Dark Side of Leadership: Effects of Supervisor Dark Triad Personalities and Person-Supervisor Fit on Employee Work-Related Attitudes

Master Thesis

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Abstract

Twenty years ago, three socially aversive personalities were combined to form the Dark Triad: Narcissism, Machiavellianism, and Psychopathy. At first, they were considered generally undesirable. Regarding performance and leadership, subsequent research has painted a more nuanced picture and found that some levels of Dark Triad personalities could be desirable under certain circumstances. The current study first tested whether this also applied to supervisors when assessed by their employees. The Dark Triad was integrated into the Job Demands-Resources model, proposing curvilinear relationships between each of the supervisors' Dark Triad (Narcissism, Machiavellianism, and Psychopathy) and their employees' work-related outcomes (Work Engagement, Burnout, and Turnover Intention): dealing with low and high levels of Dark Triad would be stressful for employees (job demand), but medium levels could be beneficial (job resource). The hierarchical regression analyses did not show any of the proposed curvilinear relationships. In fact, they were more in line with the pre-existing notion of undesirable, linear relations. However, the relationship between employees and supervisors does not solely depend on the supervisor. Therefore, the concept of Person-Supervisor fit was also explored. Correlation analyses of incongruences and polynomial regressions (for Dark Triad and HEXACO personalities) revealed that personality similarity between employees and supervisors was linked to more desirable outcomes than dissimilarity. Therefore, the results indicate that "birds of a feather may actually flock together."

Dark Side of Leadership: Effects of Supervisor Dark Triad Personalities and Person-Supervisor Fit on Employee Work-Related Attitudes

"Leadership is one of the most important topics in the human sciences and historically one of the more poorly understood."
(Hogan & Kaiser, 2005).

As leadership plays a crucial role in the success of teams and organizations, the need to accurately explain and predict leadership outcomes is essential (Northouse, 2016). For a while now, researchers and practitioners have been looking at the personality traits of leaders to address the complex issue of leadership performance. Countless academic papers have been published on what makes a good leader, and the body of non-academic literature, consisting of actual leaders' opinions and writings, is just as immense (Hogan & Kaiser, 2005). However, some eye-opening numbers have been published highlighting the importance of not only trying to predict positive leadership outcomes but also the negative ones. In their published survey, Hogan Assessments (2013) report that more than 60% of people currently in a leadership position will fail and that the average respondent would be willing to work for fewer than half of their former bosses. Hogan and colleagues' (2011) numbers look similar, reporting that about 75% of working adults find that the most stressful aspect of their job is their immediate boss. Their chapter on management derailment also summarizes published estimates of the base rate of managerial failure at an average of approximately 50%. Research on management derailment is not only crucial for moral reasons but also economic ones: Hogan et al. (2011) estimate the average cost of a derailed senior manager or executive at about one million dollars, not including golden parachutes, lost intellectual and social capital, missed business objectives and disengaged employees.

What may be the cause of these numbers? Traditionally, personality traits within the frameworks of the Big Five or the HEXACO have generally been considered socially desirable ("bright side") and therefore been used to explain positive leadership outcomes. At the same time, "dark side" personality traits have been related to adverse outcomes. However, subsequent research has shown that the picture may not be as black and white (Smith et al., 2018). These "dark side" personality traits in leaders' personalities and their relationship with work-related follower outcomes will be the focus of the first part of this research paper. The second part will explore whether certain combinations of leader-follower personality traits (their "fit") relate differently to those same follower outcomes, as well as the perceived quality of the working relationship between them.

The Dark Triad of Personality

A well-accepted framework for the purpose of predicting leadership performance with personality traits has been the Big Five or Five-Factor Model (FFM) of personality (Do & Minbashian, 2014). It consists of five distinct personality traits: Agreeableness, Conscientiousness, Extraversion, Neuroticism, and Openness to Experience (Digman, 1990). Of the Big Five, Extraversion seems to be the best predictor of leadership emergence and effectiveness, followed by Conscientiousness and Openness to Experience (Judge et al., 2002).

However, the numbers show that often leaders do not succeed. Hogan and Kaiser (2005) believe that leadership failure is related more to having undesirable qualities than to lacking desirable ones. Therefore, they looked beyond the traditional "bright side" personality traits like the Big Five and developed an inventory (called HDS) of 11 key dimensions of the "dark side" using the DSM-IV Axis II personality disorders as a guide. A more simple but similar approach to dark side personality traits has been coined by Paulhus and Williams (2002) with the term Dark Triad, consisting of three conceptually distinct but empirically overlapping personality traits: Machiavellianism, (subclinical) psychopathy, and (subclinical) narcissism.

Machiavellianism

Machiavellianism is based on statements from the 16th-century writings of Niccolò Machiavelli (1513), the political advisor to the Medici family. Richard Christie fashioned a selection of those statements into a measure of personality (Christie & Geis, 1970). It is marked by strategic manipulation, a cynical disregard for morality, and a focus on self-interest and personal gain (Muris et al., 2017).

Psychopathy

Both psychopathy and narcissism are DSM-defined personality disorders adapted to subclinical spheres. Psychopathy is a personality trait characterized by high impulsivity, thrill-seeking, low empathy, and anxiety. It is also linked to criminal behavior (Paulhus & Williams, 2002).

Narcissism

Narcissism originates from the Greek mythological figure of Narcissus, a handsome young man who rejected all romantic advances of others and eventually fell in love with his reflection in a pool of water (Muris et al., 2017). This myth covers the core features of how the personality trait narcissism is defined today, being associated with grandiosity, egocentrism, and a sense of personal entitlement (Jones & Paulhus, 2010).

Recently researchers (among them the original author D.L. Paulhus) have suggested expanding the Dark Triad and adding a fourth component (subclinical) Sadism to form the new Dark Tetrad (Paulhus et al., 2021). Sadism shares the common component of callous exploitation with the

Dark Triad personalities but adds the unique element of intrinsic pleasure in hurting others. As the Dark Tetrad is still in its infancy and little research has been done concerning leader personalities, this study will focus on the established Dark Triad.

Criticism of the Dark Triad

There have been discussions about the legitimacy of the Dark Triad. The first point of criticism is that the three personality traits intercorrelate too strongly to warrant distinct personality traits. Paulhus and Williams (2002) address this in their first publication on the Dark Triad. They acknowledge that the personalities composing this Dark Triad share several features: "To varying degrees, all three entail a socially malevolent character with behavior tendencies toward self-promotion, emotional coldness, duplicity, and aggressiveness." However, they conclude that "even in non-forensic, non-pathological, high-achievement populations, they are distinctive enough to warrant separate measurement." Furthermore, Machiavellianism and Psychopathy correlate stronger with each other than with Narcissism (Lee & Ashton, 2005).

The second point of criticism questions the legitimacy of the Dark Triad in the first place, as it may just be a combination of low levels of existing "bright side" personality traits. Lee and Ashton (2005) refute this and show that the Dark Triad cannot merely be explained by different combinations of the Five-Factor Model. Psychopathy and Machiavellianism show moderate negative correlations with Agreeableness, and Narcissism has moderate positive correlations with Extraversion. However, the six-factor model HEXACO has emerged, with its main difference being the additional factor Honesty-Humility. All three personalities of the Dark Triad are strongly associated with low levels of Honesty-Humility. Lee et al. (2013) conclude that when researchers are interested in the shared variance of the Dark Triad variables, they can simply assess the Honesty-Humility dimension of the HEXACO model. However, when interested in the unique variance of one or more Dark Triad variables, they should measure those. Smith et al. (2018) add a second argument for this distinction: the uniqueness of dark personalities stems from their origin in clinical settings, which is contrary to bright traits that primarily originated in personality psychology.

How Dark Is the Dark Triad?

Paulhus and Williams (2002) chose the adjective "dark" to describe the trio of personalities consisting of the Dark Triad. This seemed appropriate at the time because they had drawn attention for their socially aversive nature. Bright traits were considered desirable and dark traits were generally undesirable (Smith et al., 2018). Several meta-analyses and literature reviews support this notion and highlight how dark traits positively relate to undesirable workplace outcomes. Smith et

al. (2018) list examples from different sources, such as counterproductive work behaviors (CWBs) (Grijalva & Newman, 2015), abusive supervision (Greenbaum et al., 2017), unethical behavior (O'Boyle et al., 2012), and job stress (Wille et al., 2013).

However, subsequent research has shown that accepting bright side traits as "good" and dark side traits as "bad" may be oversimplified. Already early on, it appeared that the Dark Triad, especially some level of Narcissism, may actually be beneficial under certain circumstances. For example, Wallace & Baumeister (2002) conclude that Narcissists perform exceptionally well when they perceive that high performance may bring them glory: "When the task is daunting, and the world is watching, Narcissists rise to the challenge." Another example is the research by Furnham et al. (2012), who report that some dark traits (they used the multi-faceted HDS) consistently relate to work success, depending on the type of job. Schreyer et al. (2021) even report that all three facets relate positively to transformational leadership. Smith et al. (2018) applaud recent trends that paint a more nuanced picture of all personalities.

On the one hand, adding moderators, like an opportunity for glory or job types, gives more insight into the complex matter of personalities. On the other hand, there might be "too much of a good thing" for bright side personalities and "just the right amount" for dark side personalities. These nonlinear trends mean that extremely high levels of bright side traits, for example, being too conscientious, may be counterproductive, whereas medium levels of dark side traits could be beneficial. This is supported by Grijalva et al. (2015), who found in one study that leader effectiveness is highest for moderate levels of Narcissism, reporting a curvilinear, inverted U-shape. Even for arguably the darkest trait, Psychopathy, Landay and Credé (2019) find indications of the same curvilinear relationships with all measured leadership outcomes in their meta-analysis. Kaiser et al. (2015) report similar results, calling for a new interpretation of all dark side personalities, with moderate levels being the most desirable ones. According to them, the previous conflicting findings of negative, null, and positive effects for dark-side traits in leadership may be because they are associated with both strengths and weaknesses.

Leader Dark Triad in the Job-Demands-Resources Model

"Employee satisfaction means, in essence, satisfaction with supervisors."
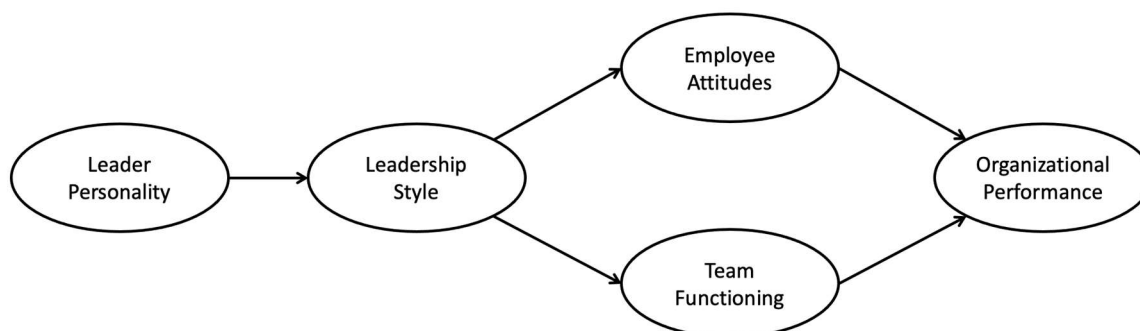(Hogan & Kaiser, 2005)

Most studies on leaders' Dark Triad focus on their own success, derailment, or leadership style. But what effect do they have on their team and their followers? Do certain personality traits of

leaders affect their employee's job-related attitudes more than others? According to Hogan & Kaiser (2005), leader personality does, in fact affect employee attitudes through leadership style, as described in their model of leader personality and organizational performance (Figure 1).
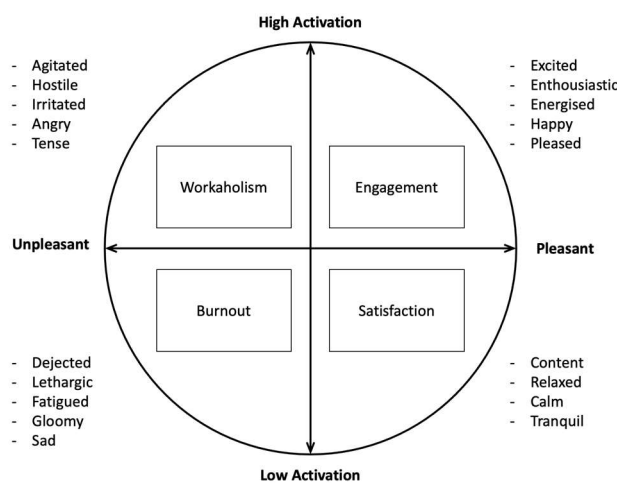
Figure 1

Leader Personality Affecting Employee Attitudes Through Leadership Style

*Note.* From Hogan & Kaiser (2005).

However, research on the effect of leader Dark Triad on followers' attitudes has been scarce and calls for more investigations (Smith et al., 2018). Job satisfaction has traditionally been one of the most researched organizational outcomes on the employee level. In recent years, however, the argument has been made that workers' preferred affective state should be engaged rather than satisfied. When looking at the circumplex of work-related affect (Figure 2), this reasoning makes sense intuitively as job engagement reflects pleasant-high activation, whereas job satisfaction reflects pleasant-low activation (Bakker & Oerlemans, 2011).

Work Engagement is a positive, fulfilling, affective-motivational state of work-related wellbeing (Bakker & Leiter, 2010). It is characterized by vigor, dedication, and absorption. Vigor is described as having high energy levels and mental resilience while working. Dedication means being strongly involved in one's work, accompanied by enthusiasm and significance. And finally absorption, as being fully engrossed in one's work. Work Engagement has many important consequences for organizations, like job performance, employee health, and job crafting (Schaufeli, 2012).

Figure 2

Circumplex Model of Work-Related Affect

Note. From Bakker & Oerlemans (2011)

This study places the leader's Dark Triad personalities and the employee's Work Engagement into the framework of Bakker and Demerouti's (2014) frequently used Job Demands-Resources (JDR) Theory (Figure 3). According to the JDR model, personal and job-related resources predict Work Engagement positively through a motivational process. In contrast, job demands can be stressors that lead to exhaustion, hindering Work Engagement and performance (Bakker & Demerouti, 2014). The role of leadership within the JDR model so far has been that supervisor feedback, and leadership style (charismatic, transformational) can be job resources, increasing the employees' Work Engagement (Katou et al., 2021). At the same time, the workload a supervisor gives them would be an example of a job demand. No research on leader dark side personalities within this framework could be found. This study aims to start filling this gap, proposing that certain levels of a leader's Dark Triad could be motivational and positively influence employees' Work Engagement.

Figure 3

Proposed Model of Leader Dark Triad and Job-Demands Resources Model
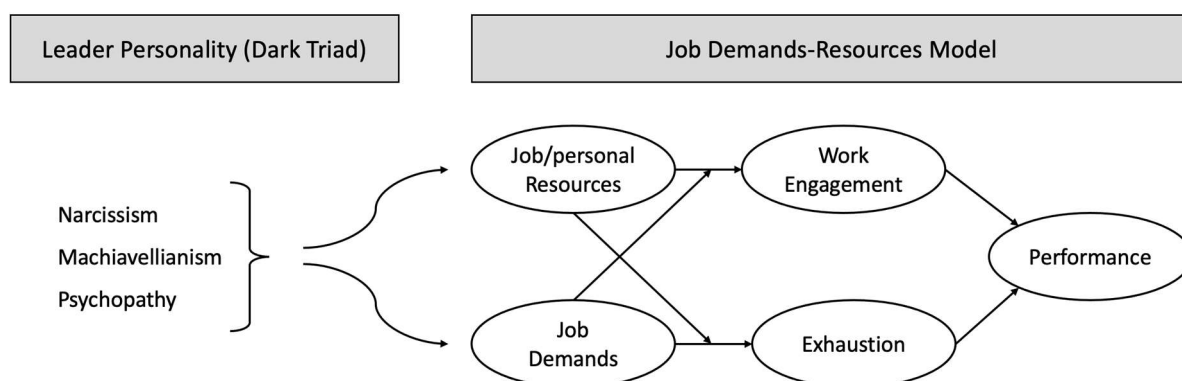
Following Smith et al.'s (2018) call for more research on nonlinear outcomes of personalities, the first three hypotheses are formulated:

Hypothesis 1a: A curvilinear, inverted U-shaped relationship exists between a supervisor's Narcissism and their employees' Work Engagement (Figure 4, left).

Hypothesis 2a: A curvilinear, inverted U-shaped relationship exists between a supervisor's Machiavellianism and their employees' Work Engagement (Figure 4, middle).

Hypothesis 3a: A curvilinear, inverted U-shaped relationship exists between a supervisor's Psychopathy and their employees' Work Engagement (Figure 4, right).

Figure 4

Illustration of Hypotheses 1a, 2a, and 3a
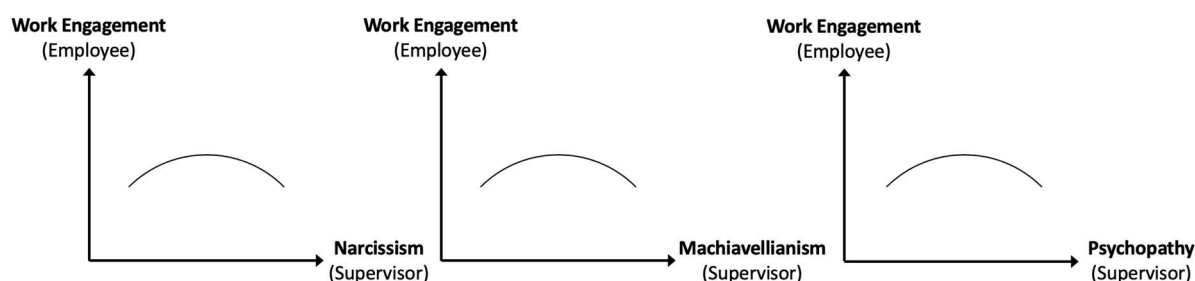
Supervisor Dark Triad and Employee Work Burnout

According to the JDR model, job demands influence Work Engagement and performance through exhaustion and Work Burnout. "Work burnout is a metaphor that is commonly used to describe a state of mental weariness" (Schaufeli & Bakker, 2004) and is usually expressed by exhaustion (i.e., a state of extreme physical or mental tiredness), cynicism (i.e., distrust in job significance) and inefficacy (i.e., not feeling confident in accomplishing the work efficiently). Work Burnout is the exact opposite of Work Engagement in the circumplex of work-related affect (Bakker & Oerlemans, 2011). Katou et al. (2021) show relationships between leadership styles, job demands, and work burnout within the JDR model. Building on this, again, we add the leader Dark Triad and propose that there is a curvilinear relationship between a leader's personality and their employees' Work Burnout, with extremely low levels and extremely high levels of the leader Dark Triad being most stressful:
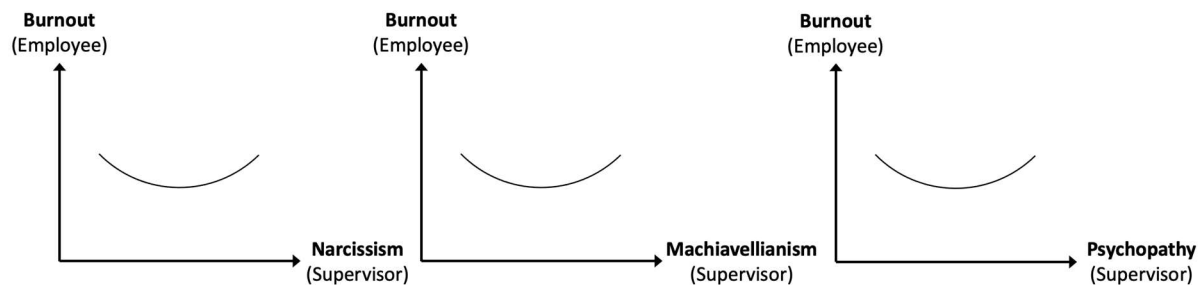
Hypothesis 1b: A curvilinear, U-shaped relationship exists between a supervisor's Narcissism and their employees' Work Burnout (Figure 5, left).

Hypothesis 2b: A curvilinear, U-shaped relationship exists between a supervisor's Machiavellianism and their employees' Work Burnout (Figure 5, middle).

Hypothesis 3b: A curvilinear, U-shaped relationship exists between a supervisor's Psychopathy and their employees' Work Burnout (Figure 5, right).

Figure 5

Illustration of Hypotheses 1b, 2b, and 3b

Supervisor Dark Triad and Employee Turnover Intention

Looking beyond the performance-related outcome variables of the JDR model, a third highly relevant element will be examined in this research paper: employee Turnover Intention. Obvious moral reasons aside, having unengaged and exhausted employees are bad for business due to their lower performances. Furthermore, re-hiring and onboarding new employees may be just as costly and is estimated at around 33 percent of an employee's annual salary (Hall, 2019) and therefore worth exploring. In line with the previous hypothesis, we expect that:

Hypothesis 1c: A curvilinear, U-shaped relationship exists between a supervisor's Narcissism and their employees' Turnover Intentions (Figure 6, left).
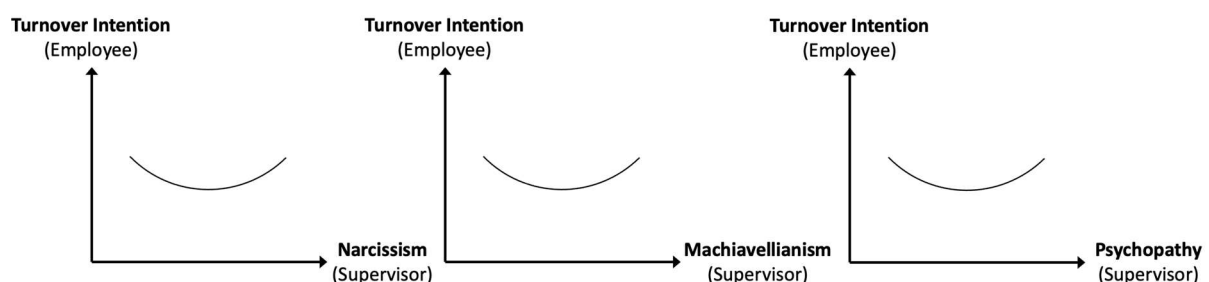
Hypothesis 2c: A curvilinear, U-shaped relationship exists between a supervisor's Machiavellianism and their employees' Turnover Intentions (Figure 6, middle).

Hypothesis 3c: A curvilinear, U-shaped relationship exists between a supervisor's Psychopathy and their employees' Turnover Intentions (Figure 6, right).

Figure 6

Illustration of Hypotheses 1c, 2c, and 3c

Person-Supervisor (Personality) Fit

In this research paper so far, the leader-follower relationship has only been explored from one side: the effects of the leader's personality on their followers. The interesting question arises whether certain combinations of personalities are more compatible and fruitful than others. Two common yet opposite sayings prevail in English-speaking cultures: Is it "opposites attract" or "birds of a feather flock together"? Maybe a highly narcissistic employee works well together with a narcissistic supervisor? Or just the opposite, that a employee low on Narcissism could be a better combination with the narcissistic leader?

The concept of person-supervisor (PS) fit is part of the larger framework called person-environment (PE) fit, which also includes person-organization (PO) fit and person-job (PJ) fit. PE fit is generally defined as the compatibility between individuals and their environment. One of their fundamental principles is that fit is a more powerful predictor of individual outcomes (e.g., job satisfaction) than either of its components (the person and the environment) alone (van Vianen, 2018).
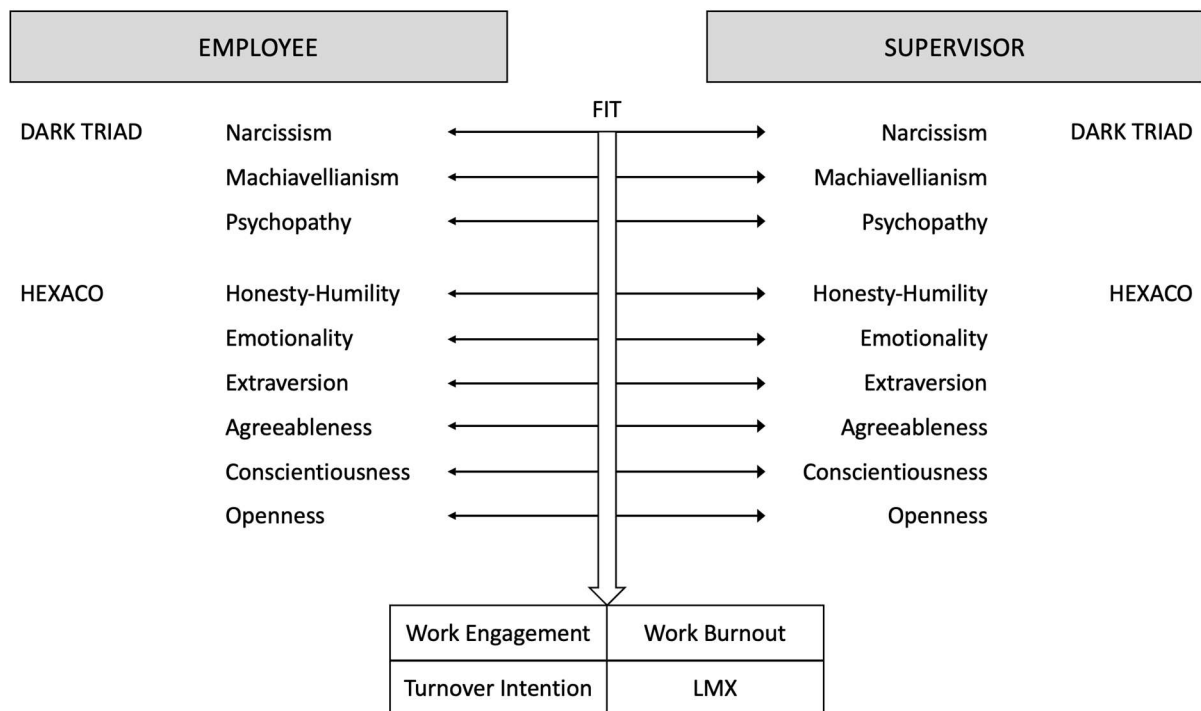
Van Vianen et al. (2011) show that if employees perceive their PS fit as high, they feel more strongly committed to the supervisor, which, in turn, facilitates their commitment to the organization as a whole. However, their study and most other studies have operationalized fit based on values instead of personality (Kristof-Brown et al., 2005; van Vianen, 2018). Iyer et al. (2020) changed this and developed a measure of personality-based PO-fit using polynomial regression analysis. They found that job satisfaction and intention to stay are higher when there is a perfect fit between the person and the organization than when the person and the organization differ in traits. This approach will be taken as inspiration for this research, applying the same principles to PS fit. To the best of my knowledge, this has not been explored using the established personality traits. One Chinese study that comes closest examines the congruence in "proactive personality" as a single trait (leader and follower) and follower work engagement using polynomial regression analysis. Their three-dimensional model shows that Work Engagement generally increases with proactive personality congruence. The highest level of Work Engagement is achieved when both leader and follower are proactive, whereas the worst combination is when the leader is proactive, and the follower is not at all (Yang et al., 2017).

So how does the PS fit in terms of personality traits relate to the employees' work-related outcomes? The answers to these questions will be searched for in an explorative manner using measures of the Dark Triad and the HEXACO model. The same outcome variables will be used as in hypotheses 1-3 on the employees' level: Work Engagement, Work Burnout, and Turnover Intention.

Research Question 1: How does the PS fit of personality traits relate to the employees' Work Engagement, Work Burnout, and Turnover Intentions (Figure 7)?

Figure 7

Illustration of Research Questions Investigating the Relationship Between Personality Based PS Fit and Outcome Variables.

EMPLOYEE		SUPERVISOR	

FIT

DARK TRIAD	Narcissism	← →	Narcissism	DARK TRIAD
	Machiavellianism	← →	Machiavellianism	
	Psychopathy	← →	Psychopathy	
HEXACO	Honesty-Humility	← →	Honesty-Humility	HEXACO
	Emotionality	← →	Emotionality	
	Extraversion	← →	Extraversion	
	Agreeableness	← →	Agreeableness	
	Conscientiousness	← →	Conscientiousness	
	Openness	← →	Openness	

Work Engagement	Work Burnout
Turnover Intention	LMX

PS fit and LMX

A different and popular theory describing the dyadic relationship between leaders and their followers has long been the Leader-Member-Exchange (LMX) theory. It is a relationship-based approach to leadership and represents the quality of employees' working relationship with their supervisors (Graen & Uhl-Bien, 1995). It has been shown to be related to numerous positive follower outcomes like job satisfaction, task performance, and organizational citizenship behavior (OCB). Breevaart et al. (2015) incorporate LMX into the JDR model and demonstrate its relationship with work engagement.

But what leads to a high LMX? Breevaart et al. (2015) cite studies showing that LMX can be increased by training leaders in their active listening skills, spending time talking to each employee, and sharing expectations. Gutermann et al. (2017) show that leaders' Work Engagement enhanced LMX, which in turn increased employee work engagement. However, as LMX assesses the relationship between supervisor and worker, it can not only depend on the leader. Van Vianen et al. (2011) combine the previously separate concepts of PS fit and LMX, which both concern the same

dyadic relationship. They show that PS fit is related to LMX, which is connected to organizational commitment.

However, as described in the previous section, they assessed PS fit in terms of values and not in terms of personalities. Bernerth et al. (2008) look into the personality congruence of leaders and followers and its relationship with LMX. Personality congruence was measured using the square root of the sum of the squared differences between each personality item rated by the supervisor and the follower. Using hierarchical regression analysis, these differences are then related to their LMX. They find that differences in all Big Five personality traits (except for Extraversion) are negatively associated with their LMX. In other words, employees should be as similar as possible to their supervisors regarding personality traits.

Interestingly, the strongest (also negative) predictor was the age difference, not the difference in a personality trait. However, this two-dimensional approach does not consider the actual scores on their personality traits, nor does it include the Dark Triad. So, for example, a leader high on narcissism and a follower low on narcissism could have a higher LMX as the opposite combination, while their absolute difference would be the same. This difference will be accounted for using polynomial regression analysis in this study. All relationships will be examined in an explorative manner using measures of the Dark Triad and the HEXACO model.

Research Question 2: How does the PS fit of personality traits relate to their LMX?

Method

Participants

A total of 141 participants clicked on the survey link, of which 110 filled out the minimum of 40 percent needed for some analyses, and 106 finished the survey. This final sample consisted of 49 men and 61 women (mean age between 35 and 39) who reported having 59 male and 49 female supervisors (two unanswered; mean age between 50 and 59). The respondents classified their supervisors as Lower Management (22), Middle Management (39), and Upper Management (46). Ninety respondents reported working in Switzerland, 16 in the Netherlands, and four elsewhere. The sample showed a diverse workforce, with the most prominent sectors being Education (26.4%), Arts and Culture (13.6%), Healthcare (10%), and Finance (10%).

Procedure

As the main focus of this research paper is the relationship between workers and their supervisors, the target participants were adults who were employed for a minimum of 16 hours a week. They were primarily recruited through personal and professional networks. Most participants

were expected to be from either the German speaking part in Switzerland or the Netherlands; therefore, the entire questionnaire was available in English, German, and Dutch. The participants did not receive a reward for their efforts. After a brief introduction, each participant had to give their informed consent. Only then were they able to start the survey.

First, they were asked to answer a few demographic questions about themselves and their supervisors. Then, to measure their personalities (Dark Triad and HEXACO), each participant was asked to rate themselves as well as their supervisor on the same item simultaneously (see Figure 8) on a 5-point Likert scale using sliders ranging from "strongly disagree" to "strongly agree. This approach was expected to have three advantages: Firstly, the participants only had to read the item once for both ratings, saving them time to fill out the questionnaire faster. Secondly, the sliders allowed for nuanced response options, as the participants were not forced to choose between whole numbers. And thirdly, having to rate the supervisor and themselves together forced the participant to actively consider the similarities and differences they perceived between them. These comparisons were used for the PS-fit.

Figure 8

Example of Sliders Participants Were Asked to Use to Rate Themselves and Their Supervisors
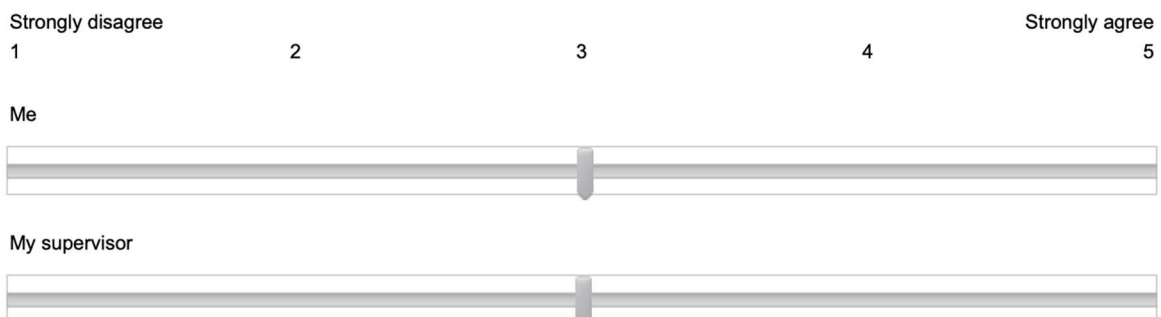
After the personality questionnaires concerning themselves and their supervisors, the participants were asked to complete the questionnaires about their Work Engagement, Burnout, Turnover Intention, and Leader-Member-Exchange (LMX). At the end of the survey, the participants were debriefed with information about the research topic, and contact information was given for the remaining questions. All questionnaires with translations can be found in Appendix A.

Measures

Gender

The participants and their supervisors' genders were coded 1 for male and 2 for female.

Age

To make the survey as mobile-friendly and accessible as possible, the participants did not have to write their and their supervisors' ages. Still, they could choose from the following categories: 18-24 (coded as 1), 25-29 (2), 30-34 (3), 35-39 (4), 40-49 (5), 50-59 (6) and 60+ years (7).

Management Level

The respondents categorized their supervisors' Management Levels as Lower Management (coded as 1), Middle Management (2), and Upper Management (3).

Dark Triad

Jonason and Webster's "Dirty Dozen" (2010) was used to measure the participants' and their supervisors' Dark Triad. It consisted of 12 total items, with four items per subscale of Narcissism (e.g. "tends to want others to admire him/her"; reported α = .84), Machiavellianism (e.g. "tends to manipulate others to get his/her way"; α = .79) and Psychopathy (e.g. "tends to lack remorse"; α = .77). They were rated on a 5-point Likert scale, ranging from "strongly disagree" to "strongly agree."

As mentioned previously, all scales were offered in three languages. The Dutch version was validated by Barelds (2016), supporting its use. The German version by Küfner et al. (2015) also showed a good structure, internal consistencies, and stability.

HEXACO

To measure both the participants' as well as their supervisors' HEXACO, the Brief HEXACO Inventory (BHI) was used (de Vries, 2013). Again, each participant was asked to rate themselves as well as their supervisor on the same item simultaneously (e.g. "works very precisely") on a 5-point Likert scale using a slider ranging from "strongly disagree" to "strongly agree." The reported alphas were relatively low and between .44 (Agreeableness) and .72 (Extraversion). However, the author argued that the fact that the BHI scales had low alpha reliabilities did not seem to have major validity repercussions and encouraged its use. Its domain scales showed adequate levels of test-retest reliability and adequate levels of self-other agreement, as well as high levels of convergent correlations with the HEXACO-PI-R. Upon request, the author shared the German and Dutch translations of the BHI for this study.

Work Engagement

To measure Work Engagement, the Utrecht Work Engagement Scale (UWES) was used (Schaufeli & Bakker, 2004). In this questionnaire, the participants were asked to rate 17 statements on how often they had felt certain emotions while working (e.g., "time flies when I'm working") on a 7-point Likert scale from "never" to "always/every day" (α = .93). The Dutch and German versions of the UWES were part of the manual provided by the authors.

Work Burnout

The questionnaire was based on the work of Schaufeli and Salanova (2007) and measured along the dimensions of exhaustion (α = .77), cynicism (α = .84), and inefficacy (α = .80), each comprising four items. Example items were as follows: "I find it hard to relax after a day's work," "I doubt the significance of my work," and "I do not feel confident about accomplishing my work efficiently." The statements were rated on a 7-point Likert scale from "never" to "always/every day." This questionnaire was a slightly adapted version of the Maslach Burnout Inventory – General Survey (MBI-GS).

No translations of this adapted version could be found. Therefore the questionnaire was translated using a forward-backward translation by bi-lingual scholars. The remaining differences were discussed until a consensus was reached.

Turnover Intentions

To measure Turnover Intention, the six-item version of the Turnover Intention Scale (TIS-6) was used (Bothma & Roodt, 2013). Example items were as follows: "How often have you considered leaving your job?" and "How likely are you to accept another job at the same compensation level should it be offered to you?". They were rated on a 5-point Likert scale ranging from "never" to "always" and "highly likely" to "highly unlikely," respectively (α = .80).

No translations of this adapted version could be found. Therefore the questionnaire was translated using a forward-backward translation by bi-lingual scholars. The remaining differences were discussed until a consensus was reached.

LMX

Leader-Member-Exchange (LMX) was measured using the LMX scale, consisting of 7 items (Graen & Uhl-Bien, 1995). An example item was: "Regardless of how much formal authority he/she has built into his/her position, what are the chances that your leader would use his/her power to help you solve problems in your work?". They were rated on a 5-point Likert scale ranging from "none" to "very high." The original paper did not report an alpha. However, a study with the Dutch version reported an alpha of .91.

The author of the study where the Dutch version of the LMX had been used (Breevaart et al., 2015) was contacted, and she shared their translation for this research. The German version has been validated by Schyns & Paul (2014).

Statistical Analyses

A power analysis was performed with G*Power to determine the sample size needed. As this tool could not be used for nonlinear effects, the power analysis was conducted under the

assumption of linearity. Assuming medium effect sizes (f^2 = .15), a sample size of 96 participants rating themselves and their supervisors was needed for a power of .80 with an alpha of .05 (Faul et al., 2009).

Hypothesis 1a-3c

For hypotheses 1a to 3c, a curvilinear relationship was examined between the supervisors' Dark Triad (independent variables: Narcissism, Machiavellianism, Psychopathy) and their employees' work-related outcomes (dependent variables: Work Engagement, Work Burnout, Turnover Intention). A hierarchical multiple regression was performed for each of the nine hypotheses (H1a-H3c) using SPSS. At stage one, additionally, to the control variables, the respective Supervisor Dark Triad variable (X) was entered to test a linear relationship (control variables not included): $Y = a_0 + a_1X$.

At stage two, the quadratic term of the respective Supervisor Dark Triad variable (X^2) was added to test the hypothesized curvilinear relationship (control variables not included): $Y = a_0 + a_1X + a_2X^2$. All quadratic forms of the Supervisor Dark Triad variables had to be computed (Supervisor Narcissism^2, Supervisor Machiavellianism^2, Supervisor Psychopathy^2).

Research Questions PS Fit

Two methods were used to answer the explorative research questions concerning the fit between the leader and the follower (PS fit). The first analysis followed Bernerth et al.'s (2008) approach to personality incongruence. Personality incongruence was measured using the square root of the squared differences between each personality trait (employee and supervisor) rated by the participant: $\sqrt{(X - Y)^2}$. This value represents dyad personality similarity/dissimilarity. A large score represents considerable differences between dyad personalities, and a score close to zero represents similarity between employee and supervisor personalities[1]. The personality incongruences between employee and supervisor were then correlated to the outcome variables Work Engagement, Burnout, Turnover Intention, and LMX. The second analysis followed up on any significant correlations ($p < .05$).

The second approach to the PS fit consists of a polynomial regression with a subsequent response surface analysis. Shanock et al. (2010) provide a detailed and step-by-step explanation of conducting and interpreting these analyses. The four steps are as follows (a more detailed summary can be found in Appendix B):

Step 1: Descriptive Information About the Occurrence of Support Discrepancies. Before conducting the polynomial regression analyses, Shanock et al. (2010) highlighted the importance of

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[1] Bernerth et al. (2008) call this difference "personality congruence", however this is confusing as larger numbers represent an incongruence rather than a congruence. Therefore this study used the term "personality incongruence".

inspecting whether there were discrepancies between the two predictors (Employee and Supervisor Personality Trait) in the first place.

Step 2: Run Polynomial Regression in SPSS and Calculate the Surface Values. The general form of the equation to test for relationships using polynomial regression is $Z = b_0 + b_1X + b_2Y + b_3XY + b_4X^2 + b_5Y^2 + e$, where Z is a dependent variable, X is Predictor 1 (e.g., Employee Narcissism), Y is Predictor 2 (e.g., Supervisor Narcissism), and e is the error term. Thus, the outcome variable is regressed on each of the two predictor variables (X and Y), the interaction between the two predictor variables (XY), and the squared terms for each of the two predictors (X^2 and Y^2).

Rather than directly interpreting the results from the polynomial regression analysis, if the R^2 was significantly different from zero, the results of the polynomial regression were evaluated with surface tests. This "response surface pattern" was graphed to provide a three-dimensional visual representation of the data to aid interpretation. Shanock et al. (2010) provided the formulas to determine each surface value's significance, and added a free-to-use Excel template to their article. The response surface analysis first tests the linear and curvilinear relationship along the line of perfect agreement (a.k.a. line of congruence, LOC, X = Y) and then along the line of incongruence (LOIC, X = -Y). See Appendix B and Shanock et al. (2010) for a more in-depth discussion.

Step 3: Graph the Results in Excel.

Step 4: Interpret the Surface Values and Graph.

<div align="center">

Results

</div>

Descriptive statistics and correlations

Descriptive statistics, internal reliability coefficients, and bivariate correlations are shown in Table 1. First, the significant differences and correlations concerning hypothesis 1a to hypothesis 3c are briefly highlighted, followed by the significant correlations concerning the additional research questions.

Male supervisors were rated significantly higher ($M = 2.98$, $SD = 0.85$) on Narcissism than female supervisors ($M = 2.47$, $SD = 0.93$), $t(103) = 2.94$, $p = .004$. No significant gender differences were found in supervisor Machiavellianism, $t(104) = 0.77$, $p = .460$, and in supervisor Psychopathy, $t(102) = 1.37$, $p = .174$. Male employees scored significantly higher ($M = 2.08$, $SD = 0.68$) on Machiavellianism than females ($M = 1.81$, $SD = 0.66$), $t(106) = 2.10$, $p = .039$. No significant gender differences were found in employee Narcissism, $t(105) = 1.73$, $p = .086$, and in employee Psychopathy, $t(105) = 1.92$, $p = .058$. Supervisors of Middle and Upper Management scored significantly higher ($M = 2.87$, $SD = 0.91$) than Lower Management ($M = 2.30$, $SD = 0.79$) on

Narcissism, $t(102) = -2.70$, $p = .008$, and on Machiavellianism ($M = 2.36$, $SD = 0.93$ vs. $M = 1.84$, $SD = 0.78$), $t(103) = -2.39$, $p = .019$, but not on Psychopathy, $t(101) = -1.33$, $p = .186$.

Supervisor Narcissism correlated positively with the outcome variables employee Burnout ($r(106) = .24$, $p = .013$) and Turnover Intention ($r(106) = .36$, $p < .001$). Supervisor Machiavellianism correlated positively with the outcome variable employee Turnover Intention ($r(106) = .31$, $p = .001$). Finally, there was a negative correlation between supervisor Psychopathy and employee Work Engagement ($r(105) = -.22$, $p = .025$), and a positive correlation with employee Burnout ($r(105) = .35$, $p < .001$) and Turnover Intention ($r(105) = .29$, $p = .002$).

The correlations concerning the research questions about employee-supervisor fit showed that all personality dyads (Dark Triad and HEXACO) had a significant positive correlation. For example, employee Narcissism correlated with supervisor Narcissism ($r(107) = .69$, $p < .001$), and employee Conscientiousness correlated with supervisor Conscientiousness ($r(110) = .50$, $p < .001$).

All outcome variables also showed significant correlations among each other. Work Engagement correlated negatively with Burnout ($r(106) = -.35$, $p < .001$) and Turnover Intention ($r(106) = -.31$, $p = .001$), and positively with LMX ($r(106) = .29$, $p = .003$). Furthermore, there was a positive correlation between Burnout and Turnover Intention ($r(106) = .57$, $p < .001$) and a negative correlation between Burnout and LMX ($r(106) = -.38$, $p < .001$), as well as Turnover Intention and LMX ($r(106) = -.40$, $p < .001$).

Hypothesis Testing

Before conducting the hierarchical multiple regressions for hypotheses 1a-3c, the relevant assumptions of this statistical analysis were tested. Firstly, based on the power analysis performed with G*power, the sample size of 110 was deemed adequate given the six independent variables included in the analysis. The screening of outliers (through standardized residuals, Mahalanobis, and Cook's distance) revealed two (for H1a, H2a, H3a) and one (for H1b, H2b, H3b) cases with a Mahalanobis distance greater than 20, the critical threshold for this sample size and the number of predictors (Barnett & Lewis, 1978). After closer examination, no reason could be found to exclude them from the analysis. Residual and scatter plots indicated that the assumptions of normality and homoscedasticity were all met. The correlations (see Table 1) shows that supervisor Narcissism and Machiavellianism were significantly yet not highly correlated with the control variable supervisor Gender and supervisor Narcissism also with supervisor Management Level. The collinearity statistics (i.e., Tolerance and VIF) were all within acceptable limits. Therefore, the assumption of multicollinearity was met.

Table 1

Means, Standard Deviations, Bivariate Correlations, and Reliabilities (in Parentheses) of Variables (N = 110)

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
Control Variables Employee															
1 Gender	1.55	.50	--												
2 Age	4.13	1.83	-.06	--											
Control Variables Supervisor															
3 Gender	1.45	.50	.10	.14	--										
4 Age	5.37	1.05	-.07	.28**	-.04	--									
5 Management Level	2.22	.77	-.08	.03	-.15	.36**	--								
Dark Triad (DD) Employee															
6 Narcissism	2.34	.77	-.17	-.08	-.16	-.02	.13	(.75)							
7 Machiavellianism	1.93	.68	-.20*	.01	-.05	.16	.27**	.63**	(.68)						
8 Psychopathy	1.89	.64	-.18	.06	-.02	.07	-.04	.38**	.54**	(.57)					
Dark Triad (DD) Supervisor															
9 Narcissism	2.75	.92	-.12	.01	-.29**	.04	.21*	.69**	.56**	.27**	(.80)				
10 Machiavellianism	2.23	.92	-.07	.06	-.07	.17	.20*	.38**	.70**	.40**	.63**	(.80)			
11 Psychopathy	2.15	.71	-.05	.01	-.13	.16	.09	.24*	.47**	.64**	.47**	.62**	(.59)		
HEXACO Employee															
12 Honesty-Humility	4.05	.59	.25**	.13	.21*	-.07	-.20*	-.53**	-.50**	-.39**	-.44**	-.33**	-.26**	(.44)	
13 Emotionality	2.89	.69	.49**	-.13	-.02	-.05	.04	-.11	.02	-.12	-.05	.06	.10	.11	(.55)
14 Extraversion	3.99	.65	.07	-.05	.15	-.11	.04	-.03	-.17	-.32**	-.19*	-.25*	-.37**	.14	-.09
15 Agreeableness	3.34	.57	-.07	-.17	.01	.04	.00	-.18	-.15	-.30**	-.06	-.10	-.16	.08	-.13
16 Conscientiousness	3.65	.59	-.05	-.16	-.12	.10	.05	-.25*	-.42**	-.30**	-.14	-.28**	-.19*	.25**	-.03
17 Openness	3.54	.66	-.19*	.22*	.15	.15	.00	.06	-.03	.05	.05	-.12	.01	-.17	-.42**
HEXACO Supervisor															
18 Honesty-Humility	3.83	.68	.10	-.05	.22*	-.12	-.21*	-.34**	-.47**	-.34**	-.64**	-.68**	-.53**	.62**	.05
19 Emotionality	2.37	.64	.22*	.14	.28**	-.05	-.16	-.02	.08	.11	.07	.16	.03	.15	.35**
20 Extraversion	4.06	.59	-.10	-.19	.03	-.18	-.09	-.07	-.18	-.41**	-.08	-.28**	-.37**	.13	-.01
21 Agreeableness	3.34	.51	.08	.01	-.02	.05	-.12	-.21*	-.09	-.12	-.29**	-.18	-.24*	.26**	-.05
22 Conscientiousness	3.79	.68	-.08	-.03	.00	-.03	-.07	-.28**	-.38**	-.10	-.23*	-.37**	-.18	.24*	-.16
23 Openness	3.48	.59	-.23*	.01	-.02	.24*	.22*	-.15	-.06	-.12	-.09	-.17	-.09	.03	-.19*
Outcome variables															
24 Work Engagement	4.79	.82	-.07	.03	.03	.04	.23*	.14	.02	-.13	.03	-.11	-.22*	.00	-.15
25 Burnout	2.51	.66	.00	-.01	-.20*	.06	.01	.16	.13	.19	.24*	.12	.35**	-.06	.24*
26 Turnover Intention	2.56	.65	-.07	-.14	-.22*	.06	.13	.14	.17	.12	.36**	.31**	.29**	-.18	.23*
27 LMX	3.94	.70	-.13	-.15	.09	-.07	-.07	-.01	-.19	-.09	-.20*	-.40**	-.31**	.01	-.28**

Notes. *p < .05, **p < .01. Gender: 1 = male, 2 = female. Age: 1 = 18-24 years, 2 = 25-29, 3 = 30-34, 4 = 35-39, 5 = 40-49, 6 = 50-59, 7 = 60+. Management Level: 1 = Lower, 2 = Middle, 3 = Upper Management.

Table 1: continued

	14	15	16	17	18	19	20	21	22	23	24	25	26	27
HEXACO Employee														
17 Extraversion	(.69)													
18 Agreeableness	.02	(.42)												
19 Conscientiousness	.01	.24*	(.59)											
20 Openness	.07	.01	.04	(.58)										
HEXACO Supervisor														
21 Honesty-Humility	.26**	.03	.18	-.05	(.61)									
22 Emotionality	-.13	-.20*	-.30**	-.12	.01	(.57)								
23 Extraversion	.46**	.14	.17	.03	.29**	-.24*	(.65)							
24 Agreeableness	.06	.23*	.01	-.06	.34**	-.05	.05	(.24)						
25 Conscientiousness	.13	.16	.50**	.16	.32**	-.27**	.08	.06	(.69)					
26 Openness	.18	.21*	.18	.47**	.10	-.22*	.12	.19*	.28**	(.54)				
Outcome variables														
27 Work Engagement	.34**	.05	.11	.12	.14	-.11	.23*	-.04	.13	.20*	(.93)			
28 Burnout	-.33**	-.07	-.12	-.05	-.17	.11	-.22*	-.01	-.08	-.18	-.35**	(.81)		
29 Turnover Intention	-.25**	-.02	-.08	-.17	-.24*	.05	-.08	.17	-.13	-.16	-.31**	.57**	(.70)	
30 LMX	.22*	.16	.35**	.15	.30**	-.39**	.35**	.04	.51**	.26**	.29**	-.38**	-.40**	(.89)

Notes. *$p < .05$, **$p < .01$. Gender: 1 = male, 2 = female. Age: 1 = 18-24 years, 2 = 25-29, 3 = 30-34, 4 = 35-39, 5 = 40-49, 6 = 50-59, 7 = 60+. Management Level: 1 = Lower, 2 = Middle, 3 = Upper Management.

Supervisor Narcissism

Hypothesis 1a. A two-stage hierarchical multiple regression was conducted to test hypothesis 1a with Work Engagement as the dependent variable (see Table 2). At stage one, additionally to the control variables, supervisor Narcissism was entered. The regression model was not significant, $F(6,96) = 1.09$, $p = .372$, nor was supervisor Narcissism a significant linear predictor $t(96) = -0.17$, $p = .868$. At stage two, the quadratic term of supervisor Narcissism was added to test the hypothesized curvilinear relationship. Again, neither the regression model was significant, $F(7,95) = 0.10$, $p = .440$, nor the quadratic term of supervisor Narcissism $t(95) = -0.67$, $p = .507$. Therefore, hypothesis 1a was rejected.

Hypothesis 1b. A two-stage hierarchical multiple regression was conducted to test hypothesis 1b with Burnout as the dependent variable (see Table 2). At stage one, additionally to the control variables, supervisor Narcissism was entered. The regression model was not significant, $F(6,96) = 1.50$, $p = .186$, however supervisor Narcissism was a significant, positive linear predictor $t(96) = 2.09$, $p = .039$ (see Figure 9). At stage two, the quadratic term of supervisor Narcissism was added to test the hypothesized curvilinear relationship. Again, neither the regression model was significant, $F(7,95) = 1.36$, $p = .231$, nor the quadratic term of supervisor Narcissism $t(95) = -0.75$, $p = .455$. Therefore, hypothesis 1b was rejected.

Table 2

*Hierarchical Regression Models with Supervisor Narcissism as the Predictor*

Variable	Work Engagement (H1a)		Burnout (H1b)		Turnover Intention (H1c)	
	Step 1 ß	Step 2 ß	Step 1 ß	Step 2 ß	Step 1 ß	Step 2 ß
Control Variables						
Gender E	-.06	-.06	.04	.04	-.02	-.02
Age E	.03	.05	-.01	-.02	-.16	-.17
Gender S	.06	.05	-.15	-.14	-.10	-.10
Age S	-.06	-.06	.08	.08	.08	.08
Management Level S	.26*	.26*	-.08	-.08	.02	.02
Predictor Variables						
Narcissism S	-.02	-.36	.22*	.60	.32**	.45
Narcissism S × Narcissism S		.35		-.39		-.13
R^2	.06	.07	.09	.09	.17	.17
ΔR^2		.01		.00		.00
F	1.09	0.10	1.50	1.36	3.25**	2.77*

Note. N = 102. E = Employee, S = Supervisor. * $p < .05$ ** $p < .01$.

Hypothesis 1c. A two-stage hierarchical multiple regression was conducted to test hypothesis 1c with Turnover Intention as the dependent variable (see Table 2). At stage one, additionally to the control variables, supervisor Narcissism was entered. The regression model was significant, $F(6,96) = 3.25$, $p = .006$, with supervisor Narcissism as a significant, positive linear predictor $t(96) = 3.25$, $p = .002$ (see Figure 9). At stage two, the quadratic term of supervisor Narcissism was added to test the hypothesized curvilinear relationship. Again, the regression model was significant, $F(7,95) = 2.77$, $p = .012$, however the quadratic term of supervisor Narcissism was not $t(95) = -0.25$, $p = .802$. Therefore, hypothesis 1c was rejected.

Figure 9

Supervisor Narcissism Plotted with Employee Work Engagement and Employee Turnover Intention.
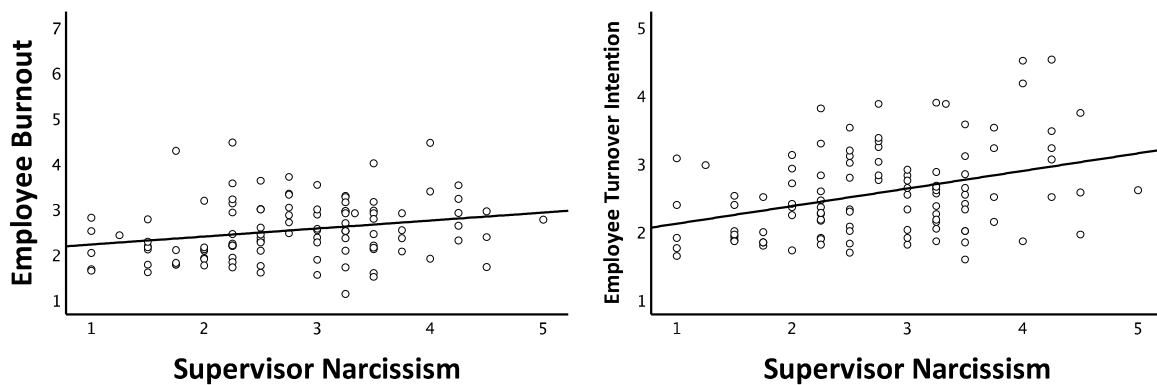
Supervisor Machiavellianism

Hypothesis 2a. A two-stage hierarchical multiple regression was conducted to test hypothesis 2a with Work Engagement as the dependent variable (see Table 3). At stage one, additionally to the control variables, supervisor Machiavellianism was entered. The regression model was not significant, $F(6,96) = 1.53$, $p = .177$, nor was supervisor Machiavellianism a significant linear predictor $t(96) = -1.58$, $p = .119$. At stage two, the quadratic term of supervisor Machiavellianism was added to test the hypothesized curvilinear relationship. Again, neither the regression model was significant, $F(7,95) = 1.55$, $p = .162$, nor the quadratic term of supervisor Machiavellianism $t(95) = 1.26$, $p = .212$. Therefore, hypothesis 2a was rejected.

Hypothesis 2b. A two-stage hierarchical multiple regression was conducted to test hypothesis 2b with Burnout as the dependent variable (see Table 3). At stage one, additionally to the control variables, supervisor Machiavellianism was entered. The regression model was not significant, $F(6,96) = 0.92$, $p = .483$, nor was supervisor Machiavellianism a significant linear predictor $t(96) = 1.03$, $p = .305$. At stage two, the quadratic term of supervisor Machiavellianism was added to test the hypothesized curvilinear relationship. Again, neither the regression model was significant,

$F(7,95) = 0.89$, $p = .518$, nor the quadratic term of supervisor Machiavellianism $t(95) = -0.84$, $p = .401$. Therefore, hypothesis 2b was rejected.

Hypothesis 2c. A two-stage hierarchical multiple regression was conducted to test hypothesis 2c with Turnover Intention as the dependent variable (see Table 3). At stage one, additionally to the control variables, supervisor Machiavellianism was entered. The regression model was significant, $F(6,96) = 2.94$, $p = .011$, as was supervisor Machiavellianism a significant, positive linear predictor $t(96) = 2.97$, $p = .004$ (see Figure 10). At stage two, the quadratic term of supervisor Machiavellianism was added to test the hypothesized curvilinear relationship. Again, the regression model was significant, $F(7,95) = 2.51$, $p = .021$, however the quadratic term of supervisor Machiavellianism was not $t(95) = -0.29$, $p = .771$. Therefore, hypothesis 2c was rejected.
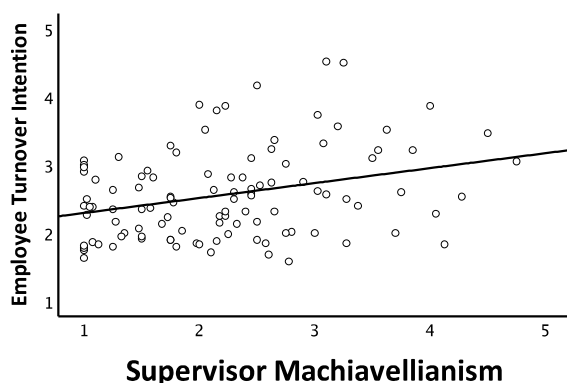
Table 3

Hierarchical Regression Models with Supervisor Machiavellianism as the Predictor

Variable	Work Engagement (H2a)		Burnout (H2b)		Turnover Intention (H2c)	
	Step 1 ß	Step 2 ß	Step 1 ß	Step 2 ß	Step 1 ß	Step 2 ß
Control Variables						
Gender E	-.07	-.07	.03	.03	-.03	-.03
Age E	.03	.05	.00	-.01	-.15	-.15
Gender S	.06	.05	-.20	-.19	-.17	-.17
Age S	-.04	-.02	.06	.04	.03	.03
Management Level S	.28*	.29**	-.06	-.07	.03	.03
Predictor Variables						
Machiavellianism S	-.16	-.76	.11	.52	.29**	.42
Machiavellianism S × Machiavellianism S		.61		-.42		-.14
R^2	.09	.10	.05	.06	.16	.16
ΔR^2		.01		.01		.00
F	1.53	1.55	.92	.89	2.94*	2.51*

Note. N = 102. E = Employee, S = Supervisor. * $p < .05$ ** $p < .01$.

Figure 10

Supervisor Machiavellianism Plotted with Employee Turnover Intention.

Supervisor Psychopathy

Hypothesis 3a. A two-stage hierarchical multiple regression was conducted to test hypothesis 3a with Work Engagement as the dependent variable (see Table 4). At stage one, additionally to the control variables, supervisor Psychopathy was entered. The regression model was not significant, $F(6,96) = 2.15$, $p = .055$, however supervisor Psychopathy was a significant, negative linear predictor, $t(96) = -2.44$, $p = .017$ (see Figure 11). At stage two, the quadratic term of supervisor Psychopathy was added to test the hypothesized curvilinear relationship. The regression model was significant, $F(7,95) = 3.08$, $p = .006$, as well as the quadratic term of supervisor Psychopathy $t(95) = 2.79$, $p = .006$. Adding the quadratic term of supervisor Psychopathy to the regression model explained an additional 6.7% of the variation in Work Engagement, and this change in R^2 was significant, $F(1,95) = 7.76$, $p = .006$. However, hypothesis 3a expected a curvilinear, inverted U-shaped relationship, and the regression model showed a U-shaped relationship (see also Figure 11). Therefore, hypothesis 3a was rejected.

Hypothesis 3b. A two-stage hierarchical multiple regression was conducted to test hypothesis 3b with Burnout as the dependent variable (see Table 4). At stage one, additionally to the control variables, supervisor Psychopathy was entered. The regression model was significant, $F(6,96) = 2.85$, $p = .014$, with supervisor Psychopathy as a significant, positive linear predictor $t(96) = 3.48$, $p < .001$ (see Figure 11). At stage two, the quadratic term of supervisor Psychopathy was added to test the hypothesized curvilinear relationship. The regression model was significant, $F(7,95) = 3.08$, $p = .006$, as well as the quadratic term of supervisor Psychopathy $t(95) = -2.00$, $p = .049$. Adding the quadratic term of supervisor Psychopathy to the regression model explained an additional 3.4% of the variation in Work Engagement, and this change in R^2 was significant, $F(1,95) = 3.98$, $p = .049$. However, hypothesis 3b expected a curvilinear, U-shaped relationship, and the regression model showed an inverted U-shaped relationship (see also Figure 11). Therefore, hypothesis 3b was rejected.

Hypothesis 3c. A two-stage hierarchical multiple regression was conducted to test hypothesis 3c with Turnover Intention as the dependent variable (see Table 4). At stage one, additionally to the control variables, supervisor Psychopathy was entered. The regression model was significant, $F(6,96) = 2.67$, $p = .020$, with supervisor Psychopathy as a significant, positive linear predictor, $t(96) = 2.70$, $p = .008$ (see Figure 11). At stage two, the quadratic term of supervisor Psychopathy was added to test the hypothesized curvilinear relationship. The regression model was significant, $F(7,95) = 2.69$, $p = .014$, however the quadratic term of supervisor Psychopathy was not, $t(95) = -1.60$, $p = .111$. Therefore, hypothesis 3c was rejected.

Table 4

Hierarchical Regression Models with Supervisor Psychopathy as the Predictor

Variable	Work Engagement (H3a)		Burnout (H3b)		Turnover Intention (H3c)	
	Step 1 ß	Step 2 ß	Step 1 ß	Step 2 ß	Step 1 ß	Step 2 ß
Control Variables						
Gender E	-.07	-.04	.04	.02	-.04	-.05
Age E	.03	.07	.01	-.02	-.14	-.16
Gender S	.04	.00	-.16	-.14	-.15	-.13
Age S	-.03	.04	.02	-.03	.03	-.01
Management Level S	.26*	.27*	-.05	-.05	.07	.07
Predictor Variables						
Psychopathy S	-.24*	-1.83**	.33**	1.47*	.26**	1.19*
Psychopathy S × Psychopathy S		1.60**		-1.15*		-.93
R^2	.12	.19**	.15	.18	.14	.17
ΔR^2		.07**		.03*		.03
F	2.15	3.08*	2.85*	3.01**	2.67*	2.69*

Note. N = 102. E = Employee, S = Supervisor. * $p < .05$ ** $p < .01$

Figure 11

Supervisor Psychopathy Plotted with Employee Work Engagement, Burnout, and Turnover Intention
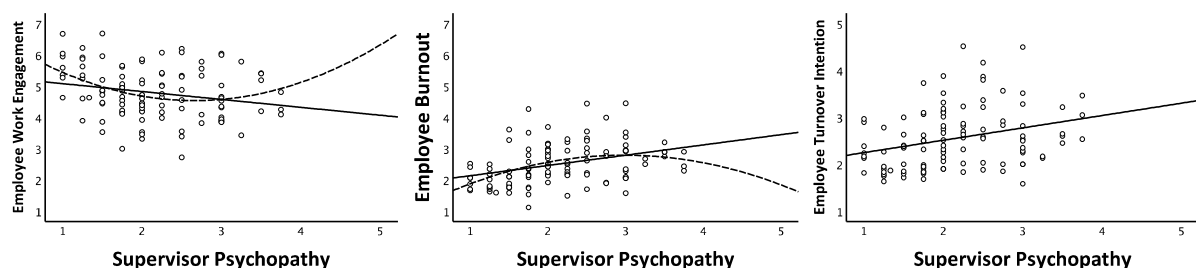
Note. The solid line represents the linear fit, and the striped line the quadratic fit of the data.

Person-Supervisor (PS) Fit Research Questions

First, the PS fit was evaluated in terms of personality incongruence as proposed by Bernerth et al. (2008). The personality incongruence between employee and supervisor was correlated to the outcome variables Work Engagement, Burnout, Turnover Intention, and LMX (see Table 5). A large score represented considerable differences between dyad personalities and a score close to zero represented similarity between employee and supervisor personalities. It appeared that all significant correlations between personality incongruences related negatively to the desirable outcome variables (Work Engagement and LMX) and positively to the undesirable outcome variables (Burnout and Turnover Intention).

Additionally, the simple difference between the personalities (supervisor Personality minus employee Personality, S - E) was correlated to LMX (see final column Table 5). A score below zero represented a supervisor's personality score lower than the employee's (S - E < 0). A score above zero represented a supervisor's personality score higher than the employee's (S - E > 0). This expanded on the findings of the incongruences and could indicate whether there may be a specific direction in which some of them influence the LMX. Supervisor-Employee difference of the Dark Triad correlated negatively with LMX, which indicated that when the employees reported having supervisors who were higher on them on each of the Dark Triad, their LMX was lower. At the same time, when employees reported their supervisors to be higher on Honesty-Humility and Conscientiousness, their LMX was also higher. The simple difference in Openness did not correlate significantly with LMX as opposed to the incongruence, indicating that the direction of differences (whether employee or supervisor was higher) did not matter.

Table 5

Correlations Between Employee and Supervisor Personality Incongruence and Outcome Variables

	Incongruence				Difference (S - E)
	Work Engagement	Burnout	Turnover Intention	LMX	LMX
Dark Triad					
Narcissism	-.06	.13	.33**	-.29**	-.27**
Machiavellianism	-.08	.08	.22*	-.32**	-.37**
Psychopathy	-.22*	.30**	.31**	-.29**	-.26**
HEXACO					
Honesty-Humility	-.06	.01	.04	-.21*	.34**
Emotionality	.02	.19†	.18†	-.08	-.07
Extraversion	-.16	.17†	.19†	-.18†	.11
Agreeableness	-.03	.16†	.05	-.16	-.11
Conscientiousness	-.01	.12	-.07	-.10	.32**
Openness	-.23*	.18†	.11	-.27**	.08

Note. N between 105 and 110. E = Employee, S = Supervisor.
† $p < .1$ * $p < .05$ ** $p < .01$

Next, the polynomial regressions with response surface analyses were performed. Influential cases were closely examined because these analyses were much less robust and more sensitive to outliers. According to Barnett and Lewis (1978), values of the Mahalanobis distance greater than 20 are problematic in a sample size of around 100 with five predictors. They were removed in those cases where very few outliers (always below 2% of the data) had a disproportionate influence on the outcome. Response surface analyses were only conducted when the polynomial regression was significant or showed significant coefficients (Shanock et al., 2010).

Narcissism Fit

Four polynomial regressions were performed to analyze the PS fit in terms of Narcissism related to employee Work Engagement, Burnout, Turnover Intention, and LMX (see Table 6). The regression model with Turnover Intention was significant, $F(5,96) = 3.15$, $p = .011$. The regression model with the outcome variable Work Engagement was not significant, $F(5,96) = 1.58$, $p = .173$, however employee Narcissism (b_1) was a significant positive predictor, $t(5,96) = 2.55$, $p = .012$.

Table 6

Polynomial Regression Coefficients and Response Surface Parameters of both Employees' and Supervisors' Narcissism on Employees' Work Engagement, Burnout, Turnover Intention and LMX.

	Work Engagement	Burnout	Turnover Intention	LMX
Polynomial Regression coefficients				
b_1 E	.70*	2.57	2.49	.170
b_2 S	-.33	-.10	-.02	-.229
b_3 E^2	.33	.19	.21	-.027
b_4 E × S	-.23	-.02	.19	.037
b_5 S^2	.08	.04	-.22	.046
F	1.58	1.39	3.15*	1.48
R^2	.08	.07	.20	.07
Response surface parameters				
a_1	0.38†	-	-	-
a_2	0.18	-	-	-
a_3	1.03*	-	-	-
a_4	0.64	-	-	-

Notes. N = 101. E = Employee Narcissism, S = Supervisor Narcissism. Polynomial regression coefficients (b_1 - b_5) are unstandardized b-weights. Response surface parameters are computed as follows: $a_1 = b_1 + b_2$; $a_2 = b_3 + b_4 + b_5$; $a_3 = b_1 - b_2$; $a_4 = b_3 - b_4 + b_5$.
† $p < .1$ * $p < .05$ ** $p < .01$.
4 cases with disproportional influence were excluded (Mahalanobis > 20).

Response surface analysis indicated that Work Engagement increased along the line of congruence (LOC; X = Y) as employee and supervisor Narcissism both increased (a_1). It also increased along the line of incongruence (LOC; X = -Y) when the direction of the discrepancy was such that employee Narcissism was higher than supervisor Narcissism rather than vice versa (a_3). So taken together, the result suggests that employee Work Engagement primarily depends on their own levels of Narcissism (see Figure 12), which is also supported by the significant b_1 coefficient (employee Narcissism) of the polynomial regression (see Table 6).

Figure 12

Response Surface Suggesting that Work Engagement Increased in a Linear Surface Along the LoC (Parameter a_1), as well as the LoIC Parameter a_3) of Employee and Supervisor Narcissism
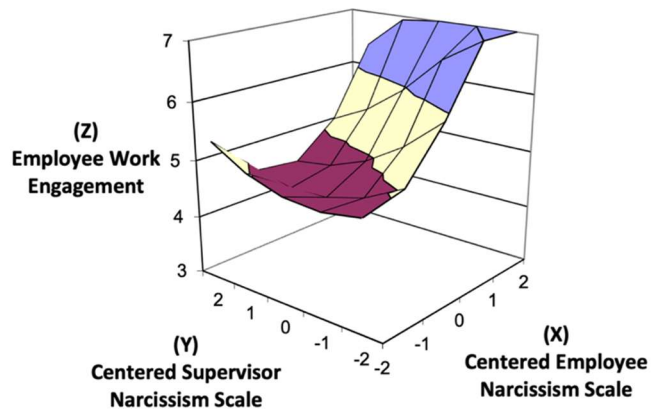
Note. Z-axis starts at three instead of one for visual aid. LoC = Line of Congruence (X = Y), LoIC = Line of InCongruence (X = -Y). The depicted curvilinear surface along the LoIC was not significant.

Response surface analysis for employee Turnover Intention as the outcome variable did not show any significant parameters (see Table 6). The polynomial regression analyses for employee Burnout and LMX were not significant and therefore did not warrant a response surface analysis.

Machiavellianism Fit

Four polynomial regressions were performed to analyze the PS fit in terms of Machiavellianism related to employee Work Engagement, Burnout, Turnover Intention and LMX. None of them showed a significant coefficient to warrant a response surface analysis. To enhance the readability of the results section, the corresponding table was removed and placed in the Appendix C instead.

Psychopathy Fit

Four polynomial regressions were performed to analyze the PS fit in terms of Psychopathy related to employee Work Engagement, Burnout, Turnover Intention and LMX (see Table 7). At the p < .01 level, the regression model with Burnout was significant, $F(5,94) = 5.70$, $p < .001$, as well as with Turnover Intention, $F(5,94) = 4.95$, $p < .001$, and LMX, $F(5,95) = 3.46$, $p = .006$.

Burnout. Response surface analysis for Employee Burnout as the outcome variable showed a positive significant parameter a_3 at the $p < .1$ level and a_4 (see Table 7) at the $p < .05$ level. The positive a_4 suggested a convex surface along the line of incongruence (LOIC; X = -Y). So the outcome variable Turnover Intention increased more sharply as degree of discrepancy increased (see Figure 13). In other words, as the distance between employees and supervisors increased on the

Psychopathy scale, the higher the employees' Turnover Intentions were. The positive parameter a_3, which was only significant at the p < .1 level, indicated that this effect may have been stronger when the discrepancy is such that employee Psychopathy was higher than supervisor Psychopathy.

Table 7

Polynomial Regression Coefficients and Response Surface Parameters of both Employees' and Supervisors' Psychopathy on Employees' Work Engagement, Burnout, Turnover Intention and LMX.

	Work Engagement	Burnout	Turnover Intention	LMX
Polynomial Regression coefficients				
b_1 E	-.09	.58	.95*	-.39
b_2 S	.32	-.47	-.74*	.26
b_3 E^2	-.11	.66*	.84**	-.49†
b_4 E × S	-.03	-.83*	-1.06**	.80*
b_5 S^2	.44	.02	.14	-.20
F	2.01†	5.70**	4.95**	3.46**
R^2	.10	.23	.21	.15
Response surface parameters				
a_1	-	0.10	0.21	-0.13
a_2	-	-0.15	-0.08	0.11
a_3	-	1.05†	1.69**	-0.65
a_4	-	1.50*	2.03**	-1.49†

Notes. N = 100. E = Employee Psychopathy, S = Supervisor Psychopathy.
Polynomial regression coefficients (b_1 - b_5) are unstandardized b-weights. Response surface parameters are computed as follows: $a_1 = b_1 + b_2$; $a_2 = b_3 + b_4 + b_5$; $a_3 = b_1 - b_2$; $a_4 = b_3 - b_4 + b_5$.
† $p < .1$ * $p < .05$ ** $p < .01$.
5 cases with disproportional influence were excluded (Mahalanobis > 20).

Turnover Intention. Response surface analysis for Turnover Intention as the outcome variable showed positive significant parameters a_3 and a_4 (see Table 7) at the *p* < .05 level. Again, this indicated a convex surface along the line of incongruence (LOIC; X = -Y). So the outcome variable Turnover Intention increased more sharply as degree of discrepancy increased (see Figure 13). In other words, as the distance between employees and supervisors increased on the Psychopathy scale, the higher the employees' Turnover Intentions were. In addition, the positive parameter a_3 suggested that this effect may have been stronger when the discrepancy is such that employee Psychopathy was higher than supervisor Psychopathy.

LMX. Response surface analysis for LMX as the outcome variable showed a negative significant parameter a_4 (see Table 7) at the *p* < .1 level. This indicated a concave surface along the line of incongruence (LOIC; X = -Y). So the outcome variable Burnout decreased more sharply as

degree of discrepancy increased (see Figure 13). In other words, as the distance between employees and supervisors increased on the Psychopathy scale, the lower the LMX was.

Figure 13

Response Surfaces with Employee and Supervisor Psychopathy as Predictors of Employee Burnout, Turnover Intention, and LMX
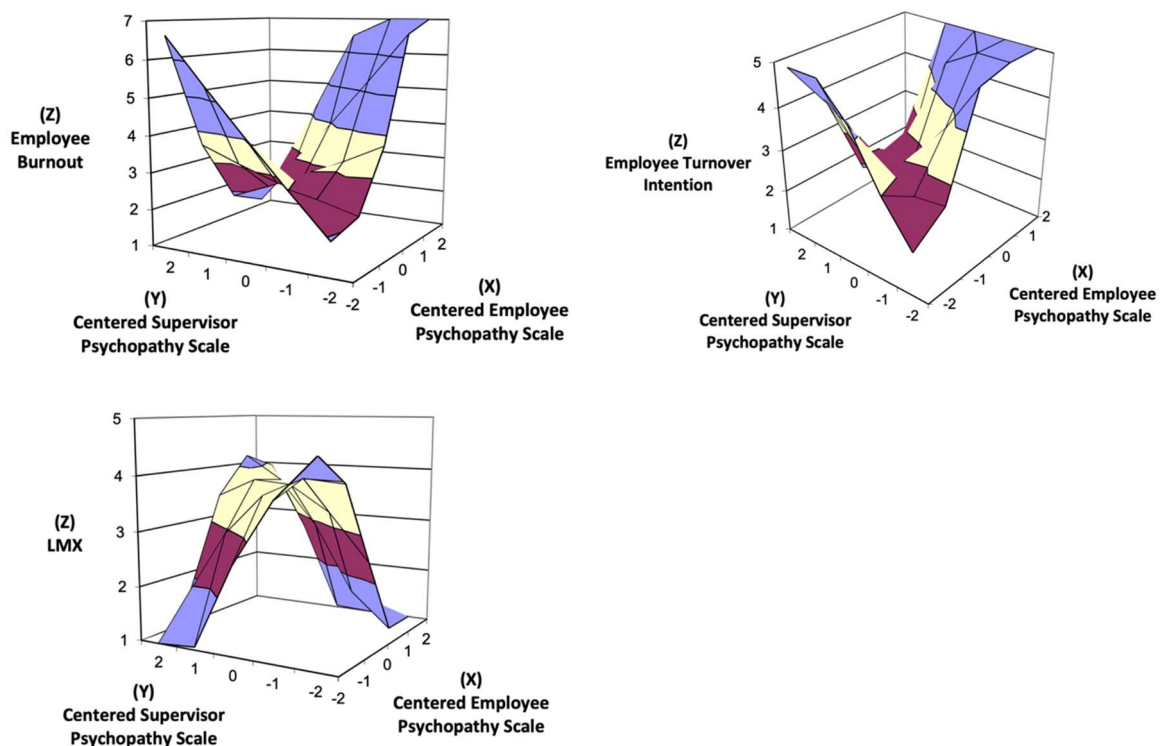
HEXACO Fit with LMX

Polynomial regression analyses with HEXACO personalities and the outcome variables Work Engagement, Burnout, and Turnover Intention did not show significant results and were therefore not reported. However, most HEXACO dyads showed significant relations to LMX. Table 8 shows all polynomial regressions and response surface analyses of employees' and supervisors' HEXACO with the outcome variable LMX. All polynomial regressions were significant on at least the *p* < .05 level, except for Agreeableness.

Honesty-Humility. Response surface analysis with Honesty-Humility did not show any significant parameters.

Emotionality. Response surface analysis with Emotionality showed the positive significant parameter a_3 (see Table 8) at the *p* < .1 level along the line of incongruence (LOIC; X = -Y). Figure 14 (top left) supports this and shows that high levels of supervisor Emotionality corresponded with low LMX.

Table 8

Polynomial Regression Coefficients and Response Surface Parameters of both Employees' and Supervisors' HEXACO on LMX.

	H	E	X	A	C	O
Polynomial Regression coefficients						
b_1 E	-.28	.15	.05	-.22	-.16	-.09
b_2 S	.50†	-.45*	.16	.13	.73**	-.02
b_3 E^2	.01	.11	-.39†	.25	.45*	-.19
b_4 E x S	-.01	.35	.74*	.52	-.23	.71*
b_5 S^2	.01	-.13	-.25	-.34	-.14	-.13
F	3.16*	4.51**	3.89**	1.87	9.21**	2.46*
p	.011	< .001	.003	.106	< .001	.038
R^2	.14	.14	.12	.09	.32	.11
df1, df2	5, 100	5,99	5, 98	5,99	5,99	5,98
Response Surface parameters						
a_1	0.22	-0.31	0.20	-	0.57*	-0.12
a_2	0.01	0.32	0.10	-	0.08	0.38†
a_3	-0.78	0.60†	-0.11	-	-0.89**	-0.07
a_4	0.03	-0.38	-1.38*	-	0.54	-1.04+

Notes. N = 100. E = Employee Psychopathy, S = Supervisor Psychopathy.
Polynomial regression coefficients (b_1 - b_5) are unstandardized b-weights. Response surface parameters are computed as follows: $a_1 = b_1 + b_2$; $a_2 = b_3 + b_4 + b_5$; $a_3 = b_1 - b_2$; $a_4 = b_3 - b_4 + b_5$.
† *p* < .1 * *p* < .05 ** *p* < .01.
Cases with disproportional influence were excluded (Mahalanobis > 20) for each analysis: H(3), E(4), X(6), A (5), C(5), O(5).

Extraversion. Response surface analysis with Extraversion showed a negative significant parameter a_4 (see Table 8) at the *p* < .05 level. This indicated a concave surface along the line of incongruence (LOIC; X = -Y). So the outcome variable LMX decreased more sharply as the degree of discrepancy increased (see Figure 14, top right). In other words, as the distance between employees and supervisors increased on the Extraversion scale, the lower the LMX was.

Conscientiousness. Response surface analysis with Conscientiousness showed the significant positive parameter a_1 and negative a_3 at the *p* < .05 level (see Table 8). The positive coefficient a_1 (along the LOC, X = Y) indicated that LMX increased as employee and supervisor Conscientiousness both increased. At the same time, the significant negative coefficient a_3 indicated that LMX was higher when the direction of the discrepancy was such that supervisor Conscientiousness was higher than employee Conscientiousness rather than vice versa (see Figure 14, bottom left).

Openness. Finally, the response surface analysis with Openness showed a positive significant parameter a_2 (relating to the line of congruence, LOC; X = Y) and a negative significant parameter a_4 (relating to the line of incongruence, LOIC; X = -Y) at the *p* < .1 level (see Table 8). A positive a_2 suggested that the surface along the LOC was positive and a convex (upward curving). So, LMX was

highest along the LOC when both employee and supervisor were either both high or both low on Openness (see Figure 14, bottom right). The negative a_4 suggested that the surface was concave along the LOIC (downward curving). In other words, LMX decreased more sharply as the degree of discrepancy between employee and supervisor Openness increased (see also Figure 14).

Figure 14

Response Surfaces with Employee and Supervisor HEXACO as Predictors of LMX
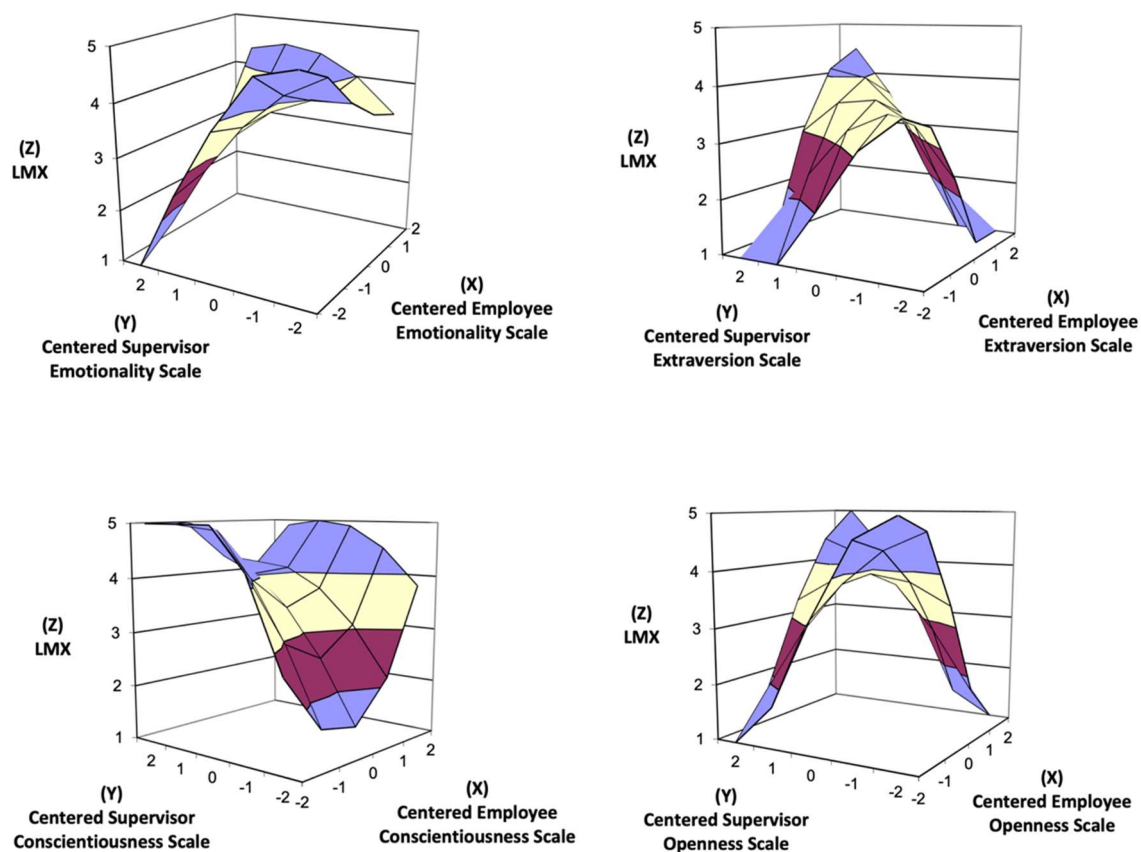
Discussion

Dark Triad Hypotheses

When the Dark Triad was introduced by Paulhus and Williams (2002), the personality traits Narcissism, Machiavellianism and Psychopathy, of which it consisted, were considered as generally undesirable. However, subsequent research has painted a more nuanced picture when including moderating factors or examining nonlinear relationships (Smith et al., 2018), finding that Dark Triad personalities can be desirable under certain circumstances. In the first part of this study, the Dark Triad of supervisors is placed into the Job-Demands-Resources model, arguing that on the one hand,

certain levels of a supervisor's Dark Triad could be motivational and therefore act as a job resource that influences their Work Engagement. On the other hand, dealing with certain levels of Dark Triad may act as a job demand and influence outcomes like Burnout and Turnover Intentions.

Answering the call for more research on nonlinear relationships with personalities, this study explored the possibility that the supervisors' Dark Triad might have a curvilinear relationship with work-related outcomes on their employees' side. However, the hierarchical regression analyses did not show any of the proposed curvilinear relationships. In fact, they were more in line with the pre-existing notion of undesirable, linear relations.

Supervisor Dark Triad and Employee Work Engagement

Of the Dark Triad, Psychopathy displayed a significant negative linear relation with employee Work Engagement, whereas Machiavellianism and Narcissism did not. This result shows that some supervisor personalities may, in fact play a role in the JDR model and influence their followers Work Engagement. The hypothesized curvilinear relations proposed that medium levels of the supervisor Dark Triad could be motivational and would lead to increased Work Engagement. This was not supported and only low levels of supervisor Psychopathy related to higher Work Engagement. In other words, supervisors who scored low on Psychopathy may have been able to be a motivational force for their employees. As supervisor Psychopathy increased, Work Engagement only decreased, indicating that higher levels may solely act as a job demand for their employees. A look beyond the Dark Triad personalities and the proposed hypotheses shows that the supervisor personalities Extraversion and Openness correlated significantly positive with employee Work Engagement (Table 1). This indicates that there may exist a motivational aspect to certain supervisor personalities, just not within the Dark Triad.

Significant Curvilinearity in Psychopathy Model. Besides the linear model with supervisor psychopathy, the quadratic one was significant too. However, its suggested form was inverted compared to the associated hypotheses (convex instead of concave, compare Figure 6 to Figure 11). This result suggests that very low and very high levels of supervisor Psychopathy would be related to higher Work Engagement and only medium levels with lower Work Engagement. However, this result is misleading, as a quick look into the scatterplot in Figure 11 shows. The curvilinearity only stems from the lowest levels of supervisor Psychopathy possible, which were related to very high Work Engagement. Simultaneously, the curvilinearity shows its prominent increase above the value of four, where no supervisors even scored. The conclusion could be drawn that supervisor Psychopathy is still negatively related to employee Work Engagement but with a flattening decline. The same issue occurred with employee Burnout as the outcome variable; however in reverse (see also Figure 11).

Supervisor Dark Triad and Employee Burnout

In the circumplex model of work-related affect, Burnout is on the opposite side of Work Engagement. The correlations between them support this (Table 2), showing a significant negative relationship between Burnout and Work Engagement. It is therefore unsurprising that their results are similar, yet not exactly the same. Of the Dark Triad, supervisor Narcissism and Psychopathy displayed significant negative linear relations with employee Burnout, but Machiavellianism did not. This indicates that dealing with increasing supervisor Narcissism and Psychopathy may be exhausting (job demand) for employees, leading to a higher Burnout score. Again, the proposed curvilinearity, with only very low and very high levels of the supervisor Dark Triad being exhausting, was not supported. The linear relation seemed to be much stronger for supervisor Psychopathy, with an explained variance of 15 percent, compared to the Narcissism model with only 9 percent.

Supervisor Dark Triad and Employee Turnover Intention

Beyond the scope of the JDR model, it was hypothesized that there would also be a curvilinear, U-shaped relationship between all three of the supervisor Dark Triad and their employees' Turnover Intentions (see Figure 6). Again, the proposed curvilinearity was not found. All three regression models with supervisor Narcissism, Machiavellianism and Psychopathy showed a positive and linear relationship with employee Turnover Intention. The strength of the relations also seemed to be similar, as the explained variances of the three models were comparable (between 14 and 17 percent).

Summary of Supervisor Dark Triad

To summarize, the closely related concepts of Work Engagement and Burnout seemed to be mainly affected by supervisor Psychopathy. This is in line with Landay and Credé's (2019) conclusions, who report weak positive correlations with leadership emergence but weak to moderate associations with leadership effectiveness and transformational leadership. In contrast, all three of the supervisor Dark Triad showed negative relations with employee Turnover Intentions. As the traits of the Dark Triad share a common, overlapping core ("tendencies toward self-promotion, emotional coldness, duplicity, and aggressiveness," Paulhus & Williams, 2002), it could be argued that it is this shared core that influences employee Turnover Intentions. Lee et al. (2013) remark that this common variance is comparable to low Honesty-Humility levels. Indeed, the correlations (Table 1) show that supervisor Honesty-Humility is also negatively correlated with employee Turnover Intentions.

One reason the expected curvilinear relations were not found could lie in the current study's design. Some previous studies linking supervisor Dark Triad to positive performance (Furham et al., 2012) or leadership outcomes (Schreyer et al., 2021) relied entirely on self-reported personalities

and outcome variables. Others, like the meta-analysis by Grijalva et al. (2015), included studies made up of students. When asking the employees who work with their supervisors, it appears that the Dark Triad lives up to its name.

Dark Triad Person-Supervisor Fit

The concept of Person-Supervisor (PS) fit was examined in the second part of this study. So far, most studies have operationalized PS fit in terms of values instead of personalities (Kristof-Brown et al., 2005; van Vianen, 2018). The analysis of PS fit was twofold. First, PS fit was assessed in terms of personality incongruence, as proposed by Bernerth et al. (2008). In general, all significant correlations between personality incongruences related negatively to the desirable outcome variables (Work Engagement and LMX) and positively to the undesirable outcome variables (Burnout and Turnover Intention, see Table 6). Then, polynomial regressions with response surface analyses were performed. In terms of PS fit, they generally supported the findings of the more straightforward incongruence analysis, indicating that similarity between employee and supervisor was more desirable than vice versa.

Dark Triad PS Fit and Work Engagement

Of the Dark Triad, Psychopathy incongruence correlated significantly and negatively with the outcome variable Work Engagement, whereas Narcissism and Machiavellianism incongruence did not. Polynomial regression analyses did not replicate this finding but did reveal that employee Narcissism related positively to their Work Engagement, independent of how narcissistic their supervisors were.

Dark Triad PS Fit and Burnout

The Dark Triad incongruence showed the same pattern with employee Burnout as the outcome variable. Psychopathy incongruence correlated positively with Burnout, yet this time it was confirmed by the polynomial regression analysis. Additionally, it revealed that both directions of the incongruence related positively to Burnout. This indicated that not only high supervisor with low employee Psychopathy were an unfavorable combination, but also low supervisor with high employee Psychopathy.

Dark Triad PS Fit and Turnover Intention

The incongruence analysis with the third outcome variable, employee Turnover Intention, showed that it was positively correlated with the incongruence of all three Dark Triad personalities. The polynomial regression analysis only confirmed this for employee and supervisor Psychopathy, again suggesting that the misfit may be unfavorable in both directions (high supervisor with low employee Psychopathy and vice versa).

Summary Dark Triad Person-Supervisor Fit

Whereas the regression analyses for the hypotheses showed that supervisor Dark Triad related to higher employee Turnover Intention, the incongruence analyses, and polynomial regressions gave further insight into the dynamic relationship between employees and their supervisors. The higher employee Turnover Intention did not only depend on increasing levels of supervisor Dark Triad but also the score difference between them and their employees. So the Turnover Intentions increased if supervisors scored high and employees low on the Dark Triad. However, if they both scored similarly, even higher levels of supervisor Dark Triad did not seem to relate to higher Turnover Intentions. Furthermore, Work Engagement did not seem to be affected by the PS fit and Burnout only in terms of Psychopathy fit.

Caution with Psychopathy Fit Interpretation. The polynomial regressions for Psychopathy (Table 9 and its associated Figure 13) show that an incongruence affects the outcomes in both directions (supervisor Psychopathy higher than employee Psychopathy and vice versa). Burnout and Turnover Intention results also imply that the effects may be even stronger when employee Psychopathy is higher than supervisor Psychopathy. This should be interpreted with caution, as it is because the largest differences between scores only occurred for high supervisor with low employee scores and none vice versa (for details see Appendix D).

Dark Triad and HEXACO PS Fit with LMX

The previous analyses related first supervisor and then both employee and supervisor Dark Triad personalities directly to work-related outcomes on the employees' side. Multiple underlying mechanisms may mediate the relationship between supervisor personality and employee work attitudes. One is leadership style, as Hogan and Kaiser (2005) proposed. Another one could be the Leader-Member-Exchange (LMX), which may be more directly influenced by employees' and supervisors' personalities. Supervisors influence their employees' work attitudes like Work Engagement, but they are by no means the only factor. Among them are a range of situational factors (e.g., task variety, task significance, social support from colleagues, etc.) and personal factors (e.g., positive affect, proactive personality) that are linked to higher Work Engagement (Christian et al., 2011). LMX is a narrower construct that solely focuses on the relationship between employee and supervisor and has, in turn, been shown to relate positively to Work Engagement within the frameworks of the JDR model (Breevaart et al., 2015). The correlations of this study support these findings, showing a significant positive relationship between LMX and Work Engagement (Table 1). Furthermore, LMX showed significant negative relations with Burnout and Turnover Intention. So, could LMX be the mediating construct between PS personality fit and the previously mentioned

work-related outcomes? The incongruence analyses and polynomial regressions of the Dark Triad and HEXACO personalities with LMX as the outcome variable indicate that that may be the case.

Dark Triad and LMX

The incongruence analysis showed that the incongruence of all three components of the Dark Triad were negatively related to LMX. Next, the basic difference (supervisor personality minus employee personality score) was correlated to LMX, revealing that the dissimilarity between employee and supervisor leading to lower LMX primarily stemmed from those cases where supervisors scored higher than the employees on all Dark Triad scales. The polynomial regressions did not add any new insights. So again, when supervisors were rated higher on the Dark Triad scales than the employees, this related to an unfavorable outcome, this time lower LMX.

HEXACO and LMX

Honesty-Humility. The analysis of the HEXACO personalities added to these findings and painted a nuanced picture of the PS fit relating to LMX. The incongruence of Honesty-Humility related overall negatively to LMX. Having seen the first results, this is not surprising, as this is the dimension most closely associated with the Dark Triad (Lee et al., 2013). However, correlating the basic difference between the scores to LMX revealed that this is only the case if the employee is higher on Honesty-Humility than the supervisor. If it is vice versa, such that the supervisor is higher on Honesty-Humility than the employee, this leads to a higher LMX.

Emotionality. The incongruence of the personality trait, Emotionality, did not show any relation to LMX. The polynomial regression supported this finding. However, it showed that if the supervisor was high on Emotionality, this related to lower LMX, independently from how the Employee scored.

Extraversion. For Extraversion, the incongruence was also related to lower LMX, and the polynomial regression showed that both directions of misfit equally led to lower LMX. As both employee and supervisor Extraversion correlated positively with LMX, the ideal combination would be if they both scored high on Extraversion.

Agreeableness. The dimension Agreeableness was the only one that did not show any relation to LMX.

Conscientiousness. The incongruence of Conscientiousness did not correlate significantly with LMX. However, the raw difference of the scores did so positively, indicating that whenever the supervisors were rated higher than the employees themselves, this led to higher LMX. The response surface analysis of the polynomial regression shed more light on this relationship, showing two things. First, if the employee and supervisor are similar in Conscientiousness, they should both score high for the highest LMX. Second, if they are different, the supervisor should be the one scoring

higher on Conscientiousness. So essentially, the supervisor just should not be very low on Conscientiousness.

Openness. And finally, the incongruence analysis for Openness showed a negative correlation with LMX. The response surface analysis supported this finding and again revealed two effects. Employees and supervisors who score similarly on Openness combine for a high LMX. And building on this already high LMX, the best combinations were with both of them scoring either very high or very low on Openness.

Summary LMX

Bernerth et al. (2008) related the personality incongruence in terms of the Big 5 to LMX. They found that all their measured personality differences related negatively to LMX, concluding that employees and supervisors should be as similar as possible for the highest LMX. The results of this study generally support their finding while painting a more nuanced picture. First, the Big 5 was expanded to the HEXACO, and the Dark Triad was also included. Second, for some personalities, like Honesty-Humility, the direction of discrepancy mattered. And third, employee and supervisor scores did not matter equally for certain personalities. For example, only the supervisors' Emotionality was relevant for the LMX. A concise summary of these findings with recommendations for a maximized LMX can be found in Table E1 (Appendix E).

Future Studies

This study relied on employees reporting their own and their supervisors' personalities. Malesza and Kaczmarek (2018) found substantial convergent validity between self and other-agreement on Dark Triad personalities, warranting the use of other-reporting. Future studies could include the more traditional self-reporting by supervisors and explore how this may affect the same outcomes. These self-reports could also use more extensive questionnaires that cover the sub facets of each Dark Triad, for example, the distinction between vulnerable and grandiose Narcissists.

The subject of gender differences in Dark Triad personalities was beyond the scope of this study and gender was only added as a control variable. In the first publication about the Dark Triad, men scored significantly higher than women in all facets (Paulhus & Williams, 2002). Fifteen years later, Muris et al. (2017) concluded in their meta-analysis that Dark Triad traits are generally more prominent in men than women. In this study, however, male supervisors only scored significantly higher than their female counterparts on Narcissism. This raises the immediate question: is this because they did not rate themselves, and are women just as "dark"? Or is it just the women who emerged as leaders that scored higher on the Dark Triad? Previous research supports the latter. Malesza and Kaczmarek (2018) report that their peer ratings did show the expected gender

differences in Narcissism and Psychopathy. However, the participants in their study were students rating other students and family members, not supervisors. Pfeffer (2021) summarizes that all three of the Dark Triad predict leadership emergence. Combining these findings, one could argue that among non-leaders, Dark Triad is more prominent in men than in women. Among leaders, this difference may not be quite as great.

As a final point, it was mentioned in the beginning that Paulhus et al. (2021) have recently expanded the Dark Triad to a Dark Tetrad, adding Sadism to the group. It shares the common component of callousness or impaired empathy and adds the unique element of intrinsic pleasure in hurting others. Future research could include their expanded questionnaire, now having the newest member.

Practical Implications

Given the findings of this study, one thing is clear: personality matters! This is by no means a revolutionary or even a very bold statement. Personality questionnaires are already used for hiring and promotions in the organizational context. But when selecting supervisors, Dark Triad scales could be added with the intention of screening, especially for signs of Psychopathy. Concerning the complex relationship between employees and their supervisors, it appears that LMX, at least to some extent, is influenced by the personality dispositions of the persons involved. Previous research suggested that low LMX would lead to poor performance and even turnover (Bernerth et al., 2008) and that high LMX related to higher Work Engagement (Breevaart et al., 2015). The results of this study are very much in line with these findings. Therefore, when an organization knows that a supervisor hiring new staff is extraverted, conscientious, and open, it would make sense for them not to recruit someone who is completely mismatched with them on these personality traits (see recommendations in Table E1). As suggested by this study and others before, such a mismatch may hinder the formation of LMX.

Limitations

The results of this study must be considered in light of certain limitations. First, the reliance on other-reporting of personality questionnaires has been criticized by some researchers. Proponents argue that "perception is reality" and observer ratings are more objective, but critics find that people know themselves best, which outweighs the risk of socially desirable answers (McRae, 1994). While Malesza and Kaczmarek (2018) found substantial convergent validity between self- and other-agreement on Dark Triad personalities, their participants were students who rated close friends and family members. Such intimate knowledge cannot necessarily be assumed for all

employee-supervisor relationships. An expected advantage of the chosen approach is that the employees were forced to compare themselves to their supervisor and actively think about how similar or different they believed they were. However, this led to the second limitation: all pairs of employee and supervisor personalities correlated with each other (e.g., employee Narcissism with supervisor Narcissism). This is something to keep in mind, yet not necessarily an issue. For the incongruence and fit analyses, the differences between employees and supervisors were of major interest. Therefore it could be argued that all differences found were conscious decisions by the employees.

The third limitation is the brevity of the personality scales that were used. The Dirty Dozen measuring the Dark Triad consisted of 12 items and the Brief HEXACO Inventory (BHI) of 24 items (both questionnaires with four items per personality). The Dirty Dozen showed satisfactory psychometric properties but has been criticized for not adequately capturing the nuances of the Dark Triad by Jones and Paulhus (2014), who subsequently developed their own Short Dark Triad scale. They both remain the most used short questionnaires assessing the Dark Triad (Paulhus et al., 2021). The Dirty Dozen was chosen for this study because the items seemed more practical for other-reporting. The BHI, on the other hand, showed relatively low reliabilities for its personalities. However, the author of the BHI reports that domain scales showed adequate levels of test-retest stability and adequate levels of self-other agreement, as well as high levels of convergent correlations with the HEXACO-PI-R (de Vries, 2013).

The final limitation concerns the number of analyses that were performed. With nine hypotheses (H1a-H3c), the probability of a Type I error is increased. The Type I error occurs when believing that there is a genuine effect in the population when there is no effect (Field, 2018). At the alpha level of .05, this probability is a substantial 37 percent (= $1 - .95^9$). One way to control the familywise error rate is dividing alpha by the number of tests, which would result in an alpha of .0056, which is very conservative. To not lose too much statistical power to detect effects that do exist, the middle ground could be accepting an alpha of .01. The probability of making a Type I error would then be 8.6 percent (= $1 - .99^9$). An alpha of .01 would not change the essence of the findings of H1a-H3a. For one, the linear relation between supervisor Narcissism and employee Burnout, which only showed small effect sizes, would not be significant. And secondly, the linear relation between supervisor Psychopathy and employee Burnout would also (barely) not be significant anymore.

Conclusion

Various studies have recently shown that Dark Triad personalities could, under certain circumstances, be beneficial for performance and leadership. In this study, it was the employees who reported on their supervisors' personalities, as well as their own work-related outcomes. When asking them, the people directly affected, no such positive outcomes of the supervisors' Dark Triad could be found. The results were more in line with the traditional view that increased levels of Dark Triad personalities are mostly detrimental. The closely related concepts of Work Engagement and Burnout seemed to be mainly affected by supervisor Psychopathy, whereas all three of the supervisor Dark Triad showed positive, linear relations with employee Turnover Intention.

Next, the PS fit of employee and supervisor Dark Triad personalities expanded on these findings. It showed that employee Turnover Intention depended not only on increasing levels of supervisor Dark Triad but also on the difference between them and their employees. Turnover Intentions appeared to be especially high when low Dark Triad employees worked under high Dark Triad supervisors. Again, Work Engagement and Burnout were mainly affected by Psychopathy incongruence and less by Narcissism and Machiavellianism.

Finally, it was explored how the PS fit of the Dark Triad and the HEXACO personalities related to the Leader-Member-Exchange (LMX). This resulted in differentiated findings of the PS fit where an ideal combination of employee and supervisor was found for each personality trait. Overall, similarity between employee and supervisor personalities related to a higher LMX. For Honesty-Humility and Conscientiousness, the direction of discrepancy mattered (supervisors should score higher than their employees), whereas for Openness, it did not (discrepancy affected LMX in both directions equally). And for Emotionality, only the supervisor levels influenced the LMX. As LMX is positively related to Work Engagement and negatively to Burnout and Turnover Intention, these findings could be helpful for HR managers in hiring and promotion decisions.

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Appendix A: Participant Introduction in Qualtrics and Questionnaires

This survey is available in English, Dutch, and German. Please choose your preferred language at the top of this screen.

Hi and welcome to this research study!

My name is Joris Steinmann and for my Master thesis at the Erasmus University Rotterdam (Work and Organizational Psychology) I am conducting research on the working relationship of employees and their supervisors, as well as their personalities. If you have any questions regarding this survey please do not hesitate to contact me via email at 626020js@eur.nl.

The study as a whole should take you around 20 minutes to complete and your participation in this research is voluntary. You have the right to withdraw at any point during the study.

Please be assured that your responses will be treated in an entirely confidential and anonymous way. This study is conducted in compliance with the ethical guidelines of Erasmus University Rotterdam.

By clicking the button below, you acknowledge that your participation in the study is voluntary and that you are aware that you can terminate your participation in the study at any time and for any reason without repercussions.

Thank you for your time and participation.

Table A1

Dark Triad Dirty Dozen (Jonason and Webster, 2010)

Nr.	SPSS	Rev.	English	Dutch	German
1	DDM1		tends to manipulate others to get his/her way.	heeft de neiging om anderen te manipuleren om zijn/haar zin te krijgen	neigt dazu, andere zu manipulieren, um seinen/ihren Willen durchzusetzen.
2	DDP1		tends to lack remorse.	heeft zelden ergens spijt van	neigt dazu, keine Gewissensbisse zu haben.
3	DDN1		tends to want others to admire him/her.	wil graag dat anderen hem/haar bewonderen	neigt dazu, von anderen bewundert werden zu wollen.
4	DDM2		has used deceit or lied to get his/her way.	heeft weleens bedrogen of gelogen om zijn/haar zin te krijgen	hat getäuscht oder gelogen, um seinen/ihren Willen durchzusetzen.
5	DDP2		tends to be unconcerned with the morality of his/her actions.	maakt zich niet druk om de morele aspecten van zijn/haar gedrag	neigt dazu, sich nicht um die Moral seiner/ihrer Handlungen zu kümmern.
6	DDN2		tends to want others to pay attention to him/her.	wil graag dat anderen aandacht voor hem/haar hebben	neigt dazu, von anderen beachtet werden zu wollen.
7	DDM3		has used flattery to get his/her way.	heeft vleierij (mooie praatjes) gebruikt om zijn/haar zin te krijgen	hat Schmeicheleien genutzt, um seinen/ihren Willen durchzusetzen.
8	DDP3		tends to be callous or insensitive.	heeft de neiging om hard of ongevoelig te zijn	neigt dazu, gefühllos oder unsensibel zu sein.
9	DDN3		tends to seek prestige or status.	streeft vooral prestige of status na	neigt dazu, nach Ansehen oder Status zu streben.
10	DDM4		tends to exploit others towards his/her own end.	heeft de neiging om anderen uit te buiten voor zijn/haar eigen doeleinden	neigt dazu, andere für seine Zwecke auszunutzen.
11	DDP4		tends to be cynical.	heeft de neiging om cynisch te zijn	neigt dazu, zynisch zu sein.
12	DDN4		tends to expect special favors from others.	verwacht vaak speciale gunsten van anderen	neigt dazu, besondere Gefälligkeiten von anderen zu erwarten.

Table A2

Brief HEXCO Inventory (BHI) (de Vries, 2013)

Nr.	SPSS	Rev.	English	Dutch	German
1	HO1		can look at a painting for a long time.	kan lang naar een schilderij kijken.	kann lange ein Gemälde betrachten.
2	HC1		makes sure that things are in the right spot.	zorgt dat dingen altijd op de juiste plek liggen.	sorgt stets dafür, dass alle Dinge an ihrem Ort sind.
3	HA1	R	remains unfriendly to someone who was mean to him/her.	blijft onaardig tegen iemand die gemeen was.	bleibt unfreundlich gegenüber jemandem, der ihn/sie schlecht behandelt hat
4	HX1	R	thinks that nobody likes talking with him/her.	denkt dat niemand graag met hem/haar wil praten.	Denkt, dass sich niemand gerne mit ihm/ihr unterhält.
5	HE1		is afraid of feeling pain.	is bang om pijn te lijden.	hat Angst, verletzt zu werden.
6	HH1		finds it difficult to lie.	vindt het moeilijk om te liegen.	Es fällt ihm/ihr schwer zu lügen.
7	HO2	R	thinks science is boring.	Vindt wetenschap saai.	findet Wissenschaft langweilig.
8	HC2	R	postpones complicated tasks as long as possible.	Stelt ingewikkelde taken zo lang mogelijk uit.	schiebt schwierige Aufgaben so lange wie möglich auf.
9	HA2	R	often expresses criticism.	Geeft vaak kritiek.	übt oft Kritik.
10	HX2		easily approaches strangers.	Legt gemakkelijk contact met vreemden.	kommt leicht in Kontakt mit Fremden.
11	HE2	R	worries less than others.	Maakt zich minder zorgen dan anderen.	macht sich weniger Sorgen als andere.
12	HH2	R	would like to know how to make lots of money in a dishonest manner.	Is benieuwd hoe je op een oneerlijke manier veel geld kan verdienen.	ist neugierig, wie man auf unehrliche Art und Weise Geld verdienen kann.
13	HO3		has a lot of imagination.	Heeft veel fantasie.	hat viel Fantasie.
14	HC3		works very precisely.	Werkt erg nauwkeurig.	arbeitet sehr genau.
15	HA3		tends to quickly agree with others.	Is het snel met anderen eens.	neigt dazu, anderen schnell zuzustimmen.
16	HX3		likes to talk with others.	Praat graag met anderen.	redet gerne mit anderen.
17	HE3	R	can easily overcome difficulties on his/her own.	Kan prima in z'n eentje moeilijkheden overwinnen.	kann gut Schwierigkeiten aus eigener Kraft überwinden.
18	HH3	R	wants to be famous.	Wil graag beroemd zijn.	würde gerne berühmt sein.
19	HO4		likes people with strange ideas.	Houdt van mensen met rare ideeën.	mag Menschen mit seltsamen Ideen.
20	HC4	R	often does things without really thinking.	Doet vaak dingen zonder echt na te denken.	tut oft Dinge, ohne darüber nachzudenken.
21	HA4		Even when he/she is treated badly, he/she remains calm.	Zelfs als hij/zij slecht behandeld wordt, blijft hij/zij kalm.	bleibt ruhig, auch wenn er/sie schlecht behandelt wird.
22	HX4	R	is seldom cheerful.	Is zelden opgewekt.	ist selten heiter.
23	HE4		has to cry during sad or romantic movies.	Moet huilen bij trieste of romantische films.	muss weinen, wenn er/sie traurige oder romantische Filme sieht.
24	HH4	R	believes that he/she is entitled to special treatment.	kan lang naar een schilderij kijken.	denkt, dass er/sie Anspruch auf eine Sonderbehandlung hat.

Table A3

Utrecht Work Engagement Scale (UWES) (Schaufeli & Bakker, 2004)

Nr.	SPSS	Rev.	English	Dutch	German
1	VI01*		At my work, I feel bursting with energy	Op mijn werk bruis ik van energie.	Bei meiner Arbeit bin ich voll überschäumender Energie
2	DE01		I find the work that I do full of meaning and purpose	Ik vind het werk dat ik doe nuttig en zinvol.	Meine Arbeit ist nützlich und sinnvoll
3	AB01		Time flies when I'm working	Als ik aan het werk ben, dan vliegt de tijd voorbij.	Während ich arbeite, vergeht die Zeit wie im Fluge
4	VI02*		At my job, I feel strong and vigorous	Als ik werk voel ik me fit en sterk.	Beim Arbeiten fühle ich mich fit und tatkräftig
5	DE02*		I am enthusiastic about my job	Ik ben enthousiast over mijn baan.	Ich bin von meiner Arbeit begeistert
6	AB02		When I am working, I forget everything else around me	Als ik werk vergeet ik alle andere dingen om me heen.	Während ich arbeite, vergesse ich alles um mich herum.
7	DE03*		My job inspires me	Mijn werk inspireert mij.	Meine Arbeit inspiriert mich
8	VI03*		When I get up in the morning, I feel like going to work	Als ik 's morgens opsta heb ik zin om aan het werk te gaan	Wenn ich morgens aufstehe, freue ich mich auf meine Arbeit
9	AB03*		I feel happy when I am working intensely	Wanneer ik heel intensief aan het werk ben, voel ik mij gelukkig.	Ich fühle mich glücklich, wenn ich intensiv arbeite
10	DE04*		I am proud of the work that I do	Ik ben trots op het werk dat ik doe.	Ich bin stolz auf meine Arbeit
11	AB04*		I am immersed in my work	Ik ga helemaal op in mijn werk.	Ich gehe völlig in meiner Arbeit auf
12	VI04		I can continue working for very long periods at a time	Als ik aan het werk ben, dan kan ik heel lang doorgaan.	Wenn ich arbeite, kann ich für sehr lange Zeit dran bleiben
13	DE05		To me, my job is challenging	Mijn werk is voor mij een uitdaging.	Meine Arbeit ist eine Herausforderung für mich
14	AB05*		I get carried away when I'm working	Mijn werk brengt mij in vervoering.	Meine Arbeit reißt mich mit
15	VI05		At my job, I am very resilient, mentally	Op mijn werk beschik ik over een grote mentale (geestelijke) veerkracht.	Bei meiner Arbeit bin ich geistig sehr widerstandsfähig
16	AB06		It is difficult to detach myself from my job	Ik kan me moeilijk van mijn werk losmaken.	Ich kann mich nur schwer von meiner Arbeit lösen
17	VI06		At my work I always persevere, even when things do not go well	Op mijn werk zet ik altijd door, ook als het tegenzit.	Bei meiner Arbeit halte ich immer durch, auch wenn es mal nicht so gut läuft

Table A4

Work Burnout (Schaufeli & Salanova, 2007)

Nr.	SPSS	Rev.	English	Dutch	German
1	VI01*		At my work, I feel bursting with energy	Op mijn werk bruis ik van energie.	Bei meiner Arbeit bin ich voll überschäumender Energie
2	DE01		I find the work that I do full of meaning and purpose	Ik vind het werk dat ik doe nuttig en zinvol.	Meine Arbeit ist nützlich und sinnvoll
3	AB01		Time flies when I'm working	Als ik aan het werk ben, dan vliegt de tijd voorbij.	Während ich arbeite, vergeht die Zeit wie im Fluge
4	VI02*		At my job, I feel strong and vigorous	Als ik werk voel ik me fit en sterk.	Beim Arbeiten fühle ich mich fit und tatkräftig
5	DE02*		I am enthusiastic about my job	Ik ben enthousiast over mijn baan.	Ich bin von meiner Arbeit begeistert
6	AB02		When I am working, I forget everything else around me	Als ik werk vergeet ik alle andere dingen om me heen.	Während ich arbeite, vergesse ich alles um mich herum.
7	DE03*		My job inspires me	Mijn werk inspireert mij.	Meine Arbeit inspiriert mich
8	VI03*		When I get up in the morning, I feel like going to work	Als ik 's morgens opsta heb ik zin om aan het werk te gaan	Wenn ich morgens aufstehe, freue ich mich auf meine Arbeit
9	AB03*		I feel happy when I am working intensely	Wanneer ik heel intensief aan het werk ben, voel ik mij gelukkig.	Ich fühle mich glücklich, wenn ich intensiv arbeite
10	DE04*		I am proud of the work that I do	Ik ben trots op het werk dat ik doe.	Ich bin stolz auf meine Arbeit
11	AB04*		I am immersed in my work	Ik ga helemaal op in mijn werk.	Ich gehe völlig in meiner Arbeit auf
12	VI04		I can continue working for very long periods at a time	Als ik aan het werk ben, dan kan ik heel lang doorgaan.	Wenn ich arbeite, kann ich für sehr lange Zeit dran bleiben
13	DE05		To me, my job is challenging	Mijn werk is voor mij een uitdaging.	Meine Arbeit ist eine Herausforderung für mich
14	AB05*		I get carried away when I'm working	Mijn werk brengt mij in vervoering.	Meine Arbeit reißt mich mit
15	VI05		At my job, I am very resilient, mentally	Op mijn werk beschik ik over een grote mentale (geestelijke) veerkracht.	Bei meiner Arbeit bin ich geistig sehr widerstandsfähig
16	AB06		It is difficult to detach myself from my job	Ik kan me moeilijk van mijn werk losmaken.	Ich kann mich nur schwer von meiner Arbeit lösen
17	VI06		At my work I always persevere, even when things do not go well	Op mijn werk zet ik altijd door, ook als het tegenzit.	Bei meiner Arbeit halte ich immer durch, auch wenn es mal nicht so gut läuft

Table A5

Turnover Intention Scale (TIS-6) (Bothma & Roodt, 2013)

Nr.	SPSS	Rev.	English	Dutch	German
1	TIS1		How often have you considered leaving your job?	Hoe vaak heb je overwogen je baan op te geven?	Wie oft haben Sie schon daran gedacht, Ihren Job kündigen?
2	TIS2		To what extent is your current job satisfying your personal needs?	In welke mate beantwoordt uw huidige job aan uw persoonlijke behoeften?	Inwieweit erfüllt Ihre derzeitige Tätigkeit Ihre persönlichen Bedürfnisse?
3	TIS3	R	How often are you frustrated when not given the opportunity at work to achieve your personal work-related goals?	Hoe vaak bent u gefrustreerd als u op het werk niet de kans krijgt om uw persoonlijke werkgerelateerde doelen te bereiken?	Wie oft sind Sie frustriert, wenn Sie bei der Arbeit nicht die Möglichkeit haben, Ihre persönlichen arbeitsbezogenen Ziele zu erreichen?
4	TIS4		How often do you dream about getting another job that will better suit your personal needs?	Hoe vaak droomt u ervan een andere baan te krijgen die beter aan uw persoonlijke behoeften voldoet?	Wie oft träumen Sie davon, einen anderen Job zu finden, der Ihren persönlichen Bedürfnissen besser entspricht?
5	TIS5		How likely are you to accept another job at the same compensation level should it be offered to you?	Hoe groot is de kans dat u een andere baan met hetzelfde salarisniveau accepteert, mocht die u worden aangeboden?	Wie wahrscheinlich ist es, dass Sie eine andere Stelle mit demselben Gehalt annehmen würden, wenn sie Ihnen angeboten würde?
6	TIS6	R	How often do you look forward to another day at work?	Hoe vaak kijk je uit naar een nieuwe dag op het werk?	Wie oft freuen Sie sich auf den nächsten Arbeitstag?

Table A6

LMX (Graen & Uhl-Bien, 1995)

Nr.	SPSS	Rev.	English	Dutch	German
1	LMX1		My supervisor usually lets me know how satisfied (s)he is with me.	Mijn leidinggevende laat mij weten of hij/zij tevreden is met mijn werk.	Mein/e Vorgesetzte/r lässt mich wissen, ob er mit meiner Arbeit zufrieden ist.
2	LMX2		My supervisor understands my job problems and needs	Mijn leidinggevende heeft begrip voor mijn problemen en wensen met betrekking tot mijn werk.	Mein/e Vorgesetzte/r versteht meine beruflichen Probleme und Bedürfnisse.
3	LMX3	R	My supervisor recognizes my potential	Mijn leidinggevende herkent mijn potentieel.	Mein/e Vorgesetzte/r erkennt mein Potential.
4	LMX4		My supervisor uses his/her influence to help me solve problems in my work.	Mijn leidinggevende gebruikt zijn invloed om mij te helpen problemen op het werk op te lossen.	Mein/e Vorgesetzte/r nutzt seinen/ihren Einfluss, um mir bei Arbeitsproblemen zu helfen.
5	LMX5		My supervisor would "bail me out" at his/her expense if necessary.	Mijn leidinggevende staat voor mij in als dat nodig is.	Mein/e Vorgesetzte/r würde mir auf seine/ihre Kosten aus der Patsche helfen.
6	LMX6	R	I have enough confidence in my leader that I would defend and justify his or her decision if he or she were not present to do so.	Ik heb genoeg vertrouwen in mijn leidinggevende dat ik zijn of haar beslissing zou verdedigen en rechtvaardigen als hij of zij niet aanwezig was om dat te doen.	Ich habe genügend Vertrauen in mein/e Vorgesetzte/r, um seine/ihre Entscheidungen zu verteidigen, wenn er/sie nicht anwesend wäre.
7	LMX7		I have an effective working relationship with my supervisor.	Ik heb een effectieve werkrelatie met mijn leidinggevende.	Ich habe ein effektives Arbeitsverhältnis mit meinem/r Vorgesetzten.

Appendix B: Detailed Procedure For Polynomial Regressions

Using polynomial regression analysis, one can examine the following: 1) How does agreement between two predictor variables relate to an outcome? 2) How does the degree of discrepancy between two predictor variables relate to an outcome? 3) How does the direction of the discrepancy between two predictor variables relate to an outcome? Shanock et al. (2010) provide a detailed and step-by-step analysis of conducting and interpreting these analyses. The first two steps are summarized here:

  Step 1: Descriptive Information About the Occurrence of Support Discrepancies. Before conducting the polynomial regression analyses, Shanock et al. (2010) highlight the importance of inspecting whether there were discrepancies between the two predictors (Employee and Supervisor Personality Trait) in the first place. If it turned out that very few participants had discrepant values the practical value of exploring how discrepancies affect an outcome variable would be small. They recommend standardizing the scores for each predictor variable. Any participant with a standardized score on one predictor variable that is half a standard deviation above or below the standardized score on the other predictor variable would be considered to have discrepant values. Only if there was a sufficient percentage of discrepant ratings (at least 10 percent) further analyses would be warranted. Table 1 shows that all percentages of discrepant ratings were above the recommended threshold of 10 percent.

Table B1

Percentages of Employee Personality Trait Levels Over (E > S), Under (E < S), and In-Agreement (E = S) with Supervisor Personality Trait Levels

	E > S	E = S	E < S
Dark Triad			
Narcissism	22.7	54.5	22.7
Machiavellianism	20.9	63.6	15.5
Psychopathy	24.5	59.1	16.4
HEXACO			
Honesty-Humility	24.5	54.5	20.9
Emotionality	30.9	32.7	36.4
Extraversion	29.1	46.4	24.5
Agreeableness	28.2	40.0	31.8
Conscientiousness	27.3	40.0	32.7
Openness	30.0	42.7	27.3

Note. N = 110. E = Employee, S = Supervisor. E > S indicates that the standardized Employee Personality Trait score is more than 0.5 SD above the Supervisor score. E < S indicates that the standardized Employee Personality Trait score is more than 0.5 SD under the Supervisor score. E = S indicates that the standardized Employee Personality Trait score is within -0.5 and +0.5 SD of the Supervisor score.

Step 2: Run Polynomial Regression in SPSS and Calculate the Surface Values. First, the predictors were centered (Employee and Supervisor Dark Triad and HEXACO) around the midpoint of their respective scales. Three (3) was subtracted from each score because the Dark Triad and the HEAXACO were measured on a 5-point Likert-type scale. Centering aids interpretation and reduces the potential for multicollinearity. Then, three new variables per personality trait (nine total, three for the Dark Triad and six for the HEXACO) were computed: (a) the square of the centered employee trait variable (e.g., centered Employee Narcissism squared); (b) the cross-product of the centered trait variables (e.g., centered Employee × centered Supervisor Narcissism); and (c) the square of the centered supervisor trait variable (e.g., centered Supervisor Narcissism squared). Next, the polynomial regression analyses run for each personality trait and each outcome variable. The general form of the equation to test for relationships using polynomial regression is $Z = b_0 + b_1X + b_2Y + b_3XY + b_4X^2 + b_5Y^2 + e$, where Z is a dependent variable, X is Predictor 1 (e.g., Employee Narcissism), Y is Predictor 2 (e.g., Supervisor Narcissism), and e is the error term. Thus, the outcome variable is regressed on each of two predictor variables (X and Y), the interaction between the two predictor variables (XY), and the squared terms for each of the two predictors (X^2 and Y^2).

Rather than directly interpreting the results from the polynomial regression analysis, if the R^2 was significantly different from zero, the results of the polynomial regression were evaluated with regard to four surface test values: a_1, a_2, a_3, and a_4. This "response surface pattern" was graphed to provide a three-dimensional visual representation of the data to aid interpretation (Shanock et al., 2010). The formulas to determine the significance of each surface value are provided by Shanock et al. (2010) who added a free to use Excel template to their article. The value a_1 tests the linear relationship along the line of perfect agreement (a.k.a. line of congruence, LOC, X = Y) as it relates to the outcome variable. The value a_2 tests the curvilinear relationship along the LOC. The value a_3 tests the linear relationship along the line of incongruence (LOIC, X = -Y) and a_4 tests the curvilinear relationship along the LOIC. For a more in-depth discussion, see Shanock et al. (2010).

Step 3: Graph the Results in Excel.

Step 4: Interpret the Surface Values and Graph.

Appendix C: Polynomial Regression for Machiavellianism

Table C1

Polynomial Regression Coefficients and Response Surface Parameters of both Employees' and Supervisors' Machiavellianism on Employees' Work Engagement, Burnout, Turnover Intention and LMX.

	Work Engagement	Burnout	Turnover Intention	LMX
Polynomial Regression coefficients				
b_1 E	.42	-.34	.02	.03
b_2 S	.01	.09	.16	-.22
b_3 E^2	-.04	-.21	.03	-.20
b_4 E × S	.18	.07	.05	.18
b_5 S^2	.10	-.04	-.10	.04
F	1.64	0.66	1.38	4.12**
R^2	.08	.03	.07	.17
Response surface parameters				
a_1	-	-	-	-
a_2	-	-	-	-
a_3	-	-	-	-
a_4	-	-	-	-

Notes. N = 105. E = Employee Machiavellianism, S = Supervisor Machiavellianism. Polynomial regression coefficients (b_1 - b_5) are unstandardized b-weights. Response surface parameters are computed as follows: $a_1 = b_1 + b_2$; $a_2 = b_3 + b_4 + b_5$; $a_3 = b_1 - b_2$; $a_4 = b_3 - b_4 + b_5$.
† $p < .1$ * $p < .05$ ** $p < .01$.
4 cases with disproportional influence were excluded (Mahalanobis > 20).

Appendix D: Caution with Psychopathy Incongruence Interpretation

The polynomial regressions for Psychopathy (Table 9 and its associated Figure 13) show that an incongruence affects the outcomes in both directions (supervisor Psychopathy higher than employee Psychopathy and vice versa). The results for Burnout and Turnover Intention also imply that the effects may be even stronger when employee Psychopathy is higher than supervisor Psychopathy. This should at least be interpreted with caution, as it is due to the fact that very large differences between the scores only occurred for higher supervisor with lower employee scores. Counting the cases with large absolute differences (here: more than plus/minus one) showed that there were nine cases (out of 106) where the supervisors were rated much higher than the employees, yet none the other way around. Within the difference of plus/minus one, the scores were evenly distributed. Therefore the effects of the Psychopathy misfit may be inflated in the direction of very high employee with very low supervisor Psychopathy, as these combinations did not occur in the dataset.

Appendix E: Summary and Recommendations of PS fit with LMX

Table E1

Summary of PS fit with LMX

Personality Trait	Findings	Recommendation
Dark Triad	Differences relate to lower LMX, especially if S > E	S < E, or at least S = E
Honesty-Humility	S < E relates to lower LMX, however S > E relates to higher LMX	S > E
Emotionality	High S leads to low LMX, independent from E	Low S
Extraversion	Difference leads to lower LMX, both directions	E = S, ideally both high
Agreeableness	-	-
Conscientiousness	S > E relates to higher LMX, but E and S each also both correlate positively with LMX	S not low, ideally E and S both high
Openness	Differences relate to lower LMX in both directions, best combination if either both high or both low.	E = S, best if either both high or both low

Notes. E = Employee, S = Supervisor.