Age and Workplace Deviance: A Meta-Analytic Test of Two Mediating Mechanisms

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Abstract

In the current meta-analysis, we examine the relation between age and workplace deviance, and find a small but significant negative correlation ($\bar{\rho} = -.092, k = 198$). More importantly, we test two complementary mechanisms to help explain this relation. Specifically, based on the neo-socioanalytical model of personality change, we hypothesized that those Big Five personality domains that change with age and trait negative affect would mediate this relation. These hypotheses were supported, as the Big Five traits conscientiousness, agreeableness, and neuroticism, as well as trait negative affect simultaneously mediated the negative relation between age and workplace deviance. These findings highlight two important underlying mechanisms for this relation and suggest several opportunities for organizations to reduce the occurrence of workplace deviance. Further theoretical and practical implications as well as limitations and future research ideas are discussed.

Keywords: age, workplace deviance, counterproductive work behavior, personality, neo-socioanalytical model of personality change

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Workplace deviance can have far-reaching and detrimental consequences for a number of important outcomes at work. For example, it is associated with a reduction of task and team performance (Dunlop & Lee, 2004; Sackett, 2002), lower levels of organizational citizenship behavior (Dalal, 2005), and with higher turnover intentions and higher levels of burnout (Mackey et al., 2019). Organizations therefore want to prevent the occurrence of workplace deviance. As such, the prediction of workplace deviance is an important criterion in job selection contexts (Ones et al., 2007) and levels of workplace deviance are often used in employees' performance evaluations (Lievens et al., 2008; Welbourne et al., 1998).¹

Previous research has shown that workplace deviance can be predicted by characteristics of the organizational environment (e.g., abusive supervision; Mitchell & Ambrose, 2007) or by stable individual differences (e.g., personality; Berry, Ones, & Sackett, 2007; Salgado, 2002). One important category of such stable individual differences are demographic characteristics. For example, Ng, Lam, and Feldman (2016) provided meta-analytic evidence that, on average, women behave in a slightly less deviant manner in the workplace than men. Another important demographic characteristic is age. Previous meta-analyses (Berry et al., 2007, 2012; Ng & Feldman, 2008; Pletzer, 2021) have only indirectly addressed the relation between age and workplace deviance, but consistently find a small negative relation ($r = -.05$ to $-.17$).

In the current meta-analysis, we aim to extend these findings by providing a comprehensive meta-analytic overview of the age-workplace deviance relation based on a much larger number of studies compared to previous meta-analyses. Importantly, we also answer Ng and Feldman's (2013) call for more research that addresses “*why* older workers may or may not perform at the same level as the younger workers” (p. 508). Although workplace deviance is not the same as job performance, it is an important behavior performed by employees that negatively contributes to their overall job performance and to the success

of the organization. Workplace deviance is therefore widely regarded as an operationalization of job performance (Ng & Feldman, 2008; Rotundo & Sackett, 2002), and understanding *why* age relates negatively to workplace deviance is crucial to reduce levels of workplace deviance. We test two complementary mediating mechanisms for the relation between age and workplace deviance based on the *neo-socioanalytical model of personality change* (Roberts & Wood, 2006), which holds that personality traits show small changes across the lifespan. Pletzer (2021) recently demonstrated that the HEXACO traits honesty-humility, emotionality, and conscientiousness mediate the relation between age and workplace deviance, but the more commonly used Big Five personality traits and trait negative affect have not yet been investigated as mediators of this relation. We aim to fill this gap. By doing so, we also provide meta-analytic estimates for all tested relations between age, Big Five personality traits, negative affect, and workplace deviance, except for the relations between the Big Five personality traits and negative affect.²

Workplace Deviance

Workplace deviance (or counterproductive work behavior) has been defined as “voluntary behavior that violates significant organizational norms and in so doing threatens the well-being of an organization, its members, or both” (Robinson & Bennett, 1995, p. 556). Empirical evidence indicates that deviant behavior by employees is related to profit loss for organizations (Detert et al., 2007), and the direct and indirect costs of workplace deviance have been estimated to be in the billions for the US economy alone (e.g., National Retail Foundation, 2018; Needleman, 2008). Workplace deviance can be divided into sub-dimensions based on the target of the behaviors: the organization or its employees (Bennett & Robinson, 2000; Thrasher et al., 2020). Organizational deviance refers to behaviors that undermine the success of the organization, such as stealing, damaging company property, or leaving work early without permission. Interpersonal deviance refers to behaviors directed toward members of the organization, such as gossiping or verbally abusing co-workers. As

workplace deviance is considered a key problem for every organization (Porath & Pearson, 2013), it is important for both researchers and practitioners to understand the extent to which workplace deviance is predicted by individual differences, including age. Furthermore, understanding the underlying mechanisms of the age-workplace relation is crucial because it can point towards opportunities for organizations to decrease the occurrence of workplace deviance and thereby improve their success.

Neo-Socioanalytical Model of Personality Change

Personality describes the set of stable traits that determine human feelings, thoughts, and behavior (Larsen & Buss, 2005). It is most commonly assessed with the Big Five model (or Five-Factor Model; Goldberg, 1990; McCrae & Costa, 1992), which posits that human personality can be described using the following five personality traits: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. However, other personality traits, such as trait negative affect (Watson et al., 1988), also exist that are not sufficiently captured by the Big Five. Although personality is generally assumed to be relatively stable and even has a large genetic component (Jang et al., 1996), most scholars agree that personality can change in response to new experiences, challenges, and environments, even in adulthood (e.g., Soto, John, Gosling, & Potter, 2011). Accordingly, the *neo-socioanalytical model of personality change* posits that personality characteristics, such as the Big Five personality traits (Goldberg, 1990; McCrae & Costa, 1992) or trait negative affect (Watson et al., 1988), change slightly across the adult lifespan (Roberts & Wood, 2006). A basic tenet of this model is that age-related changes in social roles, such as finding a partner, starting a family, or establishing one's career, are the driving mechanisms of personality development (i.e., the social investment principle; Roberts & Wood, 2006). Social roles come with a set of societal expectations and contingencies, which promote a reward structure that calls for more normative patterns of personality traits (Roberts et al., 2005). Indeed, longitudinal, cross-sectional, and meta-analytic evidence shows pervasive normative

development changes: Individuals score higher on conscientiousness and agreeableness, and lower on neuroticism and trait negative affect as they grow older (Charles et al., 2001; Roberts et al., 2006; Roberts & Mroczek, 2008; Terracciano et al., 2005). Exactly these personality traits are strong predictors of workplace deviance (Berry et al., 2007, 2012; Pletzer et al., 2019; Salgado, 2002).

The Mediating Effects of Big Five Personality Traits. Conscientious individuals are hard-working, disciplined, and responsible, and should therefore refrain from acting deviantly because such behavior usually requires resources that could otherwise be spent on goal attainment (cf. activity regulation theory; Zijlstra, Roe, Leonora, & Krediet, 1999). Agreeable individuals, who can be characterized as compassionate, social, and trusting, should refrain from acting deviantly because this would jeopardize their group belonging at work (cf. group-value theory; Lind & Lissak, 1985). A similar reasoning can be applied to neurotic individuals, who might be more likely to act deviantly because they do not value group belonging as much and function less well in teams (Barrick et al., 1998). Meta-analytic average effect sizes support these expectations and demonstrate that those Big Five personality domains that change with age (i.e., conscientiousness, agreeableness, and neuroticism) also correlate with workplace deviance: Conscientiousness and agreeableness are negatively ($r = -.31$ and $r = -.29$, respectively), whereas neuroticism is positively correlated with workplace deviance ($r = .16$; Pletzer et al., 2019). The average meta-analytic effect sizes for the relations of the other two Big Five personality domains, openness to experience and extraversion, with workplace deviance are not substantial ($r = -.04$ and $r = -.07$, respectively; Pletzer et al., 2019), but do show considerable variation. In other words, the correlations of openness to experience and extraversion with workplace deviance might be weaker, stronger, or even differ in direction depending on the situational context. However, in formulating our hypotheses we rely on the average meta-analytic correlations. According to the neo-socioanalytical model of personality change and research linking Big Five traits to

levels of workplace deviance, we therefore expect that those personality domains that change with age mediate the relation between age and workplace deviance.

Hypothesis 1: The personality traits of conscientiousness, agreeableness, and neuroticism mediate the negative relation between age and workplace deviance.

The Mediating Effect of Trait Negative Affect. Trait negative affect predisposes individuals to experience higher levels of various negative affective events and mood states (Watson et al., 1988). To better understand the relation between age and trait negative affect, *socio-emotional selectivity theory* can be used in addition to the neo-socioanalytical model of personality change. Socio-emotional selectivity theory states that individuals become increasingly selective and spend more time on emotionally meaningful goals and activities as they grow older and their time horizons shrink (Carstensen, 1992). In line with this theory, research has consistently found that individuals develop a more pronounced preference for positive over negative emotions with increasing age (i.e., positivity effect; e.g., Mather & Carstensen, 2005), a shift that already starts in middle-aged adults (i.e., 40-50 years old; Carstensen & Mikels, 2005). Hence, middle-aged and older individuals are motivated to retain positive memories and to self-select into positive and meaningful situations. They also experience fewer interpersonal conflicts and less stress in response to conflicts if they occur (Birditt et al., 2005). In addition to this increased motivation to avoid negative emotions and conflicts, older (rather than younger) individuals have also been found to use more appropriate emotion regulation strategies due to their increased experience with emotional situations (Charles, 2010; Scheibe et al., 2015; Scheibe & Carstensen, 2010). These emotion regulation skills decrease the likelihood of experiencing negative emotions even further (Mather & Carstensen, 2005). In addition, age reduces memory for negative events (Charles et al., 2003). In line with the neo-socioanalytical model of personality change, such age-related experiences can shape traits (Roberts & Wood, 2006). Indeed, evidence consistently indicates that age is negatively related to trait negative affect (Charles et al., 2001; Mroczek &

Kolarz, 1998). Trait negative affect, in turn, is positively associated with workplace deviance (Bing et al., 2007; Dalal, 2005; Lee & Allen, 2002; Spector & Fox, 2002). Following this evidence, we hypothesize that:

Hypothesis 2: Trait negative affect mediates the negative relation between age and workplace deviance.

It should be mentioned, as a note of caution, that it is not entirely clear how distinct trait negative affect is from the Big Five traits. A recent meta-analysis (Anglim et al., 2020) demonstrated that negative affect correlates quite strongly with neuroticism ($r = .56$), and also exhibits modest correlations with conscientiousness ($r = -.25$), extraversion ($r = -.21$), and agreeableness ($r = -.25$). The meta-analytic correlation with openness to experience is also significant, but substantially weaker ($r = -.05$). Given the conceptual and empirical overlap of the Big Five traits, and especially of neuroticism, with trait negative affect, it is crucial to examine the incremental mediation of one over the other as this will not only illuminate the link between age and workplace deviance but also contribute to the debate about how distinct the Big Five traits and trait negative affect are (Miller et al., 2009). We will therefore explore if the Big Five traits, and especially conscientiousness, agreeableness, and neuroticism, can incrementally explain the relation between age and workplace deviance over and above the mediating effect of trait negative affect.

Method

Systematic Literature Search

We conducted a systematic literature search on *Web of Science* in August 2019. We searched for articles containing the keywords *workplace deviance*, *counterproductive work behavior**, *organizational deviance*, *interpersonal deviance*, or *CWB* in the title, abstract, or in the keywords. This way, we identified 1548 scientific articles. The first author examined all articles in full; 204 articles met our inclusion criteria (see below). In addition, we searched *GoogleScholar* and *PsycInfo* for more articles containing the abovementioned keywords.

Finally, we examined prior meta-analyses published on the topic of workplace deviance (e.g., Berry et al., 2012, 2007; Ng & Feldman, 2008; Ng et al., 2016) to see whether these contained any additional studies we might have missed in our literature search. This way, we identified 22 additional articles that were included.

Several criteria had to be met for a study to be included in our meta-analysis. First, the article had to report the correlation coefficient (r) between age and workplace deviance, and the respective sample size N . Second, workplace deviance had to be measured at the individual level. Studies that reported levels of workplace deviance on a team or organizational level were excluded. Third, age had to be measured on a continuous scale. Studies that used a categorical measure of age were excluded. Based on these inclusion criteria, 284 independent samples and 506 effect sizes were included in the meta-analysis. Included articles were published between 1990 and 2019, with a median publication year of 2014. The first author and a student assistant, who had a Master's degree and who worked fulltime as a research assistant at the time of the coding, independently coded approximately half (53.6%) of all effect size data (i.e., correlations, reliabilities, and sample sizes), which resulted in more than 97% absolute agreement. All inconsistencies in the codings were resolved after revisiting the article and discussing the respective coding. The first author then proceeded to code all additional effect sizes and study characteristics. The codings for each included effect size and the references of all included studies can be found in the supplementary materials.

Definition of Variables

Age. The sample mean age among all included independent samples ranged between 18.85 and 50.71 years, with an average age of 34.96 years ($SD = 6.72$).

Workplace deviance. In the current meta-analysis, we included all measures of workplace deviance. However, we did not include measures that assess the individual behaviors of absenteeism and lateness because these behaviors can also be determined by

factors that do not violate organizational norms (e.g., being sick; Porter & Steers, 1973). This inclusion criterion is in line with other meta-analyses about workplace deviance (e.g., Berry et al., 2012; Ng et al., 2016). Workplace deviance can be assessed as an overall construct which encompasses all deviant behaviors ($k = 198$). However, many articles differentiate between interpersonal and organizational deviance. Interpersonal workplace deviance includes all behaviors directed at other individuals in the organization (e.g., coworkers or supervisors) or at customers ($k = 133$). Examples of such behaviors are insulting a coworker or playing a prank on a coworker. Organizational workplace deviance includes all deviant behaviors directed at the organization in which an individual is employed ($k = 150$). We exploratorily examine if age relates differently to interpersonal and organizational workplace deviance.

Trait negative affect. Of the $k = 30$ studies that assessed negative affect, $k = 27$ used the *Positive and Negative Affect Schedule* (PANAS; Watson et al., 1988) and $k = 3$ used the *Job-Related Affective Well-Being Scale* (JAWS; Katwyk, Fox, Specter, & Kelloway, 2000). Although the JAWS is designed to measure state affect, scores on the JAWS are highly correlated with scores on the trait-based PANAS ($r = -.53$ between the JAWS and the negative affectivity subscale of the PANAS; Katwyk et al., 2000). We therefore decided to also include those studies using the JAWS.

Personality. The Big Five personality traits were assessed with various measures, such as the NEO-PI-R (Costa & McCrae, 2008) or items from the International Personality Item Pool (IPIP; Goldberg et al., 2006). We also coded studies that used the HEXACO personality inventory for the domains conscientiousness, extraversion, and openness to experience because these domains are almost identical to those in the Big Five framework (Ashton & Lee, 2007; Lee & Ashton, 2004). We did not code studies using the HEXACO to assess the domains emotionality/neuroticism and agreeableness because there are important conceptual differences between the HEXACO and the Big Five for these domains (Ashton et al., 2014). This choice is justified by the finding that the relations of conscientiousness,

extraversion, and openness to experience with workplace deviance do not differ between the Big Five and the HEXACO framework, while they do differ for emotionality/neuroticism and agreeableness (Pletzer et al., 2019).

Data Analysis

We used the Hunter and Schmidt (2014) type method for meta-analyses of correlation coefficients in a random-effects model. If a study reported only the correlations of age with interpersonal and organizational workplace deviance, but not with overall workplace deviance, we used composite formulas to aggregate the two correlations and corrected them with an aggregate reliability estimate calculated using Mosier's reliability formula (Hunter & Schmidt, 2014). First, we provide sample size weighted effect size estimates to account for differential sampling error in the input correlations. Second, we corrected all correlation coefficients for unreliability in the criterion using internal reliabilities (i.e., Cronbach's alpha). If no reliabilities were provided in an article, we corrected the correlation using the weighted average reliability estimates for the respective workplace deviance from across all other studies included in this meta-analysis (see supplementary materials for these weighted average reliabilities).³ We ran all further analyses on the corrected correlation unless specified otherwise. To assess heterogeneity of effect sizes, we computed a Q statistic, τ , and an I^2 index using the Hunter and Schmidt (2014) estimator. The I^2 index indicates variability in the effect size based on real (rather than chance) differences between effect sizes. Benchmark values for the interpretation of I^2 are: 25% = low, 50% = medium, and 75% = high (Higgins et al., 2003). We also report the percentage of variance in r that can be explained by unreliability. We test for publication bias using a rank correlation and regression test for funnel plot asymmetry (Begg & Mazumdar, 1994; Egger et al., 1997). These indicators assess if effect sizes and precision differ systematically. If that is the case, publication bias is present in the data. Note that publication bias is unlikely to exist because the majority of studies included in this meta-analysis were not carried out to explicitly examine the relation between

age and workplace deviance. All analyses were conducted using the *metafor* package in R (Viechtbauer, 2010).

Two-Stage Meta-Analytic Structural Equation Modeling. A two-stage random-effects meta-analytic structural equation modeling (MASEM) (Cheung, 2014, 2015) was conducted to test Hypotheses 1 and 2. To do so, we additionally examined all included studies to identify whether a measure of either one of the Big Five personality domains (i.e., openness to experience, conscientiousness, extraversion, agreeableness, neuroticism) or of trait negative affect was included. We coded the effect sizes between age, workplace deviance (overall, interpersonal, organizational), and the respective mediator (see supplementary materials for the codings).

MASEM combines meta-analysis with structural equation modeling and consists of two stages. In the first stage, the correlations corrected for unreliability in both the predictor and the criterion (e.g., in conscientiousness and workplace deviance) between all variables from all primary studies are synthesized into an overall correlation matrix weighted by sample size. Whenever a study only reported correlations between interpersonal or organizational workplace deviance (and not for overall workplace deviance) and the mediator or age, we calculated a composite correlation with overall workplace deviance using the same procedures as described above. In the second stage, this meta-analytic correlation matrix is subjected to a structural equation model to test the mediation hypotheses. Using meta-analytic corrected correlations in such tertiary analysis is problematic given that the generalizability of our findings relies on the availability of other population values besides the meta-analytic correlations for all modeled relations (e.g., population estimates of variability; Tett, Hundley, & Christiansen, 2017). Currently no solution exists how to best handle this issue, making it even more necessary to mention that the generalizability of our findings from the MASEM should be interpreted with caution. In the current study, we test six mediators (the Big Five traits and negative affect). If the indirect effect is significant and the direct effect decreases in

magnitude, or becomes non-significant, a mediation is present. These analyses were conducted using the *metaSEM* package in *R* (Cheung, 2014).

Comparing Mediating Mechanisms. To test the incremental mediation of the Big Five traits over and above the mediation of trait negative affect, we constructed an average correlation matrix including all correlations between age, all Big Five traits, trait negative affect, and workplace deviance (see supplementary materials). The correlations between the Big Five traits and negative affect were taken from Anglim et al. (2020); all other correlations were taken from the current meta-analysis, using the effect size estimate that was based on the largest sample size.

It is not possible to conduct a MASEM on such a constructed average correlation matrix because MASEM relies on both the correlation and the covariance matrix, which can be calculated only when pooling correlation matrices from primary studies. We therefore fit a structural equation model using the *lavaan* package in *R* (Rosseel, 2012) on this average correlation matrix using the harmonic mean across all cells as the sample size (Viswesvaran & Ones, 1995). To compare the mediating effects of trait negative affect with that of the Big Five traits, we first fit a model with only trait negative affect as a mediator to circumvent the unfair advantage that would exist if we would enter the Big Five traits first simply because they are more in number. We then examine if trait negative affect still mediates the relation between age and workplace deviance after the indirect effects via the Big Five traits are also included in the model. It is important to emphasize that this analytic approach treats the correlation matrix as a covariance matrix, which ignores the sampling uncertainty across studies (Cheung, 2020). More specifically, the values on the diagonal in a correlation matrix are always one, whereas they can have any non-negative value in a covariance matrix. This results in biased fitness indices and standard errors; standard errors are underestimated whereas test statistics are over-estimated. However, to the best of our knowledge, there is no more appropriate analytic method given the current data structure.

Results

Relation between Age and Workplace Deviance

A small negative but significant weighted correlation between age and workplace deviance was found, $r = -.085$, 95% confidence interval (CI): $-.102, -.068$, $p < .001$, $k = 198$ (see Table 1). Correcting for unreliability in the criterion slightly strengthens the overall weighted effect size, $\bar{\rho} = -.092$, 95% CI: $-.111, -.073$, $p < .001$, $k = 198$. Using these corrected correlations, high variability in the effect size distribution existed ($I^2 = 77.55$, $Q(197) = 884.19$, $p < .001$), which justifies the use of a random-effects model. Study effect sizes and precision differed significantly according to the regression test ($p = .038$), indicating that publication bias might have influenced the results of the current meta-analysis.⁴ Note that these results are based on self-ratings if a study included both self- and other-ratings of workplace deviance to guarantee the independence of the included effect sizes. However, the overall weighted effect size does not change substantially when including other-ratings instead, $r = -.082$, $\bar{\rho} = -.089$, 95% CI: $-.108, -.070$, $p < .001$, $k = 198$. Hence, we perform all MASEM analyses using self-ratings when both self- and other-ratings were included in a study and other-ratings when these were the only ratings included in a study.

Moderators for the Age-Workplace Deviance Relation

We also explored if the relation between age and workplace deviance is moderated by certain study characteristics (detailed results can be found in the supplementary materials). Organizational ($\bar{\rho} = -.102$) and interpersonal workplace deviance ($\bar{\rho} = -.077$) exhibited similar correlations with age, $Q(1) = 2.457$, $p = .117$. Age correlated more strongly with self-ratings ($\bar{\rho} = -.103$) than with other-ratings ($\bar{\rho} = -.041$) of workplace deviance, $Q(1) = 7.648$, $p = .006$. The correlation between age and workplace deviance did not differ when the Bennett and Robinson (2000) measure was used ($\bar{\rho} = -.096$) compared to when another workplace deviance measure was used ($\bar{\rho} = -.088$), $Q(1) = 0.181$, $p = .671$.

Ng and Feldman (2008) found that the age-workplace deviance relation is more negative in samples with higher mean sample age. Using a much larger sample of studies, we replicate this finding: The age-workplace deviance relation is weakest in samples with a mean age 25 years or younger ($\bar{\rho} = -.059$), followed by samples with a mean age of 25 to 39 years ($\bar{\rho} = -.103$). The strongest correlation is observed in samples with a mean age of 40 years or older ($\bar{\rho} = -.127$). The difference between these effect sizes estimates is significant, $Q(2) = 7.428, p = .024$. Using the mean sample age as a continuous moderator in a meta-regression also indicates that the age-workplace deviance becomes more negative for samples with higher mean age ($\beta = -.001, p = .037$). We also examined if the percentage of female participants in a given study moderates the relation between age and workplace deviance, but did not find a significant moderation ($\beta = -.001, p = .058$). The publication year (or the year in which a study was conducted for unpublished studies) did moderate the age-workplace deviance relation ($\beta = .010, p < .001$), indicating that more recent studies find weaker effects.

Taken together, these findings suggest that the age-workplace deviance relation is not influenced by the form of or by the measure used to assess workplace deviance, and also not by the gender composition of the included samples. However, the age-workplace deviance relation is stronger later in life and when relying on self-reports of workplace deviance, and weaker in more recent studies.

MASEM Mediation Test

Table 2 shows the results of the separate meta-analyses conducted in the first stage of the MASEM. The overall weighted effect sizes found in this smaller subset of studies ($k = 20 - 36$) resemble those found in the overall age-workplace deviance meta-analysis ($k = 198$) and in other meta-analyses of personality and workplace deviance (Berry et al., 2007, 2012; Pletzer et al., 2019; Salgado, 2002). Trait negative affect correlates positively with workplace deviance ($\bar{\rho} = .346$), and only the subset of studies measuring trait negative affect find a

slightly larger effect size for the age-workplace deviance relation ($\bar{\rho} = -.160$ compared to $\bar{\rho} = -.092$ in the overall meta-analysis).

Table 3 shows the results of the MASEM used to test the hypotheses. The chi-square statistic for these mediation models is always 0 and the goodness-of-fit indices for structural equation models do not apply because all mediation models were saturated path models (Cheung, 2015). As hypothesized, trait negative affect, conscientiousness, agreeableness, and neuroticism all partially mediate the relation between age and workplace deviance (also see Figure 1 and 2). Only extraversion and openness to experience do not mediate the relation between age and workplace deviance (see Table 3).

When testing all Big Five traits in one model ($k = 12$, $N = 3,183$), the three indirect effects for conscientiousness, agreeableness, and neuroticism are significant as well. The total effect of age on workplace deviance then is $-.105$ (95% CI: $-.159$, $-.051$), while the direct effect when adding the five mediators to the model becomes non-significant, $-.051$ (95% CI: $-.109$, $.010$). The indirect effects are as follows: openness to experience: $-.000$ (95% CI: $-.005$, $.005$), conscientiousness: $-.030$ (95% CI: $-.059$, $-.010$), extraversion: $-.001$ (95% CI: $-.109$, $.010$), agreeableness: $-.018$ (95% CI: $-.036$, $-.005$), and neuroticism: $-.011$ (95% CI: $-.023$, $.003$). This indicates that the relation between age and workplace deviance is mediated by conscientiousness, agreeableness, and neuroticism, but not by extraversion and openness to experience. The indirect effect for conscientiousness is the strongest. Overall, Hypothesis 1 is partially and Hypothesis 2 is fully supported.⁵

Incremental Mediation Analyses

To examine the incremental mediation of the Big Five traits over and above the mediating effect of trait negative affect, we constructed one correlation matrix corrected for unreliability with all study variables (see supplementary materials), and fit different structural models using this correlation matrix. For all models, we used the harmonic mean sample size, which was 5727.

In the first model, we only entered trait negative affect as a mediator of the relation between age and workplace deviance. Replicating the above results, trait negative affect partially mediates the relation between age and workplace deviance: The indirect effect (-.044; 95% CI: -.053, -.035) and the direct effect (-.048; 95% CI: -.072, -.023) are both significant. In the second model, we only modelled indirect effects via all Big Five traits (and not via trait negative affect). Again replicating the above results, conscientiousness (-.022; 95% CI: -.028, -.016), agreeableness (-.019; 95% CI: -.025, -.012), and neuroticism (-.006; 95% CI: -.009, -.003) mediated the relation between age and workplace deviance. Extraversion and openness to experience did not mediate this relation. The direct effect remained significant as well (-.044; 95% CI: -.068, -.020). In the third model, we simultaneously modelled indirect effects via trait negative affect and via all Big Five traits. The direct effect of age on workplace deviance was no longer significant (-.021; 95% CI: -.044, .003). The indirect effects via conscientiousness (-.021; 95% CI: -.027, -.015), agreeableness (-.016; 95% CI: -.022, -.010), neuroticism (.007; 95% CI: .004, .010), and trait negative affect (-.039; 95% CI: -.048, -.031) were all significant. The indirect effects via extraversion and openness to experience were not significant.⁶ Note that the sign for the indirect effect of neuroticism is reversed when trait negative affect is also included compared to when it is not included in the model (.007 versus -.006; see above). This finding also holds when including only indirect effects via neuroticism and trait negative affect (excluding all other Big Five traits): The indirect effect via neuroticism remains positive (.003; 95% CI: .001, .005), whereas the indirect via trait negative affect is negative (-.047; 95% CI: -.057, -.037).

Discussion

Given the increasingly dominant role older workers play and will continue to play in the workforce, it is crucial to understand how organizations can reap the benefits of their characteristics and skills. In the current meta-analysis, which is based on more than 200

studies, we contribute to that goal: We find a small negative correlation between age and workplace deviance. This finding corroborates prior scientific evidence demonstrating that older individuals are less likely to engage in deviant and criminal behavior (e.g., Sampson & Laub, 1992), and more likely to engage in organizational citizenship behavior (Ng & Feldman, 2008; Pletzer, 2021) and to volunteer in general (Okun et al., 1998). More importantly, we do not only show that age relates to workplace deviance, but also test two complementary underlying mechanisms for this relation and therefore provide an answer to *why* age relates negatively to workplace deviance (Ng & Feldman, 2013). The current findings demonstrate that this negative relation can be explained using predictions based on the neo-socioanalytical model of personality change (Roberts & Wood, 2006) and on the socio-emotional selectivity theory (Carstensen, 1992): Conscientiousness, agreeableness, and neuroticism as well as trait negative affect mediate the negative relation between age and workplace deviance. As such, age-related changes in personality traits can explain the negative relation between age and workplace deviance.

The *neo-socioanalytical model of personality change* posits that personality traits, including Big Five personality traits, change slightly across the adult lifespan (Roberts & Wood, 2006). Those personality traits within the Big Five personality model that change over time (i.e., agreeableness, conscientiousness, and neuroticism; Roberts & Mroczek, 2008; Roberts, Walton, & Viechtbauer, 2006) are negatively related to levels of workplace deviance (Berry et al., 2007, 2012; Pletzer et al., 2019; Salgado, 2002). The results of the current meta-analysis confirm the hypothesis that these Big Five personality traits mediate the negative relation between age and workplace deviance. On average, extraversion and openness to experience do not relate to workplace deviance and also do not mediate the relation between age and workplace deviance. The findings for Big Five conscientiousness, neuroticism, extraversion, and openness to experience converge with those for their HEXACO counterparts by Pletzer (2021). In other words, both Big Five and HEXACO

conscientiousness and neuroticism/emotionality mediate the relation between age and workplace deviance, whereas both Big Five and HEXACO extraversion and openness to experience do not mediate this relation. The findings do, however, differ for agreeableness: Big Five agreeableness mediates this relation, whereas HEXACO agreeableness does not. This difference can be explained by the fact that Big Five agreeableness captures variance associated with HEXACO honesty-humility, which does significantly mediate the age-workplace deviance relation (Pletzer, 2021). This variance captured by Big Five agreeableness and HEXACO honesty-humility, but not by HEXACO agreeableness, apparently mediates the relation between age and workplace, resulting in the finding that only Big Five but not HEXACO agreeableness mediates the age-workplace deviance relation.

Another explanation for the age-workplace deviance relation is based on *socio-emotional selectivity theory* (Carstensen, 1992), which states that as individuals age, they self-select into emotionally meaningful and positive experiences, and possess lower levels of trait negative affect. For example, older, compared to younger, individuals focus more on goals related to generativity and emotions (Penningroth & Scott, 2012), and show less confrontational behavior when having disagreements with others in the workplace (Davis et al., 2009). More importantly, older individuals have been found to appraise and respond to emotional events differently than younger individuals, and to regulate their emotional reaction to those events better (Scheibe & Zacher, 2013). These age-related changes in emotional experiences at work, their behavioral consequences, and especially the subsequent reduced levels of trait negative affect are one of the explanatory mechanisms for our finding that levels of workplace deviance decrease with age. Individuals show lower levels of trait negative affect with increasing age, which is, in turn, associated with reduced levels of workplace deviance. These findings highlight a second important underlying process of the negative relation between age and workplace deviance.

Interestingly, we found that both the Big Five traits (i.e., conscientiousness, agreeableness, and neuroticism) and trait negative affect simultaneously mediate the age-workplace deviance relation, emphasizing that these two mediating mechanisms complement each other in explaining this relation. This finding has an important implication: It suggests that although neuroticism and negative affect are strongly related ($r = .56$; Anglim et al., 2020), they are not the same. This is further highlighted by the finding in the current meta-analysis that neuroticism and trait negative affect correlate differently with age ($\bar{\rho} = -.070$ and $\bar{\rho} = -.130$, respectively) and with workplace deviance ($\bar{\rho} = .202$ and $\bar{\rho} = .345$, respectively), and that the direction of the indirect effect of neuroticism is reversed when trait negative affect is also included in the model. This indicates that the specific variance in neuroticism that is not captured by trait negative affect relates negatively to workplace deviance. One possible explanation for this is the finding in previous research that the anxiety facet of neuroticism, which is not sufficiently captured by trait negative affect, does not significantly correlate with workplace deviance, whereas the anger facet, which is sufficiently captured by trait negative affect, correlates positively with workplace deviance (Hastings & O'Neill, 2009). Future research should further examine cancellation and/or masking effects among the facets of neuroticism (Pletzer et al., 2020).

Related to this, trait negative affect seems to capture unique variance not captured by the Big Five traits that helps to further explain the relation between age and workplace deviance. In fact, the constructed correlation matrix shows that the Big Five traits explain 16.3% of the variance in workplace deviance, whereas adding trait negative affect as a predictor explains an additional 5.1% of the variance in workplace deviance. This indicates that trait negative affect also has incremental validity in explaining workplace deviance beyond the Big Five traits, which aligns with prior research suggesting that trait negative affect has incremental validity over and above the Big Five traits in predicting workaholism (Clark et al., 2010).

Practical Implications

Overall, the current findings propose two important underlying mechanisms for the relation between age and workplace deviance. Understanding these mechanisms is crucial because, next to the scientific support for the two lifespan theories described above, it highlights important opportunities for practitioners to decrease the occurrence of workplace deviance and thereby improve work environments and organizational success. For example, various studies have shown that older individuals are disadvantaged in selection and employment decisions (e.g., Ahmed et al., 2012; Bendick et al., 1997; Duncan & Loretto, 2004), which is unjustified from a strictly performance-based view (leaving ethical and moral views aside; Ng & Feldman, 2008). In combination with the current findings, this suggests that organizations which avoid discriminating against older individuals in job selection might reap competitive benefits by observing lower levels of workplace deviance among their employees than those organizations which do discriminate against older individuals. Considering the costly nature of workplace deviance, even small decreases in workplace deviance are crucial for organizational success. For example, employee theft, which is only one specific form of workplace deviance, costs organizations \$46.8 billion in the USA alone. Although the amount of explained variance in workplace deviance using age as a predictor seems small at first sight (0.85% based on $\rho = -.092$), it could help organizations to save almost \$400 million when relying on the \$46.8 billion estimate mentioned above. One way for organizations to achieve such cost reductions is to take further steps to reduce age discrimination in employment decisions. For example, Finkelstein, Burke, and Raju (1995) suggested that highlighting job-relevant information and deemphasizing less important characteristics, such as age, have been shown to reduce age biases in hiring decisions.

Another opportunity to reduce levels of workplace deviance arises from the exploration of the two underlying mechanisms for the relation between age and workplace deviance because it helps researchers and practitioners to target the process by which age

relates negatively to workplace deviance. Building on our finding that trait negative affect mediates the relation between age and workplace deviance and on the fact that trait and state negative affect are strongly related (e.g., Shallcross et al., 2013), organizations could try to reduce the experience of state negative affect, especially among younger workers, to possibly reduce levels of workplace deviance. Following trait activation theory (Tett & Burnett, 2003) and situational strength theory (Meyer et al., 2010), organizations could also try to create organizational environments that reward the expression of those personality traits that relate negatively to workplace deviance, especially among younger workers who are more predisposed to act deviantly. The current findings suggest that such organizational interventions might lead to reduced levels of workplace deviance.

Limitations and Future Research

The current meta-analysis is not without limitations. First, most included studies use a cross-sectional design that does not allow an inference of causality. However, age is a characteristic that cannot be changed volitionally, rendering the use of it as a predictor of the Big Five traits, of trait negative affect, and subsequently of workplace deviance reasonable. A similar limitation pertains to the tested mediations, which are all based on correlational data. Given the vast amount of evidence on both Big Five traits (Berry et al., 2007, 2012; Pletzer et al., 2019; Salgado, 2002) and trait negative affect (e.g., Aquino et al., 1999; Chen, Chen, & Liu, 2013; Lee & Allen, 2002b; Samnani, Salamon, & Singh, 2013) as predictors of workplace deviance, it is reasonable to assume that they determine workplace deviance. This argument is, however, based on the conceptual inference of trait-based causality, which holds that personality traits are relatively stable and therefore cannot be easily affected by behaviors (Larsen & Buss, 2005), and not on more rigorous experimental control. As the neo-socioanalytical model of personality change (Roberts & Wood, 2006) suggests, investing in social roles, such as work and family roles, is one of the driving mechanisms of personality development. Thus, personality can also change in response to work events (for a review, see

Tasselli, Kilduff, & Landis, 2018). Accordingly, our findings could also indicate that acting deviantly at work changes one's personality traits. Indeed, Hudson and Roberts (2016) found that employees who act more deviantly over time also become less emotionally stable and less extraverted. Our findings should therefore be interpreted with caution.

Second, the age-workplace deviance relation was significantly stronger when workplace deviance was assessed through self- compared to other-reports, suggesting an alternative explanation for the negative relation between age and workplace deviance: As memory decreases with increasing age, especially when it comes to negative events (Charles et al., 2003), it might be that older individuals do not recall their deviant acts as well as younger individuals. However, it is unclear if this memory bias also applies in work settings. Future research should therefore corroborate our findings with more objective measures of workplace deviance that are not prone to be influenced by such biases and/or use diary studies to reduce the influence of recall bias (Ohly et al., 2010).

Third, there might be other variables, such as work attitudes (Rhodes, 1983) or goal orientations (Ebner et al., 2006), that should be examined as mediators before we fully understand why age relates negatively to workplace deviance.

Fourth, although our results suggest that the overall relation between age and workplace deviance is slightly negative, these results might not generalize across all situations given the high variability in the effect size distribution. For example, the 80% credibility interval for the age-workplace deviance relation (-.239, .055) and for other examined relations included zero (e.g., for the age-neuroticism relation, -.205 to .065, and for the neuroticism-workplace deviance relation, -.025 to .429), suggesting that some effect size estimates might actually be reversed in sign compared to the average observed meta-analytic correlation under certain circumstances. In other words, the 80% credibility interval for the age-workplace deviance indicates that a given observed correlation could be smaller than -.239 in 10% of the cases, or larger than .055 in another 10% of the cases. Given this high variability in some of

the analyzed effect size distributions, it remains questionable if our mediation results would also hold up in cases where the correlation would be reversed in sign, and our findings should be interpreted in light of this limitation. The fact that some credibility intervals include zero also suggest that more moderator analyses are necessary to determine under which circumstances age relates negatively to workplace deviance, and possibly even under which circumstances a positive relation might be found. For example, age, and individual differences more generally, might be more strongly related to workplace deviance at higher levels in the organizational hierarchy because situations are then weaker, making traits more predictive of workplace deviance (Decelles et al., 2012; Galinsky et al., 2008). Similar findings were obtained for the relations of agreeableness and conscientiousness with job performance, which became stronger at higher levels of job autonomy (Barrick & Mount, 1993). Future research should investigate if this also holds for the age-workplace deviance relation.

Fifth, publication bias might have influenced the results of the current meta-analysis. Although publication bias is unlikely to influence the current results because most studies were not carried out to explicitly examine the age-workplace deviance relation, some studies that were carried out to assess this relation might remain unpublished because of non-significant results. In addition, the selective reporting of significant results within primary studies might have biased the results of the current meta-analysis.

Conclusion

Age is negatively related to workplace deviance, and results of the current meta-analysis demonstrate that the Big Five domains conscientiousness, agreeableness, and neuroticism as well as trait negative affect can explain this negative relation. Our findings therefore contribute to a better understanding of the underlying mechanisms between individual differences and organizational behavior in general and between age and workplace deviance specifically. As older workers are still disadvantaged in employment and promotion

decisions (e.g., Ahmed, Andersson, & Hammarstedt, 2012), we hope that our findings help organizations realize the competitive benefits of fairer selection procedures.

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Tables

Table 1

Overall meta-analytic results for the relation between age and workplace deviance

	Overall Effect Size									Heterogeneity				Publication Bias	
	<i>k</i>	<i>N</i>	<i>r</i>	<i>SDr</i>	$\bar{\rho}$	<i>SD</i> ρ	%Var	95% CI	80% CrI	<i>p</i>	<i>Q</i>	<i>T</i>	<i>I</i> ²	Rank _{<i>p</i>}	Reg _{<i>p</i>}
WD	198	58,903	-.085	.106	-.092	.115	24.78	-.111, -.073	-.239, .055	<.001	884.19	.114	77.55	-	.038
ID	133	42,657	-.071	.100	-.077	.108	26.46	-.099, -.056	-.215, .061	<.001	567.25	.107	76.46	.060	.033
OD	150	48,151	-.093	.113	-.102	.123	21.17	-.124, -.079	-.260, .056	<.001	794.51	.123	81.05	.112	.214

Note. *k* = cumulative number of studies; *N* = cumulative sample size; *r* = sample size weighted correlation; *SDr* = standard deviation for *r*; $\bar{\rho}$ = correlation corrected for unreliability; *SD $\bar{\rho}$* = standard deviation for $\bar{\rho}$; %Var = percentage of variance attributable to unreliability; 95% CI = 95% confidence interval for $\bar{\rho}$; 80% CrI = 80% credibility interval for $\bar{\rho}$; *p* = *p*-value for $\bar{\rho}$; *Q*, *T*, and *I*² = indices of heterogeneity for $\bar{\rho}$; Rank_{*p*} = *p*-value for the rank correlation test of funnel plot asymmetry using $\bar{\rho}$; Reg_{*p*} = *p*-value for the regression test of funnel plot asymmetry using $\bar{\rho}$; WD = overall workplace deviance; ID = interpersonal workplace deviance, OD = organizational workplace deviance.

Table 2
Meta-analytic results used to test the mediation hypotheses

	<i>r</i>	SD <i>r</i>	$\bar{\rho}$	SD $\bar{\rho}$	95% CI	80% CrI	<i>T</i>	<i>I</i> ²
Age – Negative Affect – WD (<i>k</i> = 32, <i>N</i> = 10,709)								
Age – NA	-.123**	.061	-.130**	.065	-.160, -.099	-.213, -.046	.063	57.86
Age – WD	-.143**	.101	-.153**	.109	-.196, -.111	-.292, -.014	.106	79.65
NA – WD	.304**	.180	.345**	.201	.274, .416	.089, .602	.197	94.41
Age – Openness – WD (<i>k</i> = 20, <i>N</i> = 5,425)								
Age – O	.028	.091	.031	.107	-.023, .086	-.106, .169	.103	73.96
Age – WD	-.096**	.111	-.104**	.122	-.163, -.044	-.260, .053	.118	79.06
O – WD	-.058*	.114	-.069	.150	-.140, .001	-.262, .123	.146	85.09
Age – Conscientiousness – WD (<i>k</i> = 36, <i>N</i> = 11,525)								
Age – C	.091**	.106	.103**	.125	.058, .148	-.057, .263	.123	83.01
Age – WD	-.098**	.093	-.106**	.105	-.146, -.067	-.241, .028	.103	77.38
C – WD	-.268**	.129	-.321**	.163	-.377, -.266	-.529, -.113	.160	91.34
Age – Extraversion – WD (<i>k</i> = 20, <i>N</i> = 5,425)								
Age – E	-.026	.113	-.027	.125	-.088, .034	-.187, .133	.121	79.56
Age – WD	-.096**	.110	-.104**	.121	-.163, -.044	-.259, .052	.117	78.92
E – WD	-.058	.132	-.065	.158	-.139, .008	-.267, .136	.153	86.32
Age – Agreeableness – WD (<i>k</i> = 24, <i>N</i> = 8,243)								
Age – A	.072**	.073	.077**	.093	.032, .121	-.043, .196	.090	73.68
Age – WD	-.106**	.076	-.116**	.088	-.158, -.074	-.229, -.004	.085	71.37
A – WD	-.271**	.132	-.330**	.179	-.404, -.257	-.559, -.101	.175	93.21
Age – Neuroticism – WD (<i>k</i> = 22, <i>N</i> = 7,219)								
Age – N	-.066**	.059	-.070**	.069	-.108, -.033	-.205, .065	.066	58.49
Age – WD	-.074**	.057	-.081**	.067	-.119, -.044	-.212, .049	.064	56.76
N – WD	.177**	.089	.202**	.116	.148, .256	-.025, .429	.113	81.84

Note. *k* = cumulative number of studies; *N* = cumulative sample size; *r* = sample-size weighted mean correlation; SD*r* = standard deviation for *r*; $\bar{\rho}$ = weighted correlation coefficient corrected for unreliability; SD $\bar{\rho}$ = standard deviation for $\bar{\rho}$; 95% CI = 95% confidence interval for $\bar{\rho}$; 80% CrI = 80% credibility interval for $\bar{\rho}$; NA = Negative affect; O = Openness to Experience, C = Conscientiousness, E = Extraversion, A = Agreeableness, N = Neuroticism; WD = workplace deviance; * *p* < .05, ** *p* < .001

Table 3

Total, indirect, and direct effects for all six tested meta-analytic mediation models

Mediator	<i>k</i>	<i>N</i>	Total Effect	Indirect Effect	Direct Effect	Mediation
Negative Affect	32	10,709	-.153 (-.196, -.111)*	-.043 (-.058, -.030)*	-.110 (-.154, -.066)*	Partial
Openness to Experience	20	5,425	-.104 (-.163, -.044)*	-.002 (-.008, .002)	-.101 (-.161, -.042)*	No
Conscientiousness	36	11,525	-.106 (-.146, -.067)*	-.074 (-.115, -.032)*	-.032 (-.048, -.018)*	Partial
Extraversion	20	5,425	-.104 (-.163, -.044)*	.002 (-.003, .009)	-.106 (-.165, -.046)*	No
Agreeableness	24	8,243	-.116 (-.158, -.074)*	-.025 (-.041, -.010)*	-.092 (-.135, -.048)*	Partial
Neuroticism	22	7,219	-.081 (-.119, -.044)*	-.014 (-.023, -.006)*	-.067 (-.105, -.030)*	Partial

Note. *k* = cumulative number of studies; *N* = cumulative sample size; Values in brackets are 95% confidence intervals, **p* < .05.

Figures

Figure 1

Personality traits as mediators for the relation between age and workplace deviance.

Note. a) Mediation model with conscientiousness, b) mediation model with agreeableness, c) mediation model with neuroticism, a = relation between age and mediator, b = relation between mediator and workplace deviance; $a*b$ = Indirect effect, c = total relation between age and workplace deviance, c' = direct effect in the mediation model; * $p < .01$

Figure 2

Negative affect mediating the relation between age and workplace deviance.

Note. a = relation between age and negative affect, b = relation between negative affect and workplace deviance; $a*b$ = indirect effect, c = total relation between age and workplace deviance, c' = direct effect in the mediation model; * $p < .01$

Figure 3

Testing all Big five traits as mediators for the relation between age and workplace deviance

Note. a = relation between age and mediator, b = relation between mediator and workplace deviance; a*b = indirect effect, c = total relation between age and workplace deviance, c' = direct effect in the mediation model; * $p < .05$

Footnotes

¹ Two forms of workplace deviance are commonly distinguished: interpersonal and organizational workplace deviance. The former describes deviant behavior directed toward other members of the organization, such as insulting a colleague or disobeying the supervisor's instructions. The latter characterizes deviant behavior targeting the organization, such as coming late to work or stealing from the employer. Both forms can vary in severity, but are always detrimental and costly for organizations (Henle et al., 2005; Sackett, 2002).

² For the relations between the Big Five personality traits and negative affect, we rely on effect size estimates from Anglim, Horwood, Smillie, Marrero, and Wood (2020). These estimates are: openness – negative affect $r = -.05$, $\bar{\rho} = -.06$; conscientiousness – negative affect $r = -.25$, $\bar{\rho} = -.29$; extraversion – negative affect $r = -.21$, $\bar{\rho} = -.24$; agreeableness – negative affect $r = -.25$, $\bar{\rho} = -.30$; neuroticism – negative affect $r = .56$, $\bar{\rho} = .65$.

³ This was only the case for 34 of the 509 coded effect sizes (6.7%). For the MASEM, the percentage of studies that did not report reliabilities for the mediator and therefore had to be corrected using the average reliability across all other included studies ranged between 2.3% and 7.9%.

⁴ The rank correlation test could not be performed for overall workplace deviance because the underlying R function cannot handle such large number of studies.

⁵ The overall conclusions remain the same when testing the mediation hypotheses with sample-size weighted correlations not corrected for unreliability. The conclusions also remain the same for both interpersonal and organizational workplace deviance. Detailed results can be found in the supplementary materials.

⁶ The results remain qualitatively the same when only examining conscientiousness, agreeableness, neuroticism, and trait negative affect as mediators for the age-workplace deviance relation: All four personality traits then mediate the relation between age and workplace deviance, but the relation between age and workplace remains statistically

significant (-.026; 95% CI: -.049, -.003). The results also remain qualitatively the same when using observed correlations not corrected for unreliability instead of correlations corrected for unreliability. In addition, the results also largely remain the same for both interpersonal and organizational workplace deviance, with just two small exceptions for interpersonal workplace deviance. First, openness to experience (.002, 95% CI: .000, .004) also significantly mediates the relation between age and interpersonal workplace deviance in the model with all Big Five traits and trait negative affect as mediators. Second, neuroticism no longer mediates the relation between age and interpersonal workplace deviance in a model in which only neuroticism and trait negative affect were entered as mediators.