**The Dark Triad and Competitive Psychological Climate at Work:
A Model of Reciprocal Relationships in Dependence of Age and
Organization Change**

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## Abstract

Integrating an interactionist model of personality development, the cumulative continuity model of personality development, and selection-evocation-manipulation theory, the present study analysed reciprocal relations of the Dark Triad common core and its sub-traits of narcissism, psychopathy, and Machiavellianism with competitive psychological climate. Moreover, within a large ($N = 1,185$) and longitudinal sample of employees from Germany, latent cross-lagged panel analyses were applied to analyse the moderating roles of age and organization change (i.e., organizational turnover). Overall, results revealed positive reciprocal relations between the Dark Triad common core, its sub-traits, and competitive psychological climate. The Dark Triad common core and Machiavellianism were more stable within the older (50 to 59 years) compared to the younger (25 to 34 years) age group. However, we found no age differences for the relation between competitive psychological climate and change in the Dark Triad common core or its sub-traits. Among employees who changed organizations, the Dark Triad common core, narcissism, and psychopathy were more strongly positively related to the change in competitive psychological climate than in the non-change group. This suggests stronger selection compared to evocation-manipulation effects for individuals with high values in the Dark Triad common core, narcissism, and psychopathy, but not for Machiavellianism.

*Keywords:* Dark Triad, Competitive Climate, Age, Organizational Turnover, Reciprocity

**The Dark Triad and Competitive Psychological Climate at Work:**
**A Model of Reciprocal Relations in Dependence of Age and Organization Change**

In recent times, the Dark Triad (Paulhus & Williams, 2002), which subsumes three dark traits (i.e., narcissism, psychopathy, Machiavellianism) has moved into the spotlight of organizational research (e.g., Cohen, 2016; Spain, Harms, & LeBreton, 2014). The Dark Triad provides a more "dark" view on employee behaviour and explains variance in work-related outcomes (O'Boyle, Forsyth, Banks, & McDaniel, 2012; Spain et al., 2014), beyond the Big Five (e.g., Clark, Lelchook, & Taylor, 2010; Wille, De Fruyt, & De Clercq, 2013). Moreover, the associated destructive behaviours of Dark Triad personalities (e.g., counterproductive work behaviour or abusive supervision)–even when assuming small effects–may result in a relatively large impairment for organizations (Cohen, 2016; Spain et al., 2014). Although past research identified important individual and organization correlates of the Dark Triad (e.g., Jonason, Wee, & Li, 2015; O'Boyle et al., 2012; Spain et al., 2014), it remains largely unknown how the Dark Triad relates to changes in the work environment, and if and how the Dark Triad is shaped by the work environment.

The main aim of this study therefore was to analyse a reciprocal model between the Dark Triad and its distinct sub-traits and the perceived work environment in terms of competitive psychological climate, defined as "the degree to which employees perceive organization rewards to be contingent on comparisons of their performance against that of their peers" (Brown, Cron, & Slocum, 1998, p. 89). This study builds upon recent research on reciprocal relations between personality and perceptions of the work environment (Li, Fay, Frese, Harms, & Gao, 2014; Roberts, Caspi, & Moffitt, 2003; Sutin & Costa, 2010). Similar to past studies, we build upon an interactionist model of personality development as theoretical background to understand the assumed reciprocal relationships (Johnson, 1997; Le, Donnellan, & Conger, 2014). However, the study also clearly extends past research by analysing dark personality traits and by integrating potential boundary conditions (i.e., age and organization change in terms of organizational turnover) that were derived from the cumulative continuity model of personality development (Roberts & Caspi, 2003; Roberts, Walton, & Viechtbauer, 2006) and from selection-evocation-manipulation theory (Buss, 1987).

As such, our study makes three main contributions to the literature on personality-environment dynamics in organizational settings. First, past research analysed reciprocal relationships between non-dark traits, for instance, the Big Five (Sutin & Costa, 2010) or proactive personality (Li et al., 2014) and the perceived work environment. Hence, we only know little about whether the Dark Triad also exhibits such dynamics in the workplace (Paulhus & Williams, 2002; Spain et al., 2014). However, such knowledge–specifically about predictors of Dark Triad changes–is meaningful and could provide important implications for organizational and personnel management due to the above-mentioned undesirable organizational consequences of the Dark Triad.

Second, there is little knowledge how the work environment and personality affect each other differently in younger versus older age groups (past research focused on younger and middle-

aged groups, e.g., Donnellan, Hill, & Roberts, 2015; Li et al., 2014; Roberts et al., 2003; Sutin & Costa, 2010). However, specifically knowledge about older age groups provide theoretical contributions to life span related personality-environment interactions (Baltes, 1987; Roberts & Caspi, 2003) and seems critical for human resource management because of the aging workforce in many countries (e.g., Van der Heijden, Gorgievski, & De Lange, 2016; Zacher, 2015).

Third, by investigating if the reciprocal effects between the Dark Triad and perceived competitive climate differ for people who stayed in their current organization as compared to those who changed their organization, we shed more light on selection versus evocation or manipulation effects (selection-evocation-manipulation theory, Buss, 1987). Dark Triad personalities could (a) select themselves to environments that they perceive as competitive (i.e., selection effect, organization change), (b) proactively and agentically shape their work environments so that the climate is perceived as more competitive (i.e., manipulation effect, organization non-change), and (c) interpret environmental cues as more competitive (i.e., evocation effect, organization non-change). Knowledge about evocation or manipulation of changes in perceived psychological climates is meaningful for organizations because psychological climates relate to outcomes like job satisfaction and performance, work attitudes, and motivation (Parker et al., 2003).

**The Dark Triad and Competitive Psychological Climate at Work: Conceptual Issues**

The *Dark Triad* subsumes three dark traits: narcissism, psychopathy, and Machiavellianism (Jonason & Webster, 2010; O'Boyle et al., 2012; Spurk, Keller, & Hirschi, 2015). *Narcissism* is characterized by a grandiose, yet fragile sense of the self, which may be represented by a sense of perceived entitlement and superiority over others (Emmons, 1989; Jonason et al., 2015; Paulhus & Williams, 2002) and can be reflected by behaviors such as exhibitionism, immodesty, and persistent attention seeking (Jakobwitz & Egan, 2006). *Psychopathy* is characterized by impulsivity, low empathy, low anxiety, and a lack of guilt or remorse (Brankley & Rule, 2014; Cohen, 2016; Paulhus & Williams, 2002), which may result in arrogant and deceitful social interactions (Jakobwitz & Egan, 2006). Finally, *Machiavellianism* is characterized by the belief in the effectiveness of manipulative tactics in dealing with other people and a glib social charm (Jonason & Webster, 2010; O'Boyle et al., 2012; Paulhus & Williams, 2002). Individuals high in Machiavellianism are likely to exploit others, and are unlikely to be concerned with interests beyond their own (Jakobwitz & Egan, 2006).

Past research applied different approaches to the study of the Dark Triad and merged the three single sub-traits into one overall score, analysed them separately, or modelled the shared variance or common core (McLarnon & Tarraf, 2017; O'Boyle et al., 2012). To solve this discrepancy, a recent conceptual study (McLarnon & Tarraf, 2017) suggested to analyse both the Dark Triad common core (which might reflect malevolency and exploitative tendencies, Garcia, Rosenberg, MacDonald, Räisänen, & Ricciardi, 2017; Jonason, Kavanagh, Webster, & Fitzgerald, 2011; O'Boyle et al., 2012) and its distinct sub-traits separately as such a conceptual bifactor model provides the best description of the Dark Triad and allows for the most comprehensive

implications. Building upon these recent conceptual developments in Dark Triad research, we will consider both, the Dark Triad common core and its distinct sub-traits in this study.

*Competitive psychological climate at work* has been conceptualized as an individual-level construct comprising an individual's psychologically meaningful representations of proximal organization structures, processes, and events (James, Hater, Gent, & Bruni, 1978; Rousseau, 1988). For our purposes, it makes theoretically sense to analyse the individual's representation of the work environment because theories of individual workplace selection and personality change refer to processes that occur on the individual level and not, for instance, on the organizational level of analysis (Buss, 1987; Johnson, 1997; Le et al., 2014; Roberts & Caspi, 2003). Moreover, psychological climates are usually formed on the basis of the more objective work environment like organizational characteristics (Field & Abelson, 1982; James, Hartman, Stebbins, & Jones, 1977; Lawler, Hall, & Oldham, 1974; Parker et al., 2003) and are also empirically positively related to organizational climate (Fletcher, Major, & Davis, 2008; Parker et al., 2003).

We decided to focus on competitive psychological climate as indicator of the perceived environment, because research suggests that Dark Triad personalities are attracted to (Jonason et al., 2015) and are potentially affected by competitive contexts in the workplace (Nübold et al., 2017). Moreover, we argue that a competitive environment and related perceptions possess high relevance for *all* Dark Triad sub-traits *and* their common core (McLarnon & Tarraf, 2017; Nübold et al., 2017), and therefore presents a parsimonious and suitable concept to analyse reciprocal relationships between the Dark Triad and the perceived work environment.

**The Dark Triad as Predictor of Competitive Psychological Climate**

One framework for understanding the Dark Triad in relation to its environment is selection-evocation-manipulation theory (Buss, 1987; Jonason & Schmitt, 2012), which states that people's personality traits lead individuals to select the environments best suited for them, evoke unintentionally responses from others that further social aims, and intentionally use tactics and exploitation to manipulate environments (including other people) to achieve strategic goals. Supporting this assumption research has found that people with high scores in the Dark Triad prefer jobs with the possibility to attain leadership positions, upward mobility, or exert power and social influence (Spain et al., 2014). Another study showed that the Dark Triad is related to specific types of occupational interests that may affect career choices regarding occupations and perceived work environments (Jonason et al., 2015; Jonason, Wee, Li, & Jackson, 2014). Moreover, research showed that individuals with high values on the Dark Triad manipulate other individuals—and thereby their social work environment—to attain their goals (Jonason, Slomski, & Partyka, 2012).

We *hypothesize* that individuals with high values on the Dark Triad perceive their work environment and related changes as more competitive because of three reasons. First, they should select themselves to work environments that they perceive as competitive (i.e., selection effect of selection-evocation-manipulation theory). Factors that build a competitive psychological climate are, for instance, perceptions of differential rewards, performance evaluations based on comparisons with others, perceived competition with others, and frequent status comparisons by

the social environment such as co-workers or supervisors (Fletcher et al., 2008). Therefore, if Dark Triad personalities perceive the work environment as more competitive they should be attracted by these workplaces because Dark Triad related attributes and behaviours are more expected and accepted in a competitive environment.

For instance, Dark Triad individuals like to compete with others and thereby show their superiority in the social system, while showing malevolent and exploitive tendencies (O'Boyle et al., 2012; Paulhus & Williams, 2002; Rauthmann & Kolar, 2013). Moreover, competitive situations represent a basis for self-enhancement, proving superiority over others, and persistent attention seeking, which are important strivings for individuals high in narcissism (Emmons, 1989; Jakobwitz & Egan, 2006; Spain et al., 2014). Low anxiety, a lack of guilt, and arrogant social interactions, which are aspects of psychopathy (Brankley & Rule, 2014; Cohen, 2016), should be well received within climates that are competitive. Trait aspects of Machiavellianism like manipulating other people, preferring high status positions (Dahling, Whitaker, & Levy, 2009; Jakobwitz & Egan, 2006), or being highly selfish without considering interests of others, should also push towards environments that are perceived as competitive, because in such environments there exists a need to look out for oneself, and only a few egocentric top performers may achieve powerful, high status positions (Brown et al., 1998; Fletcher et al., 2008). Further empirical support that narcissism, psychopathy, and Machiavellianism might be all similarly attracted by competitive climates was provided in a recent meta-analysis (Vize, Lynam, Collison, & Miller, in press), where all three traits were positively related to aggression, impulsivity, risk-taking, and social dominance.

The little existing research on competitive psychological climates provides further support for this reasoning. Some studies showed that competitive psychological climate is associated with destructive work conditions (Fletcher et al., 2008; Keller, Spurk, Baumeler, & Hirschi, 2016), and leads to unethical, high-risk behaviour (Ordóñez, Schweitzer, Galinsky, & Bazerman, 2009). Hence, individuals with Dark Triad personalities should prefer a competitive psychological climate at work because they are, by definition, attracted to high-risk behaviour, including unethical and counterproductive work behaviour (O'Boyle et al., 2012; Spain et al., 2014).

Second, for the same reason Dark Triad individuals may select workplaces that they perceive as competitive, they might also actively manipulate (Buss, 1987; Jonason & Schmitt, 2012) their work environment to become more competitive (i.e., manipulation effect of selection-evocation-manipulation theory). This might be reached by applying different manipulation strategies (Jonason et al., 2012), other agentic strategies (Rauthmann & Kolar, 2013), or job crafting (Bipp & Demerouti, 2015) that affect the Dark Triad personalities' formal working structure, their colleagues/ supervisors, or their job demands. As a consequence, their perceptions about the competitve climate should also become stronger (e.g., Lawler et al., 1974; Parker et al., 2003).

Third, according to selection-evocation-manipulation theory (Buss, 1987), evocation refers to eliciting or provoking reactions from the (social) environment unintentionally. Kelley and Stahelski (1970) found that competitive persons in a prisoner's dilemma game tended to elicit competition, even when interacting with cooperative, non-competitive persons. This evocation process apparently occurs without the awareness of the competitor, who simply assumes that he

or she acts in a competitive environment. This assumption is then confirmed by the (unknowingly evoked) competitive actions of others. In our study, because of an accumlation of such competitive environmental interpretations of Dark Triad individuals over time, the subjectively perceived competitive climate should also become stronger over time.

**Reciprocal Relations between the Dark Triad and Competitive Psychological Climate**

As mentioned above, we furthermore assume that personality and perceptions of the work environment reinforce each other over time (Le et al., 2014; Li et al., 2014; Roberts et al., 2003). This view is reflected in the "corresponsive principle" of personality development (Roberts et al., 2003), which assumes that people choose environments that fit with their personality traits and that the resulting experiences accentuate those same personal characteristics over time. When the individual commits to a social role, his or her personality shifts to reflect the expectancies of that role. Behaviours within social institutions (e.g., organizations) are rewarded or punished based on role expectations; personality change is thus a response to these contingencies. Research supported this assumption by showing that participation in certain occupational roles leads to changes in extraversion, agreeableness, and openness (Denissen, Ulferts, Ludtke, Muck, & Gerstorf, 2014), possibly because of socializing pressures of perceived norm demands (for similar studies on work-environmental induced changes in non-dark traits see: Le et al., 2014; Li et al., 2014; Roberts et al., 2003; Sutin & Costa, 2010). The study of Li et al. (2014), for instance, found that job demands and job control affected proactive personality changes. These assumptions and results thus suggest that the everyday reality of the job and its related perceptions promotes personality change.

In case of competitive psychological climates at work, it might be possible that individuals are getting rewarded (i.e., in terms of recognition, promotion, responsibility) for high levels of individualized, egocentric, selfish, manipulative, and sometimes harsh and slightly aggressive or exploitative behaviours because these behaviours might be seen as "normal" and potentially successful in highly competitive environments (Brown et al., 1998; Fletcher et al., 2008; O'Neill & O'Reilly, 2010). In highly perceived competitive climates, individuals may identify with the role of a "competitor" or even more extremely with the role of a "warrior." Winning this battle might lead to more benefits and power in the career tournament (O'Neill & O'Reilly, 2010), which is important for Dark Triad individuals. This role identification might exert its influence on Dark Triad development, including the Dark Triad common core as well as its sub-traits. Such a reasoning is in line with recent assumptions about fluctuations in Dark Triad expressions. Nübold et al. (2017) proposed a model where role modelling in terms of a competitive context should affect state narcissism, psychopathy, and Machiavellianism. Moreover, the model assumes that coping with stress (like high time pressure) affects Dark Triad fluctuations because under stressful conditions, a lack of cognitive resources that are needed to inhibit dark impulses and motives is plausible. Because competitive psychological climates are associated with subjective stress experiences (Fletcher et al., 2008), this might be another reason why the Dark Triad is affected by competitive environments.

Therefore, we hypothesize that individuals who work under conditions that they perceive as highly competitive change their Dark Triad traits more over time. To summarize, based on selection-evocation-manipulation theory, the interactionist perspective, specifically the corresponsive principle, and empirical results found in other personality and work domains, we postulate:

*Hypothesis 1: There exists a positive reciprocal relation between (a) the Dark Triad common core, (b) narcissism, (c) psychopathy, and (d) Machiavellianism and competitive psychological climate at work.*

## Cumulative Continuity of Personality Development: The Moderating Role of Age

According to the cumulative continuity model (Roberts & Caspi, 2003), identity processes can help explain the patterns of continuity and change in personality traits across the life course. Specifically, the development of a strong identity is positively related to personality stability. Furthermore, with age, a person's identity becomes clarified and strengthened, and this helps to explain the increasing stability in personality traits across the life course (see also Baltes, 1987). Empirical results largely support these assumptions for non-dark traits (McCrae & Costa, 2005; Roberts & DelVecchio, 2000; Specht, Egloff, & Schmukle, 2011). In general, Caspi, Roberts, and Shiner (2005) concluded that "personality traits continue to change throughout adulthood, but only modestly after age 50" (p. 467).

Although most of the studies in this field were conducted with higher- and lower-order traits related to the Big Five, these findings have important implications for our study. First, the assumptions and findings suggest that Dark Triad traits might show higher rank-order stability for older as compared to younger employees. This is likely because the increase in stability with age did not differ by the analysed traits (e.g., agreeableness versus neuroticism) in meta-analytic findings (Caspi et al., 2005) and because some components of dark traits can be modelled via specific clusters of Big Five sub-traits (Wille et al., 2013). Second, a higher stability in personality in age groups above 50 compared to younger age groups implies that other factors (e.g., competitive psychological climate) should have weaker/ stronger effects on personality change in older/ younger age groups, respectively. We hence formulate the following hypotheses:

*Hypothesis 2: The (a) Dark Triad common core, (b) narcissism, (c) psychopathy, and (d) Machiavellianism show a higher rank-order stability among older employees compared to younger employees.*

*Hypothesis 3: The effect of competitive psychological climate on changes in (a) the Dark Triad common core, (b) narcissism, (c) psychopathy, and (d) Machiavellianism over time is weaker among older employees compared to younger employees.*

## Selection, Evocation, or Manipulation: The Moderating Role of Organization Change

We already explained the major assumptions of possible selection, evocation, and manipulation effects of the Dark Triad above (Buss, 1987; Jonason & Schmitt, 2012). However, one problem of disentangling these theoretically different effects empirically is that selection

cannot be differentiated clearly from evocation and manipulation without defining a clear transition related to the selection of and drifting towards a new environment (Buss, 1987; Schneider, Goldstein, & Smith, 1995). Therefore, in this study, we disentangled selection from evocation and manipulation processes via analysing organization change versus non-change as a moderator. More specifically, organization change represents a clear transition point whereby individuals select a new organizational environment in expense of the old occupied organizational environment (Buss, 1987; Tett & Meyer, 1993). Under such organization change conditions, therefore, people with stronger Dark Triad traits can be assumed to select themselves into jobs where they perceive a more competitive work climate (Jonason et al., 2015; Jonason et al., 2014). Contrary, under conditions of organization non-change, selection effects are implausible and evocation and manipulation of the environment is a much more plausible explanation for changes in perceived organizational climate. However, in case of organization change and thereby by selection effects, more fundamental changes of the perceived competitive climate seem possible, compared to unintentional evocation or intentional manipulation when staying in the same organization. We hence assume:

> *Hypothesis 4: The effect of (a) the Dark Triad common core, (b) narcissism, (c) psychopathy, and (d) Machiavellianism on changes in competitive psychological climate over time is stronger among people who change organization compared to those who stay in their organization.*

## Method

### Sample and Procedure

The sample was gathered in Germany through a survey company (i.e., Respondi, panel pool with more than 100,000 participants) with substantial experience in scientific data sampling. Other research has applied a similar approach with high data quality (e.g., Keller et al., 2016; Ng & Feldman, 2010). The online panel service invited individuals with respect to criteria provided by the research team: working in private industry (not self-employed or working students), aged between 25 and 34 (young employee group) and between 50 and 59 (old employee group), and working a minimum of 50% of full-time employment. We chose to sample two clearly distinct age groups to maximize the interpretability of potential age differences while retaining maximum power in multi-group comparisons. Moreover, an age of 50 represents a meaningful cut-off age to analyse age differences in personality stabilities due to increased personality stability after this age (Caspi et al., 2005). Conversely, the age group between 25 and 34 seems to be especially responsive to early socialisation effects (compared to the group of above 50) due to occupational entry (Roberts et al., 2003). We dummy coded age as 0 = *young employee group*, 1 = *old employee group*.

The participants were rewarded with 2€ for the completion of the survey. Within the survey, the scales were randomized within contently defined blocks; the items were randomized within each scale. In total, 1,731 individuals responded to the survey within 14 days at T1 and completed the Dark Triad and competitive psychological climate questionnaires. The sample at T1 comprised

792 women (46%), 899 (52%) participants were in the older age group (50 to 59 years), 481 individuals had completed university studies (28%, the others had a lower occupational degree), and participants worked approximately 37 hours by contract per week *(SD* = 6.13). One year later (T2), all respondents were invited again by the panel service to participate in a follow-up survey containing again the measures of the Dark Triad and competitive psychological climate as well as an indication of whether they have changed their organization in the past year. The final sample size for the analyses was 1,185, the 68% who also completed the survey at T2. This sample comprised 554 women (47%), 315 individuals had completed university studies (27%), 695 (58%) participants were in the older age group, and participants in the final sample worked approximately 36 hours by contract per week at T2 *(SD* = 8.03). Between T1 and T2, 148 individuals (12%) had changed their organization. Frequent industrial sectors within the sample were private service industry (15%), merchandising (11%), production (10%), health (9%), and information technology (6%). The final sample was not different from the complete sample at T1 with respect to the focal variables of this study.

**Timing of Measurement**

        Past research applied different timespans when analysing effects of perceived work characteristics on personality change. A study that analysed cross-lagged effects from perceived work characteristics to personality over a 10-year period failed to identify such effects (Sutin & Costa, 2010). One reason might be that this study took place over a relatively long period and perceptions about work characteristics are prone to change substantially over such long timespans (e.g., because of organization restructuring, rotation in colleagues or supervisors, or general economic developments). Hence, to assess effects of the perceived work climate on personality change, shorter periods might be better suited to detect such effects. Following, we applied a similar strategy as Li et al. (2014) who identified effects of the perceived work environment on personality change by applying a 1-year and a 2-year time-lag.

**Measures**

    *Dark Triad.* The "Dirty Dozen" measure was used as a short scale to measure the Dark Triad (4 items on a 9-point Likert-type scale for each Dark Triad sub-trait, 1 = do not agree at all, 9 = fully agree; Jonason & Webster, 2010). Sample items are "I tend to want others to pay attention to me", for narcissism, "I tend to lack remorse", for psychopathy, or "I tend to manipulate others to get my way", for Machiavellianism. The scale showed construct validity (Jonason & Webster, 2010), also within German-speaking samples (Küfner, Dufner, & Back, 2014; Spurk et al., 2015). The Dirty Dozen showed high levels of reliability and construct validity in several empirical studies, including tests of discriminant validity between the three Dark Triad sub-traits and in relation to other personality traits (Koehn, Okan, & Jonason, 2018). Moreover, convergent validity with other Dark Triad measures and personality traits, predictive validity for relevant outcomes, and the appropriateness of modelling a common latent Dark Triad factor was shown (e.g., Garcia et al., 2017; Jonason et al., 2011; Jonason & McCain, 2012; Jonason & Webster, 2010; Küfner et

al., 2014; Spurk et al., 2015). Besides these positive characteristics of the scale, recent studies also criticise the scale because due to its shortness the single subscales seem to not cover the whole breadth of the underlying Dark Triad sub-traits (e.g., Carter, Campbell, Muncer, & Carter, 2015; Jones & Paulhus, 2014; Maples, Lamkin, & Miller, 2014; Miller et al., 2012). This should be considered when interpreting the results about the Dark Triad sub-traits within this study. Moreover, overall the Dirty Dozen seems to measure malevolent, exploitative, callous, and manipulative tendencies (Jonason et al., 2011; Kajonius, Persson, Rosenberg, & Garcia, 2016; O'Boyle et al., 2012), which should be accounted for when interpreting the results of the Dark Triad common core within this study. The Cronbach's alphas of all applied measures can be seen in Table 1.

*Competitive psychological climate.* We used an accepted scale developed by Fletcher et al. (2008) that consists of 4 items on a 7-point Likert-type scale, 1 = do not agree at all, 7 = fully agree. This scale measures the individual psychological experience of competitive climate at work Sample items are "The amount of recognition you get in this company depends on how you perform compared to other" or "Everybody is concerned with being the top performer." The scale showed construct validity and was related, for instance, to higher levels of job stress or lower levels of job satisfaction (Fletcher et al., 2008). The German language version showed similar psychometric properties compared to the English language version (Keller et al., 2016).

*Organization change.* At T2, we asked participants if they have changed their organization since T1. This question had a dichotomous answering format (0 = no organization change, 1 = organization change).

**Data Analytic Procedure and Latent Dark Triad Modelling**

The hypotheses were tested within a latent cross-lagged panel design with two time points (1-year timespan; Kenny, 1975; Kline, 2011). Such models are well suited to test how personality and competitive psychological climate mutually influence each other over time, and are also referred to as modelling autoregressive change in the outcome variables at T2 (Ferrer & McArdle, 2003). In case of latent cross-lagged panel models, measurement error and reliability of the measurements are statistically taken into account when calculating the model parameters (Kline, 2011).

We used *M*plus version 7.3 (Muthén & Muthén, 1998-2015) to build four different cross-lagged panel models. In one model, the Dark Triad subscale composite scores (i.e., narcissism, psychopathy, and Machiavellianism) were used as indicators for the latent Dark Triad factor. Such a model allows reasoning about the shared variance or common core of the three Dark Triad sub-traits (cf. Jonason et al., 2011). Furthermore, as recommended by McLarnon and Tarraf (2017) we estimated three additional models where every single Dark Triad trait was included separately. In every cross-lagged panel model, the four items of the competitive psychological climate scale were used as indicators of the latent competitive psychological climate factor. The same indicators of all constructs were allowed to correlate over time.

We first analysed every model within the whole sample. Afterwards, we analysed two sets of models: (a) the sample of younger vs. older employees and (b) organization changers vs. organization non-changers with multiple-group analyses and by constraining relevant paths (e.g., Dark Triad → competitive psychological climate and vice versa) to be equal across groups (Kline, 2011). In all analyses, we used a Full Information Maximum Likelihood Estimator with robust standard errors (MLR) to account for optimal missing data treatment on single variables and to account for skewed distributions of the variables (Muthén & Muthén, 1998-2015; Schafer & Graham, 2002). Because we used the MLR estimator, we conducted all chi-square difference tests (e.g., for testing the moderation hypotheses) by a scaling correcting procedure described by Satorra and Bentler (2001).

## Results

### Preliminary Analyses

***Means and correlations.*** Table 1 to 3 show the means, standard deviations, and correlations between the study variables, for the overall sample and divided by group membership (young versus old employees and organization changers versus non-changers, respectively). According to conducted t-tests, there was a mean increase for the Dark Triad ($M_{t1} = 3.41$, $M_{t2} = 3.51$, $t = 2.65$, $p < .01$) and Machiavellianism ($M_{t1} = 3.36$, $M_{t2} = 3.53$, $t = 3.62$, $p < .001$) in the overall sample, and for the Dark Triad and all its single sub-traits among older employees (Dark Triad: $M_{t1} = 3.02$, $M_{t2} = 3.18$, $t = 3.49$, $p < .01$; Narcissism: $M_{t1} = 3.04$, $M_{t2} = 3.17$, $t = 2.21$, $p < .05$; Psychopathy: $M_{t1} = 3.05$, $M_{t2} = 3.19$, $t = 2.27$, $p < .05$; Machiavellianism: $M_{t1} = 2.94$, $M_{t2} = 3.16$, $t = 4.05$, $p < .001$). Machiavellianism increased within the organization non-change group ($M_{t1} = 3.32$, $M_{t2} = 3.51$, $t = 4.04$, $p < .01$). There were no other mean changes in all analysed sub-samples, all $t$-values below 1.96, all $p$-values above .05. Furthermore, the correlations between the Dark Triad and its sub-traits and competitive psychological climate at work were positive within and across time in all groups, all $p$-values below .05, with the exception of the relations between competitive psychological climate at T1 and psychopathy and Machiavellianism at T2 in the group of organization change, both $p$-values above .05.

***Confirmatory factor analyses and testing for measurement invariance.*** First, to show that the three Dark Triad sub-traits can be meaningfully distinguished, we compared a measurement model where all 12 items loaded on one general latent factor with a model where four items loaded on the theoretically assumed factors (i.e., three correlated latent factors: narcissism, psychopathy, Machiavellianism). Moreover, we compared this theoretically assumed three-factor solution with three two-factor solutions (Machiavellianism-psychopathy on one factor, Machiavellianism-narcissism on one factor, narcissism-psychopathy on one factor). The three-factor solution fitted the data always better (T1: $\Delta\chi^2 = 1055.89$, $\Delta df = 3$, $p < .001$; T2: $\Delta\chi^2 = 360.40$, $\Delta df = 3$, $p < .001$), allowing differentiated analyses for the separate factors at both time points.

Furthermore, we tested longitudinal measurement invariance via comparing two models without and with equality constraints on the factor loadings, and comparing them via a chi-square difference test (Vandenberg & Lance, 2000). Full metric invariance was confirmed for all

measures (all *p*-values above .05). In a next step, we tested for cross-group (i.e., young vs. old and changers vs. non-changers) invariance (Vandenberg & Lance, 2000). Regarding both group comparisons, the tests showed full metric cross-group invariance of the applied measurements (all *p*-values above .05), despite two exceptions. Narcissism and psychopathy showed partial metric age-group invariance at T1 (in both cases one item was non-invariant). Altogether, sufficient measurement invariance across time and groups for comparing structural relationships was confirmed (Vandenberg & Lance, 2000). Model fit statistics for longitudinal and cross-group metric invariance were as follows: CFI from .94 to .99, RMSEA from .036 to .052, SRMR from .021 to .042. All standardized factor loadings were above the recommended threshold level of .40 (Kline, 2011). We applied these invariant measurement models in all further analyses to test the hypotheses.

## Reciprocal Relations between the Dark Triad and Competitive Psychological Climate

*Dark Triad common core.* Table 4 shows the results of the latent cross-lagged panel analysis. For reasons of completeness and because the later conducted effect size difference tests are based on unstandardized values, we report both standardized and unstandardized results there. Regarding the overall sample, competitive psychological climate at T1 positively predicted the change in the Dark Triad common core from T1 to T2 ($\beta = .10$, $p < .01$). Additionally, the Dark Triad common core at T1 positively predicted the change in competitive psychological climate from T1 to T2 ($\beta = .13$, $p < .01$). In other words, individuals with higher values on the Dark Triad common core (i.e., malevolent, exploitative, callous, and manipulative tendencies) at T1 showed a stronger positive change in competitive psychological climate at work over one year. Moreover, those individuals who reported a higher competitive psychological climate at work at T1 showed a stronger positive change in their Dark Triad common core over one year. Therefore, we found positive reciprocal relations between the Dark Triad common core and competitive psychological climate at work, supporting Hypothesis 1a.

Additionally, we tested if the two cross-lagged effects (Dark Triad common core → competitive psychological climate and competitive psychological climate → Dark Triad common core) differed in size. This was not the case. Altogether, the model explained 46% of the variance of the Dark Triad common core at T2 and 35% of the variance of competitive psychological climate at T2. The model fit indices of the model signalled that the model fitted well to the data ($\chi^2 = 185.54$, $df = 69$, CFI = .98, RMSEA = .038, SRMR = .031).

*Dark Triad sub-traits: Narcissism, psychopathy, and Machiavellianism.* Within the overall sample, the results were very similar for narcissism, psychopathy, and Machiavellianism. The change in competitive psychological climate from T1 to T2 was positively predicted by narcissism ($\beta = .10$, $p < .01$), psychopathy ($\beta = .08$, $p < .05$), and Machiavellianism ($\beta = .11$, $p < .01$) at T1. Furthermore, competitive psychological climate at T1 was positively related to the change in narcissism ($\beta = .10$, $p < .01$), psychopathy ($\beta = .12$, $p < .001$), and Machiavellianism ($\beta = .11$, $p < .01$) from T1 to T2. Again, reciprocal relationships occurred, supporting Hypothesis 1b to 1d.

Additionally, we tested if the two cross-lagged effects (Dark Triad sub-traits → competitive psychological climate and competitive psychological climate → Dark Triad sub-traits) differed in size. This was not the case. Altogether, the models explained between 34% and 44% in the outcomes. The model fit indices signalled that the models fitted well to the data (Model narcissism: $\chi^2$ = 227.83, $df$ = 95, CFI = .98, RMSEA = .034, SRMR = .028; model psychopathy: $\chi^2$ = 250.48, $df$ = 96, CFI = .97, RMSEA = .037, SRMR = .036; model Machiavellianism: $\chi^2$ = 213.93, $df$ = 95, CFI = .98, RMSEA = .033, SRMR = .025).

**Moderation Analysis: Age**

To test the moderating effect of age, we conducted multiple-group structural equation modelling (SEM) analysis. We calculated the same models as presented above within the group of young and old employees. Specifically, to test Hypothesis 2, we compared a model in which the autoregressive paths between the Dark Triad or its sub-traits from T1 to T2 were constrained to be equal across age groups (Model 2) with a model where all paths were freed (Baseline: Model 1). For a test of Hypothesis 3, we compared a model in which the paths of competitive psychological climate at T1 on the Dark Triad or its sub-traits at T2 were constrained to be equal across age groups (Model 3) with a model where all paths were freed (Baseline: Model 1). A significant drop in model fit for Model 2 and Model 3 (compared to Model 1, via a chi-square difference test) would provide support for Hypothesis 2 and 3 (Kline, 2011). The results of these model comparisons and model fit statistics are shown in Table 5. The resulting coefficients from Model 1, separated by age groups can be seen in Table 4.

*Dark Triad common core.* The comparison of the stabilities of the Dark Triad common core between the young and the old employees (Model 1 against Model 2) revealed that the Dark Triad common core was more stable within old employees (β = .65, $p$ < .001) compared to young employees (β = .55, $p$ < .001), supporting Hypothesis 2a. A further chi-square difference test revealed that Model 1 and Model 3 did not differ with respect to model fit. Therefore, the effect of competitive psychological climate at T1 on the change of the Dark Triad common core from T1 to T2 was not moderated by age (model young: β = .12, $p$ < .05; model old: β = .09, $p$ < .05), and Hypothesis 3a was not supported.

*Dark Triad sub-traits: Narcissism, psychopathy, and Machiavellianism.* The comparison of the stabilities of narcissism, psychopathy, and Machiavellianism between the young and the old employees (Model 1 against Model 2) revealed that only Machiavellianism showed different stabilities across age groups (model young: β = .51, $p$ < .001; model old: β = .67, $p$ < .001). No stability differences were found in case of narcissism (model young: β = .57, $p$ < .001; model old: β = .60, $p$ < .001) and psychopathy (model young: β = .54, $p$ < .001; model old: β = .55, $p$ < .001). Altogether, these results support Hypothesis 2d but not 2b and 2c. Moreover, the effects of competitive psychological climate at T1 on the change in narcissism (model young: β = .09, $p$ = .10; model old: β = .11, $p$ < .01), psychopathy (model young: β = .14, $p$ < .05; model old: β = .12, $p$ < .01), and Machiavellianism (model young: β = .13, $p$ < .01; model old: β = .09, $p$ < .05) were not moderated by age. Therefore, Hypotheses 3b to 3d were not supported.

**Moderation Analysis: Organization Change**

To test for the moderating influence of organization change, we conducted further multiple-group SEM analyses similar to the one above. However, we specified the groups as organization changers and organization non-changers. Specifically, to test Hypothesis 4, we compared a model in which the paths of the Dark Triad at T1 on competitive psychological climate at T2 were constrained to be equal across groups (Model 2) with a model where all paths were freed (Baseline: Model 1). These results can be seen in Table 6. The resulting coefficients from Model 1, separated by organization change versus non-change groups can be seen in Table 4.

*Dark Triad common core.* Results revealed a significant difference between Model 1 and 2. For employees who changed their organization, the effect of the Dark Triad common core at T1 on the change of competitive psychological climate from T1 to T2 was larger ($\beta = .46$, $p < .001$) compared to employees who did not change their organization ($\beta = .12$, $p < .01$), supporting Hypothesis 4a. Interestingly, in case of an organization change, the stability coefficient of competitive psychological climate was weak and nonsignificant compared to the stability coefficient in case of an organization non-change ($\beta = .07$, *ns* and $\beta = .58$, $p < .001$), indicating that individuals perceived the competitive climate in the new organization differently than in the old organization.

*Dark Triad sub-traits: Narcissism, psychopathy, and Machiavellianism*. The effect of narcissism and psychopathy at T1 on the change of competitive psychological climate from T1 to T2 was larger in the organization change group ($\beta = .36$, $p < .01$ and $\beta = .44$, $p < .001$, respectively) compared to employees who did not change their organization ($\beta = .10$, $p < .01$ and $\beta = .04$, *ns*, respectively), supporting Hypothesis 4b and 4c. The effect of Machiavellianism at T1 on the change of competitive psychological climate from T1 to T2 did not differ by groups (organization changers: $\beta = .28$, $p < .05$; organization non-changers: $\beta = .10$, $p < .01$), providing no support for Hypothesis 4d.

**Discussion**

This study is, to our knowledge, the first that investigated reciprocal relations between dark personality traits (i.e., the Dark Triad common core and narcissism, psychopathy, and Machiavellianism) and perceptions about the work environment (i.e., competitive psychological climate). Moreover, by drawing on cumulative continuity model of personality development (Roberts & Caspi, 2003), the study analysed the moderating effects of age. Based on reasoning of selection-evocation-manipulation theory (Buss, 1987), organization change in terms of turnover was investigated as a second moderator. Generally, independently from the analysed moderators, the study found consistent support for positive reciprocity between competitive psychological climate at work and the Dark Triad common core as well as the distinct Dark Triad sub-traits (Hypotheses 1a to 1d were fully supported). Specifically, regarding the here applied Dirty Dozen measure, the results concerning the Dark Triad common core can be interpreted as results about the Dark Triad core characteristics of malevolency, exploitation, callousness, and manipulation (Jonason et al., 2011; Kajonius et al., 2016; O'Boyle et al., 2012).

Across the moderator analyses, the findings were more consistent and as expected for the Dark Triad common core than for its sub-traits that showed slightly inconsistent patterns in dependence of the considered moderator hypothesis (Hypotheses 2a to 2d on age-dependent Dark Triad stabilities were partially supported, Hypotheses 3a to 3d on age-dependent effects on personality changes were not supported, and Hypotheses 4a to 4d on organization change-dependent effects on competitive psychological climate changes were largely supported). These results add to past research because instead of perceived job characteristics (e.g., job demands, social support, physical demands; Li et al., 2014; Sutin & Costa, 2010) and non-dark personality traits (e.g., Frese, Garst, & Fay, 2007; Sutin & Costa, 2010), the study focused on a perceived organizational climate variable that theoretically fits to the Dark Triad common core of malevolency, exploitation, callousness, and manipulation, as well as to the single sub-traits. Overall, the results shed light on (a) life span-related dark personality changes due to perceptions about the work environment (i.e., social influence processes within an interactionist personality development model) and (b) changes in the perceived work environment that are related to dark personality traits (i.e., selection versus evocation and manipulation effects).

**Theoretical Implications: Cumulative Continuity in Dark Triad Personalities**

Against the background that past research on work-induced personality changes did not analyse older age groups (Frese et al., 2007; Li et al., 2014; Sutin & Costa, 2010) and thereby neglected life span-related theorizing, results of the moderating role of age group are especially interesting. In our study, the Dark Triad common core and Machiavellianism were more stable among older employees, and thereby showed a similar life span-related stability pattern compared to other personality traits (Caspi et al., 2005; McCrae & Costa, 2005). Conversly, we found no age differences in the stabilies of narcissism and psychopathy. These results suggest that cumulative continuity in dark personality stabilities might depend on the dark personality sub-trait.

However, despite this higher stability in the Dark Triad common core and Machiavellianism for older employees, competitive psychological climate was consistently related to the changes in all dark traits in the same magnitude for both old and young employees. At least two important theoretical implications can be derived from these results. First, the higher stabilities (i.e., cumulative continuity) for some Dark Triad aspects among older employees do not imply that perceptions of the work environment cannot shape personality in older age. Hence, this finding might provide support for recent developments in theorizing about the ageing workforce that assumes that older employees might be more adaptable than presumed in the past (Van der Heijden et al., 2016; Zacher, 2015). Second, these results show that the underlying processes (e.g., correspondive principle, social influence processes) that trigger personality changes are at least partially comparable for young and old employees.

Finally, besides revealing insight into work-related personality research, the findings of our study also add to research on competitive psychological climate at work. Past research on competitive psychological climate is scarce and mainly focused on job attitudes, performance, stress, or motivation as possible outcomes (Brown et al., 1998; Fletcher et al., 2008; Keller et al.,

2016). We extended this research by adding personality change as one further consequence of perceived competition within the organization. Moreover, there are recent calls to investigate antecedents of psychological climates at work, and our study provides a deeper understanding of how "dark" personality might function as such an antecedent (Beus, Munoz, & Arthur, 2015; Parker et al., 2003).

**Theoretical Implications: Selection-Evocation-Manipulation**

By applying a full cross-lagged panel design and by analysing organization change as a moderator, we were able to disentangle selection effects (i.e., organization change) from evocation and manipulation effects (i.e., organization non-change). The finding that individuals with higher values on the Dark Triad common core, narcissism, and psychopathy change their perceptions about the competitive environment more in case of an organization change compared to an organization non-change is an indicator that individuals with these characteristics are showing stronger selection effects compared to evocation and manipulation effects. A closer look at the results in case of organization change even suggests that the change in perceptions about the competitive environment might be a reflection of true environmental changes because the perceived competitive climate showed a large variability (nonsignificant stability) between T1 and T2. Therefore, our study provides more strict conclusions about true selection effects than other studies that applied a longitudinal design without analysing organization change as a moderator (e.g., Frese et al., 2007; Li et al., 2014; Sutin & Costa, 2010). Notably, the selection effect consistently occurred for the Dark Triad common core as well as for all Dark Triad sub-traits. These results contribute to Dark Triad research as they show that independently from covered trait aspects (McLarnon & Tarraf, 2017), perceived competition seems to pull people with dark traits (i.e., malevolent, exploitative, callous, and manipulative tendencies) towards competitive work environments.

The differential analysis of organization changers and non-changers allows deriving further theoretical implications. Specifically, under the condition of organization non-change, we also identified positive relationships between the Dark Triad common core, narcissism, Machiavellianism, and the change in competitive psychological climate. This suggests that specifically malevolent, exploitative, narcissistic, and manipulative individuals perceived their work environment as more competitive over time. This process can be explained in two different ways. First, for agentic personalities such as Dark Triad individuals (Rauthmann & Kolar, 2013), proactive strategies like job crafting (Tims, Bakker, & Derks, 2012) or manipulative behaviours (Jonason et al., 2012) might induce true change in the work environment. Because of this, the perceived competition also changes (i.e., manipulation effect). Second, individuals high on the Dark Triad may perceive more competitiveness over time not only because the workplace became more competitive, but also for reasons of interpreting cues more towards a fit to their personality (i.e., evocation effect). The evocation explanation of our findings provides an interesting view about inner-person mechanisms related to the Dark Triad. However, the results do not allow for a clear distinction between manipulation versus evocation effects.

Finally, two findings should gain specific attention when discussion selection-evocation-manipulation effects. First, the evocation-manipulation effect was nonsignificant for psychopathy. This implies that impulsive, low empathic, and low anxious individuals that tend to be arrogant and deceitful in social intertactions (Brankley & Rule, 2014; Cohen, 2016; Paulhus & Williams, 2002) do not change their perceptions of the competitive work climate over time in case of organization non-change. Second, unexpectedly, the effect of Machiavellism on change in perceived competitive climate did not significantly differ between organization changers and non-changers. This implies that individuals with high levels on Machiavellianism are doing equally well in selecting or evocating and manipulating perceived competitive climates. This might be comprehensible to some degree, because individuals high in Machiavellianism are characterized by the belief in the effectiveness of manipulative tactics and show glib social charm (Jonason & Webster, 2010; O'Boyle et al., 2012; Paulhus & Williams, 2002). Following, they might especially prefer and be particularily succesfull in manipulating their environment.

**Practical Implications**

From an applied perspective, the findings of the study might be of special interest for personnel selection, specifically for personnel marketing. It might be that organizations that promote a strong competitive climate draw the attention of Dark Triad individuals. Although individuals with high values on the Dark Triad common core or its sub-traits might possess relevant professional skills for a position, there exists also a risk in hiring them because individuals with high values on the Dark Triad usually show higher levels of, for instance, counterproductive work behaviour or abusive supervision (O'Boyle et al., 2012; Spain et al., 2014). Hence, organizations should at least be aware of the possibility that if their organizational characteristics (e.g., culture, climate, or image) are being perceived as competitive, Dark Triad individuals might be overrepresented in the applicant population. In such a case, a pre-screening of Dark Triad traits within the personnel selection process might be especially required.

Regarding personnel and organizational development, the present study suggests that the dark personality of young (e.g., newcomers, early career employees) and old (e.g., experienced workers, late career employees) employees is shaped by perceptions about the organizational climate. Because the perceived organizational climate is at least partially under control of the organization (Beus et al., 2015; Field & Abelson, 1982; James et al., 1977; Lawler et al., 1974; Parker et al., 2003; Schneider & Reichers, 1983), organizations should be aware of the possibility that promoting competitive climates might reinforce dark personalities within their organization. Similarly, based on trait activation theory (Tett & Burnett, 2003), it might be that Dark Triad related behaviour is triggered by a competitive climate that finally results in counterproductive, unethical organizational behaviour. Moreover, personality research found that within-person variation in personality states can be triggered by relevant situational cues (Fleeson, 2001). Together with the here provided findings, such reasoning suggests that a decrease in competitive psychological climates might also decrease Dark Triad expressions at work. Therefore, personnel

and organizational development practices might be effective in modulating/interrupting the here described dynamic process.

Finally, the results of the study might be of specific interest for age-related human resource practices, because we found that perceptions about the work environment are related to changes in the personality of older employees. Hence, against the background of age-specific personnel development and job design (Truxillo, Cadiz, & Hammer, 2015), organizations should take the possibility into account that the personality-related socialization process is still ongoing for older employees.

**Limitations and Future Research**

Although we applied a longitudinal full cross-lagged panel design based on a relatively large, partly representative sample, the study still has some limitations that should be discussed. First, no middle-age group was included. Therefore, the results cannot be generalized to employees aged between 35 to 49 years. However, given that we found only minor age differences in the results, it might be that the here identified effects would also be observed within middle age groups. Nonetheless, for a more continuous analysis of the here age-related moderation hypotheses, future studies should consider age as a continuous variable.

Second, we relied on two measurement points as a basis for the lagged analysis because this design is sufficient to detect the effects of interest within our study and allows conclusions about positive reciprocity between the Dark Triad and competitive psychological climate, based on a residual change model (Ferrer & McArdle, 2003). Nonetheless, future research might use three or more time points and explicitly model the role of time in terms of different change patterns (Cole & Maxwell, 2003; Duncan & Duncan, 1995). However, independent of the chosen number of measurements and applied statistical procedure, causal explanations should be undertaken with caution because third variable influences and alternative explanations cannot be ruled out entirely (Mitchell & James, 2001). While the cross-lagged effects in the overall sample were significant due to the large sample size and associated power, the effects were relatively small. However, the observed effect sizes are comparable to other studies on personality change (e.g., Le et al., 2014; Li et al., 2014; Roberts et al., 2003; Sutin & Costa, 2010).

Third, all constructs were measured by self-report that might have inflated the observed relations among constructs to some degree (Podsakoff, MacKenzie, & Podsakoff, 2012). However, the applied longitudinal design reduces such effects and the applied CFA shows that the concepts are sufficiently empirically distinct.

Fourth, the selected measurement scale of the Dark Triad with the Dirty Dozen was a trade of "between precision and efficiency that are often at odds in measurement" (Jonason & Webster, 2010, p. 431). We are aware of a current discussion about which measurements should be best applied to assess the Dark Triad. Within this discussion, on the one side, several critical results regarding the Dirty Dozen have been provided (e.g., Carter et al., 2015; Jones & Paulhus, 2014, 2017; Lee et al., 2013; Maples et al., 2014; Miller et al., 2012). For example, Kajonius et al. (2016) stated that the scale may assess a more general exploitation factor, which we accounted for when

interpreting the results of the Dark Triad common core in this paper. Other studies question the construct or predictive validity of parts of the Dirty Dozen (Jones & Paulhus, 2017; Miller et al., 2012) or specifically show that the Machiavellianism subscale measures more aspects of psychopathy than of Machiavellianism (a common problem for all available scales; Miller, Hyatt, Maples-Keller, Carter, & Lynam, 2017). These critical voices should be considered when interpreting the results of the Dark Triad common core and its single sub-traits within this study. Moreover, future research should conduct comparable Dark Triad change studies with applying different available measures (Jones & Paulhus, 2014) or potentially in the future developed scales (Miller et al., 2017).

On the other side, there are also recent studies that provide support for the validity of the Dirty Dozen scale, at least for central components of it (Jonason & Webster, 2010; Küfner et al., 2014; McLarnon & Tarraf, 2017; Özsoy, Rauthmann, Jonason, & Ardıç, 2017; Savard, Simard, & Jonason, 2017; Vize et al., in press). To provide more evidence that the here applied scale is suitable in the context of competitive psychological climates, we correlated the Dirty Dozen and the SD3 short Dark Triad scale (Jones & Paulhus, 2014) with competitive psychological climate within an independent sample of $N = 125$ employees from Germany. Results showed that the Dirty Dozen correlated with $r = .26$ and the SD3-T with $r = .27$ (both $p < .01$) with competitive psychological climate. On a subscale level, all subscales with the exception of SD3-Narcissism correlated positively with competitive psychological climate. All results from this analysis can be obtained from the authors. These findings suggest that our reported results may not be meaningfully biased due to the specific Dark Triad measure applied in this study.

Fifth, we focused on perceived climate because it makes sense to assume that the subjective experience of the environment is more strongly related to personality change as opposed to purely objective characteristics (Frese et al., 2007; Inkeles & Levinson, 1963; Roberts, Wood, & Smith, 2005). However, future research could use more objective measures and/or measures on higher levels, such as the work group and/or organization, to derive broader practical implications of this research. Finally, we did not differentiate between involuntary and voluntary organization change, which might be a fruitful distinction in future research on this topic.

**Conclusion**

Based on an interactionist model of personality development (Johnson, 1997; Roberts & Caspi, 2003), the present study found reciprocal relations between the Dark Triad (i.e., common core, narcissism, psychopathy, and Machiavellianism) and an individual's perception about existing competition at the workplace. By including age as a moderator of the relations, the study further contributes to the knowledge about life span-related dark personality changes and human resource management. By including organization change as a moderator of the relations, the study extends earlier research by better disentangling selection from evocation and manipulation effects in the interplay between personality change and the perceived work environment.

# References

Baltes, P. B. (1987). Theoretical propositions of life-span developmental psychology: On the dynamics between growth and decline. *Developmental Psychology, 23*, 611-626.

Beus, J. M., Munoz, G. J., & Arthur, W., Jr. (2015). Personality as a multilevel predictor of climate: An examination in the domain of workplace safety. *Group & Organization Management, 40*, 625-656.

Bipp, T., & Demerouti, E. (2015). Which employees craft their jobs and how? Basic dimensions of personality and employees' job crafting behaviour. *Journal of Occupational and Organizational Psychology, 88*, 631-655.

Brankley, A. E., & Rule, N. O. (2014). Threat perception: How psychopathy and Machiavellianism relate to social perceptions during competition. *Personality and Individual Differences, 71*, 103-107.

Brown, S. P., Cron, W. L., & Slocum, J. W. (1998). Effects of trait competitiveness and perceived intraorganizational competition on salesperson goal setting and performance. *The Journal of Marketing, 62*, 88–98.

Buss, D. M. (1987). Selection, evocation, and manipulation. *Journal of Personality and Social Psychology, 53*, 1214-1221.

Carter, G. L., Campbell, A. C., Muncer, S., & Carter, K. A. (2015). A Mokken analysis of the Dark Triad 'Dirty Dozen': Sex and age differences in scale structures, and issues with individual items. *Personality and Individual Differences, 83*, 185-191.

Caspi, A., Roberts, B. W., & Shiner, R. L. (2005). Personality development: Stability and change. *Annual Review of Psychology, 56*, 453-484.

Clark, M. A., Lelchook, A. M., & Taylor, M. L. (2010). Beyond the Big Five: How narcissism, perfectionism, and dispositional affect relate to workaholism. *Personality and Individual Differences, 48*, 786-791.

Cohen, A. (2016). Are they among us? A conceptual framework of the relationship between the dark triad personality and counterproductive work behaviors (CWBs). *Human Resource Management Review, 26*, 69-85.

Cole, D. A., & Maxwell, S. E. (2003). Testing mediational models with longitudinal data: Questions and tips in the use of structural equation modeling. *Journal of Abnormal Psychology, 112*, 558–577.

Dahling, J. J., Whitaker, B. G., & Levy, P. E. (2009). The development and validation of a new Machiavellianism scale. *Journal of management, 35*, 219-257.

Denissen, J. J. A., Ulferts, H., Ludtke, O., Muck, P. M., & Gerstorf, D. (2014). Longitudinal transactions between personality and occupational roles: A large and heterogenuous study of job beginners, stayers, and changers. *Developmental Psychology, 50*, 1931–1942.

Donnellan, M. B., Hill, P. L., & Roberts, B. W. (2015). Personality development across the life span: Current findings and future directions. In M. Mikulincer, P. R. Shaver, M. L. Cooper & R. J. Larsen (Eds.), *APA handbook of personality and social psychology* (pp. 107–126). Washington, DC, USA: American Psychological Association.

Duncan, T. E., & Duncan, S. C. (1995). Modeling the processes of development via latent variable growth curve methodology. *Structural Equation Modeling: A Multidisciplinary Journal, 2*, 187–213.

Emmons, R. A. (1989). Exploring the relations between motives and traits: The case of narcissism. In D. M. Buss & N. Cantor (Eds.), *Personality Psychology* (pp. 32-44). New York: Springer.

Ferrer, E., & McArdle, J. (2003). Alternative structural models for multivariate longitudinal data analysis. *Structural Equation Modeling, 10*, 493-524.

Field, R. G., & Abelson, M. A. (1982). Climate: A reconceptualization and proposed model. *Human Relations, 35*, 181–201.

Fleeson, W. (2001). Toward a structure-and process-integrated view of personality: Traits as density distributions of states. *Journal of personality and social psychology, 80*, 1011-1027.

Fletcher, T. D., Major, D. A., & Davis, D. D. (2008). The interactive relationship of competitive climate and trait competitiveness with workplace attitudes, stress, and performance. *Journal of Organizational Behavior, 29*, 899–922.

Frese, M., Garst, H., & Fay, D. (2007). Making things happen: Reciprocal relationships between work characteristics and personal initiative in a four-wave longitudinal structural equation model. *Journal of Applied Psychology, 92*, 1084–1102.

Garcia, D., Rosenberg, P., MacDonald, S., Räisänen, C., & Ricciardi, M. R. (2017). Measuring malevolent character: Data using the Swedish version of Jonason's Dark Triad Dirty Dozen. *Data in brief, 14*, 648.

Inkeles, A., & Levinson, D. J. (1963). The personal system and the sociocultural system in large-scale organizations. *Sociometry, 26*, 217-229.

Jakobwitz, S., & Egan, V. (2006). The dark triad and normal personality traits. *Personality and Individual Differences, 40*, 331-339.

James, L. R., Hartman, A., Stebbins, M. W., & Jones, A. P. (1977). Relationships between psychological climate and a vie model for work motivation. *Personnel Psychology, 30*, 229–254.

James, L. R., Hater, J. J., Gent, M. J., & Bruni, J. R. (1978). Psychological climate: Implications from cognitive social learning theory and interactional psychology. *Personnel Psychology, 31*, 783–813.

Johnson, J. (1997). Units of analysis for the description and explanation of personality. In R. Hogan, J. Johnson & S. Briggs (Eds.), *Handbook of Personality Psychology* (pp. 73-93). San Diego: Academic Press.

Jonason, P. K., Kavanagh, P. S., Webster, G. D., & Fitzgerald, D. (2011). Comparing the measured and latent dark triad: Are three measures better than one. *Journal of Methods and Measurement in the Social Sciences, 2*, 28-44.

Jonason, P. K., & McCain, J. (2012). Using the HEXACO model to test the validity of the Dirty Dozen measure of the Dark Triad. *Personality and Individual Differences, 53*, 935-938.

Jonason, P. K., & Schmitt, D. P. (2012). What have you done for me lately? Friendship-selection in the shadow of the Dark Triad traits. *Evolutionary Psychology, 10*, 400-421.

Jonason, P. K., Slomski, S., & Partyka, J. (2012). The Dark Triad at work: How toxic employees get their way. *Personality and Individual Differences, 52*, 449-453.

Jonason, P. K., & Webster, G. D. (2010). The dirty dozen: A concise measure of the dark triad. *Psychological Assessment, 22*, 420.

Jonason, P. K., Wee, S., & Li, N. P. (2015). Competition, autonomy, and prestige: Mechanisms through which the Dark Triad predict job satisfaction. *Personality and Individual Differences, 72*, 112-116.

Jonason, P. K., Wee, S., Li, N. P., & Jackson, C. (2014). Occupational niches and the Dark Triad traits. *Personality and Individual Differences, 69*, 119-123.

Jones, D. N., & Paulhus, D. L. (2014). Introducing the short dark triad (SD3) a brief measure of dark personality traits. *Assessment, 21*, 28-41.

Jones, D. N., & Paulhus, D. L. (2017). Duplicity among the dark triad: Three faces of deceit. *Journal of personality and social psychology, 113*, 329.

Kajonius, P. J., Persson, B. N., Rosenberg, P., & Garcia, D. (2016). The (mis) measurement of the Dark Triad Dirty Dozen: Exploitation at the core of the scale. *PeerJ, 4*, e1748.

Keller, A. C., Spurk, D., Baumeler, F., & Hirschi, A. (2016). Competitive climate and workaholism: Negative sides of future orientation and calling. *Personality and Individual Differences, 96*, 122–126.

Kelley, H. H., & Stahelski, A. J. (1970). Social interaction basis of cooperators' and competitors' beliefs about others. *Journal of Personality and Social Psychology, 16*, 66.

Kenny, D. A. (1975). Cross-lagged panel correlation: A test for spuriousness. *Psychological Bulletin, 82*, 887.

Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3rd ed.). New York: Guilford Press.

Koehn, M. A., Okan, C., & Jonason, P. K. (2018). A primer on the Dark Triad traits. *Australian Journal of Psychology*.

Küfner, A. C., Dufner, M., & Back, M. D. (2014). Das Dreckige Dutzend und die Niederträchtigen Neun [The Dirty Dozen and the Naughty Nine: Short scales for the assessment of narcissism, Machiavellianism, and psychopathy]. *Diagnostica, 61*, 76-91.

Lawler, E. E., Hall, D. T., & Oldham, G. R. (1974). Organizational climate: Relationship to organizational structure, process, and performance. *Organizational Behavior and Human Performance, 11*, 139–155.

Le, K., Donnellan, M. B., & Conger, R. (2014). Personality development at work: Workplace conditions, personality changes, and the correspondive principle. *Journal of Personality, 82*, 44-56.

Lee, K., Ashton, M. C., Wiltshire, J., Bourdage, J. S., Visser, B. A., & Gallucci, A. (2013). Sex, power, and money: Prediction from the Dark Triad and Honesty–Humility. *European Journal of Personality, 27*, 169-184.

Li, W.-D., Fay, D., Frese, M., Harms, P. D., & Gao, X. Y. (2014). Reciprocal relationship between proactive personality and work characteristics: A latent change score approach. *Journal of Applied Psychology, 99*, 948-965.

Maples, J. L., Lamkin, J., & Miller, J. D. (2014). A test of two brief measures of the dark triad: the dirty dozen and short dark triad. *Psychological assessment, 26*, 326.

McCrae, R., & Costa, P. (2005). Personality development: Stability and change. *Journal of Personality and Social Psychology, 3*, 173-175.

McLarnon, M. J., & Tarraf, R. C. (2017). The Dark Triad: Specific or general sources of variance? A bifactor exploratory structural equation modeling approach. *Personality and Individual Differences, 112*, 67-73.

Miller, J. D., Few, L. R., Seibert, L. A., Watts, A., Zeichner, A., & Lynam, D. R. (2012). An examination of the Dirty Dozen measure of psychopathy: A cautionary tale about the costs of brief measures. *Psychological Assessment, 24*, 1048–1053.

Miller, J. D., Hyatt, C. S., Maples-Keller, J. L., Carter, N. T., & Lynam, D. R. (2017). Psychopathy and Machiavellianism: A distinction without a difference? *Journal of personality, 85*, 439-453.

Mitchell, T. R., & James, L. R. (2001). Building better theory: Time and the specification of when things happen. *Academy of Management Review, 26*, 530–547.

Muthén, L. K., & Muthén, B. O. (1998-2015). *Mplus user's guide (7th ed.)*. Los Angeles, CA: Muthén & Muthén.

Ng, T. W. H., & Feldman, D. C. (2010). The effects of organizational embeddedness on development of social capital and human capital. *Journal of Applied Psychology, 95*, 696–712.

Nübold, A., Bader, J., Bozin, N., Depala, R., Eidast, H., Johannessen, E. A., & Prinz, G. (2017). Developing a taxonomy of dark triad triggers at work – A grounded theory study protocol. *Frontiers in Psychology, 8*, 1-10.

O'Boyle, E. H., Forsyth, D. R., Banks, G. C., & McDaniel, M. A. (2012). A meta-analysis of the dark triad and work behavior: A social exchange perspective. *Journal of Applied Psychology, 97*, 557–579.

O'Neill, O. A., & O'Reilly, C. A. (2010). Careers as tournaments: The impact of sex and gendered organizational culture preferences on MBAs' income attainment. *Journal of Organizational Behavior, 31*, 856–876.

Ordóñez, L. D., Schweitzer, M. E., Galinsky, A. D., & Bazerman, M. H. (2009). Goals gone wild: The systematic side effects of overprescribing goal setting. *The Academy of Management Perspectives, 23*, 6-16.

Özsoy, E., Rauthmann, J. F., Jonason, P. K., & Ardıç, K. (2017). Reliability and validity of the Turkish versions of Dark Triad Dirty Dozen (DTDD-T), Short Dark Triad (SD3-T), and Single Item Narcissism Scale (SINS-T). *Personality and Individual Differences, 117*, 11-14.

Parker, C. P., Baltes, B. B., Young, S. A., Huff, J. W., Altmann, R. A., Lacost, H. A., & Roberts, J. E. (2003). Relationships between psychological climate perceptions and work outcomes: A meta-analytic review. *Journal of Organizational Behavior, 24*, 389–416.

Paulhus, D. L., & Williams, K. M. (2002). The dark triad of personality: Narcissism, Machiavellianism, and psychopathy. *Journal of Research in Personality, 36*, 556-563.

Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology, 63*, 539–569.

Rauthmann, J. F., & Kolar, G. P. (2013). Positioning the Dark Triad in the interpersonal circumplex: The friendly-dominant narcissist, hostile-submissive Machiavellian, and hostile-dominant psychopath? *Personality and Individual Differences, 54*, 622-627.

Roberts, B. W., & Caspi, A. (2003). The cumulative continuity model of personality development: Striking a balance between continuity and change in personality traits across the life course. In S. U.M. & L. U. (Eds.), *Understanding Human Development* (pp. 183-214). Boston, MA: Springer.

Roberts, B. W., Caspi, A., & Moffitt, T. E. (2003). Work experiences and personality development in young adulthood. *Journal of Personality and Social Psychology, 84*, 582–593.

Roberts, B. W., & DelVecchio, W. F. (2000). The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies. *Psychological Bulletin, 126*, 3-25.

Roberts, B. W., Walton, K. E., & Viechtbauer, W. (2006). Patterns of mean-level change in personality traits across the life course: A meta-analysis of longitudinal studies. *Psychological Bulletin, 132*, 1-25.

Roberts, B. W., Wood, D., & Smith, J. L. (2005). Evaluating five factor theory and social investment perspectives on personality trait development. *Journal of Research in Personality, 39*, 166-184.

Rousseau, D. M. (1988). The construction of climate in organizational research. In C. L. Cooper & I. T. Robertson (Eds.), *International Review of Industrial and Organizational Psychology* (Vol. 3). Oxford, England: John Wiley & Sons.

Satorra, A., & Bentler, P. M. (2001). A scaled difference chi-square test statistic for moment structure analysis. *Psychometrika, 66*, 507–514.

Savard, C., Simard, C., & Jonason, P. K. (2017). Psychometric properties of the French-Canadian version of the Dark Triad Dirty Dozen. *Personality and Individual Differences, 119*, 122-128.

Schafer, J. L., & Graham, J. W. (2002). Missing data: Our view of the state of the art. *Psychological Methods, 7*, 147–177.

Schneider, B., Goldstein, H. W., & Smith, D. B. (1995). The ASA framework: An update. *Personnel Psychology, 48*, 747-773.

Schneider, B., & Reichers, A. E. (1983). On the etiology of climates. *Personnel Psychology, 36*, 19-39.

Spain, S. M., Harms, P., & LeBreton, J. M. (2014). The dark side of personality at work. *Journal of Organizational Behavior, 35*, 41-60.

Specht, J., Egloff, B., & Schmukle, S. C. (2011). Stability and change of personality across the life course: The impact of age and major life events on mean-level and rank-order stability of the Big Five. *Journal of Personality and Social Psychology, 101*, 862-882.

Spurk, D., Keller, A. C., & Hirschi, A. (2015). Do bad guys get ahead or fall behind? Relationships of the Dark Triad of personality with objective and subjective career success. *Social Psychological and Personality Science, 7*, 113-121.

Sutin, A. R., & Costa, P. T. (2010). Reciprocal influences of personality and job characteristics across middle adulthood. *Journal of Personality, 78*, 257–288.

Tett, R. P., & Burnett, D. D. (2003). A personality trait-based interactionist model of job performance. *Journal of Applied Psychology, 88*, 500–517.

Tett, R. P., & Meyer, J. P. (1993). Job satisfaction, organizational commitment, turnover intention, and turnover: path analyses based on meta-analytic findings. *Personnel psychology, 46*, 259-293.

Tims, M., Bakker, A. B., & Derks, D. (2012). Development and validation of the job crafting scale. *Journal of Vocational Behavior, 80*, 173-186.

Truxillo, D. M., Cadiz, D. M., & Hammer, L. B. (2015). Supporting the aging workforce: A review and recommendations for workplace intervention research. *Annual Review of Organizational Psychology and Organizational Behavior, 2*, 351-381.

Van der Heijden, B. I., Gorgievski, M. J., & De Lange, A. H. (2016). Learning at the workplace and sustainable employability: A multi-source model moderated by age. *European Journal of Work and Organizational Psychology, 25*, 13-30.

Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational Research Methods, 3*, 4–69.

Vize, C. E., Lynam, D. R., Collison, K. L., & Miller, J. D. (in press). Differences among dark triad components: A meta-analytic investigation. *Personality Disorders: Theory, Research, and Treatment*.

Wille, B., De Fruyt, F., & De Clercq, B. (2013). Expanding and reconceptualizing aberrant personality at work: Validity of Five-Factor Model aberrant personality tendencies to predict career outcomes. *Personnel Psychology, 66*, 173-223.

Zacher, H. (2015). Successful aging at work. *Work, Aging and Retirement, 1*, 4–25.

Table 1

*Cronbach's alphas, Means, Standard Deviations, and Pearson's Correlations between the Study Variables: Overall Sample*

| | | M | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Dark Triad T1 | 3.41 | 1.51 | .91 | | | | | | | | | |
| 2 | Dark Triad T2 | 3.51 | 1.43 | .62*** | .92 | | | | | | | | |
| 3 | Narcissism T1 | 3.46 | 1.84 | .86*** | .52*** | .90 | | | | | | | |
| 4 | Narcissism T2 | 3.52 | 1.66 | .58*** | .88*** | .60*** | .86 | | | | | | |
| 5 | Psychopathy T1 | 3.41 | 1.63 | .81*** | .49*** | .52*** | .35*** | .77 | | | | | |
| 6 | Psychopathy T2 | 3.48 | 1.54 | .47*** | .83*** | .31*** | .57*** | .52*** | .73 | | | | |
| 7 | Machiavellianism T1 | 3.36 | 1.82 | .89*** | .57*** | .67*** | .50*** | .60*** | .39*** | .91 | | | |
| 8 | Machiavellianism T2 | 3.53 | 1.71 | .58*** | .91*** | .45*** | .74*** | .43*** | .65*** | .61*** | .88 | | |
| 9 | CPC T1 | 3.54 | 1.28 | .26*** | .26*** | .29*** | .27*** | .14*** | .17*** | .22*** | .23*** | .82 | |
| 10 | CPC T2 | 3.53 | 1.21 | .26*** | .29*** | .26*** | .33*** | .16*** | .18*** | .23*** | .26*** | .52*** | .84 |

*Note.* CPC = Competitive Psychological Climate, Cronbach's alphas in the diagonal, $N$ = 1,138-1,185.

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

Table 2

*Means, Standard Deviations, and Pearson's Correlations between the Study Variables: Young and Old Employees*

| | Young Employees | | Old Employees | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | M | SD | M | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1  Dark Triad T1 | 3.98 | 1.57 | 3.01 | 1.34 | | .62*** | .82*** | .55*** | .78*** | .46*** | .87*** | .59*** | .24*** | .25*** |
| 2  Dark Triad T2 | 4.00 | 1.43 | 3.18 | 1.34 | .55*** | | .50*** | .87*** | .44*** | .82*** | .58*** | .91*** | .24*** | .30*** |
| 3  Narcissism T1 | 4.05 | 1.89 | 3.04 | 1.69 | .88*** | .46*** | | .59*** | .42*** | .28*** | .59*** | .42*** | .29*** | .24*** |
| 4  Narcissism T2 | 4.01 | 1.65 | 3.17 | 1.57 | .53*** | .88*** | .55*** | | .28*** | .53*** | .47*** | .71*** | .27*** | .35*** |
| 5  Psychopathy T1 | 3.91 | 1.66 | 3.05 | 1.51 | .81*** | .46*** | .56*** | .35*** | | .49*** | .56*** | .39*** | .07*** | .15*** |
| 6  Psychopathy T2 | 3.91 | 1.56 | 3.19 | 1.45 | .40*** | .83*** | .25*** | .56*** | .49*** | | .38*** | .63*** | .12*** | .16*** |
| 7  Machiavellianism T1 | 3.96 | 1.89 | 2.94 | 1.64 | .89*** | .49*** | .71*** | .46*** | .59*** | .31*** | | .64*** | .22*** | .23*** |
| 8  Machiavellianism T2 | 4.07 | 1.70 | 3.16 | 1.62 | .50*** | .91*** | .40*** | .74*** | .38*** | .63*** | .51*** | | .22*** | .27*** |
| 9  CPC T1 | 3.69 | 1.23 | 3.44 | 1.30 | .25*** | .25*** | .26*** | .24*** | .19*** | .21*** | .19*** | .21*** | | .54*** |
| 10  CPC T2 | 3.62 | 1.22 | 3.46 | 1.20 | .25*** | .27*** | .28*** | .29*** | .14** | .19*** | .20*** | .22*** | .47*** | |

*Note.* CPC = Competitive Psychological Climate, values below the diagonal are for young employees, the values above the diagonal are for old employees. *N* for young employees = 464-490, *N* for old employees = 673-695.
* *p* < .05, ** *p* < .01, *** *p* < .001.

Table 3

*Means, Standard Deviations, and Pearson's Correlations between the Study Variables: Organization Changers and Non-Changers*

| | | Organization Change | | Organization Non-Change | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *M* | *SD* | *M* | *SD* | | | | | | | | | | |
| 1 | Dark Triad T1 | 3.70 | 1.59 | 3.37 | 1.50 | | .56*** | .87*** | .55*** | .82*** | .42*** | .90*** | .53*** | .37*** | .39*** |
| 2 | Dark Triad T2 | 3.67 | 1.53 | 3.49 | 1.42 | .63*** | | .44*** | .89*** | .51*** | .86*** | .49*** | .92*** | .23* | .41*** |
| 3 | Narcissism T1 | 3.77 | 1.91 | 3.42 | 1.83 | .86*** | .53*** | | .53*** | .54*** | .25** | .68*** | .38*** | .44*** | .34*** |
| 4 | Narcissism T2 | 3.71 | 1.70 | 3.49 | 1.65 | .58*** | .88*** | .61*** | | .40*** | .61*** | .45*** | .75*** | .28** | .46*** |
| 5 | Psychopathy T1 | 3.64 | 1.67 | 3.38 | 1.62 | .81*** | .49*** | .52*** | .35*** | | .55*** | .64*** | .42*** | .19* | .39*** |
| 6 | Psychopathy T2 | 3.60 | 1.69 | 3.47 | 1.52 | .47*** | .83*** | .31*** | .56*** | .51*** | | .31** | .68*** | .17 | .31*** |
| 7 | Machiavellianism T1 | 3.68 | 1.95 | 3.32 | 1.80 | .89*** | .58*** | .67*** | .51*** | .60*** | .40*** | | .55*** | .31*** | .28** |
| 8 | Machiavellianism T2 | 3.69 | 1.79 | 3.51 | 1.70 | .59*** | .91*** | .46*** | .74*** | .43*** | .64*** | .62*** | | .16 | .31** |
| 9 | CPC T1 | 3.81 | 1.34 | 3.50 | 1.27 | .24*** | .26*** | .27*** | .27*** | .13*** | .17*** | .20*** | .24*** | | .23* |
| 10 | CPC T2 | 3.58 | 1.20 | 3.52 | 1.21 | .24*** | .28*** | .26*** | .31*** | .13*** | .16*** | .22*** | .25*** | .55*** | |

*Note.* CPC = Competitive Psychological Climate, values below the diagonal are for organization non-changers, the values above the diagonal are for organization changers. *N* for organization non-changers = 1,018-1,037, *N* for organization changers = 119-148.
* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 4

*Results of the Latent Cross-Lagged Panel Models: Dark Triad, Narcissism, Psychopathy, Machiavellianism for Overall Sample, for Young versus Old Employees, and for Organization Changers versus Non-Changers*

| Structural Path Coefficients | Standardized Model Results | | | Unstandardized Model Results | | |
|---|---|---|---|---|---|---|
| | Estimate | *SE* | *p* | Estimate | *SE* | *p* |
| *Dark Triad (Overall Sample)* | | | | | | |
| Dark Triad T1 → Dark Triad T2 | .64 | .03 | .000 | .80 | .03 | .000 |
| CPC T1 → CPC T2 | .54 | .03 | .000 | .51 | .04 | .000 |
| Dark Triad T1 → CPC T2 | .13 | .04 | .000 | .11 | .03 | .000 |
| CPC T1 → Dark Triad T2 | .10 | .03 | .002 | 1.12 | .03 | .000 |
| Dark Triad T1 ↔ CPC T1 | .32 | .04 | .000 | .57 | .08 | .000 |
| Dark Triad T2 ↔ CPC T2 | .16 | .05 | .000 | .17 | .05 | .001 |
| *Dark Triad (Young Employees)* | | | | | | |
| Dark Triad T1 → Dark Triad T2 | .55 | .06 | .000 | .50 [a] | .05 | .000 |
| CPC T1 → CPC T2 | .49 | .05 | .000 | .50 | .06 | .000 |
| Dark Triad T1 → CPC T2 | .13 | .06 | .027 | .11 | .05 | .026 |
| CPC T1 → Dark Triad T2 | .12 | .06 | .038 | .13 | .06 | .042 |
| Dark Triad T1 ↔ CPC T1 | .29 | .06 | .000 | .51 | .12 | .000 |
| Dark Triad T2 ↔ CPC T2 | .13 | .07 | .070 | .14 | .08 | .081 |
| *Dark Triad (Old Employees)* | | | | | | |
| Dark Triad T1 → Dark Triad T2 | .65 | .04 | .000 | .67 [a] | .05 | .000 |
| CPC T1 → CPC T2 | .56 | .04 | .000 | .51 | .04 | .000 |
| Dark Triad T1 → CPC T2 | .14 | .05 | .003 | .13 | .05 | .004 |
| CPC T1 → Dark Triad T2 | .09 | .04 | .026 | .09 | .04 | .029 |
| Dark Triad T1 ↔ CPC T1 | .32 | .05 | .000 | .50 | .09 | .000 |
| Dark Triad T2 ↔ CPC T2 | .19 | .06 | .001 | .17 | .06 | .003 |
| *Dark Triad (Organizational Changers)* | | | | | | |
| Dark Triad T1 → Dark Triad T2 | .61 | .11 | .000 | .60 | .12 | .000 |
| CPC T1 → CPC T2 | .06 | .14 | .671 | .06 | .13 | .673 |
| Dark Triad T1 → CPC T2 | .44 | .13 | .001 | .36 [a] | .10 | .000 |
| CPC T1 → Dark Triad T2 | .00 | .13 | .983 | .00 | .15 | .983 |
| Dark Triad T1 ↔ CPC T1 | .46 | .09 | .000 | .92 | .24 | .000 |
| Dark Triad T2 ↔ CPC T2 | .29 | .13 | .025 | .37 | .19 | .052 |
| *Dark Triad (Organizational Non-Changers)* | | | | | | |
| Dark Triad T1 → Dark Triad T2 | .64 | .03 | .000 | .63 | .04 | .000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| CPC T1 → CPC T2 | .58 | .03 | .000 | .56 | .04 | .000 |
| Dark Triad T1 → CPC T2 | .11 | .04 | .003 | .10 [a] | .03 | .003 |
| CPC T1 → Dark Triad T2 | .12 | .03 | .000 | .12 | .04 | .000 |
| Dark Triad T1 ↔ CPC T1 | .29 | .04 | .000 | .51 | .08 | .000 |
| Dark Triad T2 ↔ CPC T2 | .14 | .05 | .004 | .13 | .05 | .006 |
| *Narcissism (Overall Sample)* | | | | | | |
| Narcissism T1 → Narcissism T2 | .61 | .03 | .000 | .54 | .03 | .000 |
| CPC T1 → CPC T2 | .54 | .03 | .000 | .52 | .04 | .000 |
| Narcissism T1 → CPC T2 | .10 | .04 | .003 | .07 | .02 | .003 |
| CPC T1 → Narcissism T2 | .10 | .03 | .002 | .14 | .05 | .003 |
| Narcissism T1 ↔ CPC T1 | .32 | .04 | .000 | .81 | .10 | .000 |
| Narcissism T2 ↔ CPC T2 | .23 | .04 | .000 | .29 | .06 | .000 |
| *Narcissism (Young Employees)* | | | | | | |
| Narcissism T1 → Narcissism T2 | .57 | .05 | .000 | .47 | .04 | .000 |
| CPC T1 → CPC T2 | .49 | .06 | .000 | .50 | .06 | .000 |
| Narcissism T1 → CPC T2 | .16 | .06 | .004 | .10 | .03 | .004 |
| CPC T1 → Narcissism T2 | .09 | .06 | .103 | .13 | .08 | .105 |
| Narcissism T1 ↔ CPC T1 | .28 | .06 | .000 | .69 | .16 | .000 |
| Narcissism T2 ↔ CPC T2 | .15 | .07 | .027 | .21 | .10 | .033 |
| *Narcissism (Old Employees)* | | | | | | |
| Narcissism T1 → Narcissism T2 | .60 | .04 | .000 | .56 | .04 | .000 |
| CPC T1 → CPC T2 | .58 | .04 | .000 | .53 | .04 | .000 |
| Narcissism T1 → CPC T2 | .06 | .05 | .172 | .04 | .03 | .174 |
| CPC T1 → Narcissism T2 | .11 | .04 | .008 | .14 | .05 | .009 |
| Narcissism T1 ↔ CPC T1 | .33 | .05 | .000 | .75 | .12 | .000 |
| Narcissism T2 ↔ CPC T2 | .29 | .05 | .000 | .34 | .07 | .000 |
| *Narcissism (Organization Changers)* | | | | | | |
| Narcissism T1 → Narcissism T2 | .56 | .10 | .000 | .50 | .10 | .000 |
| CPC T1 → CPC T2 | .06 | .14 | .640 | .06 | .13 | .644 |
| Narcissism T1 → CPC T2 | .36 | .12 | .004 | .21 [a] | .07 | .004 |
| CPC T1 → Narcissism T2 | .03 | .13 | .835 | .04 | .18 | .835 |
| Narcissism T1 ↔ CPC T1 | .51 | .09 | .000 | 1.38 | .31 | .000 |
| Narcissism T2 ↔ CPC T2 | .40 | .11 | .000 | .66 | .22 | .002 |
| *Narcissism (Organization Non-Changers)* | | | | | | |
| Narcissism T1 → Narcissism T2 | .62 | .03 | .000 | .55 | .03 | .000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| CPC T1 → CPC T2 | .59 | .03 | .000 | .56 | .04 | .000 |
| Narcissism T1 → CPC T2 | .10 | .04 | .008 | .06 [a] | .02 | .007 |
| CPC T1 → Narcissism T2 | .11 | .03 | .001 | .15 | .05 | .001 |
| Narcissism T1 ↔ CPC T1 | .29 | .04 | .000 | .72 | .10 | .000 |
| Narcissism T2 ↔ CPC T2 | .19 | .04 | .000 | .24 | .06 | .000 |
| *Psychopathy (Overall Sample)* | | | | | | |
| Psychopathy T1 → Psychopathy T2 | .59 | .03 | .000 | .55 | .04 | .000 |
| CPC T1 → CPC T2 | .56 | .03 | .000 | .54 | .04 | .000 |
| Psychopathy T1 → CPC T2 | .08 | .04 | .026 | .08 | .04 | .026 |
| CPC T1 → Psychopathy T2 | .12 | .03 | .000 | .11 | .03 | .000 |
| Psychopathy T1 ↔ CPC T1 | .20 | .04 | .000 | .30 | .07 | .000 |
| Psychopathy T2 ↔ CPC T2 | .08 | .05 | .101 | .07 | .04 | .108 |
| *Psychopathy (Young Employees)* | | | | | | |
| Psychopathy T1 → Psychopathy T2 | .54 | .06 | .000 | .50 | .06 | .000 |
| CPC T1 → CPC T2 | .53 | .05 | .000 | .54 | .06 | .000 |
| Psychopathy T1 → CPC T2 | .03 | .06 | .653 | .02 | .05 | .653 |
| CPC T1 → Psychopathy T2 | .14 | .06 | .020 | .14 | .06 | .022 |
| Psychopathy T1 ↔ CPC T1 | .25 | .06 | .000 | .42 | .11 | .000 |
| Psychopathy T2 ↔ CPC T2 | .13 | .07 | .063 | .14 | .08 | .071 |
| *Psychopathy (Old Employees)* | | | | | | |
| Psychopathy T1 → Psychopathy T2 | .55 | .04 | .000 | .53 | .05 | .000 |
| CPC T1 → CPC T2 | .59 | .04 | .000 | .54 | .04 | .000 |
| Psychopathy T1 → CPC T2 | .13 | .04 | .002 | .13 | .04 | .002 |
| CPC T1 → Psychopathy T2 | .12 | .04 | .004 | .11 | .04 | .006 |
| Psychopathy T1 ↔ CPC T1 | .12 | .05 | .000 | .19 | .08 | .024 |
| Psychopathy T2 ↔ CPC T2 | .03 | .07 | .614 | .03 | .06 | .616 |
| *Psychopathy (Organization Changers)* | | | | | | |
| Psychopathy T1 → Psychopathy T2 | .73 | .08 | .000 | .74 | .10 | .000 |
| CPC T1 → CPC T2 | .14 | .14 | .299 | .13 | .13 | .307 |
| Psychopathy T1 → CPC T2 | .44 | .12 | .000 | .43 [a] | .12 | .000 |
| CPC T1 → Psychopathy T2 | .04 | .10 | .711 | .03 | .09 | .712 |
| Psychopathy T1 ↔ CPC T1 | .26 | .11 | .022 | .43 | .20 | .035 |
| Psychopathy T2 ↔ CPC T2 | .10 | .15 | .492 | .10 | .14 | .502 |
| *Psychopathy (Organization Non-Changers)* | | | | | | |
| Psychopathy T1 → Psychopathy T2 | .58 | .04 | .000 | .53 | .04 | .000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| CPC T1 → CPC T2 | .61 | .03 | .000 | .58 | .04 | .000 |
| Psychopathy T1 → CPC T2 | .04 | .04 | .230 | .04 [a] | .04 | .230 |
| CPC T1 → Psychopathy T2 | .13 | .03 | .000 | .12 | .03 | .000 |
| Psychopathy T1 ↔ CPC T1 | .18 | .04 | .000 | .28 | .07 | .000 |
| Psychopathy T2 ↔ CPC T2 | .06 | .05 | .249 | .05 | .04 | .255 |
| *Machiavellianism (Overall Sample)* | | | | | | |
| Machiavellianism T1 → Machiavellianism T2 | .62 | .03 | .000 | .59 | .03 | .000 |
| CPC T1 → CPC T2 | .55 | .03 | .000 | .52 | .04 | .000 |
| Machiavellianism T1 → CPC T2 | .11 | .03 | .001 | .08 | .02 | .001 |
| CPC T1 → Machiavellianism T2 | .11 | .03 | .001 | .14 | .04 | .001 |
| Machiavellianism T1 ↔ CPC T1 | .26 | .04 | .000 | .57 | .09 | .000 |
| Machiavellianism T2 ↔ CPC T2 | .12 | .05 | .008 | .14 | .06 | .010 |
| *Machiavellianism (Young Employees)* | | | | | | |
| Machiavellianism T1 → Machiavellianism T2 | .51 | .05 | .000 | .45 [a] | .05 | .000 |
| CPC T1 → CPC T2 | .51 | .05 | .000 | .52 | .06 | .000 |
| Machiavellianism T1 → CPC T2 | .11 | .06 | .047 | .08 | .04 | .046 |
| CPC T1 → Machiavellianism T2 | .13 | .05 | .012 | .18 | .07 | .014 |
| Machiavellianism T1 ↔ CPC T1 | .21 | .06 | .000 | .47 | .14 | .001 |
| Machiavellianism T2 ↔ CPC T2 | .09 | .07 | .183 | .12 | .09 | .189 |
| *Machiavellianism (Old Employees)* | | | | | | |
| Machiavellianism T1 → Machiavellianism T2 | .67 | .03 | .000 | .67 [a] | .04 | .000 |
| CPC T1 → CPC T2 | .57 | .04 | .000 | .52 | .04 | .000 |
| Machiavellianism T1 → CPC T2 | .11 | .04 | .009 | .09 | .04 | .009 |
| CPC T1 → Machiavellianism T2 | .09 | .04 | .030 | .10 | .05 | .034 |
| Machiavellianism T1 ↔ CPC T1 | .26 | .05 | .000 | .51 | .10 | .000 |
| Machiavellianism T2 ↔ CPC T2 | .14 | .06 | .019 | .14 | .06 | .022 |
| *Machiavellianism (Organization Changers)* | | | | | | |
| Machiavellianism T1 → Machiavellianism T2 | .59 | .09 | .000 | .53 | .09 | .000 |
| CPC T1 → CPC T2 | .17 | .14 | .211 | .16 | .13 | .225 |
| Machiavellianism T1 → CPC T2 | .28 | .11 | .012 | .18 | .07 | .012 |
| CPC T1 → Machiavellianism T2 | .01 | .12 | .954 | .01 | .16 | .954 |
| Machiavellianism T1 ↔ CPC T1 | .35 | .11 | .001 | .88 | .29 | .002 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Machiavellianism T2 ↔ CPC T2 | .22 | .13 | .104 | .34 | .22 | .119 |

*Machiavellianism (Organization Non-Changers)*

| | | | | | | |
|---|---|---|---|---|---|---|
| Machiavellianism T1 → Machiavellianism T2 | .63 | .03 | .000 | .60 | .03 | .000 |
| CPC T1 → CPC T2 | .59 | .03 | .000 | .57 | .04 | .000 |
| Machiavellianism T1 → CPC T2 | .10 | .04 | .005 | .07 | .03 | .006 |
| CPC T1 → Machiavellianism T2 | .12 | .03 | .000 | .16 | .04 | .000 |
| Machiavellianism T1 ↔ CPC T1 | .24 | .04 | .000 | .51 | .09 | .000 |
| Machiavellianism T2 ↔ CPC T2 | .09 | .05 | .049 | .11 | .05 | .052 |

*Note.* $N = 1,185$, CPC = Competitive Psychological Climate, Results are based on structural equation modelling using *M*plus, → = regression coefficient, ↔ = correlation coefficient, [a] symbolizes differences in effects sizes that test Hypotheses 2 till Hypothesis 4, differences refer to the comparison of younger versus older employees or organization changers versus non-changers, differences are tested with a chi-square difference test and delta AICs as can be seen in Table 5 and 6.

Table 5

*Model Fits for Model Comparisons Testing the Age-Related Hypotheses 2 and 3*

| | $\chi^2$ | df | SB-$\Delta\chi^2$ | $\Delta df$ | p | CFI | RMSEA | SRMR | AIC |
|---|---|---|---|---|---|---|---|---|---|
| *Dark Triad* | | | | | | | | | |
| Model 1 (Baseline) [a] | 254.09 | 143 | - | - | - | .981 | .036 | .039 | 53266.57 |
| Model 2 (Hypothesis 2) [a] | 259.93 | 144 | 5.26 | 1 | .022 | .980 | .037 | .042 | 53271.87 |
| Model 3 (Hypothesis 3) | 254.33 | 144 | 0.36 | 1 | .549 | .981 | .036 | .040 | 53264.98 |
| *Narcissism* | | | | | | | | | |
| Model 1 (Baseline) | 354.64 | 195 | - | - | - | .978 | .037 | .038 | 63349.15 |
| Model 2 (Hypothesis 2) | 356.90 | 196 | 2.25 | 1 | .134 | .978 | .037 | .039 | 63350.03 |
| Model 3 (Hypothesis 3) | 354.61 | 196 | 0.03 | 1 | .871 | .978 | .037 | .038 | 63347.17 |
| *Psychopathy* | | | | | | | | | |
| Model 1 (Baseline) | 322.02 | 198 | - | - | - | .975 | .033 | .043 | 66986.81 |
| Model 2 (Hypothesis 2) | 322.27 | 199 | 0.25 | 1 | .617 | .975 | .032 | .043 | 66985.16 |
| Model 3 (Hypothesis 3) | 322.34 | 199 | 0.32 | 1 | .572 | .975 | .032 | .043 | 66985.10 |
| *Machiavellianism* | | | | | | | | | |
| Model 1 (Baseline) [a] | 318.07 | 195 | - | - | - | .983 | .033 | .032 | 63021.71 |
| Model 2 (Hypothesis 2) [a] | 331.67 | 196 | 15.11 | 1 | .000 | .981 | .034 | .042 | 63036.09 |
| Model 3 (Hypothesis 3) | 318.92 | 196 | 0.75 | 1 | .386 | .983 | .033 | .033 | 63020.77 |

*Note.* $N = 1,185$, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, SRMR = Standardized Root Mean Square Residual, AIC = Akaike Information Criterion, [a] these models differ due to a significant chi-square difference test, SB = Satorra-Bentler scaled delta chi-square.

Table 6

*Model Fits for Model Comparisons Testing the Organization Change-Related Hypothesis 4*

| | $\chi^2$ | *df* | SB-$\Delta\chi^2$ | $\Delta df$ | *p* | CFI | RMSEA | SRMR | AIC |
|---|---|---|---|---|---|---|---|---|---|
| *Dark Triad* | | | | | | | | | |
| Model 1 (Baseline) [a] | 281.11 | 143 | - | - | - | .978 | .040 | .037 | 53429.77 |
| Model 2 (Hypothesis 4) [a] | 286.70 | 144 | 6.00 | 1 | .014 | .977 | .041 | .042 | 53433.84 |
| *Narcissism* | | | | | | | | | |
| Model 1 (Baseline) [a] | 344.32 | 195 | - | - | - | .981 | .036 | .034 | 63499.98 |
| Model 2 (Hypothesis 4) [a] | 347.66 | 196 | 3.34 | 1 | .068 | .980 | .036 | .036 | 63502.07 |
| *Psychopathy* | | | | | | | | | |
| Model 1 (Baseline) [a] | 391.38 | 198 | - | - | - | .965 | .041 | .043 | 67193.14 |
| Model 2 (Hypothesis 4) [a] | 401.35 | 199 | 12.21 | 1 | .000 | .963 | .041 | .050 | 67202.33 |
| *Machiavellianism* | | | | | | | | | |
| Model 1 (Baseline) | 351.33 | 195 | - | - | - | .980 | .037 | .033 | 63187.62 |
| Model 2 (Hypothesis 4) | 353.61 | 196 | 2.28 | 1 | .131 | .980 | .037 | .035 | 63187.84 |

*Note.* $N = 1,185$, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, SRMR = Standardized Root Mean Square Residual, AIC = Akaike Information Criterion, [a] these models differ due to a significant or marginally significant chi-square difference test, SB = Satorra-Bentler scaled delta chi-square.