concurrent correlation between the actor and partner's interruption behaviour.

Table E5 *Standardised Estimates from APIM of Age and Stonewalling for all dyads fifteen minute observation (n = 54 dyads)*

	Actor	Partner	C2
No back channels[1]	-.07 (*p* = .399)	-.04 (*p* = .647)	.15 (*p* = .119)
Active away behaviour[1]	-.03 (*p* = .711)	-.13 (*p* = .125)	.11 (*p* = .266)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation

Notes: c1 = .63*** (*p* < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own stonewalling behaviour; partner = influence of one participant's age on their friend's stonewalling behaviour; c2 = concurrent correlation between the actor and partner's stonewalling behaviour.

Table E6 *Standardised Estimates from APIM of Age and Pouting for all dyads fifteen minute observation (n=54 dyads)*

	Actor	Partner	C2
Pouting[1]	-.16 (p = .067)	.11 (p = .202)	-.02 (p = .848)

*** Significant at the .001 level [1]Square root transformation
** Significant at the .01 level
* Significant at the .05 level

Notes: c1 = .63*** (p < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own pouting behaviour; partner = influence of one participant's age on their friend's pouting behaviour; c2 = concurrent correlation between the actor and partner's pouting behaviour.

Appendix 3F

Actor-Partner Interdependence Models for Age and Observed Behaviour for 5 Minutes for Friendship Dyads with a Friendship Length of 12 Months and Below (*n* = 36 dyads)

Eye contact*:** Significant partner effects were revealed for looking at friend's face and friend's non-face suggesting as age increased in the actor their partner looked more both at their friend's face and friend's non-face. The concurrent correlation between this behaviour for the actor and partner was significant suggesting similarity in this behaviour (see table F1). ***Interest: Positive actor and partner effects were revealed for head nods and a positive partner effect was found for 'uh huhs'. This suggests that as age increased women displayed more head nods and as age increased in the actor their partner demonstrated more head nods and 'uh huhs'. The concurrent correlation between 'uh huhs' for the actor and partner was significant suggesting similarity in this behaviour (see table F2). ***Talking:*** A significant positive partner effect was found for laughing, suggesting as age increased in the actor their partner laughed more. The concurrent correlation for laughing between the actor and partner was significant suggesting similarity in this behaviour (see table F3). ***Interruptions:*** A significant negative partner effect was revealed for successful interruptions suggesting as the actor's age increased their partner had fewer successful interruptions (see table F4). ***Stonewalling:*** A positive actor effect and negative partner effect were found for active away behaviour, suggesting as age increased in the actor they engaged in more active away behaviour and their partner engaged in less active away behaviour (see table F5). No other significant actor or partner effects were revealed.

Table F1 *Standardised Estimates from APIM of Age and Eye Contact*
For dyads with a friendship length of 12 months or under five minute observation (n=36 dyads)

	Actor	Partner	C2
Face	.06 (*p* = .473)	.25** (*p* = .003)	.29* (*p* = .018)
Non-face[3]	.12 (*p* = .158)	.19* (*p* = .033)	.31* (*p* = .012)
Self[1]	-.10 (*p* = .285)	-.21 (*p* = .019)	.17 (*p* = .153)
Environment	.00 (*p* = .996)	-.06 (*p* = .516)	.01 (*p* = .924)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation
[3]Inverse transformation

Notes: c1 = .54*** (*p* < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own eye contact behaviour; partner = influence of one participant's age on their friend's eye contact behaviour; c2 = concurrent correlation between the actor and partner's eye contact behaviour.

Table F2 *Standardised Estimates from APIM of Age and Interest*
for dyads with a friendship length of 12 months or under five minute observation(n = 36 dyads)

	Actor	Partner	C2
Head nods[1]	.18* (*p* = .044)	.27** (*p* = .003)	.06 (*p* = .611)
Uh huhs[1]	-.16 (*p* = .072)	.21* (*p* = .017)	.27* (*p* = .026)
Leaning forward[3]	-.06 (*p* = .564)	.10 (*p* = .299)	.17 (*p* = .151)
Elaboration[1]	-.08 (*p* = .377)	-.13 (*p* = .151)	.06 (*p* = .619)
Open ended[3]	.10 (*p* = .295)	-.02 (*p* = .857)	-.01 (*p* = .951)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation
[3]Inverse transformation

Notes: c1 = .54*** (*p* < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own interest behaviour; partner = influence of one participant's age on their friend's interest behaviour; c2 = concurrent correlation between the actor and partner's interest behaviour.

Table F3 *Standardised Estimates from APIM of Age and Talking for dyads with a friendship length of 12 months or under five minute observation (n = 36 dyads)*

	Actor	Partner	C2
Not talking	-.16 (*p* = .142)	-.07 (*p* = .515)	-.49***
General[1]	.17(*p* = .066)	.06 (*p* = .525)	.09 (*p* = .472)
Friend[3]	-.17 (*p* = .055)	-.01 (*p* = .881)	.23 (*p* = .063)
Gossip[1]	-.14 (*p* = .083)	-.06 (*p* = .450)	.50***
Laughing[1]	-.03 (p = .678)	.26** (*p* = .001)	.57***
Self-disclosure one[2]	-.11 (*p* = .164)	-.15(*p* = .045)	.63***
Self-disclosure two[3]	-.17 (*p* = .029)	-.13 (*p* = .106)	.56***
Self-disclosure three[3]	-.09 (*p* = .205)	.10 (*p* = .183)	.81***

*** Significant at the .001 level [1]Square root transformation
** Significant at the .01 level [3]Inverse transformation
* Significant at the .05 level

Notes: c1 = .54*** (*p* < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own talking behaviour; partner = influence of one participant's age on their friend's talking behaviour; c2 = concurrent correlation between the actor and partner's talking behaviour.

Table F4 *Standardised Estimates from APIM of Age and Interruptions (Domineering) for dyads with a friendship length of 12 months or under five minute observation (n=36 dyads)*

	Actor	Partner	C2
Successful interruption[2]	.02 (p = .855)	-.32***	.16 (p = .196)
Unsuccessful interruption[3]	.17 (p = .089)	-.14 (p = .164)	-.12 (p = .308)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[2]Log10 transformation
[3]Inverse transformation

Notes: c1 = .54*** (p < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own interruptions; partner = influence of one participant's age on their friend's interruptions; c2 = concurrent correlation between the actor and partner's interruptions.

Table F5 *Standardised Estimates from APIM of Age and Stonewalling for dyads with a friendship length of 12 months or under five minute observation (n = 36 dyads)*

	Actor	Partner	C2
No back channels[1]	-.10 (p = .331)	-.05 (p = .593)	-.09 (p = .444)
Active away behaviour[1]	.28** (p = .004)	-.23* (p = .018)	-.07 (p = .577)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation

Notes: c1 = .54*** (p < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own stonewalling behaviour; partner = influence of one participant's age on their friend's stonewalling behaviour; c2 = concurrent correlation between the actor and partner's stonewalling behaviour.

Table F6 *Standardised Estimates from APIM of Age and Pouting for dyads with a friendship length of 12 months or under (n=36 dyads) five minute observation*

	Actor	Partner	C2
Pouting [1]	-.002 (p = .987)	-.12 (p = .227)	.07 (p = .538)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation

Notes: c1 = .54*** (p < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own pouting behaviour; partner = influence of one participant's age on their friend's pouting behaviour; c2 = concurrent correlation between the actor and partner's pouting behaviour.

Appendix 3G

Age and Observed Behaviour for 15 Minutes for Friendship Dyads with a Friendship Length of 12 months and Below (*n* = 36 dyads)

Eye contact: A significant positive actor effect was revealed for looking at friend's non-face suggesting as age increased women looked more at their friend, but not directly at their face. A significant positive partner effect was found for looking at self and significant negative partner effect for looking at the environment. This showed that as the actor's age increased their partner looked more at their self and looked less at the environment. Please note that that the data for looking at friends face was negatively skewed, therefore reflection was used before transformation and the relationship is shown in brackets (see table G1). ***Interest:*** A significant negative partner effect was found for asking elaboration questions suggesting as the actor's age increased their partner asked less elaboration questions (see table G2). ***Talking:*** A significant positive actor effect was revealed for talking about their friend and a significant negative actor effect was found for laughing, suggesting as age increased women talked about their friend more and laughed less. A significant negative actor and partner effect were revealed for self-disclosure one and three. This suggests that as age increased women self-disclosed less at level one and three and as the actor's age increased their partner self-disclosed less at level one and level three. A significant negative partner effect was revealed for self-disclosure four suggesting as age increased in the actor their partner disclosed less private information. Finally, a significant positive actor and partner effect were found for discussing questions one to three (questions on friendship ideals and dynamics) suggesting as age increased women spent longer discussing friendship and what makes a good friend (see table G3). No other significant actor or partner effects were revealed.

Table G1 *Standardised Estimates from APIM of Age and Eye Contact for dyads with a friendship length of 12 months or under fifteen minute observation (n=36 dyads)*

	Actor	Partner	C2
Face[1] (Nb used refection prior to transformation)	-.01 (.01) (*p* = .920)	-.18 (*p* = .064)	.00 (*p* = .979)
Non-face[3]	.25** (*p* = .009)	.08 (*p* = .438)	-.06 (*p* = .617)
Self[3]	.14 (*p* = .146)	.21* (*p* = .025)	-.03 (*p* = .798)
Environment[1]	-.08 (*p* = .361)	-.21* (*p* = .020)	.01 (*p* = .919)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation
[3]Inverse transformation

Notes: c1 = .54*** ($p < .001$) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own eye contact behaviour; partner = influence of one participant's age on their friend's eye contact behaviour; c2 = concurrent correlation between the actor and partner's eye contact behaviour.

Table G2 *Standardised Estimates from APIM of Age and Interest for dyads with a friendship length of 12 months or under fifteen minute observation (n = 36 dyads)*

	Actor	Partner	C2
Head nods[1]	.15 (*p* = .098)	.23 (*p* = .009)	.12 (*p* = .304)
Uh huhs[1]	-.07 (*p* = .455)	.16 (*p* = .100)	.09 (*p* = .466)
Leaning forward[3]	.13 (*p* = .145)	-.12 (*p* = .158)	.40** (*p* = .002)
Elaboration[1]	-.03 (*p* = .674)	-.27 ***	.57***
Open ended[1]	.03 (*p* = .751)	-.07 (*p* = .538)	-.26* (*p* = .033)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation
[3]Inverse transformation

Notes: c1 = .54*** ($p < .001$) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own interest behaviour; partner = influence of one participant's age on their friend's interest behaviour; c2 = concurrent correlation between the actor and partner's interest behaviour.

Table G3 *Standardised Estimates from APIM of Age and Talking for dyads with a friendship length of 12 months or under (fifteen minute observation (n = 36 dyads)*

	Actor	Partner	C2
Not talking	-.07 (*p* = .526)	-.10 (*p* = .335)	-.22 (*p* = .075)
General	-.06 (*p* = .472)	-.06 (*p* = .509)	.33 (*p* = .009)
Friend[1]	.33***	-.04 (*p* = .684)	.11 (*p* = .375)
Gossip[1]	-.06 (*p* = .460)	-.11 (*p* = .145)	.73***
Laughing[1]	-.19* (*p* = .026)	.12 (*p* = .150)	.41 (*p* = .001)
Self-disclosure one[1]	-.24***	-.32***	.51***
Self-disclosure two[1]	-.02 (*p* = .797)	-.04 (*p* = .675)	.26* (*p* = .035)
Age self-disclosure three[3]	-.18* (*p* = .031)	-.20* (*p* = .017)	.30* (*p* = .015)
Self-disclosure four[3]	.07 (*p* = .323)	-.61***	.38 (*p* = .003)
Discussing questions 1-3[2]	.20* (*p* = .010)	.25** (*p* = .002)	.39 (*p* = .002)
Discussing question 4[2]	.14 (*p* = .094)	-.11 (*p* = .161)	.60***

*** Significant at the 0.001 level
** Significant at the 0.01 level
* Significant at the 0.05 level

[1]Square root transformation
[2]Log10 transformation
[3]Inverse transformation

Notes: c1 = .54*** (*p* < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own talking behaviour; partner = influence of one participant's age on their friend's talking behaviour; c2 = concurrent correlation between the actor and partner's talking behaviour.

Table G4 *Standardised Estimates from APIM of Age and Interruptions (Domineering) for dyads with a friendship length of 12 months or under fifteen minute observation (n = 36 dyads)*

	Actor	Partner	C2
Successful interruption[1]	-.13 (*p* = .148)	-.12 (*p* = .200)	.15 (*p* = .211)
Unsuccessful interruption[1]	-.18 (*p* = .074)	.05 (*p* = .599)	-.16 (*p* = .189)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation

Notes: c1 = .54*** (p < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own interruptions; partner = influence of one participant's age on their friend's interruptions; c2 = concurrent correlation between the actor and partner's interruptions.

Table G5 *Standardised Estimates from APIM of Age and Stonewalling for dyads with a friendship length of 12 months or under fifteen minute observation (n = 36 dyads)*

	Actor	Partner	C2
No back channels[1]	-.11 (*p* = .233)	-.10 (*p* = .314)	.14 (*p* = .232)
Active away behaviour [1]	-.03 (*p* = .739)	-.16 (*p* = .100)	.05 (*p* = .680)

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1]Square root transformation

Notes: c1 = .54*** (*p* < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own stonewalling behaviour; partner = influence of one participant's age on their friend's stonewalling behaviour; c2 = concurrent correlation between the actor and partner's stonewalling behaviour.

Table G6 *Standardised Estimates from APIM of Age and Pouting for dyads with a friendship length of 12 months or under fifteen minute observation (n = 36 dyads)*

	Actor	Partner	C2
Pouting [1]	-.08 (p = .400)	-.01 (p = .899)	.09 (p = .431)

*** Significant at the .001 level [1]Square root transformation
** Significant at the .01 level
* Significant at the .05 level

Notes: c1 = .54*** (p < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own pouting behaviour; partner = influence of one participant's age on their friend's pouting behaviour; c2 = concurrent correlation between the actor and partner's pouting behaviour.

Appendix 3H

Post Interaction Measures Skewness for all Dyads (*N* = 55 dyads)

The sample size is 110 (55 dyads) with a suggested acceptable skewness of -.391 to 0.391. As suggested by Tabachnick and Fidell (2001) square root transformations were conducted first, followed by log transformation and inverse transformations if the data were still not within the acceptable skewness range.

Table H1 *First post interaction scale skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Quality	-.777	-.595	.000
Disclosure	5.884	33.227	.000
Engagement	-.421	-.429	.000
Intimacy	10.480	109.884	.000

Table H2 *First post interaction scale transformations*

	Skewness	Kurtosis	Shapiro-Wilk
Quality			
Square root	.528	-.978	.000
Log10	.279	-1.212	.000
Inverse	.196	-1.306	.000
Disclosure			
Square root	5.758	32.273	.000
Log10	2.666	13.666	.000
Inverse	2.376	4.246	.000
Engagement			
Square root	-.157	-.300	.001
Log10	-.861	.643	.000
Inverse	2.226	4.456	.000
Intimacy			
Square root	9.879	101.557	.000
Log10	2.121	16.818	.000
Inverse	1.768	1.777	.000

Table H3 *Performance ratings skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Self view	-.516	-.639	.000
View of other	-1.133	1.984	.000
Others view	10.484	109.944	.000
Others self view	-.796	.286	.000

Table H4 *Performance ratings transformations*

	Skewness	Kurtosis	Shapiro-Wilk
Self view			
Square root	.166	-1.194	.000
Log10	-.207	-.439	.000
Inverse	.559	-1.526	.000
View of other			
Square root	.262	-1.040	.000
Log10	-.045	-1.475	.000
Inverse	.362	-1.720	.000
Others view			
Square root	.340	-.705	.000
Log10	-.068	-1.257	.000
Inverse	.527	-1.459	.000
Others self view			
Square root	.273	-.801	.000
Log10	-.126	-1.277	.000
Inverse	.577	-1.411	.000

Appendix 3I

Actor-Partner Interdependence Models for Age and Quality and Engagement for whole Sample (*N* = 55 dyads)

A significant negative actor effect was revealed for engagement suggesting as age increased women reported engaging less in the interaction. (N.B. refection was used on this variable before transformation therefore the relationship is negative). The correlations between each friend's quality and engagement rating were significant suggesting they were similar in their reporting of these two interaction qualities (see table I1).

Table I1 Standardised Estimates from APIM of Age and Quality and Engagement ratings for all dyads (N = 55 dyads)

	Actor	Partner	C2
Quality[2]	.11 (-.11) (p = .065)	-.02 (.02) (p = .719)	.67***
Engagement[1]	.24 (-.24)** (p = .001)	-.01 (.01) (p = .897)	.41***

*** Significant at the 0.001 level
** Significant at the 0.01 level
* Significant at the 0.05 level

[1] Square root transformation
[2] Log 10 Transformations

Notes: c1 = .65*** (p < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own interaction quality an engagement; partner = influence of one participant's age on their friend's interaction quality and engagement; c2 = concurrent correlation between the actor and partner's interaction quality and engagement rating.

Appendix 3J

Actor-Partner Interdependence Models for Age and Performance ratings for Complete Sample (*N* = 55 dyads)

No significant actor or partner effects were revealed for age and performance ratings. The correlations were significant for the friend's ratings suggesting the friends were similar in the scores they reported for the performance ratings.

Table J1 *Standardised Estimates from APIM of Age and Performance ratings for all dyads (n = 55)*

	Actor	Partner	C2
Self view[1]	.01(.01) (*p* = .939)	.09 (-.09) (*p* = .282)	.22* (*p* = .025)
View of other[1]	.06 (-.07) (*p* = .417)	-.06 (.09) (*p* = .403)	.42***
Others view	.13 (*p* = .070)	-.02 (*p* = .809)	.46***
Others self view[1]	.12 (-.12) (*p* = .102)	.06 (-.06) (*p* = .401)	.45***

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1] Square root transformation

Notes: c1 = .65*** (*p* < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their performance ratings; partner = influence of one participant's age on their friend's performance ratings; c2 = concurrent correlation between the actor and partner's performance ratings.

Appendix 3K

Friendship Functions Skewness for all Dyads (*N* = 55 dyads)

Friendship functions skewness sample size of 110 (55 dyads). The suggested acceptable skewness is -.391 to .391. As suggested by Tabachnick and Fidell (2001) square root transformations were conducted first, followed by log transformation and inverse transformations if the data were still not within the acceptable skewness range.

Table K1 *Friendship Functions skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Companionship	-.769	4.056	.000
Help	-1.501	3.049	.000
Intimacy	-1.582	2.530	.000
Reliable Alliance	-1.375	1.479	.000
Self-Validation	-1.385	2.045	.000
Emotional Security	-1.273	1.709	.000

Table K2 *Friendship Functions transformations*

	Skewness	Kurtosis	Shapiro-Wilk
Companionship			
Square root	.783	-.027	.000
Log 10	.122	-1.302	.000
Inverse	.540	-1.471	.000
Help			
Square root	.490	-.312	.000
Log 10	-.262	-1.115	.000
Inverse	1.043	-.622	.000
Intimacy			
Square root	.776	-.327	.000
Log 10	.169	-1.389	.000
Inverse	.426	-1.650	.000
Reliable Alliance			
Square root	.637	-.575	.000
Log 10	.059	1.387	.000
Inverse	.547	-1.510	.000
Self-Validation			
Square root	.544	-.545	.000
Log10	-.161	-1.186	.000
Inverse	1.070	-.466	.000
Emotional Security			
Square root	.428	-.556	.000
Log 10	-.284	-1.659	.000
Inverse	1.180	-.217	.000

Appendix 3L

Actor-Partner Interdependence Models for Age and Friendship Functions for whole sample (*N = 55* dyads)

Please note that due to severe negative skewness reflection was performed before transformations, therefore the actual relationships are shown in brackets in the table. A significant positive partner effect was revealed for age and emotional security. This suggest that as the actor's age increased their partner perceived them as providing more emotional security. No other significant actor or partner effects were revealed. The C2 correlations were significant suggesting friends were similar to each other in the friendship functions ratings they reported (see table L1).

Table L1 *Standardised Estimates from APIM of Age and Friendship Functions ratings for all dyads (N = 55 dyads)*

	Actor	Partner	C2
Companionship[2]	.01 (-.01) (*p* = .882)	.05 (-.05) (*p* = .408)	.66***
Help[1]	.00 (*p* = .991)	.102 (-.102) (*p* = .147)	.47***
Intimacy[2]	-.02 (.02) (*p* = .814)	-.03(.03) (*p* = .657)	.51***
Reliable Alliance[2]	.01 (-.01) (*p* = .926)	-.01 (.01) (*p* = .917)	.57***
Self-validation[2]	.01(-.01) (*p* = .926)	-.01 (-.02) (*p* = .917)	.65***
Emotional Security[1]	.09 (-.09) (*p* = .215)	-.18 (.18)* (*p* = .012)	.62***

*** Significant at the .001 level
** Significant at the .01 level
* Significant at the .05 level

[1] Square root transformation [2] Log 10 Transformations

Notes: c1 = .63*** (*p* < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own friendship functions rating; partner = influence of one participant's age on their friend's friendship functions rating; c2 = concurrent correlation between the actor and partner's friendship functions ratings.

Appendix 3M

Actor-Partner Interdependence Models for Age and Post-Interaction measures for dyads with a Friendship Length of 12 Months and Under (*n* = 36 dyads)

A significant negative actor effect was revealed for age and engagement suggesting as age increased women reported they engaged less in the interaction. No other significant actor or partner effects were revealed. The C2 correlations were significant suggesting that friends were similar in reporting the quality and engagement in the interaction (see table M1).

Table M1 *Standardised Estimates from APIM of Age and Quality and Engagement ratings for dyads with a friendship length of 12 months and below (n = 36 dyads)*

	Actor	Partner	C2
Quality[2]	.11 (-.11) (*p* = .160)	-.01 (.01) (*p* = .890)	.69***
Engagement[1]	.20* (-.20) (*p* = .028)	-.05 (.05) (*p* = .545)	.30** (*p* = .015)

*** Significant at the 0.001 level
** Significant at the 0.01 level
* Significant at the 0.05 level

[1] Square root transformation
[2] Log 10 Transformations

Notes: c1 = .54*** (*p* < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own interaction quality an engagement; partner = influence of one participant's age on their friend's interaction quality and engagement; c2 = concurrent correlation between the actor and partner's interaction quality and engagement rating.

Appendix 3N

Post-interaction Skewness 12 Months and Under (*n* = 36 dyads)

Sample size is 72 (36 dyads), suggested acceptable skewness for this sample size is -.462 to .462. As suggested by Tabachnick and Fidell (2001) square root transformations were conducted first, followed by log transformation and inverse transformations if the data were still not within the acceptable skewness range.

Table N1 *First post interaction subscales skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Quality	-.727	-.722	.000
Disclosure	4.4684	20.517	.000
Engagement	-.487	-.254	.002
Intimacy	8.481	71.947	.000

Table N2 *First post interaction subscales transformations*

	Skewness	Kurtosis	Shapiro-Wilk
Quality			
Square root	.491	-1.093	.000
Log10	.262	-1.316	.000
Inverse	.166	-1.389	.000
Disclosure			
Square root	4.610	20.068	.000
Log10	2.498	9.899	.000
Inverse	2.096	2.830	.000
Engagement			
Square root	-.118	-.152	.012
Log10	-.864	.873	.000
Inverse	2.338	5.319	.000
Intimacy			
Square root	8.148	68.184	.000
Log10	2.630	17.525	.000
Inverse	1.839	2.272	.000

Table N3 *Performance ratings skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Self view	-.398	-.709	.000
View of other	-1.192	2.927	.000
Others view	8.483	71.978	.000
Others self view	-.618	-.223	.000

Table N4 *Performance ratings transformations*

	Skewness	Kurtosis	Shapiro-Wilk
Self view			
Square root	-.025	-1.186	.000
Log10	-.338	-1.369	.000
Inverse	.681	-1.386	.000
View of other			
Square root	.037	-1.147	.000
Log10	-.254	-1.415	.000
Inverse	.581	-1.489	.000
Others view			
Square root	.101	-1.079	.000
Log10	-.245	-1.255	.000
Inverse	.703	-1.204	.000
Others self view			
Square root	.147	-.957	.000
Log10	-.221	-1.269	.000
Inverse	.660	-1.305	.000

Appendix 3O

Actor-Partner Interdependence Models for Age and Performance ratings for Dyads with a Friendship Length of 12 Months and Under (*n* = 36 dyads)

No significant actor or partner effects were revealed for any of the four performance ratings. Please note as reflection was used before transformations were conducted the correct relationships for self view, view of other, and others self view are shown in brackets in table 1N. The C2 correlations were significant suggesting friends were similar to each other in the performance ratings they provided (see table O1).

Table O1 *Standardised Estimates from APIM of Age and Performance Ratings for dyads with a friendship length of 12 months and below (n = 36 dyads)*

	Actor	Partner	C2
Self view[1]	.04 (-.04) (*p* = .617)	.12 (-.12) (*p* = .165)	.32* (*p* = .010)
View of other[1]	.11 (-.11) (*p* =. 194)	-.02 (.02) (*p* = .810)	.34** (*p* = .007)
Others view	.17 (*p* = .052)	-.001 (*p* = .991)	.37** (*p* = .004)
Others self view[1]	.05 (-.05) (*p* = .592)	(.08) (-.08) (*p* = .336)	.39** (*p* = .002)

*** Significant at the 0.001 level
** Significant at the 0.01 level
* Significant at the 0.05 level

[1] Square root transformation

Notes: c1 = .54*** (*p* < .001) concurrent correlation between participant 1's age and participants 2's age; actor = influence of participant's own age on their own performance ratings; partner = influence of one participant's age on their partners performance ratings; c2 = concurrent correlation between the actor and partner's interaction performance ratings.

Appendix 3P

Friendship Functions skewness for Dyads with a Friendship Length of 12 Months and Under (*n* = 36 dyads)

The sample size is 72 (36 dyads) with a suggested acceptable skewness of -.462 to .462. As suggested by Tabachnick and Fidell (2001) square root transformations were conducted first, followed by log transformation and inverse transformations if the data were still not within the acceptable skewness range.

Table P1 *Friendship functions skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Companionship	-1.579	3.385	.000
Help	-1.374	2.633	.000
Intimacy	-1.320	1.657	.000
Reliable Alliance	-.960	.302	.000
Self-Validation	-1.390	2.256	.000
Emotional Security	-1.251	2.312	.000

Table P2 *Friendship Functions transformations*

	Skewness	Kurtosis	Shapiro-Wilk
Companionship			
Square root	.608	-.302	.000
Log 10	-.059	-1.301	.000
Inverse	.779	-1.118	.000
Help			
Square root	.369	-.451	.002
Intimacy			
Square root	.530	-.729	.000
Log 10	-.044	-1.500	.000
Reliable Alliance			
Square root	.310	-.949	.001
Self-Validation			
Square root	.434	-.407	.007
Log10	-.384	-.923	.001
Emotional Security			
Square root	.245	-.419	.006

Appendix 3Q

Actor-Partner Interdependence Models for Age and Friendship Functions for Dyads with a Friendship Length of 12 Months and Under (*n* = 36 dyads)

Please note, as reflection was performed on this data (due to severe negative skewness) all relationships are interpreted in the opposite direction. These relationships can be seen in the brackets in table Q1. A significant negative actor effect was revealed for age and reliable alliance and self-validation. This suggested that as women's age increased they reported their friend as being less of a reliable ally and providing less self-validation. In addition, a significant positive partner effect was revealed for self-validation. This suggested as the actor's age increased their partner reported them as providing more self-validation. No other significant actor or partner effects were found. The C2 correlations were significant suggesting that friends were similar in their friendship functions ratings.

Table Q1 *Standardised Estimates from APIM of age and friendship functions ratings for for dyads with a friendship length of 12 months and under (n = 36 dyads)*

	Actor	Partner	C2
Companionship[2]	.07 (-.07) (p = .346)	.10 (p = .218)	.63***
Help[1]	.01 (-.01) (p = .889)	.12 (p = .148)	.47***
Intimacy[2]	.07 (-.07) (p = .391)	-.12 (.12) (p = .137)	.59***
Reliable Alliance[1]	.17* (-.17) (p = .039)	-.08 (.08) (p = .318)	.47***
Self-validation[1]	.16* (-.16) (p = .044)	-.17* (.17) (p = .034)	.63***
Emotional Security[1]	.13 (-.13) (p = .104)	-.21 (.21) (p = .009)	.54***

*** Significant at the .001 level
** Significant at the .01 level [1] Square root transformation
* Significant at the .05 level [2] Log 10 Transformation

Notes: c1 = .54*** (p < .001) concurrent correlation between participant 1's Machiavellianism score and participants 2's age; actor = influence of participant's own age on their own friendship functions rating; partner = influence of one participant's age on their friend's friendship functions rating; c2 = concurrent correlation between the actor and partner's friendship functions ratings.

Appendix 3R

Behaviour Skewness Five Minutes 12 Months and Under (*n* = 36 dyads)

The sample size is 72 (36 dyads) with a suggested acceptable skewness of -.462 to .462. As suggested by Tabachnick and Fidell (2001) square root transformations were conducted first, followed by log transformation and inverse transformations if the data were still not within the acceptable skewness range.

Table R1 *Eye contact skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Face	-.130	-.364	.377
Non-face	1.851	3.410	.000
Self	1.372	1.317	.000
Environment	.139	.559	.663

Table R2 *Eye contact transformations*

	Skewness	Kurtosis	Shapiro-Wilk
Non face			
Square root	.719	-.465	.000
Log 10	.829	-.570	.000
Inverse	-.281	-1.501	.000
Self			
Square root	.312	-.755	.007

Table R3 *Interest skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Head nods	.916	.495	.000
Uh Huhs	2.631	8.563	.000
Leaning forward	3.226	11.307	.000
Elaboration question	1.384	1.163	.000
Open-ended question	6.623	49.832	.000

Table R4 *Interest skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Head nods			
Square root	-.077	-.106	.405
Uh huhs			
Square root	.912	.168	.000
Log 10	1.652	2.548	.000
Inverse	-1.055	0.167	.000
Leaning forward			
Square root	1.533	2.163	.000
Log 10	1.398	1.195	.000
Inverse	-.531	-1.296	.000
Elaboration question	.311	-.080	.044
Square root			
Open ended question	2.916	10.788	.000
Square root	4.289	23.746	.000
Log 10	-2.669	8.204	.000
Inverse			

Table R5 *Talking skewness*

	Skewness	Kurtosis	Shapiro -Wilk
Not talking	.105	-.681	.598
General	.809	-.045	.001
Friend	3.086	10.470	.000
Gossip	1.287	.874	.000
Laughing	1.697	3.690	.000
Self-disclosure one	2.211	5.886	.000
Self-disclosure two	2.142	4.933	.000
Self-disclosure three	5.866	34.112	.000

Table R6 *Talking transformations*

	Skewness	Kurtosis	Shapiro-Wilk
General			
Square root	.336	-.543	.218
Friend			
Square root	1.309	1.400	.000
Log 10	1.574	2.029	.000
Inverse	-.736	-.824	.000
Gossip			
Square root	.288	-.918	.001
Laughing			
Square root	.280	.796	.207
Self-disclosure one			
Square root	.537	.020	.001
Log10	.240	-.802	.000
Inverse	.706	-1.089	.000
Self-disclosure two			
Square root	.948	-.276	.000
Log 10	1.004	-.268	.000
Inverse	-.536	-1.507	.000
Self-disclosure three	5.636	25.983	.000
Square root	4.893	-.268	.000
Log 10	-3.703	13.089	.000
Inverse			

Table R7 *Stonewalling skewness*

	Skewness	Kurtosis	Shapiro-Wilk
No back channels	2.930	8.803	.000
Active away behaviour	3.203	10.140	.000

Table R8 *Stonewalling transformations*

	Skewness	Kurtosis	Shapiro-Wilk
No back channels			
Square root	2.033	2.858	.000
Log 10	2.657	5.322	.000
Inverse	-2.428	6.871	.000
Active away behaviour			
Square root	2.683	5.745	.000
Log 10	3.053	8.843	.000
Inverse	-2.929	7.790	.000

Table R9 *Interruptions skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Successful interruptions	.557	-.068	.000
Unsuccessful interruptions	2.048	4.368	.000

Table R10 *Interruptions transformations*

	Skewness	Kurtosis	Shapiro-Wilk
Successful interruptions			
Square root	-.421	-1.149	.000
Log10	.163	-.885	.000
Inverse	.133	-1.211	.000
Unsuccessful interruptions			
Square root	.920	-.501	.000
Log 10	1.130	.246	.000
Inverse	-.713	-1.228	.000

Table R11 *Pouting skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Pouting	2.111	4.706	.000

Table R12 *Pouting transformations*

	Skewness	Kurtosis	Shapiro-Wilk
Pouting			
Square root	1.081	-.203	.000
Log 10	1.718	2.447	.000
Inverse	-1.432	1.065	.000

Appendix 3S

Skewness for Observed Behaviour 15 Minutes 12 Months and Under (*n* = 36 dyads)

Please note the sample size is 72 (36 dyads) and the acceptable skewness range is -.462 to .462 (Doane & Seward, 2011). As suggested by Tabachnick and Fidell (2001) square root transformations were conducted first, followed by log transformation and inverse transformations if the data were still not within the acceptable skewness range.

Table S1 *Eye contact skewness 15 mins*

	Skewness	Kurtosis	Shapiro-Wilk
Face	-.567	.123	.052
Non-face	3.055	10.731	.000
Self	1.916	3.016	.000
Environment	1.219	2.827	.001

Table S2 *Eye contact transformations*

	Skewness	Kurtosis	Shapiro-Wilk
Face			
Square root	-.178	.168	.573
Non face			
Square root	1.218	1.484	.000
Log 10	1.528	1.998	.000
Inverse	-.695	-.733	.000
Self			
Square root	.899	.148	.000
Log 10	.861	-.255	.000
Inverse	.015	-1.225	.002
Environment			
Square root	.091	.730	.738

Table S3 *Interest skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Head nods	.797	.003	.001
Uh huhs	1.435	1.116	.000
Leaning forward	2.489	6.363	.000
Elaboration question	.741	0.328	.006
Open-ended question	1.382	1.549	.000

Table S4 *Interest transformations*

	Skewness	Kurtosis	Shapiro-Wilk
Head Nods			
Square root	-.121	-.633	.561
Uh Huhs			
Square root	.452	-.658	.001
Leaning forward			
Square root	1.243	.846	.000
Log 10	1.147	.163	.000
Inverse	-.377	-1.377	.000
Elaboration			
Square root	-.076	-.442	.452
Open ended			
Square root	.156	-.966	.000

Table S5 *Talking skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Not talking	-.126	-.782	.091
General	.319	-.889	.023
Friend	1.860	4.237	.000
Gossip	1.742	3.398	.000
Laughing	1.157	1.874	.000
Self-disclosure one	1.616	3.597	.000
Self-disclosure two	2.131	7.785	.000
Self-disclosure three	2.444	8.564	.000
Self-disclosure four	4.771	23.433	.000
Discussing question one-three	2.777	10.333	.000
Discussing question four	2.213	5.320	.000

Table S6 *Talking transformations*

	Skewness	Kurtosis	Shapiro-Wilk
Friend			
Square root	.458	.171	.149
Gossip			
Square root	.308	-.240	.052
Laughing			
Square root	.004	.390	.957
Self-disclosure one			
Square root	.132	.016	.300
Self-disclosure two			
Square root	.585	1.634	.031
Log10	.669	.650	.015
Inverse	2.875	10.111	.000
Self-disclosure three	.499	-.189	.000
Square root	.496	-.671	.000
Log 10	.239	-1.520	.000
Inverse			
Self-disclosure four			
Square root	3.926	14.976	.000
Log 10	4.033	15.733	.000
Inverse	-3.599	11.808	.000
Discussing question one to three			
Square root	1.292	2.591	.000
Log 10	-.044	.108	.907
Discussing question four			
Square root	.969	1.031	.062
Log10	.503	-.219	.089
Inverse	.809	.149	.002

Table S7 *Interruptions skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Successful interruption	1.021	.287	.000
Unsuccessful interruption	1.850	3.984	.000

Table S8 *Interruptions transformations*

	Skewness	Kurtosis	Shapiro-Wilk
Successful interruption			
Square root	-.113	-.778	.001
Unsuccessful interruption			
Square root	.498	-.902	.000
Log 10	1.572	2.609	.000
Inverse	-1.332	1.543	.000

Table S9 *Stonewalling skewness*

	Skewness	Kurtosis	Shapiro-Wilk
No back channels	2.046	4.896	.000
Active away behaviour	4.570	24.431	.000

Table S10 *Stonewalling transformations*

	Skewness	Kurtosis	Shapiro-Wilk
No back channels			
Square root	.843	-.576	.000
Log 10	1.779	3.282	.000
Inverse	-1.561	2.095	.000
Active away behaviour			
Square root	2.613	6.839	.000
Log 10	4.057	18.927	.000
Inverse	-3.635	14.700	.000

Table S11 *Pouting skewness*

	Skewness	Kurtosis	Shapiro-Wilk
Pouting	1.975	3.646	.000

Table S12 *Pouting transformations*

	Skewness	Kurtosis	Shapiro-Wilk
Pouting			
Square root	.683	-.516	.000
Log10	1.680	2.436	.000
Inverse	-1.404	1.416	.000

Appendix 4A

8th November 2006

Pamela Qualter
Psychology Department
University of Central Lancashire

Dear Pam,

Psychology Department Ethics Committee
Unique Reference Number: **PSY0607024**

The Psychology Department Ethics Committee has approved your application 'Social engagement, emotional intelligence and loneliness among school-children: Phase I and 2'. Good luck with the study.

Yours sincerely

Mike Eslea
Chair
Psychology Department Ethics Committee

Appendix 4B

Observed Playground Behaviour skewness

Observed playground behaviour skewness for girls with a sample size of 17. Doanne and Seward (2011) do not have values for acceptable skewness value for under 25 but suggest that for a sample size of 25, the acceptable skewness is -.726 to .726.

Table B1 Skewness values for all observed behaviour variables

	Skewness	Kurtosis	Shapiro-Wilk
Target-initiated acceptance	.665	.081	.078
Target-initiated rejection	1.153	.229	.007
Other-initiated acceptance	2.290	4.377	.000
other-initiated rejection	1.744	2.435	.000
Direct aggression	2.570	7.317	.000
Indirect aggression	3.748	14.790	.000
Social Monitoring	-1.055	1.206	.241

Transformations

The data were largely skewed and non-normal transformations were conducted. Although the Shapiro-Wilk test has been reported here to test for normality caution is also being shown as there is evidence suggesting it has low statistical power with smaller samples (Saculinggan & Balase, 2013). As suggested by Tabachnick and Fidell (2001) square root transformations were conducted first, followed by log transformation and inverse transformations if the data were still not within the acceptable skewness range.

Table B2 *Transformations for observed behaviour variables*

	Skewness	Kurtosis	Shapiro-Wilk
Target Initiated acceptance			
Square root	-.034	.332	.266
Target-initiated rejection			
Square root	1.007	-.132	.015
Log 10	.860	-.458	.029
Inverse	-.578	-.978	.086
Other-initiated acceptance			
Square root	1.438	2.296	.006
Log 10	-1.173	3.719	.028
Inverse	4.072	16.699	.000
Other-initiated rejection			
Square root	.812	.007	.107
Log 10	-.610	-.112	.483
Inverse	3.322	11.603	.000
Direct aggression			
Square root	2.009	4.402	.001
Log10	1.439	2.009	.015
Inverse	-.460	-.455	.464
Indirect aggression			
Square root	3.317	12.312	.000
Log 10	2.649	8.680	.000
Inverse	-1.142	1.890	.108
Social Monitoring			
Square root	-1.508	2.789	.033
Log 10	-2.013	4.972	.003
Inverse	2.997	10.168	.000