Understanding Dark Side Personality at Work:

Distinguishing and Reviewing Nonlinear, Interactive, Differential, and Reciprocal Effects

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Abstract

The topic of dark side personality at work has received considerable research attention over the past decade, and both qualitative and quantitative reviews of this field have already been published. In order to show the relevance of dark personality in the work context, existing reviews have typically focused on systematically discussing the different criteria that have been linked to dark traits (e.g., job performance, work attitudes, leadership emergence, etc.). In contrast, and complementing this earlier work, the current review paper summarizes the available literature on this topic by structuring it in terms of the nature of the relationships studied rather than in terms of the types of outcome variables. Doing so, the focus shifts from '*What* are the outcomes of dark traits?' to '*How* are dark traits related to work outcomes?'. Scrutinizing the nature of these relationships, we specifically focus on four types of effects (i.e., nonlinear, interactive, differential, and reciprocal) that highlight the complexity of how dark side traits operate in the work context. Structured this way, this review first provides a conceptual underpinning of each of these complex effects, followed by a summary of the empirical literature published over the past ten years. To conclude, we present an integration of this field, provide suggestions for future research, and highlight concrete challenges for the field of assessment.

Keywords: dark personality; maladaptive personality; dark triad; narcissism; psychopathy; Machiavellianism

Introduction

About twenty years ago, the concept of the dark side of personality was introduced as a way to understand incompetent management and bad leadership (e.g., Hogan & Hogan, 2001a; Hogan et al., 2021). Since then, dark side personality has rapidly become a productive area of research in Industrial-Organizational (I-O) psychology and management. For many researchers, the availability of an additional set of personality descriptors that goes beyond general or 'bright side' personality taxonomies, such as the Big Five, opened the door to better study the dispositional basis of negative aspects of organizational life. Still, much of this research has focused on identifying simple, linear relationships between specific traits and a range of work-related outcomes, which is also reflected in the way in which existing reviews of this literature are structured. Although informative, it now also becomes clear that such simple, linear associations between dark traits and work outcomes and behaviors paint an overly simple picture of how dark side personality actually operates in the work context (Vergauwe et al., 2021; see also O'Boyle et al., 2012). To give only one example, the consequences of narcissism can be different depending on which particular aspect of this multidimensional trait is considered (e.g., Grijalva & Newman, 2015). The aim of the current review paper is to zoom in on these complexities and to document four distinct ways of exploring the meaning, role and functioning of dark side personality traits in a more nuanced way in professional settings.

Dark Side Personality Defined and Delineated

We begin this review by discussing the ways in which dark side personality is most commonly conceptualized in the work setting. Before doing so, however, it is necessary to clarify what is meant by 'personality'. Although there are many definitions of personality, there are a number of common elements, and Funder (2010) identified those commonalities by defining personality as the individual's characteristic patterns of thought, emotion, and

behavior, together with the psychological mechanisms behind those patterns. In addition, there are two other important notions often associated with the concept of personality (Christiansen & Tett, 2013). First, personality is thought to drive and direct behavior. As a cause of people's actions, it is intrinsically motivational in nature. Second, it is involved in determining how people react to situations (Rauthmann, 2016). Thus, the impact of personality on behavior has been construed to be an interaction between the person and the situation, a point to which we will return later on.

Building on this definition, research has also started to distinguish different 'shades of personality' (e.g., Wille & De Fruyt, 2014). The distinction between the *bright side* and the *dark side* of personality is particularly the result from applying personality psychology to explain phenomena relevant in the context of organizational behavior (Hogan et al., 1994; Judge et al., 2009). More specifically, the bright side is concerned with the dispositional characteristics that observers view during social interaction when people are doing their best to get along and get ahead, such as in a job interview (Hogan & Kaiser, 2005). The dark side, in contrast, refers to the impression people make when they let down their guard—when they are stressed, tired, or otherwise less vigilant about how they are being perceived (Kaiser et al., 2015; Spain et al., 2016). Moving beyond this general definition, it is safe to conclude that there is no universally accepted taxonomy of dark side personality, and debates about the nature, content and structure of this concept are still ongoing. However, in professional contexts, there are two different conceptualizations that have received the most attention in empirical research, namely the DSM-IV axis approach and the concept of the dark triad.

The DSM-IV axis II approach to dark personality

The first conceptualization draws on the idea that dark personality traits are what characterize people when they let down their guard. These traits, which have also been referred to as aberrant personality tendencies, capture "personality peculiarities" (Wille et al.,

2013, p. 174), which may not necessarily lead to severe dysfunction in the short term, but are highly likely to be associated with problems over the long term and therefore require further attention, for instance in the context of employee screening (De Fruyt et al., 2013). Hogan and Hogan (2001a) described 11 of these tendencies that parallel the Axis II personality disorders defined in the *Diagnostic and Statistical Manual of Mental Disorders IV* (APA, 2000). Importantly, these dark side traits are not intended to describe clinical personality disorders, primarily because they do not significantly impair functioning in everyday life, which is one of the requirements for a clinical diagnosis. Instead, these dark side DSM-IV trait constructs can be understood as extreme variants of (combinations of) bright side traits (Wille & De Fruyt, 2014). In this perspective, obsessive-compulsive tendency, for instance, can be understood as roughly reflecting a combination of high conscientiousness and low openness, as expressed through pervasive preoccupations with orderliness, rules and control. Although this does not qualify as a clinical disorder, it *can* interfere with performance, decisions, and professional relationships at work.

Instruments have been developed to assist researchers and practitioners in measuring these 11 dark side traits in the work setting, hereby often using a more euphemistic naming instead of the negatively termed DSM-IV disorders (e.g., 'Diligent' instead of 'obsessive-compulsive' in the Hogan Development Survey; Hogan & Hogan, 2001b). Table 1 summarizes all 11 DSM-IV traits and their subclinical variants in the work context. For each tendency, we also briefly highlight the expected deficits in the work context.

The Dark Triad

Despite the comprehensive nature of DSM-IV trait taxonomy, its use in empirical research on dark side personality at work has remained relatively limited. Instead, the vast majority of research on dark side personality in the work context has relied on the so-called dark triad. The dark triad is the term coined by Paulhus & Williams (2002) to describe three

related but putatively distinct personality constructs – narcissism, psychopathy, and Machiavellianism. Specifically, they named these three traits the dark triad, for "*individuals with these traits share a tendency to be callous, selfish, and malevolent in their interpersonal dealings*" (Paulhus & Williams, 2002, p. 100). Although each is composed of a combination of more specific traits (see further), they also share an antagonistic core defined by tendencies including interpersonal manipulativeness and arrogance (Vize et al., 2020).

Narcissism speaks to an inflated sense of self. Narcissists feel superior to those around them and they seek social exchanges or other opportunities –also at work– that provide self-aggrandizement (Raskin & Hall, 1979). Going beyond these early descriptions, research has revealed that there are at least two dimensions of narcissism – grandiose and vulnerable – that are only modestly related and have substantially different nomological networks (Miller & Maples, 2011). What connects both narcissism dimensions is a tendency toward interpersonal antagonism and egocentrism. The quintessential (grandiose) narcissistic individual complements this with extraverted and attention-seeking behavior, while the vulnerable narcissist is characterized by introversion and displays pervasive negative affectivity and distrustfulness. The vast majority of research on narcissism at work only considers its grandiose form (see also our review section).

Psychopathy is a multifaceted construct that comprises characteristic interpersonal, affective, and behavioral tendencies (Rose et al., in press; Vergauwe et al., 2021). At the interpersonal level, psychopathy is associated with grandiosity, interpersonal dominance, and superficial charm. In terms of affect, people scoring high on this trait can be described as callous or emotionally could; they demonstrate a lack of the self-conscious emotion guilt and show little concern for how their actions affect those around them, including their co-workers and supervisors (Grigoras & Wille, 2017). Finally, at the behavioral level psychopathy is associated with impulsivity, irresponsibility, and antisocial behavior.

Christie and Geis (1970), finally, based upon the works of Machiavelli (1513/2008), described Machiavellians as being cynical, manipulating, and showing disregard for social expectations. Unlike narcissists or psychopaths, Machiavellians tend to be more salient of the social and political nature of their environments and may exhibit actions and behaviors that appear to benefit the people around them, but are ultimately self-serving. High-Machs are exceedingly willing to manipulate others and take pleasure in deceiving others, but they do not necessarily have superior ability to do so (Jones & Paulhus, 2009).

A Review of Nonlinear, Interactive, Differential, and Reciprocal Effects

The purpose of the current review paper is to improve our understanding of the manifestation and functioning of dark side traits in the work context by focusing on four types of complex effects that have been discussed only unsystematically in previous reviews of this field. Specifically, drawing on recent trends in this area of research, we focus on *nonlinear*, *interactive*, *differential* and *reciprocal* relationships between dark traits and work-related outcomes. Importantly, when reviewing this literature, we also exclusively focus on traits from the dark triad given that, with very few exceptions (e.g., Kaiser et al., 2015), most of the research investigating such complex effects has relied on this particular taxonomy.

We searched the Web of Science for all articles published in the 10-year period from 2012 until (end of) 2021, which (a) looked at associations between at least one of the three dark triad traits and outcome variables with direct relevance for the work context, and (b) considered at least one of the four complex effects mentioned above. An overview of the search terms is provided in Appendix A. Following this approach, we identified 56 articles (see Table B1 in Appendix B) that form the basis of the current review.

Nonlinear Effects: Is More Always Worse?

The specification of the dark triad was followed by an explosion of primary studies examining linear relationships between these traits and a range of work-related outcomes. The

assumption here is that higher scores on these traits are systematically accompanied by a higher likelihood of undesirable outcomes (e.g., CWBs) and/or a lower likelihood of desirable outcomes (e.g., OCBs). However, a first complexity of these trait—outcome associations challenges this idea of linearity, and instead proposes that the exact effect of the dark trait depends on the specific level at which the trait is enacted. This idea is substantiated by research reporting nonlinear (inverted U-shaped) effects of certain bright side traits, such as for instance conscientiousness, where both low and (extremely) high standings have been found to jeopardize performance (e.g., Le et al., 2010).

When applied to dark personality traits, one way to think about such nonlinear effects is in terms of a differential-severity model. With origins in the psychopathy literature, this model proposes that "successful psychopathy" can be considered as a mild expression of clinical psychopathy (Lilienfeld et al., 2015). In the work context, this aligns with the idea that a certain level of psychopathy –and by extension, other dark traits– can actually be beneficial to work performance (e.g., Vergauwe et al., 2021). In a similar vein, several authors have discussed the strengths associated with moderate expressions of dark side traits (e.g., Judge et al., 2009; Kaiser et al., 2015). The statistical consequence is that, in case of desirable work outcomes (e.g., leadership effectiveness), higher scores on a dark trait are first accompanied by more positive outcomes, up until a certain point (i.e., the inflection point) after which the negative features of this trait start to outweigh the gains and the net result becomes negative (i.e., performance starts to decrease). To better grasp these nonlinear effects, Table 2 discusses some potential positive and negative effects associated with moderate and extremely high levels of the dark triad traits, respectively.

Our review identified seven studies investigating curvilinear relationships between dark triad traits and work outcomes. Uppal (2021) found that, in a sample of sales managers, the relationships between dark triad traits and job performance were positive at the lower end

of these traits, but flattened out as the traits intensified. Most studies, however, focused on one particular dark triad trait at a time in relation to more specific work criteria.

Regarding Machiavellianism, research by both Zettler and Solga (2013) and by Shah and colleagues (2013) reported curvilinear (inverted U-shaped) associations with OCBs, such that intermediate levels of this trait yielded the highest OCB compared to both lower and higher levels. For other outcomes, the patterns of results were less equivocal. Whereas Uppal (2021) reported curvilinear effects of this trait on task-related performance, this was not the case in Zettler & Solga (2013). Finally, looking at burnout, Mirkovic and Bianchi (2019) reported a U-shaped association with depersonalization, but only for women.

Potential curvilinear effects of narcissism have been extensively discussed in the context of leadership (e.g., Judge et al., 2009). At low to moderate levels, narcissistic leaders may gain benefit from their visionary style and their ability to attract followers, without being held back by feelings of modesty or self-doubt. However, when taken too far (e.g., Kaiser & Kaplan, 2011), narcissistic features turn into arrogance and entitlement, severely undermining leadership effectiveness. As Maccoby (2000) noted: "*The very adulation that the narcissist demands can have a corrosive effect. As he expands, he listens even less to words of caution and advice*" (p. 96). Substantiating this point, Grijalva et al. (2015) provided strong evidence of such a curvilinear effect of narcissism on leadership effectiveness. Across six different samples, narcissism exhibited a statistically significant nonmonotonic relationship with leadership effectiveness: moderate levels of narcissism contribute to leadership effectiveness, up to a maximum point beyond which narcissism becomes detrimental to leadership effectiveness.

In a similar vein, the meta-analysis by Landay et al. (2019) showed that moderate psychopathy levels were associated with the highest leadership effectiveness levels, whereas the highest psychopathy scores were associated with low effectiveness. It is argued how

characteristics such as risk taking, persuasiveness, glibness and (superficial) charm may benefit leadership effectiveness. At a high level, however, risk taking may turn into recklessness and persuasiveness may turn into manipulative and exploitative behavior (Kaiser et al., 2015) which, in turn, are expected to reduce effectiveness. However, these curvilinear effects have not consistently been replicated in other research. Across two samples of supervisor-subordinate dyads, Vergauwe et al. (2021) only found evidence of linear relationships between leader psychopathy and follower-rated outcomes: negative linear relationships were found between psychopathy and task performance, while positive linear relationships were found with adaptive performance and charismatic leadership.

Interactive Effects: What other Factors have Buffering or Exacerbating Effects?

As a second complexity, a more fine grained understanding of dark personality at work can be gleaned from considering specific factors that influence the main effects of dark side traits on work outcomes. These moderating variables comprise both internal factors that reside within the individual and external factors that characterize aspects of the environment or situation in which the individual functions.

Interactions with internal variables. Research investigating the effects of dark side traits often implicitly assumes that these traits operate in a vacuum and have 'isolated' main effects. Yet, the effects of personality can in fact best be understood from the perspective of an integrated personality system in which a broad set of traits continuously interact with each other (Witt et al., 2002). One way of understanding those interactions is by looking at them as moderators, which can either serve as protective factors against negative outcomes or as amplifiers of positive outcomes. In line with these thoughts, the moderated expression model has been formalized to explain the phenomenon of 'successful psychopathy' (Lilienfeld et al., 2015; Steinert et al., 2017). Accordingly, the presence of moderators determines whether psychopathy has detrimental effects or not.

Our review identified 13 studies considering internal moderators, mostly published over the past two years. To structure this literature, a distinction can be made between three types of internal moderators that have been considered, namely traits, skills, and work attitudes.

Interactions with other traits. Ten studies have looked at how the main effects of one or more dark traits are potentially moderated by other traits. Of these studies, four have focused on interactions *within* the dark triad. Du and Templer (2021) examined how boldness, i.e., one specific aspect of psychopathy (see further), mitigated the negative effects of psychopathic meanness on job satisfaction. Kückelhaus and Blickle (2021) examined how different aspects of Machiavellianism interact with each other to predict occupational outcomes as emergent interpersonal syndromes. Taking a somewhat different approach, Nguyen and colleagues (2021) investigated the interplay between dark triad traits using a person-centered approach instead of the more typical variable-centered, moderated regression approach. These authors identified four latent profiles (i.e., benevolent, high Machiavellianism, high psychopathy, and malevolent) that differentially related to job performance and CWBs. Interestingly, the malevolent profile, comprising people with high levels of each dark triad trait (15.9% of the sample), was associated with the highest job performance in this sample. Finally, Uppal (2021) reported that people's level of cross-situational consistency in the dark triad, labeled as 'traitedness', moderated the (curvilinear) effects of the dark traits on job performance, such that for lower levels of traitedness, a lower threshold was observed at which the positive relationship between the dark trait and job performance flattens out.

Six studies have also looked at the moderating role of traits outside the dark triad. These moderators comprised both exacerbating and mitigating internal factors. For instance, Michel and Bowling (2013) reported that dispositional aggression moderated the relationship

between narcissism and CWBs, such that this positive relationship was stronger when dispositional aggression was also high. Along the same line, Smith et al. (2016) reported that a promotion focus, which is concerned with achievement, growth, and nurturance, strengthened the negative effects of narcissism and psychopathy (but not Machiavellianism) on employee task performance and helping behaviors. Finally, Simonet et al. (2017) examined how narcissism interacted with the remaining of DSM-IV axis 2 aberrant personality tendencies and adjustment. Although the findings varied somewhat across samples, they also reported that subclinical personality interactions can accelerate leader derailment, above and beyond the main effects of individual aberrant tendencies. Other research has looked at how traits can mitigate or even counteract the potential harmful effects of dark triad traits. Owens and colleagues (2015) reported that when leaders show humility, narcissism is associated with positive outcomes. Along the same line, Grover and Furnham (2021) reported that emotional intelligence buffers against negative effects of dark triad traits, such as by reducing burnout. Finally, some contradictory results were reported in a study by Vergauwe et al. (2021), where in one sample conscientiousness seemed to mitigate negative outcomes of supervisor psychopathy (in relation to follower-rated leader effectiveness), whereas opposite effects were observed in a second, independent sample.

Interactions with skills. Research on internal moderators has also looked at how specific skills interfere in the relationships between the dark triad and work outcomes. Both Schütte et al. (2018) and Kranefeld and Blickle (2021) examined the interactions between worker psychopathy and political skill, which broadly refers to the ability to adjust behavior on the basis of what is situationally appropriate. In both studies, it was shown how beneficial work-related outcomes were more likely in case psychopathy was combined with this particular skill. In a similar vein, Hamstra and colleagues (2021) reported that a social skill, apparent sincerity, mitigated the negative outcomes of manager narcissism.

Interactions with work attitudes. Finally, as a last subcategory, two studies examined the interactive effects between dark traits and work-related attitudes as internal moderators. Filipkowski and Derbis (2020) found work engagement to moderate the relationships between the dark triad and CWBs, such that higher scores were only accompanied by more CWBs when work engagement was low. Similarly, Lyons et al. (2020) reported negative relationships between two dark traits (i.e., narcissism and psychopathy) and CWB (as reported by peers) when organizational commitment was low. Both studies illustrate the potential of favorable work attitudes to mitigate undesired effects of employee dark side traits.

Interactions with external variables. The effect of dark traits at work can also depend on external factors. This idea of person by situation interactions is widespread in personality psychology, and has in the work context mainly been studied from the perspective of trait activation theory (TAT; Tett & Burnett, 2003). Accordingly, personality traits are likely to manifest in specific behaviors (at work) only when situational cues for the expression of trait-relevant behavior are present (i.e., cues that are thematically connected to the trait). For instance, extraversion is especially activated and translated into sociable behaviors at work when situational cues are salient that enable extraverts' social nature (e.g., when customers ask questions). Over the years, a vast and still growing body of literature has started to document the specific situations at work that activate the broad range of bright side personality traits (Tett et al., 2021). Progress in this field of research was also achieved by the specification of situational taxonomies such as DIAMONDS (Rauthmann et al., 2014) and CAPTION (Parrigon et al., 2017) that can easily be linked to the Big Five personality traits.

In a similar way, TAT can also be used to hypothesize on the conditions at work that may activate (or mitigate) dark side personality. For instance, De Hoogh et al. (2021) proposed that high Machs' tendencies are especially activated by situational cues that enable or align with Machs' exploitative nature. However, in contrast to the activation of general or

bright side tendencies, little information is currently available on the specific situational cues at work that may trigger dark side traits (Nübold et al., 2017). This lack of knowledge is also reflected in the large diversity of external moderators that were considered in research within the scope of the current review. Specifically, we identified a relatively large set of 24 empirical articles looking at how a variety of contextual moderators influence the predictive effects of dark triad traits at work. For discussing this literature, we distinguish five categories of external moderators.

Leadership (level, visibility, styles). A first series of studies looked at how leadership aspects influenced the effects of dark triad traits. At the most basic level, O'Boyle and colleagues (2012) demonstrated that the effects of dark traits are different depending on whether one occupies a position of authority within the organization or not. For narcissism in particular, the negative effects on performance were consistently stronger for individuals in leadership positions. Interestingly, Nevicka et al. (2018) showed that, specifically for leaders, the effects of their narcissism also depends on the degree to which they are visible to their followers. When followers had fewer opportunities to observe their leader, leader narcissism was positively related to perceived effectiveness, but this relationship disappeared when followers had more opportunities to observe their leader.

In addition, several studies have looked at how leadership styles and/or behaviors moderated the effects of employee dark traits on employee-level outcomes. Here the idea is that (mal)adaptive leader characteristics or behaviors can mitigate or amplify the negative effects of employee dark traits on their work performance and adjustment. The leadership characteristics studied entail transformational and/or transactional leadership styles (Belschak et al., 2013; Shah et al., 2021), high involvement management style (Webster & Smith, 2019), leader dark side personality traits (Belschak et al., 2018; Wisse et al., 2015), and abusive supervision (Greenbaum et al., 2017; Hurst et al., 2019; Khan et al., 2020). Reviewing these

studies yields a complex picture of how leadership styles and behaviors interact with employee dark triad traits. For instance, Greenbaum et al. (2017) and Khan et al. (2020) demonstrated how abusive supervision unlocked or 'activated' undesirable behaviors in employees higher on Machiavellianism or psychopathy, respectively. In contrast, Hurst et al. (2019) found that high psychopathy employees were *less* angry under more abusive supervisors, suggesting a buffering effect of this maladaptive leadership style in this particular case.

Organizational constraints or support. The presence of competition can be theorized to trigger dark traits, in particular Machiavellianism (Castille et al., 2017), and this has led researchers to study the moderating effects of organizational constraints (versus support). In support of this idea, Kuyumcu and Dahling (2014) reported that high Machs received higher performance ratings when organizational resources were scarce; an effect driven by Machiavellians' tendency to be career self-interested. However, Castille et al. (2017) also pointed out the negative effects of organizational constraints, by showing how resource constraints motivate Machiavellians to undermine their coworkers in order to help them achieve higher relative status. Other research focused on perceived organizational support as a potential buffer of the negative effects of employee dark traits. Specifically, Palmer et al. (2017) found that employees possessing higher levels of narcissism and psychopathy engage in certain types of CWB less frequently when they perceive the organization as being supportive. In a similar vein, Choi (2019) reported that perceived organizational support reduced the negative effects of employee narcissism on work satisfaction.

Culture and climate. Several studies have also looked into the moderating effects of (perceived) culture or climate. Smith and Webster (2017) reported that Machiavellians demonstrated higher levels of political skill when they perceived a climate of social undermining at work, and this increased level of political skill led to higher ratings of job

performance. In the context of family firms, McLarty and Holt (2019) found that perceptions of socioemotional wealth importance (i.e., the firm's preference for affective outcomes over others), mitigated the negative consequences of employees' dark triad traits on different job performance outcomes. Along the same line, Lata and Chaudhary (2020) reported that perceptions of workplace spirituality buffered the effects of dark personality, particularly narcissism and psychopathy, on employees' uncivil behaviors.

Focusing on Machiavellianism, De Hoogh et al. (2021) examined the interactive effects between this trait and two psychological work climate factors, namely rule climate and instrumental climate. Across two studies, they found that both the presence of clear rules and a climate that does not value selfishness and an 'ends-justifies-the-means mentality' were able to effectively reduce Mach leaders' tendency to show abusive supervision. These findings mirror results by O'Boyle et al. (2012), who found that organizational norms that encouraged cooperation and loyalty rather than selfishness and exploitation reduced narcissists' unethical behaviors.

Finally, Li, Kong et al. (2021) examined how the effects of leader Machiavellianism on follower work withdrawal were influenced by collectivist work climate. Across two studies, these authors found leader Machiavellianism to have a stronger effect on follower withdrawal when the work climate was perceived as high in collectivism. Importantly, cultural effects may also extend to the broader national context. In the largest study on this topic, Grijalva and Newman (2015) demonstrated that ingroup collectivist culture weakened the relationship between narcissism and CWB. This is interpreted as an example of situational strength, in which ingroup collectivist culture constitutes a strong situation that constrains a narcissist's options to engage in CWB, thereby buffering the narcissism-CWB relationship.

Job design and employment characteristics. Our review also identified two studies looking into the moderating effects of broader employment characteristics. First, Falco et al.

(2020) found that in a high demanding job, workers high on narcissism experience higher levels of work engagement, to the point that they are also at risk of workaholism. Second, Kaufman et al. (2021) reported that employment precarity strengthened the relationship between the dark triad and professional commitment.

Other. Finally, two studies were identified that did not fit the categories described above because these used an alternative research design. Both these studies explored how leader narcissism, as perceived by followers, influenced follower outcomes, and how psychological resources of these followers can buffer potentially negative effects of leader narcissism. Ellen et al. (2019) focused particularly on subordinate resource management ability, and these authors indeed found that higher levels of resource management ability attenuated the harmful effects of supervisor narcissism on a range of attitudinal and behavioral employee outcomes. In the second study, Li and Tong (2021) examine the effects of leader narcissism on employee resilience, and how this relationship is dependent on the level of employees' psychological availability (i.e., employees' perceptions of available psychological resources required for work). The results show that the lower psychological availability employees have, the more dependent they are on narcissistic leaders.

Differential Effects: Are all Subfacets Alike?

Research on dark triad traits in work and organizational contexts has long departed from the (implicit) assumption that these traits are unidimensional in nature, or at least that the existence of subdimensions within these broad traits is not particularly useful for a better understanding of how they operate in these contexts. This belief was further enhanced by the use of short measurement instruments which do not allow a more differentiated approach to dark triad traits (e.g., Short Dark Triad; Jones & Paulhus (2014); Dirty Dozen; Jonason & Webster (2010)). Yet, comparable to what is known about general or bright side traits, it is now clear that each of the dark triad traits comprises more specific subdimensions or 'facets'.

These facets relate to each other but at the same time describe different nuances or 'flavors' of the trait (Wood et al., 2015). Moreover, similar to bright side traits, this variation is important because it can lead to differential associations with work criteria of interest.

Importantly, there is currently no consensus on the exact number or even the nature of the facets underlying each of the dark triad traits, and different models have been proposed. Table 3 gives an overview of some of the most common dimensions that have been distinguished. LeBreton et al. (2018, p. 402) provide a comprehensive overview of the different measurement instruments that are available to tap into the multidimensional nature of the dark triad traits.

Narcissism. Contemporary models of narcissism consider different facets and different underlying motivational and behavioral processes (Ackerman et al., 2011; Back et al., 2013). As a first example, Ackerman et al. (2011) developed a facet structure of narcissism departing from the widely used Narcissistic Personality Inventory (NPI; Raskin & Terry, 1988). Specifically, using multiple samples, these authors provided empirical evidence for a robust three factor solution whereby the three subfacets of narcissism are labeled Leadership/Authority (L/A), Grandiose Exhibitionism (G/E), and Entitlement/ Exploitativeness (E/E) (see Table 3). Ackerman et al. (2011) also concluded on the basis of several studies that the L/A facet represents "adaptive" narcissism, and the E/E facet represents "socially toxic narcissism". The G/E facet measures a flair for theatrical self-presentation and intense self-love, and is also considered to be slightly maladaptive.

Next, grounded in a somewhat different research tradition, the model proposed by Back et al. (2013) differentiates between two separate social strategies that the narcissist can use to achieve the overarching goal of maintaining a grandiose self. *Assertive self-enhancement* refers to the tendency to gain social admiration by means of self-promotion ("Let others admire you!"), whereas *antagonistic self-protection* describes the tendency to

prevent social failure by means of self-defense ("Don't let others tear you down!"). The model proposes that people differ strongly not only in their general tendency to inhabit and maintain an overall grandiose self but also in the ease and strength with which they do this by activating narcissistic self-enhancement and self-protection, respectively. Importantly, both motivational strivings are theorized to activate quite different behavioral dynamics. Assertive self-enhancement is thought to activate a set of dynamics that are termed *narcissistic admiration*, whereas antagonistic self-protection is thought to activate a set of dynamics that are termed *narcissistic rivalry* (Back et al., 2013).

Our review identified six papers looking into differential effects of narcissism facets in the work context. Of these, two studies departed from the three-factor model based on the NPI. First, Grijalva and Newman (2015) aimed at predicting *CWB* and found opposing effects at the facet level: Whereas the E/E facet of narcissism positively predicted CWB, the L/A facet demonstrated a negative effect. In the second study, Zvi and Shtudiner (2021) found that all three narcissism facets positively predicted *resume self-misrepresentation*. However, only the two maladaptive aspects (i.e., E/E and G/E) were found to significantly (and positively) predict *CWB* in this study. These authors concluded that while everyday lying may be related to all three facets of narcissism (including the L/A facet), more serious unethical behaviors such as CWBs may not.

In addition, we also identified four studies that relied on the distinction between admirative and rivalrous aspects of narcissism. Baldegger et al. (2017) found that admiration was a positive predictor of *entrepreneurial intention*, whereas the effect of rivalry on this outcome was negative. Next, Helfrich and Dietl (2019) found rivalry to be negatively related to *intrinsic motivation*, whereas admiration had a positive relationship. Similarly, a negative association was found between rivalry and *job commitment*, whereas a positive one was found for admiration (Lehtman & Zeigler-Hill, 2020). Finally, using a sample of leader-follower

dyads, Fehn and Schütz (2021) found that both leader rivalry and admiration, as rated by followers, were negative associated with *follower attitudinal outcomes*, although the effect was more outspoken for the rivalry aspect of narcissism. Together, these results point to the conclusion that narcissistic rivalry is the more maladaptive aspect of this multidimensional dark trait in the work context.

Psychopathy. Regarding psychopathy, one model that has been widely used to clarify the multidimensional nature of this construct is the triarchic model of psychopathy (Patrick et al., 2009). This model suggests that psychopathy comprises three distinct subdimensions: *Disinhibition* (i.e., a predisposition toward deficits in impulse control), *boldness* (i.e., the compound of high dominance, low anxiousness, and venturesomeness) and *meanness* (i.e., a lack of empathy, contempt towards others, and cruelty).

Our review identified seven studies exploring differential associations between psychopathy facets and work-related criteria. First, using a combination of different measurement instruments, Lilienfeld et al. (2012) tested the hypothesis whether some features of psychopathy could be adaptive for U.S. presidents. They concluded that Fearless Dominance (i.e., reflecting boldness) was associated with a range of better performance outcomes in U.S. presidents, both subjective (e.g., ratings of persuasiveness) and objective (e.g., initiating new projects). In contrast, Impulsive Antisociality (i.e., reflecting disinhibition) and related traits of psychopathy were generally unassociated with rated presidential performance, although they were linked with more objective indicators of negative performance, including congressional impeachment resolutions.

Next, the large majority of this research examined psychopathy facets of the triarchic model in relation to a broad range of objective and subjective work outcomes (Blickle et al., 2018; Du & Templer, 2021; Kranefeld & Blickle, 2021; Neo et al., 2018; Schütte et al., 2018; Sutton et al., 2020; Vergauwe et al., 2021). Although each of these studies yield a unique set

of findings, one common thread is that boldness is often found to be associated with more positive work-related outcomes, whereas disinhibition and especially meanness generally demonstrate negative effects on people's performance or, in the case of managers, subordinate performance. Also in the study by Schütte et al. (2018), which relied on an alternative three-factor model, results provided strong support for differential relationships between psychopathic personality aspects and work-related criteria.

Machiavellianism. Finally, Machiavellianism is also a multifaceted concept that is used to describe different behavioral patterns. Already the first conceptualization of this construct, proposed by Christie and Geis (1970), subsumed different themes such as a willingness to utilize manipulative tactics and act amorally and endorse a cynical, untrustworthy view of human nature. Building on this work, Dahling et al. (2009) proposed a four-dimensional structure of this construct distinguishing *distrust of others, amoral manipulation*, *desire for control*, and *desire for status* (see Table 3). In addition, Kessler et al. (2010) introduced an alternative organizational-based model of Machiavellianism consisting of three factors: *maintaining power*, *harsh management tactics*, and *manipulative behaviors* (see Table 1 for example items). These authors demonstrated that in a non-managerial sample, only the manipulative aspect of Machiavellianism was actually related to negative outcomes, in particular more CWBs, whereas the other two dimensions showed no clear evidence of dysfunctionality. Finally, Collison et al. (2018) relied on expert ratings of the 'prototypical Machiavellian individual' to create a differentiated measure of this construct using the 30 facets of the five-factor model as the starting point. The resulting Five-Factor Machiavellianism Inventory (FFMI) distinguishes three trait-based components, namely agency, antagonism, and planfulness (see Table 3).

Our review identified a relative lack of empirical research adopting a differentiated approach to Machiavellianism in the work context during the 10-year period reviewed.

Instead, it is still more or less normative in the organizational sciences to compute scores on a single omnibus measure of overall Machiavellian tendencies. A first exception is a paper by Miller and Konopaske (2014) that looked at differential associations between Machiavellianism aspects and perceived work entitlement using Dahling et al.'s (2009) framework. These authors reported that only the dimension desire for control was negatively related to perceived work entitlement, whereas the other three dimensions demonstrated positive associations with this construct. As a second example, Greenbaum et al. (2017) also relied on Dahling's (2009) framework to present a fine-grained analysis of the Mach-trait activation process by examining the interactive effect of each Mach dimension and abusive supervision onto unethical behavior. Finally, Kückelhaus et al. (2021) and Kückelhaus and Blickle (2021) also reported differential associations between Machiavellianism aspects and self- and other reported indicators of occupational success using the FFMI (Collison et al., 2018).

Reciprocal Effects: Can Traits be both Antecedents and Outcomes?

All of the models and research described so far in this review have -at least implicitly- relied on the assumption that the associations between dark traits and work criteria are the result of traits influencing work, and not vice versa. However, there is now substantial evidence showing that, at least for general traits, the association between personality and work is bidirectional rather than unidirectional (Woods et al., 2019). Specifically, research has shown that people's experiences at work, either in terms of work attitudes, job characteristics, or career experiences, can have profound and lasting effects on patterns of personality development.

Our review of the literature identified (only) two studies that examined reciprocal effects between dark triad traits and work-related characteristics or experiences. First, Spurk and Hirschi (2018) tracked a sample of German workers across a time frame of one year and

found consistent support for positive reciprocity between the experience of a competitive psychological climate at work and dark triad traits. Second, Wille et al. (2019) studied a sample of college alumni over a 22-year time frame and examined how narcissism was reciprocally related to upward mobility on the career ladder. Latent difference score modeling showed that, over the entire interval, within-person changes in narcissism were positively related to hierarchical advancement, indicating a system of positive co-development between both processes over time. However, when reciprocity was analyzed in a time-sequential manner, i.e. from the first career stage to the second, more support was found for narcissism predicting later upward mobility than for the reversed effect from mobility to change in narcissism. Nevertheless, similar to what has been found for general personality traits, these initial results illustrate that there is plasticity in people's dark personality tendencies that can be explained -at least in part- through their specific experiences in the work context.

Discussion

The purpose of this review was to analyze the past 10 years of published research on dark triad traits in relation to work-related criteria, specifically paying attention to those studies that considered at least one of the four types of complex effects outlined above. Whereas previous reviews of this literature discussed (certain of) these linkages in a somewhat scattered manner, the current work started by first providing a conceptual underpinning of each type of complex effect, followed by a description of the research available on each topic. In this final section, we provide some guidance for future research in this area and discuss a number of implications for assessment.

Towards an Integrative Framework of Complex Effects

We structured this review by discussing each of the four complex effects separately, in order to provide a clear discussion of their underlying rationale complemented by a description of the relevant research findings. However, as research is increasingly

implementing these complex effects (with many studies being published in 2020 and 2021), it is also relevant to think about them in a more integrated manner. We therefore propose an integrative framework of complex effects and their *hybrid forms*, which can provide an even more nuanced understanding of the role of dark traits in professional contexts. For instance, it may well be that a curvilinear effect of narcissism only holds for one specific subdimension of this trait; or it can be the case that (only) the effect of one specific subdimension (e.g., narcissistic admiration) is moderated by a different trait (e.g., stability) such that interaction effects need to be considered at lower levels of the narcissism construct. In Table 4, we provide an overview of the different cases that emerge when combining the nonlinear, interactive, and differential effects, which are the three complexities related to dark traits' predictive effects.

The first three cases represent the 'simple' complex effects as they occur in isolated forms. Examples of these three cases were discussed throughout the current literature review. In *Case 4*, a combination is presented of nonlinearity and interaction. In this hybrid model, the idea is that the curvilinear association between a trait and a work outcome is moderated by either another (internal) trait or by an external work factor. One example included in our review is the study by Uppal (2019) examining whether the curvilinear relationship between dark triad traits and job performance is moderated by traitedness. In the same manner, it can very well be the case that the relationship between a dark trait and a work outcome is curvilinear, but only for a specific subdimension of that trait. The hybrid model in *Case 5* thus represents a combination of nonlinear and differential effects. Vergauwe et al. (2021), for instance, examined to what extent all three subdimensions of psychopathy demonstrated curvilinear associations with leader effectiveness. Further, *Case 6* describes how subdimensions of a trait can show differential relationships with outcomes, and that the effects of these subdimensions are moreover moderated by other individual differences and/or

contextual factors. Kranefeld and Blickle (2021), for instance, proposed that (a) the psychopathy dimensions of boldness, disinhibition, and meanness have different relations to workplace outcomes, and (2) that the effect of boldness in particular on job performance would be moderated by political skill. Finally, the most complex case (i.e., *Case 7*; not included in Table 4) describes the situation where all three predictive complex effects are considered at the same time. This is illustrated in the study by Vergauwe et al. (2021) which looked at the differential associations between psychopathy subdimensions and leader effectiveness, hereby also exploring curvilinear effects *and* potential interactions with other traits (in this case conscientiousness). As discussed by these authors, such detailed analyses of dark trait effects can in fact only yield informative results when they are connected to relevant conceptual models of the phenomenon that is studied. In this particular case, these complex effects and their hybrids were used to empirically evaluate three conceptual models (i.e., differential severity, moderated-expression, and differential configuration) that have been introduced to explain the notion of "successful psychopathy".

Implications for Assessment

In addition to the availability of adequate conceptual models, the implementation of these different complex effects also has implications for the assessment of dark traits. First, as regards the identification and interpretation of nonlinear effects, (greater) consideration is warranted of the nature of the concepts that are assessed using a specific measurement tool. As reviewed by others (e.g., LeBreton et al., 2018), dark triad traits are being measured in various ways, and it is questionable that each of these approaches yield an assessment that is equally 'dark' or 'maladaptive'. For instance, an approach where only bright side or general personality information is captured and then turned into 'compounds' of dark side tendencies (e.g., Wille et al., 2013) is likely to capture less extreme maladaptive trait information relative to assessment procedures that were explicitly designed for this purpose. The notion of

nonlinearity predicts that the effect of a dark trait changes depending on the precise level at which the trait is enacted. This means that knowledge about these scale parameters, and the comparability of these parameters across different instruments, becomes important. Item response theory (IRT) analysis provides a useful tool for this purpose (e.g., Samuel et al., 2010).

Further, looking into interactive effects as described above requires taking context into account during the assessment, and this can refer to aspects of the internal context as well as the external context. Regarding internal context, this suggests that the results of an assessment of one or more dark traits will become substantially more meaningful in the presence of information about other aspects of the 'personality system' that may mitigate or amplify the manifestation of aberrant personality tendencies. As our review illustrated, these 'internal moderators' can also refer to acquired skills (rather than traits), which can also be gleaned from assessment procedures other than the traditional psychometric personality inventory (e.g., through work samples). With regard to the external context, work and organizational psychologists have long embraced the notion that a trait is relevant in a certain situation only to the extent that this situation offers opportunity for its expression (Tett & Burnett, 2003). In practical terms, a personality-oriented job analysis can support the process of identifying relevant situational cues in the work environment and aligning these with job-related personality traits (e.g., Goffin et al., 2011). However, in order for this approach to be successful, insight is required into the specific workplace *cues* (Tett et al., 2021) that can trigger personality tendencies. By summarizing the extant literature on this topic, the current review may represent a first step in building such a taxonomy of situational features that can influence the expression of dark side traits in the work context.

Next, the accumulating evidence for differential effects of dark trait sub-facets points toward the importance of assessing these traits at a sufficiently fine-grained level. There is

mostly agreement in the applied personality literature that criterion-related validity is maximized when the bandwidth of the antecedent corresponds to that of the outcome: a broad outcome is better predicted by a broad antecedent and a narrow outcome by a narrow antecedent (but see Ones & Viswesvaran, 1996). Importantly, the consideration of multiple sub-facets of dark traits is at odds with the predominant use of so-called combined construct measures (e.g., the Short Dark Triad), which aim to measure all three aspects of the dark triad simultaneously in one brief, but undifferentiated, measure. As several of the studies reviewed in this paper have convincingly shown, adequate understanding of the consequences of dark traits in the work contexts often requires a level of assessment detail that is typically provided by single construct measures (LeBreton et al., 2018). Of course, if the assessment context allows, a combination of multiple single construct measures -one for each construct- is preferred as this will provide both broad domain coverage and deeper level insights into personality nuances.

Finally, inspection of reciprocal effects between dark traits and work criteria obviously requires the availability of multiple assessments of these traits across time affecting also research design requirements. Often in research and in practice, (dark) personality is considered the stable predictor variable, assumed to have potentially long-term effects on different aspects of organizational behavior (including attitudes, performance, leadership potential, etc.). However, the fact that traits can also change and develop in response to these experiences at work (e.g., leadership; Li et al., 2021) underlines the relevance of repeated assessments of these personality aspects across time. Further, the insights gleaned from this relatively young field of research may in the longer run also open the door for a new set of interventions in the context of coaching, training and development.

To conclude, the current review of nonlinear, interactive, differential, and reciprocal effects allows a more nuanced understanding of the complex ways in which dark side

personality can manifest in the work context. As this field continues to develop, we also hope to see more research investigating such complex effects for a broadened set of traits, going beyond the dark triad reviewed here. The DSM-IV-based taxonomy discussed in the introduction can offer a useful starting point here to investigate, for instance, how the effects of obsessive compulsive tendencies can be mitigated or aggravated in the presence of specific work demands. Similarly, future research can explore how a tendency such as avoidant personality can be influenced (nurtured) by situational forces on the job undermining the self, such as the presence of an authoritarian leader.

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Table 1

Overview of DSM-IV dark side trait constructs

DSM-IV construct	Description	Subclinical trait (HDS)	Expected deficits in the work context	Dark Triad construct
Borderline	Inappropriate anger; unstable and intense relationships alternating between idealization and devaluation	Excitable	Moody; intense, but short-lived enthusiasm for people, projects, and things; hard to please	
Avoidant	Social inhibition; feelings of inadequacy and hypersensitivity to criticism or rejection	Cautious	Indecisiveness; reluctance to take risks for fear of being rejected or negatively evaluated	
Paranoid	Distrustful and suspicious of others; motives are interpreted as malevolent	Skeptical	Cynical and doubtful of others' true intentions; quarrelsome	Machiavellianism?
Schizoid	Emotional coldness and detachment from social relationships; indifferent to praise and criticism	Reserved	Aloof and uncommunicative; lacking interest in or awareness of the feelings of others	
Passive-Aggressive	Passive resistance to adequate social and occupational performance	Leisurely	Stubbornly ignoring others' requests and becoming irritated or excusive when they persist	
Narcissistic	Extraordinarily self-confident; grandiose sense of self-importance and entitlement	Bold	Arrogant and haughty behaviors or attitudes; over valuation of own capabilities; claiming credit for others' work	Narcissism
Antisocial	Disregards for the truth; testing limits and failing to plan ahead; failure to conform	Mischievous	Impulsive; risk seeking; deceitful, cunning, and exploitative towards others	Psychopathy
Histrionic	Excessive emotionality; self-dramatizing, theatrical and exaggerated emotional expression	Colorful	Excessive need to be noticed and to be in the center of attention, which can leave others feeling underappreciated	
Schizotypal	Odd beliefs, behavior and/or speech; peculiar	Imaginative	Eccentric and fanciful thinking and behavior which undermine others' trust	
Obsessive-Compulsive	Preoccupations with orderliness, rules and control	Diligent	Inflexible about rules and procedures; (extremely) high standards for self and others	
Dependent	Difficulty making everyday decisions without excessive advice and reassurance; difficulty expressing disagreement out of fear of loss of support or approval	Dutiful	Eager to please and reluctant to disagree with others, which undermines perceptions of determination and authority	

Note. Descriptions of DSM-IV constructs are based on Furnham et al., (2014). Leadership deficits are based on Hogan & Hogan (2001a, 2009) and Hogan & Kaiser (2005). The mapping of Dark Triad constructs on DSM-IV constructs is based on Spain et al., (2014).

Table 2

Potential nonlinear effects of dark triad traits

Dark Triad Trait	Positive leadership effects (moderate levels)	Negative leadership effects (extremely high levels)
Narcissism	• Self-confidence • Charismatic • Visionary • Intrinsic motivation to lead • Charming	• Arrogant • Entitlement • Oversensitive to criticism • Lack of empathy
Psychopathy	• Decisive • Unemotional • Thrill-seeking	• Impulsive • Selfish • Callous • Lack of empathy • Terrifying
Machiavellianism	• Strategic thinking • Pragmatic • Flexible in social situations • Tactical negotiating skills	• Manipulative • Unethical behavior • Inconsiderate • Extrinsic motivation to lead

Table 3

An overview of multidimensional approaches to dark triad traits

Dark Triad trait	Description
Narcissism (Ackerman et al., 2011)	
• Leadership / Authority	Strong desire to be in positions of power and authority over others
• Grandiose Exhibitionism	Combination of self absorption, vanity, superiority, and exhibitionistic tendencies
• Entitlement / Exploitativeness	A conviction that one deserves more than others combined with an openness and perceived ability to use manipulative techniques to achieve this
Narcissism (Back et al. 2013)	
• Admiration	Striving for uniqueness (affective-motivational); grandiose fantasies (cognitive); charm (behavioral)
• Rivalry	Striving for supremacy (affective-motivational); devaluation of others (cognitive), and aggressiveness (behavioral)
Psychopathy (Patrick et al., 2009)	
• Disinhibition	Deficits in impulse control (e.g., lack of planfulness and foresight, failure to delay gratification)
• Boldness	Ability to remain calm in threatening situations
• Meanness	Lack of empathy, contempt towards others, and cruelty
Machiavellianism (Dahling et al., 2009)	
• Distrust of others	Cynical outlook on the motivations and intentions of others
• Desire for status	Desire to accumulate external indicators of success
• Desire for control	Need to exercise dominance over interpersonal situations to minimize the extent to which others have power
• Amoral manipulation	Willingness to disregard standards of morality and see value in behaviors that benefit the self at the expense of others
Machiavellianism (Kessler et al., 2010)	
• Maintaining power	E.g.: 'An effective individual builds a powerbase of strong people'
• Harsh management tactics	E.g.: 'It is not important to be aggressive and clever when dealing with organization members' (R)
• Manipulative behaviors	E.g.: 'It is important to be a good actor, but also capable of concealing this talent'
Machiavellianism (Collison et al., 2018)	
• Agency	Achievement striving, activity, assertiveness, competence, invulnerability, self-confidence
• Antagonism	Selfishness, immodesty, manipulativeness, callousness, cynism
• Planfulness	Deliberation, order

Table 4

Overview of Nonlinear, Interactive, and Differential (NID) effects and their hybrid forms

	Nonlinear	**Interactive**	**Differential**
Nonlinear	*Case 1* The relationship between a trait and the criterion is nonmonotonic or curvilinear.	*Case 4* The curvilinear association between a trait and the criterion is moderated by an other trait or by an external factor.	*Case 5* The form of the relationship between a trait and the criterion is different for various subdimensions of the trait.
Interactive	*Case 4*	*Case 2* The relationship between a trait and the criterion is moderated by an other trait or by an external factor.	*Case 6* The relationship between subdimensions of the trait and the criterion is moderated by an other trait or by an external factor.
Differential	*Case 5*	*Case 6*	*Case 3* The relation between a trait and the criterion is different for various subdimensions of the trait.

Appendix A: Overview of search terms for the review

Each of the search terms in the left side column were combined with search terms in the right side column in a pairwise manner (using the AND command). These terms were searched for in "all fields". All resulting hits were subsequently screened for the investigation of nonlinear, interactive, differential and/or reciprocal effects.

"dark triad"	"work"
"dark personality"	"workplace"
"dark trait"	"job"
"maladaptive personality"	"job performance"
"maladaptive traits"	"CWB"
"psychopathy"	"OCB"
"disinhibition"	"job satisfaction"
"boldness"	"leadership"
"meanness"	
"narcissism"	
"admiration"	
"rivalry"	
"machiavellism"	
"desire of others"	
"desire for status"	
"desire for control"	
"amoral manipulation"	

Appendix B: Studies included in the review

Table B1

Studies included in the review of nonlineair, interactive, differential and reciprocal effects

Short Reference	Dark Trait		
Nonlinear effects (n=7)*	Nar	Psy	Mach
Zettler & Solga, 2013			x
Grijalva, Harms, Newman, Gaddis, & Fraley, 2015	x		
Mirkovic & Bianchi, 2019			x
Landay, Harms, & Crede, 2019		x	
Uppal, N., 2021	x	x	x
Shah, Shahjehan, & Afsar, 2021			x
Vergauwe, Hofmans, Wille, Decuyper, & De Fruyt, 2021		x	
Interactive effects with other internal variables (n=15)	Nar	Psy	Mach
Interactive effects with traits			
Michel & Bowling, 2013	x		
Owens, Wallace, & Waldman, 2015	x		
Smith, Wallace, & Jordan, 2016	x	x	x
Simonet, Tett, Foster, Angelback, & Bartlett, 2017	x		
Uppal, N., 2021	x	x	x
Kückelhaus & Blickle, 2021			x
Grover & Furnham, 2021	x	x	x
Nguyen, N., Pascart, S., & Borteyrou, 2021	x	x	x
Du & Templer, 2021		x	
Vergauwe, Hofmans, Wille, Decuyper, & De Fruyt, 2021		x	
Interactive effects with skills			
Schutte, Blickle, Frieder, Wihler, Schnitzler, Heupel, & Zettler, 2018		x	
Hamstra, Schreurs, Jawahar, Laurijssen, & Hunermund, 2021	x		
Kranefeld & Blickle, 2021		x	
Interactive effects with work attitudes			
Filipkowski & Derbis, 2020	x	x	x
Lyons, Bowling, & Burns, 2020	x	x	x
Interactive effects with external variables (n = 25)	Nar	Psy	Mach
Leadership (level, visibility, styles)			

	Nar	Psy	Mach
O'Boyle, Forsyth, Banks, & McDaniel, 2012	x	x	x
Belschak, den Hartog, & Kalshoven, 2013			x
Wisse, Barelds, & Rietzschel, 2015	x	x	x
Greenbaum, Hill, Mawritz, & Quade, 2017			x
Belschak, Muhammad, & den Hartog, 2018			x
Nevicka, van Vianen, de Hoogh, & Voorn, 2018	x		
Webster & Smith, 2019	x	x	x
Hurst, Simon, Jung, & Pirouz, 2019		x	
Khan, Khan, Bodla, & Gul, 2020		x	
Shah, Shahjehan, & Afsar, 2021			x
Organizational constraints or support			
Kuyumcu & Dahling, 2014			x
Palmer, Komarraju, Carter, & Karau, 2017	x	x	x
Castille, Kuyumcu, & Bennett, 2017			x
Choi, 2019	x		
Culture or climate			
O'Boyle, Forsyth, Banks, & McDaniel, 2012	x	x	x
Grijalva & Newman, 2015	x		
Smith & Webster, 2017			x
McLarty & Holt, 2019	x	x	x
Lata & Chaudhary, 2020	x	x	x
Li, Kong, Lin, & Fan, 2021			x
De Hoogh, Den Hartog, & Belschak, 2021			x
Job or career characteristics			
Falco, Girardi, di Sipio, Calvo, Marogna, & Snir, 2020	x		
Kaufmann, Wheeler, & Sojo, 2021	x	x	x
Other			
Ellen, Kiewitz, Garcia, & Hochwarter, 2019	x		
Li & Tong, 2021	x		

Differential effects (n=18)	Nar	Psy	Mach
Lilienfeld, Waldman, Landfield, Watts, Rubenzer, & Faschingbauer, 2012		x	
Miller & Konopaske, 2014			x
Grijalva & Newman, 2015	x		
Baldegger, Schroeder, & Furtner, 2017	x		

	Nar	Psy	Mach
Greenbaum, Hill, Mawritz, & Quade, 2017			x
Neo, Sellbom, Smith, & Lilienfeld, 2018		x	
Blickle, Schutte, & Genau, 2018		x	
Schütte, Blickle, Frieder, Wihler, Schnitzler, Heupel, & Zettler, 2018		x	
Helfrich & Dietl, 2019	x		
Sutton, Roche, Stapleton, & Roemer, 2020		x	
Lehtman & Zeigler-Hill, 2020	x		
Fehn & Schütz, 2021	x		
Kranefeld & Blickle, 2021		x	
Kückelhaus & Blickle, 2021			x
Kückelhaus, Blickle, Kranefeld, Körnig, & Genau, 2021			x
Du & Templer, 2021		x	
Vergauwe, Hofmans, Wille, Decuyper, & De Fruyt, 2021		x	
Zvi & Shtudiner, 2021	x		
Reciprocal effects (n=2)	**Nar**	**Psy**	**Mach**
Spurk & Hirschi, 2018	x	x	x
Wille, Hofmans, Lievens, Back, & De Fruyt, 2019	x		

*Note that the numbers exceed the total of n = 53 unique studies mentioned in the paper because several studies re-occur in the different categories. 'x' indicates that an effect was investigated for a specific dark triad trait, but the effect was not necessarily established.