

Review Article

Age and Workplace Deviance: A Meta-Analytic Test and a Trait-Based Examination of Why Older Employees Engage in Less Workplace Deviance

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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 ($\bar{r} = -.124$, $k = 198$). More importantly, we test several trait-based mechanisms to help explain this relation. Specifically, based on the neo-socioanalytical model of personality change, we hypothesized that those Big Five personality traits that change with age, HEXACO honesty–humility, and trait negative affect mediate this relation. These hypotheses were supported, as the Big Five traits conscientiousness, agreeableness, and neuroticism, as well as honesty–humility and trait negative affect simultaneously mediated the negative relation between age and workplace deviance. These findings highlight 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

Workplace deviance can have far-reaching and detrimental consequences for a number of important outcomes at work. For example, it is associated with a decrease in organizational citizenship behavior (Dalal, 2005) and in task and team performance (Dunlop & Lee, 2004; Sackett, 2002), and with an increase in burnout and in turnover intentions (Mackey et al., 2021). 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).

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 et al., 2007; Salgado, 2002). One important category of such stable individual differences is demographic characteristics. For example, Ng et al. (2016) provided meta-analytic evidence that women behave, on average, in a slightly less deviant manner at work 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 found 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 to provide a more reliable and precise estimate of the true effect size. More 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 deviant behavior in the general workforce is crucial to reduce levels of workplace deviance and thereby to increase overall job performance.

Based on the *neo-socioanalytical model of personality change* (Roberts & Wood, 2006), which holds that personality, although generally assumed to be relatively stable, does

change slightly across the adult lifespan, we posit and test that personality traits mediate the negative relation of age with workplace deviance. Furthermore, based on the *socio-emotional selectivity theory* (Carstensen, 1992), which holds that individuals spend more time on emotionally meaningful goals and activities as they get older, we posit that trait negative affect might offer an additional trait-based explanation of the age–workplace deviance relation. 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 traits and trait negative affect, which are among the traits most commonly used to predict workplace deviance, have not yet been investigated as mediators of this relation. This is, however, crucial given that the Big Five model remains the predominant personality model (Feher & Vernon, 2021), and given that substantial differences between the HEXACO and Big Five model exist that might also affect relations with age and workplace deviance. In the current meta-analysis, we therefore provide a comprehensive trait-based examination of the underlying mechanisms for the relation between age and workplace deviance. We focus on the mediating effects of those Big Five personality traits that change with age (conscientiousness, agreeableness, and neuroticism), of HEXACO honesty–humility, and of trait negative affect. By doing so, we also provide novel meta-analytic estimates for the relations of age with the Big Five traits and with trait negative affect. In addition, we contribute important insights to the debate about how distinct trait negative affect is from the Big Five traits, and especially from neuroticism, by testing if all traits simultaneously mediate the relation of age with workplace deviance.

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 United States economy alone (e.g., National Retail Foundation, 2018; Needleman, 2008). Workplace deviance can be divided into subdimensions based on the target of the deviant behaviors: the organization or its employees (Bennett & Robinson, 2000; Thrasher et al., 2020). Organizational workplace deviance refers to behaviors that undermine the success of the organization, such as stealing, damaging company property, or leaving work early without permission. Interpersonal workplace deviance refers to behaviors directed toward members of the organization, such as gossiping or verbally abusing coworkers. Both forms can vary in severity, but are always detrimental and costly for organizations (Henle et al., 2005; Sackett, 2002). Workplace deviance is therefore considered a key problem for every organization (Porath & Pearson, 2013), rendering it 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 deviance

relation is crucial because it can point toward opportunities for organizations to decrease the occurrence of workplace deviance and thereby to improve their success. In the current meta-analysis, we examine if the personality traits most commonly studied as predictors of workplace deviance mediate the relation between age and workplace deviance.

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, alternative personality models exist, with the HEXACO personality model receiving most scientific attention in recent decades (Ashton & Lee, 2007). The HEXACO model posits that human personality can be most accurately described with six, not five broad personality traits, forming the HEXACO acronym: Honesty–humility, Emotionality, eXtraversion, Agreeableness, Conscientiousness, and Openness to experience. The personality traits openness to experience, conscientiousness, and extraversion are essentially the same across the Big Five and the HEXACO model. Meta-analytic convergent correlations between these Big Five traits and their HEXACO counterparts vary between .89 and .91 when corrected for attenuation (Thielmann et al., 2021). However, agreeableness and neuroticism/emotionality differ significantly across the two personality models. More specifically, HEXACO agreeableness captures reversed personality variance associated with anger and irritability which is captured by Big Five neuroticism, and HEXACO emotionality contains variance associated with the tendency to be sentimental, which is captured by Big Five agreeableness. Indeed, meta-analytic convergent correlations between these traits are generally lower, varying between .63 and .69 when corrected for attenuation (Thielmann et al., 2021). Most importantly though, recent evidence suggests that the Big Five model does not sufficiently capture trait variance associated with being honest and fair-minded (Ashton & Lee, 2019). The HEXACO personality model captures this variance with a trait called honesty–humility, which describes the tendency to be genuine, modest, and fair in interactions with others (Ashton & Lee, 2008a).¹

Another personality trait commonly studied as a predictor of workplace deviance is negative affect (Mackey et al., 2021). Meta-analytic evidence indicates that negative affect shares significant overlap with neuroticism ($r = .56$), and correlates substantially with agreeableness ($r = -.25$), conscientiousness ($r = -.25$), and extraversion ($r = -.21$) (Anglim et al., 2020), but it is not yet clear if it captures variance not included in the Big Five, especially in relation to age and workplace deviance.

Although personality is generally assumed to be relatively stable and even has a large genetic component (Jang et al.,

¹In another line of research, this variance is often conceptualized as the Dark Triad (for a review, see Furnham et al., 2013). However, increasing evidence indicates that the Dark Triad overlaps almost completely with the low pole of honesty–humility (Hodson et al., 2018; Schreiber & Marcus, 2020).

1996), most scholars agree that personality can change in response to new experiences, challenges, and environments, even in adulthood (e.g., Soto et al., 2011). Accordingly, the *neo-socioanalytical model of personality change* posits that personality traits 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, agreeableness, and honesty–humility, and lower on neuroticism and trait negative affect as they grow older (Ashton & Lee, 2016; 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 et al., 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 traits 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) correlated, 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 traits, 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 traits that change with age mediate the relation between age and workplace deviance.

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

The mediating effect of honesty–humility

Individuals scoring high on honesty–humility tend to be sincere and fair in interactions with others, and are rather modest and not interested in material things (K. Lee & Ashton, 2004). Such individuals therefore refrain from breaking the rules and from acting rudely toward others at work, possibly because it goes against their internal moral compass (Ashton & Lee, 2008b; De Vries & Van Gelder, 2015). In fact, honesty–humility has consistently emerged as the strongest dispositional predictor of workplace deviance out of all major personality traits (Pletzer et al., 2019), and recent meta-analytic evidence suggests that it even explains incremental variance in workplace deviance over and above the Big Five traits (Y. Lee et al., 2019). This might occur because personality variance captured by honesty–humility in the HEXACO model is not sufficiently captured by any of the Big Five traits (Ashton & Lee, 2019).

Honesty–humility also exhibits a strong positive age trend, increasing almost 1 standard deviation from age 18 to 60 (Ashton & Lee, 2016). As honesty–humility captures the tendency to exploit others, this strong age trend suggests that the benefits from exploiting others might be larger in young adulthood, when status, reputation, and mating success matter the most, compared to later adulthood. This interpretation is further supported by findings showing that the age trend in honesty–humility is stronger for men than for women (Ashton & Lee, 2016). Importantly, this increased competition (in young adulthood) might further drive workplace deviance (Enns & Rotundo, 2012). These findings therefore suggest that honesty–humility mediates the relation between age and workplace deviance (Pletzer, 2021), and that it does so incrementally over and above the Big Five traits. We therefore hypothesize the following:

Hypothesis 2: The personality trait honesty–humility incrementally explains the negative relation between age and workplace deviance over and above the mediating effects of conscientiousness, agreeableness, and neuroticism.

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; K. Lee & Allen, 2002; Spector & Fox, 2002). Following this evidence, we hypothesize that:

Hypothesis 3: Trait negative affect mediates the negative relation between age and workplace deviance.

As mentioned above, 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 ($r = -.21$), agreeableness ($r = -.25$), and honesty–humility ($r = -.15$). 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 will also contribute important insights 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 *socio-emotional selectivity theory* provides an additional theoretical account for the age–workplace deviance relation over and above the *neo-socioanalytical model of personality change*, by examining whether trait negative affect can incrementally explain the relation between age and workplace deviance over and above the mediating effect of conscientiousness, agreeableness, neuroticism, and honesty–humility. We therefore formulated the following research question:

Research Question 1: To what extent does trait negative affect incrementally explain the negative relation between age and workplace deviance over and above the mediating effects of conscientiousness, agreeableness, neuroticism, and honesty–humility?

Method

Systematic literature search and coding procedure

The goal of our literature search was to include as many independent samples as possible for the relation between age and workplace deviance to provide a comprehensive review of this relation. To achieve that goal, 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 1,548 scientific articles. The first author examined all articles in full; 204 articles met our inclusion criteria (see below). In addition, we searched *Google Scholar* 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., 2007, 2012; 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 trained 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 absolute agreement exceeding 97%. 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 Material](#).

Age

The sample mean age among all included independent samples ranged between 18.85 and 50.71 years,² with an average sample mean 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.

²Note that these numbers are the minimum and maximum *mean* age of the included independent samples, and not the minimum and maximum age of participants in the included independent samples. For example, the oldest participant in the study with the highest sample mean age (Anglim et al., 2018) was 72 years old. We therefore believe that the included studies cover the age range of the working population well.

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 report 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 form across all other studies included in this meta-analysis (see [Supplementary Material](#) for these weighted average reliabilities).³ We also correct correlations for indirect range restriction in age ([Oh & Schmidt, 2021](#); [Wiernik & Dahlke, 2020](#)). To do so, we use the ratio of the standard deviation (*SD*) of age in a given study to the assumed *SD* of age in the entire working population, which we estimate at 11 based on [Warr \(2008\)](#). Note that this value has been used in other age meta-analyses as well (e.g., [Kooij et al., 2011](#)). For studies that did not report the *SD* for age, we used the average *SD* (i.e., 9.04 years) across all other included studies.⁴

We ran all further analyses based on corrected correlations unless specified otherwise. To assess heterogeneity of effect sizes, we computed a *Q* statistic and an *I*² index using the [Hunter and Schmidt \(2014\)](#) estimator. The *Q* statistic follows a chi-squared distribution and is calculated as the weighted sum of squared differences between effects of individual studies and the averaged effect across studies. 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 as follows: 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 statistical artifacts, which is equal to $1 - I^2$. All analyses were conducted using the *metafor* and the *psychmeta* package in R ([Dahlke & Wiernik, 2019](#); [Viechtbauer, 2010](#)).

Constructed correlation matrix

To test our hypotheses, we constructed an average meta-analytic correlation matrix including the following variables: age, all Big Five traits, honesty–humility, trait negative affect, and workplace deviance (see [Table 3](#)).⁵ We base our analyses on correlations corrected for unreliability from prior meta-analyses (we report results based on sample size-weighted correlations in a footnote and in detail in the [Supplementary Material](#)). We were able to find meta-analytic correlations for 29 of the 36 needed relations, and we always used those correlations that were based on the largest number of participants.

We relied on the correlation from the current meta-analysis for the relation between age and (interpersonal and

organizational) workplace deviance. The correlation of age with honesty–humility came from [Pletzer \(2021\)](#) ($k = 18, N = 5,601$). The correlations of the Big Five traits with workplace deviance were taken from [Pletzer et al. \(2019\)](#) ($27 > k > 49, 7,309 > N > 15,773$), and the one between honesty–humility and workplace deviance from [Pletzer et al. \(2020\)](#) ($k = 27, N = 8,875$). The correlation between trait negative affect and workplace deviance was calculated based on the correlations of trait negative affect with interpersonal and organizational workplace deviance from [Mackey et al. \(2021\)](#) using the same composite formulas mentioned above; we conservatively relied on the lower *k* and *N* in the analyses ($k = 19, N = 5,141$).

Correlations between the Big Five traits were taken from [Van der Linden et al. \(2010\)](#), who based their analyses on a large database of studies ($k = 212, N = 144,117$). Correlations between the Big Five traits and honesty–humility were taken from [Howard and Van Zandt \(2020\)](#) ($65 > k > 79, 39,826 > N > 44,267$). Correlations of the Big Five traits ($120 > k > 172, 39,023 > N > 55,495$) and of honesty–humility ($k = 9, N = 4,134$) with negative affect were taken from [Anglim et al. \(2020\)](#).

We lacked effect sizes estimates for the relations of age with the Big Five traits and with trait negative affect. To estimate these correlations, we examined all included studies from the current age–workplace deviance meta-analysis to identify whether a measure of one of the Big Five personality traits (i.e., openness to experience, conscientiousness, extraversion, agreeableness, neuroticism) or of trait negative affect was included. If so, the first author coded the correlations between age and the respective trait (see [Supplementary Material](#) for all codings), and performed meta-analyses for these relations following the same meta-analytic procedures as outlined above for the age–workplace deviance relation.

Age and the Big Five traits

Those studies that were coded and analyzed for the relations of age with the Big Five traits relied on various measures to assess the Big Five traits, 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, 2007b](#); [K. Lee & Ashton, 2004](#)). We did not code studies using the HEXACO to assess the domains emotionality/neuroticism and agreeableness because there are important conceptual and empirical differences between the HEXACO and the Big Five for these domains ([Ashton et al., 2014](#); [Howard & Van Zandt, 2020](#)). 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](#)).

Age and trait negative affect

Studies coded for the relation of age with trait negative affect assessed trait negative affect most commonly with the *Positive and Negative Affect Schedule* (PANAS; [Watson et al., 1988](#)), but a few studies also used the *Job-Related Affective Well-Being Scale* (JAWS; [Van Katwyk et al., 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*

³This was only the case for 34 of the 509 coded effect sizes (6.7%).

⁴This was the case for 97 of the 509 coded effect sizes (19.1%).

⁵Note that we also created correlation matrices for interpersonal and organizational workplace deviance. To do so, we used meta-analytic correlations from [Mackey et al. \(2021\)](#) for the relations with the Big Five traits and from [Pletzer et al. \(2020\)](#) for the relations with honesty–humility.

= .53 between the JAWS and the negative affectivity subscale of the PANAS; Van Katwyk et al., 2000). We therefore decided to also include those studies using the JAWS.

Hypotheses testing procedure

We fit a structural equation model using the *lavaan* package in R (Rosseel, 2012) on this constructed average correlation matrix using the harmonic mean across all analyzed cells as the sample size (Viswesvaran & Ones, 1995). We first fit a model with conscientiousness, agreeableness, and neuroticism as mediators to test Hypothesis 1. We then examine if honesty–humility (incrementally) mediates the relation between age and workplace deviance to test Hypothesis 2. We follow the same procedures for trait negative affect to test Hypothesis 3 and Research Question 1. If an indirect effect is significant and the direct effect decreases in magnitude, or becomes nonsignificant, a (partial) mediation is present.

Three notes of caution need to be mentioned about this analytic approach. First, the meta-analytic correlations for the relations of age with the Big Five traits and with trait negative affect are based on the subset of studies in our age–workplace deviance meta-analysis that also assess (one of) these traits. It therefore represents a selective review of these relations, but conducting a comprehensive review of these relations would have been far beyond the scope of the current manuscript. We are confident, however, that the effect size estimates reflect the true population correlation accurately given the relatively large number of included studies ($21 > k > 45$, $5,539 > N > 13,617$). Second, 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, 2021). More specifically, the values on the diagonal in a correlation matrix are always one, whereas they can have any nonnegative value in a covariance matrix. This results in biased fit indices and standard errors; standard errors are underestimated, whereas test statistics are overestimated. However, to the best of our knowledge, there is no more appropriate analytic method given the current data structure. Third, using meta-analytic corrected correlations in 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 et al., 2017). We therefore supplement our analyses with results for all path coefficients based on full information meta-analytic structural equation modeling procedure (FIMASEM) (Yu et al., 2016), which can quantify the variability in the path estimates. Next to the constructed correlation matrix, we therefore also constructed a matrix of the standard deviations of the effect sizes ($SD\bar{p}$). $SD\bar{p}$ was not available for six of the included correlations; we therefore conservatively assumed $SD\bar{p} = 0$ for these correlations in line with suggestions by Yu et al. (2016). Using bootstrapping with 1,000 iterations, FIMASEM calculates an average path coefficient β and the SD for β across all bootstrapped correlation matrices. We also report 80% credibility intervals around β and the width of the credibility intervals. Narrower credibility intervals indicate lower heterogeneity in the effect size distribution. Yu et al. (2016) suggest that widths lower than .18 indicate little heterogeneity, widths between .18 and .54 indicate moderate heterogeneity, and widths higher than .54 indicate large heterogeneity. To conduct these analyses, we use R code from Cheung (2018).

Results

Relation between age and workplace deviance

A small negative but significant weighted correlation between age and workplace deviance was found: $r = -.092$, 95% confidence interval (CI): $-.108, -.076$, $k = 198$ (see Table 1). Correcting for range restriction in the predictor and for unreliability in the criterion increases the overall weighted effect size: $\bar{p} = -.124$, 95% CI: $-.143, -.105$, $k = 198$. Using these corrected correlations, high variability in the effect size distribution existed ($I^2 = 75.61$, $Q(197) = 807.74$, $p < .001$), which justifies the use of a random-effects model. 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, $r = -.090$, $\bar{p} = -.122$, 95% CI: $-.142, -.103$, $k = 198$.

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 Table 1 or in the Supplementary Material). Organizational ($\bar{p} = -.137$, 95% CI: $-.160, -.114$) and interpersonal workplace deviance ($\bar{p} = -.110$, 95% CI: $-.131, -.088$) exhibited similar correlations with age as indicated by overlapping CIs. Age correlated more strongly with self-ratings ($\bar{p} = -.136$, 95% CI: $-.158, -.115$) than with other-ratings ($\bar{p} = -.044$, 95% CI: $-.091, .003$) of workplace deviance. The correlation between age and workplace deviance did not differ when the Bennett and Robinson (2000) measure was used ($\bar{p} = -.134$, 95% CI: $-.161, -.106$) compared to when another workplace deviance measure was used ($\bar{p} = -.117$, 95% CI: $-.146, -.088$). 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 do not replicate this finding: The age–workplace deviance relation is relatively similar in samples with a mean age of 25 years or younger ($\bar{p} = -.115$), with a mean age of 25–39 years ($\bar{p} = -.140$), and with a mean age of 40 years or older ($\bar{p} = -.132$).⁶ 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 mean age of the included samples. However, the age–workplace deviance relation is stronger when relying on self-reports of workplace deviance.

Hypotheses tests

Table 2 shows the results of the separate meta-analyses conducted to estimate the relations of age with the Big Five traits and with trait negative affect. Findings demonstrate that conscientiousness ($\bar{p} = .133$) and agreeableness ($\bar{p} = .121$) increase, whereas neuroticism ($\bar{p} = -.111$) and trait negative affect ($\bar{p} = -.160$) decrease with age. Openness to experience and extraversion do not correlate significantly with age. These results confirm our expectations about the relations of age with these traits. We used these meta-analytic correlations in the constructed correlation matrix (see Table 3).

⁶Note that we do find a significant moderation effect of the mean sample age in line with findings by Ng and Feldman (2008) when relying on sample size-weighted correlations, and when testing the mean sample age as a continuous moderator in a meta-regression.

Table 4 shows the results of the structural equation models used to test the hypotheses. In all models, we included a direct effect from age to workplace deviance. In Model 1, we tested if the Big Five traits conscientiousness, agreeableness, and neuroticism mediate the relation of age with workplace deviance. The relation between age and workplace deviance remains statistically significant (estimate = $-.061$, $p < .001$), but all three traits partially mediate this relation ($R^2 = .152$). Note that the indirect effects via conscientiousness (estimate = $-.035$, $p < .001$) and agreeableness (estimate = $-.030$, $p < .001$) are notably stronger than the one via neuroticism (estimate = $.002$, $p = .011$). These findings support Hypothesis 1. However, the indirect effect via neuroticism is positive, which is opposite to what we expected.

In Model 2, we examined if honesty–humility mediates the age–workplace deviance relation. The indirect effect via honesty–humility is significant (estimate = $-.106$, $p < .001$), and the direct effect is no longer significant (estimate = $-.018$, $p = .064$). In Model 3, we examined if honesty–humility incrementally mediates the relation between age and workplace deviance over and above conscientiousness, agreeableness, and neuroticism. The direct effect between age and workplace deviance is no longer significant. The indirect effect via honesty–humility is by far the strongest out of all four tested indirect effects (estimate = $-.079$, $p < .001$), and the explained variance in workplace deviance increases by 4.1% ($R^2 = .193$) compared to the model with indirect effects only via conscientiousness, agreeableness, and neuroticism. In this model, conscientiousness (estimate = $-.034$, $p < .001$) and agreeableness (estimate = $-.012$, $p < .001$) still mediate the age–workplace deviance relation. Note that the indirect effect via agreeableness is substantially smaller than in Model 1, which likely happens because Big Five agreeableness shares variance with

honesty–humility. Neuroticism is no longer a significant mediator. These findings support Hypothesis 2.

We then examined if trait negative affect mediates the age–workplace deviance relation (Model 4), and find that it partially mediates this relation (estimate = $-.066$, $p < .001$), supporting Hypothesis 3. The direct effect remains significant (estimate = $-.058$, $p < .001$). Trait negative affect (estimate = $-.077$, $p < .001$) also incrementally mediates the age–workplace deviance relation over and above the indirect effects via conscientiousness (estimate = $-.037$, $p < .001$), agreeableness (estimate = $-.026$, $p < .001$), and neuroticism (estimate = $.035$, $p < .001$; Model 5). Note that the indirect effect via neuroticism remains positive but is now stronger compared to when trait negative affect was not included in the model.

At last, we simultaneously tested indirect effects via conscientiousness, agreeableness, neuroticism, honesty–humility, and trait negative affect (Model 6). All indirect effects are statistically significant, indicating that all five traits mediate the relation of age with workplace deviance. Hence, trait negative affect incrementally explains the negative relation between age and workplace deviance over and above the mediating effects of conscientiousness, agreeableness, neuroticism, and honesty–humility (Research Question 1).

Two things are noteworthy. First, the relation between age and workplace deviance is now positive (estimate = $.035$, $p < .001$). Second, as in Model 5, when both neuroticism and trait negative affect are included in the same model, the positive indirect effect via neuroticism (estimate = $.031$, $p < .001$) becomes stronger, while the other indirect effects remain negative. This pattern of results in which direct and indirect effects have opposite signs is sometimes referred to as *inconsistent mediation*, and is common in models with multiple mediators (MacKinnon et al., 2007). Our specific pattern of

Table 1. Meta-Analytic Results for the Relation of Age With Workplace Deviance

	Overall effect size									Heterogeneity	
	<i>k</i>	<i>N</i>	<i>r</i>	<i>SDr</i>	$\bar{\rho}$	<i>SDp</i>	%Var	95% CI	80% CV	<i>Q</i>	<i>I</i> ²
WD	198	58,903	-.092	.117	-.124	.117	24.39	-.143, -.105	-.275, .026	807.74	75.61
ID	133	42,657	-.080	.109	-.110	.107	26.05	-.131, -.088	-.248, .028	506.74	73.95
OD	150	48,151	-.099	.121	-.137	.123	20.79	-.160, -.114	-.296, .022	716.63	79.21

Note. *k* = cumulative number of studies; *N* = cumulative sample size; *r* = sample size-weighted correlation; *SDr* = standard deviation for *r*; $\bar{\rho}$ = mean true score correlation corrected for unreliability and range restriction; *SDp* = standard deviation for $\bar{\rho}$; %Var = percentage of variance attributable to statistical artifacts; 95% CI = 95% confidence interval for $\bar{\rho}$; 80% CV = 80% credibility interval for $\bar{\rho}$; *Q* and *I*² = indices of heterogeneity for $\bar{\rho}$. ID = interpersonal workplace deviance; OD = organizational workplace deviance; WD = overall workplace deviance.

Table 2. Meta-Analytic Results for the Relations of Age With the Big Five Traits and Trait Negative Affect

	Overall effect size									Heterogeneity	
	<i>k</i>	<i>N</i>	<i>r</i>	<i>SDr</i>	$\bar{\rho}$	<i>SDp</i>	%Var	95% CI	80% CV	<i>Q</i>	<i>I</i> ²
Openness	22	5,635	.019	.123	.010	.132	26.10	-.057, .078	-.165, .185	80.45	73.90
Conscientiousness	45	13,617	.102	.113	.133	.128	25.34	.089, .178	-.034, .300	173.64	74.66
Extraversion	21	5,539	-.028	.130	-.030	.138	22.63	-.101, .040	-.213, .152	88.38	77.37
Agreeableness	26	8,709	.084	.088	.121	.082	38.39	.077, .165	.013, .230	65.13	61.61
Neuroticism	26	8,194	-.068	.088	-.111	.066	40.59	-.151, -.071	-.198, -.024	61.60	59.14
Negative affect	42	12,894	-.129	.086	-.160	.058	42.73	-.187, -.133	-.235, -.085	95.96	57.27

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; *SDp* = standard deviation for $\bar{\rho}$; %Var = percentage of variance attributable to statistical artifacts; 95% CI = 95% confidence interval for $\bar{\rho}$; 80% CV = 80% credibility interval for $\bar{\rho}$; *Q* and *I*² = indices of heterogeneity for $\bar{\rho}$.

Table 3. Constructed Meta-Analytic Corrected Correlation Matrix

	1	2	3	4	5	6	7	8
1. Age	–							
2. Openness	.010 ^a (.132) (22, 5,635)	–						
3. Conscientiousness	.133 ^a (.128) (45, 13,617)	.200 ^c (.210) (212, 144,117)	–					
4. Extraversion	–.030 ^a (.138) (21, 5,539)	.430 ^c (.090) (212, 144,117)	.290 ^c (.160) (212, 144,117)	–				
5. Agreeableness	.121 ^a (.082) (26, 8,709)	.210 ^c (.150) (212, 144,117)	.430 ^c (.120) (212, 144,117)	.260 ^c (.190) (212, 144,117)	–			
6. Neuroticism	–.111 ^a (.066) (26, 8,194)	–.170 ^c (.150) (212, 144,117)	–.430 ^c (.160) (212, 144,117)	–.360 ^c (.080) (212, 144,117)	–.360 ^c (.090) (212, 144,117)	–		
7. Honesty–humility	.256 ^b (.148) (18, 5,601)	.061 ^d (.000) (65, 39,826)	.245 ^d (.000) (71, 42,857)	–.077 ^d (.000) (67, 39,977)	.503 ^d (.000) (79, 44,267)	–.138 ^d (.000) (68, 42,095)	–	
8. Negative affect	–.160 ^a (.058) (42, 12,894)	–.060 ^c (.100) (121, 39,538)	–.290 ^c (.140) (128, 42,358)	–.240 ^c (.120) (152, 49,212)	–.300 ^c (.140) (120, 39,023)	.650 ^c (.130) (172, 55,495)	–.180 ^c (.060) (9, 4,134)	–
9. Workplace deviance	–.124 ^a (.117) (198, 58,903)	–.082 ^f (.256) (27, 7,309)	–.372 ^f (.210) (49, 15,773)	–.045 ^f (.300) (28, 7,645)	–.362 ^f (.177) (41, 12,860)	.192 ^f (.192) (38, 11,740)	–.420 ^g (.155) (27, 8,875)	.421 ^h (.000) (19, 5,141)
10. Interpersonal workplace deviance	–.110 ^a (.107) (133, 42,657)	–.030 ^f (.150) (17, 4,571)	–.240 ^f (.120) (33, 10,426)	.030 ^f (.080) (19, 6,240)	–.400 ^f (.110) (32, 8,413)	.160 ^f (.130) (28, 8,474)	–.323 ^g (.253) (12, 3,686)	.360 ^h (.100) (19, 5,141)
11. Organizational workplace deviance	–.137 ^a (.123) (150, 48,151)	.050 ^f (.180) (17, 4,324)	–.410 ^f (.180) (39, 11,830)	–.020 ^f (.080) (19, 5,993)	–.320 ^f (.100) (30, 7,871)	.190 ^f (.140) (28, 8,227)	–.352 ^g (.177) (12, 3,427)	.410 ^h (.110) (23, 7,025)

Note. The numbers outside parentheses are sample size-weighted meta-analytic correlation coefficients corrected for range restriction and/or unreliability; numbers inside the first bracket in each cell are *SDP* values used in the FIMASEM analyses; numbers inside the second bracket in each cell are (*k*, *N*) where *k* is the number of independent samples and *N* the number of participants. ^aCorrelations meta-analyzed in the current study. ^bCorrelation taken from Pletzer (2021). ^cCorrelations taken from van der Linden et al. (2010). ^dCorrelations taken from Howard and Van Zandt (2020). ^eCorrelations taken from Anglim et al. (2020). ^fCorrelations taken from Pletzer et al. (2019). ^gCorrelations taken from Pletzer et al. (2020). ^hCorrelation taken or calculated based on Mackey et al. (2021).

Table 4. Indirect Effects From Meta-Analytic Structural Equation Models Predicting Workplace Deviance

	Model 1		Model 2		Model 3	
	β	95% CI	β	95% CI	β	95% CI
Age – WD	-.061*	-.074, -.047	-.018	-.036, 0.001	.001	-.013, .015
Indirect effects via						
Conscientiousness	-.035*	-.040, -.031	–	–	-.034*	-.038, -.029
Agreeableness	-.030*	-.034, -.026	–	–	-.012*	-.014, -.009
Neuroticism	.002*	.000, .003	–	–	-.001	-.002, .001
Honesty–humility	–	–	-.106*	-.116, -.097	-.079*	-.085, -.073
Negative affect	–	–	–	–	–	–
R^2		.152		.177		.193
Harmonic mean N		17,408		9,734		16,037
	Model 4		Model 5		Model 6	
	β	95% CI	β	95% CI	β	95% CI
Age – WD	-.058*	-.076, -.040	-.020*	-.033, -.007	.035*	.021, .049
Indirect effects via						
Conscientiousness	–	–	-.037*	-.041, -.032	-.035*	-.040, -.030
Agreeableness	–	–	-.026*	-.029, -.022	-.009*	-.011, -.007
Neuroticism	–	–	.035*	.030, .040	.031*	.026, .036
Honesty–humility	–	–	–	–	-.073*	-.078, -.067
Negative affect	-.066*	-.074, -.058	-.077*	-.084, -.069	-.074*	-.082, -.066
R^2		.181		.404		.420
Harmonic mean N		10,379		16,416		13,847

Note. All results are based on \bar{p} ; β = path coefficients; 95% CI = 95% confidence interval for β ; WD = workplace deviance. * $p < .05$.

results indicates that the negative relation between age and workplace deviance can be fully explained by age-related changes in these five traits. Furthermore, the mediating effect of trait negative affect seems to suppress the mediating effect of neuroticism (MacKinnon et al., 2000). In other words, trait negative affect explains that part of the variance in neuroticism that causes a negative indirect age–workplace deviance relation. The variance in neuroticism that is unexplained by trait negative effect causes a positive indirect age–workplace deviance relation.

Note that the results remain fairly similar when including the other two Big Five traits openness to experience and extraversion in the model as well. The results are also quite similar when tested separately for interpersonal and organizational workplace deviance. The only notable difference is that the indirect effect via agreeableness is stronger for interpersonal workplace deviance and the indirect effect via conscientiousness is stronger for organizational workplace deviance, which is in line with previous research (Mackey et al., 2021; Pletzer et al., 2019). Detailed results of these analyses can be found in the [Supplementary Material](#).

The average path coefficients based on the FIMASEM approach (see [Table 5](#)) are very similar to those from the regular meta-analytic structural equation modeling approach. Most importantly, the 80% credibility intervals for most of the indirect effects can be considered narrow (width < .18), suggesting that the examined indirect effects are fairly robust. Only the 80% credibility intervals for indirect effects via honesty–humility are moderate in size. It also needs to be noted that many of the 80% credibility intervals include zero,

suggesting that moderation effects could be present in these paths (Whitener, 1990).

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 aligns with 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). More importantly, we do not only show that age relates to workplace deviance, but also provide a comprehensive trait-based test of the 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 the negative relation of age with workplace deviance can be explained using predictions based on the neo-socioanalytical model of personality change (Roberts & Wood, 2006): Conscientiousness, agreeableness, honesty–humility, and trait negative affect consistently emerge as mediators for the negative relation between age and workplace deviance. As such, age-related changes in personality traits can explain this relation.

Table 5. Indirect Effects From Meta-Analytic Structural Equation Models Predicting Workplace Deviance Based on the FIMASEM Approach

	Model 1				Model 2				Model 3			
	Avg. β	$SD\beta$	80% CV	Width	Avg. β	$SD\beta$	80% CV	Width	Avg. β	$SD\beta$	80% CV	Width
Age – WD	–.060	.137	–.237, .116	.352	–.012	.152	–.207, .183	.391	.004	.175	–.221, .229	.450
Indirect effects via												
Conscientiousness	–.024	.062	–.104, .055	.159	–	–	–	–	–.024	.063	–.105, .056	.161
Agreeableness	–.029	.040	–.081, .022	.102	–	–	–	–	–.011	.045	–.069, .047	.115
Neuroticism	–.006	.033	–.049, .037	.086	–	–	–	–	–.010	.035	–.054, .035	.089
Honesty–humility	–	–	–	–	–.108	.086	–.219, .003	.222	–.079	.097	–.203, .045	.249
Negative affect	–	–	–	–	–	–	–	–	–	–	–	–
R^2	.315	.149	.123, .506	.383	.199	.119	.046, .353	.307	.413	.162	.205, .621	.416
Harmonic mean N				17,408				9,734				16,037
	Model 4				Model 5				Model 6			
	Avg. β	$SD\beta$	80% CV	Width	Avg. β	$SD\beta$	80% CV	Width	Avg. β	$SD\beta$	80% CV	Width
Age – WD	–.055	.119	–.207, .098	.305	–.024	.144	–.209, .160	.369	.037	.185	–.200, .274	.474
Indirect effects via												
Conscientiousness	–	–	–	–	–.024	.065	–.108, .060	.168	–.025	.067	–.111, .061	.171
Agreeableness	–	–	–	–	–.027	.041	–.080, .026	.105	–.009	.048	–.071, .053	.124
Neuroticism	–	–	–	–	.024	.054	–.045, .094	.138	.020	.056	–.052, .091	.144
Honesty–humility	–	–	–	–	–	–	–	–	–.075	.103	–.208, .058	.265
Negative affect	–.065	.025	–.097, –.033	.064	–.069	.053	–.136, –.001	.135	–.067	.056	–.139, .005	.144
R^2	.194	.024	.164, .224	.059	.436	.153	.239, .633	.394	.527	.161	.321, .734	.413
Harmonic mean N				10,379				16,416				13,847

Note. All results are based on $\bar{\beta}$; avg. β = average path coefficient across 1,000 iterations; $SD\beta$ = standard deviation for β ; 80% CV = 80% credibility interval for the path coefficient; width = width of the 80% credibility interval; WD = 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). Accordingly, and in line with previous findings (Roberts et al., 2006; Roberts & Mroczek, 2008), we demonstrate that conscientiousness and agreeableness increase with age, whereas neuroticism and trait negative affect decrease across the lifespan. Exactly these traits are crucial predictors 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 the Big Five traits conscientiousness, agreeableness, and neuroticism mediate the negative relation between age and workplace deviance. However, HEXACO honesty–humility is the personality trait that has the highest criterion-related validity for workplace deviance and that also shows the strongest age-related increase among all examined personality traits (Ashton & Lee, 2016; Pletzer, 2021). In the current meta-analysis, it incrementally mediates the relation of age with workplace deviance over and above the Big Five traits and emerges as the strongest mediator of this relation. This finding suggests that the Big Five omits important variance capturing individual differences in honesty and fairness that can also help to explain the negative 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 reduced levels of trait negative affect are one of the explanatory mechanisms for our finding that levels of workplace deviance decrease with age: Individuals possess lower levels of trait negative affect with increasing age, which is, in turn, associated with reduced levels of workplace deviance. In fact, trait negative affect also incrementally mediates the negative age–workplace deviance relation over and above the indirect effects via conscientiousness, agreeableness, neuroticism, and honesty–humility. These findings highlight a second, complementary underlying process of the negative relation between age and workplace deviance, and suggest 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 ($\bar{\rho} = -.111$ and $\bar{\rho} = -.160$, respectively), and that the direction of the indirect effect of neuroticism is more positive when trait negative affect is 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 finding comes from previous research demonstrating 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, 2021), especially in relation to trait negative affect, age, and workplace deviance. In addition, a finer-grained examination of the relations of personality facets with each other as well as with age and workplace deviance would further illuminate why and how age relates to workplace deviance.

Taken together, the current findings demonstrate that future studies examining age-related changes in personality should focus on conscientiousness, agreeableness, neuroticism, trait negative affect, and honesty–humility. The same conclusion applies when using personality traits to predict workplace deviance. When researchers have to choose between different traits to increase efficiency, honesty–humility, trait negative affect, and conscientiousness, in that specific order, are the traits that can be relied upon to maximize the prediction of workplace deviance.

It is also important to compare the current results to those by Pletzer (2021). The findings for Big Five conscientiousness, neuroticism, extraversion, and openness to experience largely converge with those found by Pletzer (2021) for their HEXACO counterparts. 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 either do not mediate this relation or exhibit very weak indirect effects. 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, can apparently explain the relation between age and workplace deviance, resulting in the finding that only Big Five but not HEXACO agreeableness mediates the age–workplace deviance relation.

Practical implications

Overall, the current findings highlight 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 that 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 that 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 United States alone. Although the amount of explained variance in workplace deviance using age as a predictor seems small at first sight (1.54% based on $\bar{p} = -.124$), it could help organizations save almost \$720 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 et al. (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 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. For example, recent evidence suggests that personality traits can be changed through interventions (Roberts et al., 2017), and such interventions can even be implemented on smartphones (Stieger et al., 2020). Organizations could utilize these findings to decrease levels of workplace deviance especially among younger employees. 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 prone to act deviantly. The current findings suggest that such organizational interventions might lead to reduced levels of workplace deviance. And finally, practitioners interested in predicting proneness to engage in workplace deviance in job selection settings should keep in mind that trait negative affect incrementally explains the age–workplace deviance relation over and above the Big Five traits and honesty–humility. It could therefore be useful to assess this trait in a recruitment setting.

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 can be changed by external factors, rendering the use of it as a predictor of the examined personality traits, 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 the examined personality traits as predictors of workplace deviance (Mackey et al., 2021; Pletzer et al., 2019), 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 et al., 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 tend to become less emotionally stable and less extraverted. Our findings should therefore be interpreted with this limitation in mind.

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 already exists in the employed adult population and if it 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 that should be examined as mediators before we fully understand why age relates negatively to workplace deviance. For example, Peng et al. (2021) recently demonstrated that emotional labor strategies and organizational cynicism serially mediate the age–workplace deviance relation. Other mediators, such as work attitudes (Rhodes, 1983) or goal orientations (Ebner et al., 2006), could also explain this relation.

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 ($-.275, .026$) and for some other examined relations (e.g., for the age–conscientiousness relation, $-.034$ to $.300$) included zero, 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 $-.275$ in 10% of the cases or larger than $.026$ in another 10% of the cases. The same applies to our mediation results, for which the FIMASEM results demonstrated that most of the 80% credibility intervals for the indirect effects included zero. More specifically, only the 80% credibility intervals for the indirect effects via negative affect seemed more robust, suggesting that all other indirect effects might be weaker and possibly even reversed in sign under certain circumstances. 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 suggests 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 individual differences 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 and selective reporting of significant results within primary studies 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 nonsignificant results. In addition and as stated in the *Method* section already, the correlations of age with the Big Five traits and with trait negative affect are based on a selective subset of studies included for the age–workplace deviance meta-analysis, and therefore do not provide a comprehensive review of these relations. We did, however, include a fairly large amount of studies and are therefore confident that these correlations provide valid and reliable estimates of the true population correlations.

Conclusion

Age is negatively related to workplace deviance, and results of the current meta-analysis demonstrate that the personality traits conscientiousness, agreeableness, honesty–humility, and 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 in particular. As older workers are still disadvantaged in employment and promotion decisions (e.g., Ahmed et al., 2012), we hope that our findings help organizations to realize the competitive benefits of fairer selection procedures.

Supplementary Material

Supplementary material is available online at *Work, Aging, and Retirement*.

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References

- Ahmed, A. M., Andersson, L., & Hammarstedt, M. (2012). Does age matter for employability? A field experiment on ageism in the Swedish labour market. *Applied Economics Letters*, 19(4), 403–406. doi:10.1080/13504851.2011.581199
- Anglim, J., Horwood, S., Smillie, L. D., Marrero, R. J., & Wood, J. K. (2020). Predicting psychological and subjective well-being from personality: A meta-analysis. *Psychological Bulletin*, 146(4), 279–323. doi:10.1037/bul0000226
- Anglim, J., Lievens, F., Everton, L., Grant, S. L., & Marty, A. (2018). HEXACO personality predicts counterproductive work behavior and organizational citizenship behavior in low-stakes and job applicant contexts. *Journal of Research in Personality*, 77, 11–20. doi:10.1016/j.jrp.2018.09.003
- Ashton, M. C., & Lee, K. (2007). Empirical, theoretical, and practical advantages of the HEXACO model of personality structure. *Personality and Social Psychology Review*, 11(2), 150–166. doi:10.1177/1088868306294907
- Ashton, M. C., & Lee, K. (2008a). The HEXACO model of personality structure and the importance of the H factor. *Social and Personality Psychology Compass*, 2(5), 1952–1962. doi:10.1111/j.1751-9004.2008.00134.x
- Ashton, M. C., & Lee, K. (2008b). The prediction of Honesty–Humility-related criteria by the HEXACO and Five-Factor Models of personality. *Journal of Research in Personality*, 42(5), 1216–1228. doi:10.1016/j.jrp.2008.03.006
- Ashton, M. C., & Lee, K. (2016). Age trends in HEXACO-PI-R self-reports. *Journal of Research in Personality*, 64, 102–111. doi:10.1016/j.jrp.2016.08.008
- Ashton, M. C., & Lee, K. (2019). How well do Big Five measures capture HEXACO scale variance? *Journal of Personality Assessment*, 101(6), 567–573. doi:10.1080/00223891.2018.1448986
- Ashton, M. C., Lee, K., & De Vries, R. E. (2014). The HEXACO Honesty–Humility, agreeableness, and emotionality factors: A review of research and theory. *Personality and Social Psychology Review*, 18(2), 139–152. doi:10.1177/1088868314523838
- Barrick, M. R., & Mount, M. K. (1993). Autonomy as a moderator of the relationships between the Big Five personality dimensions and job performance. *Journal of Applied Psychology*, 78(1), 111–118. doi:10.1037/0021-9010.78.1.111
- Barrick, M. R., Neubert, M. J., Mount, M. K., & Stewart, G. L. (1998). Relating member ability and personality to work-team processes and team effectiveness. *Journal of Applied Psychology*, 83(3), 377–391. doi:10.1037/0021-9010.83.3.377
- Bendick, M. J., Jackson, C. W., & Horacio, J. (1997). Employment discrimination against older workers. *Journal of Aging & Social Policy*, 8(4), 37–41. doi:10.1300/J031v08n04
- Bennett, R. J., & Robinson, S. L. (2000). Development of a measure of workplace deviance. *Journal of Applied Psychology*, 85(3), 349–360. doi:10.1037/0021-9010.85.3.349
- Berry, C. M., Carpenter, N. C., & Barratt, C. L. (2012). Do other-reports of counterproductive work behavior provide an incremental contribution over self-reports? A meta-analytic comparison. *Journal of Applied Psychology*, 97(3), 613–636. doi:10.1037/a0026739
- Berry, C. M., Ones, D. S., & Sackett, P. R. (2007). Interpersonal deviance, organizational deviance, and their common correlates: A review and meta-analysis. *Journal of Applied Psychology*, 92(2), 410–424. doi:10.1037/0021-9010.92.2.410
- Bing, M. N., Stewart, S. M., Davison, H. K., Green, P. D., McIntyre, M. D., & James, L. R. (2007). An integrative typology of personality assessment for aggression: Implications for predicting counterproductive workplace behavior. *Journal of Applied Psychology*, 92(3), 722–744. doi:10.1037/0021-9010.92.3.722
- Birditt, K. S., Fingerman, K. L., & Almeida, D. M. (2005). Age differences in exposure and reactions to interpersonal tensions: A daily diary study. *Psychology and Aging*, 20(2), 330–340. doi:10.1037/0882-7974.20.2.330
- Carstensen, L. L. (1992). Social and emotional patterns in adulthood: Support for socioemotional selectivity theory. *Psychology and Aging*, 7(3), 331–338. doi:10.1037/0882-7974.7.3.331
- Carstensen, L. L., & Mikels, J. A. (2005). At the intersection of emotion and cognition. *Current Directions in Psychological Science*, 14(3), 117–121. doi:10.1111/j.0963-7214.2005.00348.x
- Charles, S. T. (2010). Strength and vulnerability integration: A model of emotional well-being across adulthood. *Psychological Bulletin*, 136(6), 1068–1091. doi:10.1037/a0021232
- Charles, S. T., Mather, M., & Carstensen, L. L. (2003). Aging and emotional memory: The forgettable nature of negative images for older adults. *Journal of Experimental Psychology: General*, 132(2), 310–324. doi:10.1037/0096-3445.132.2.310

- Charles, S. T., Reynolds, C. A., & Gatz, M. (2001). Age-related differences and change in positive and negative affect over 23 years. *Journal of Personality and Social Psychology*, 80(1), 136–151. doi:[10.1037/0022-3514.80.1.136](https://doi.org/10.1037/0022-3514.80.1.136)
- Cheung, M. W.-L. (2018). Issues in solving the problem of effect size heterogeneity in meta-analytic structural equation modeling: A commentary and simulation study on Yu, Downes, Carter, and O'Boyle (2016). *Journal of Applied Psychology*, 103(7), 787–803. doi:[10.1037/apl0000284](https://doi.org/10.1037/apl0000284)
- Cheung, M. W.-L. (2021). Meta-analytic structural equation modeling. In *Oxford research encyclopedia of business and management*. Oxford University Press. doi:[10.1093/acrefore/9780190224851.013.225](https://doi.org/10.1093/acrefore/9780190224851.013.225)
- Costa, P. T., & McCrae, R. R. (2008). The revised NEO Personality Inventory (NEO-PI-R). In G. J. Boyle, G. Matthews, & D. H. Saklofske (Eds.), *The SAGE handbook of personality theory and assessment*, Vol. 2. *Personality measurement and testing* (pp. 179–198). Sage Publications, Inc.
- Dahlke, J. A., & Wiernik, B. M. (2019). psychmeta: An R package for psychometric meta-analysis. *Applied Psychological Measurement*, 43(5), 415–416. doi:[10.1177/0146621618795933](https://doi.org/10.1177/0146621618795933)
- Dalal, R. S. (2005). A meta-analysis of the relationship between organizational citizenship behavior and counterproductive work behavior. *Journal of Applied Psychology*, 90(6), 1241–1255. doi:[10.1037/0021-9010.90.6.1241](https://doi.org/10.1037/0021-9010.90.6.1241)
- Davis, M. H., Kraus, L. A., & Capobianco, S. (2009). Age differences in responses to conflict in the workplace. *International Journal of Aging and Human Development*, 68(4), 339–355. doi:[10.2190/AG.68.4.d](https://doi.org/10.2190/AG.68.4.d)
- Decelles, K. A., Derue, D. S., Ceranic, T. L., & Margolis, J. D. (2012). Does power corrupt or enable? When and why power facilitates self-interested behavior. *Journal of Applied Psychology*, 97(3), 681–689. doi:[10.1037/a0026811](https://doi.org/10.1037/a0026811)
- Detert, J. R., Treviño, L. K., Burris, E. R., & Andiappan, M. (2007). Managerial modes of influence and counterproductivity in organizations: A longitudinal business-unit-level investigation. *Journal of Applied Psychology*, 92(4), 993–1005. doi:[10.1037/0021-9010.92.4.993](https://doi.org/10.1037/0021-9010.92.4.993)
- De Vries, R. E., & Van Gelder, J.-L. (2015). Explaining workplace delinquency: The role of Honesty–Humility, ethical culture, and employee surveillance. *Personality and Individual Differences*, 86, 112–116. doi:[10.1016/j.paid.2015.06.008](https://doi.org/10.1016/j.paid.2015.06.008)
- Duncan, C., & Loretto, W. (2004). Never the right age? Gender and age based discrimination in employment. *Gender, Work and Organization*, 11(1), 95–114. doi:[10.1111/j.1468-0432.2004.00222.x](https://doi.org/10.1111/j.1468-0432.2004.00222.x)
- Dunlop, P. D., & Lee, K. (2004). Workplace deviance, organizational citizenship behavior, and business unit performance: The bad apples do spoil the whole barrel. *Journal of Organizational Behavior*, 25(1), 67–80. doi:[10.1002/job.243](https://doi.org/10.1002/job.243)
- Ebner, N. C., Freund, A. M., & Baltes, P. B. (2006). Developmental changes in personal goal orientation from young to late adulthood: From striving for gains to maintenance and prevention of losses. *Psychology and Aging*, 21(4), 664–678. doi:[10.1037/0882-7974.21.4.664](https://doi.org/10.1037/0882-7974.21.4.664)
- Enns, J. R., & Rotundo, M. (2012). When competition turns ugly: Collective injustice, workgroup identification, and counterproductive work behavior. *Human Performance*, 25(1), 26–51. doi:[10.1080/08959285.2011.631646](https://doi.org/10.1080/08959285.2011.631646)
- Feher, A., & Vernon, P. A. (2021). Looking beyond the Big Five: A selective review of alternatives to the Big Five model of personality. *Personality and Individual Differences*, 161. doi:[10.1016/j.paid.2020.110002](https://doi.org/10.1016/j.paid.2020.110002)
- Finkelstein, L. M., Burke, M. J., & Raju, M. S. (1995). Age discrimination in simulated employment contexts: An integrative analysis. *Journal of Applied Psychology*, 80(6), 652–663. doi:[10.1037/0021-9010.80.6.652](https://doi.org/10.1037/0021-9010.80.6.652)
- Furnham, A., Richards, S. C., & Paulhus, D. (2013). The Dark Triad of personality: A 10 year review. *Social and Personality Psychology Compass*, 7(3), 199–216. doi:[10.1111/spc3.12018](https://doi.org/10.1111/spc3.12018)
- Galinsky, A. D., Magee, J. C., Gruenfeld, D. H., Whitson, J. A., & Liljenquist, K. A. (2008). Power reduces the press of the situation: Implications for creativity, conformity, and dissonance. *Journal of Personality and Social Psychology*, 95(6), 1450–1466. doi:[10.1037/a0012633](https://doi.org/10.1037/a0012633)
- Goldberg, L. R. (1990). An alternative “description of personality”: The Big-Five Factor structure. *Journal of Personality and Social Psychology*, 59(6), 1216–1229. doi:[10.1037/0022-3514.59.6.1216](https://doi.org/10.1037/0022-3514.59.6.1216)
- Goldberg, L. R., Johnson, J. A., Eber, H. W., Hogan, R., Ashton, M. C., Cloninger, C. R., & Gough, H. G. (2006). The International Personality Item Pool and the future of public-domain personality measures. *Journal of Research in Personality*, 40(1), 84–96. doi:[10.1016/j.jrp.2005.08.007](https://doi.org/10.1016/j.jrp.2005.08.007)
- Hastings, S. E., & O'Neill, T. A. (2009). Predicting workplace deviance using broad versus narrow personality variables. *Personality and Individual Differences*, 47(4), 289–293. doi:[10.1016/j.paid.2009.03.015](https://doi.org/10.1016/j.paid.2009.03.015)
- Henle, C. A., Giacalone, R. A., Jurkiewicz, C. L., Henle, C. A., Giacalone, R. A., & Jurkiewicz, C. L. (2005). The role of ethical ideology in workplace deviance. *Journal of Business Ethics*, 56(3), 219–230. doi:[10.1007/s10551-004-2779-8](https://doi.org/10.1007/s10551-004-2779-8)
- Higgins, J. P. T., Thompson, S. G., Deeks, J. J., & Altman, D. G. (2003). Measuring inconsistency in meta-analysis. *British Medical Journal*, 327, 557–560. doi:[10.1136/bmj.327.7414.557](https://doi.org/10.1136/bmj.327.7414.557)
- Hodson, G., Book, A., Visser, B. A., Volk, A. A., Ashton, M. C., & Lee, K. (2018). Is the Dark Triad common factor distinct from low Honesty–Humility? *Journal of Research in Personality*, 73, 123–129. doi:[10.1016/j.jrp.2017.11.012](https://doi.org/10.1016/j.jrp.2017.11.012)
- Howard, M. C., & Van Zandt, E. C. (2020). The discriminant validity of honesty–humility: A meta-analysis of the HEXACO, Big Five, and Dark Triad. *Journal of Research in Personality*, 87, 103982. doi:[10.1016/j.jrp.2020.103982](https://doi.org/10.1016/j.jrp.2020.103982)
- Hudson, N. W., & Roberts, B. W. (2016). Social investment in work reliably predicts change in conscientiousness and agreeableness: A direct replication and extension of Hudson, Roberts, and Lodi-Smith (2012). *Journal of Research in Personality*, 60, 12–23. doi:[10.1016/j.jrp.2015.09.004](https://doi.org/10.1016/j.jrp.2015.09.004)
- Hunter, J. E., & Schmidt, F. L. (2014). *Methods of meta-analysis: Correcting error and bias in research findings*. Sage Publications.
- Jang, K. L., Livesley, W. J., & Vernon, P. A. (1996). Heritability of the Big Five personality dimensions and their facets: A twin study. *Journal of Personality*, 64(3), 577–591. doi:[10.1111/j.1467-6494.1996.tb00522.x](https://doi.org/10.1111/j.1467-6494.1996.tb00522.x)
- Kooij, D. T. A. M., De Lange, A. H., Jansen, P. G. W., Kanfer, R., & Dikkers, J. S. E. (2011). Age and work-related motives: Results of a meta-analysis. *Journal of Organizational Behavior*, 32(2), 197–225. doi:[10.1002/job.665](https://doi.org/10.1002/job.665)
- Larsen, R. J., & Buss, D. M. (2005). *Personality psychology: Domains of knowledge about human nature* (2nd ed.). McGraw Hill.
- Lee, K., & Allen, N. J. (2002). Organizational citizenship behavior and workplace deviance: The role of affect and cognition. *Journal of Applied Psychology*, 87(1), 131–142. doi:[10.1037/0021-9010.87.1.131](https://doi.org/10.1037/0021-9010.87.1.131)
- Lee, K., & Ashton, M. C. (2004). Psychometric properties of the HEXACO personality inventory. *Multivariate Behavioral Research*, 39(2), 303–328. doi:[10.1207/s15327906mbr3902](https://doi.org/10.1207/s15327906mbr3902)
- Lee, Y., Berry, C. M., & Gonzalez-Mulé, E. (2019). The importance of being humble: A meta-analysis and incremental validity analysis of the relationship between Honesty–Humility and job performance. *Journal of Applied Psychology*, 104(12), 1535–1546. doi:[10.1037/apl0000421](https://doi.org/10.1037/apl0000421)
- Lievens, F., Conway, J. M., & De Corte, W. (2008). The relative importance of task, citizenship and counterproductive performance to job performance ratings: Do rater source and team-based culture matter? *Journal of Occupational and Organizational Psychology*, 81(1), 11. doi:[10.1348/096317907X182971](https://doi.org/10.1348/096317907X182971)
- Lind, E. A., & Lissak, R. I. (1985). Apparent impropriety and procedural fairness judgments. *Journal of Experimental Social Psychology*, 21(1), 19–29. doi:[10.1016/0022-1031\(85\)90003-4](https://doi.org/10.1016/0022-1031(85)90003-4)

- Mackey, J. D., McAllister, C. P., Parker Ellen, B., III & Carson, J. E. (2021). A meta-analysis of interpersonal and organizational workplace deviance research. *Journal of Management*, 47(3), 597–622. doi:10.1177/0149206319862612
- MacKinnon, D. P., Fairchild, A. J., & Fritz, M. S. (2007). Mediation analysis. *Annual Review of Psychology*, 58, 593–614. doi:10.1146/annurev.psych.58.110405.085542
- MacKinnon, D. P., Krull, J. L., & Lockwood, C. M. (2000). Equivalence of the mediation, confounding and suppression effect. *Prevention Science*, 1(4), 173–181. doi:10.1023/A:1026595011371
- Mather, M., & Carstensen, L. L. (2005). Aging and motivated cognition: The positivity effect in attention and memory. *Trends in Cognitive Sciences*, 9(10), 496–502. doi:10.1016/j.tics.2005.08.005
- McCrae, R. R., & Costa, P. T. (1992). Personality trait structure as a human universal. *American Psychologist*, 52(5), 509–516. doi:10.1037/0003-066X.52.5.509
- Meyer, R. D., Dalal, R. S., & Hermida, R. (2010). A review and synthesis of situational strength in the organizational sciences. *Journal of Management*, 36(1), 121–140. doi:10.1177/0149206309349309
- Miller, D. J., Vachon, D. D., & Lynam, D. R. (2009). Neuroticism, negative affect, and negative affect instability: Establishing convergent and discriminant validity using ecological momentary assessment. *Personality and Individual Differences*, 47(8), 873–877. doi:10.1016/j.paid.2009.07.007
- Mitchell, M. S., & Ambrose, M. L. (2007). Abusive supervision and workplace deviance and the moderating effects of negative reciprocity beliefs. *Journal of Applied Psychology*, 92(4), 1159–1168. doi:10.1037/0021-9010.92.4.1159
- Mroczek, D. K., & Kolarz, C. M. (1998). The effect of age on positive and negative affect: A developmental perspective. *Journal of Personality and Social Psychology*, 75(5), 1333–1349. doi:10.1037/0022-3514.75.5.1333
- National Retail Foundation. (2018). NRF/University of Florida survey says retail 'shrink' decreased to \$46.8 billion in 2017. National Retail Foundation. <https://nrf.com/media-center/press-releases/nrfuniversity-florida-survey-says-retail-shrink-decreased-468-billion>
- Needleman, S. E. (2008). Businesses say theft by their workers is up. *The Wall Street Journal*. <https://www.wsj.com/articles/SB122896381748896999>
- Ng, T. W. H., & Feldman, D. C. (2008). The relationship of age to ten dimensions of job performance. *Journal of Applied Psychology*, 93(2), 392–423. doi:10.1037/0021-9010.93.2.392
- Ng, T. W. H., & Feldman, D. C. (2013). How do within-person changes due to aging affect job performance? *Journal of Vocational Behavior*, 83(3), 500–513. doi:10.1016/j.jvb.2013.07.007
- Ng, T. W. H., Lam, S. S. K., & Feldman, D. C. (2016). Organizational citizenship behavior and counterproductive work behavior: Do males and females differ? *Journal of Vocational Behavior*, 93, 11–32. doi:10.1016/j.jvb.2015.12.005
- Oh, I.-S., & Schmidt, F. L. (2021). Suggestions for improvement in psychometric corrections in meta-analysis and implications for research on worker age and aging. *Work, Aging and Retirement*, 7(3), 167–173. doi:10.1093/workar/waab001
- Ohly, S., Sonnentag, S., Niessen, C., & Zapf, D. (2010). Diary studies in organizational research: An introduction and some practical recommendations. *Journal of Personnel Psychology*, 9(2), 79–93. doi:10.1027/1866-5888/a000009
- Ones, D. S., Dilchert, S., Viswesvaran, C., & Judge, T. A. (2007). In support of personality assessment in organizational settings. *Journal of Applied Psychology*, 60(4), 995–1027. doi:10.1111/j.1744-6570.2007.00099.x
- Peng, Y., Ma, J., Zhang, W., & Jex, S. (2021). Older and less deviant? The paths through emotional labor and organizational cynicism. *Work, Aging and Retirement*, 7(1), 20–30. doi:10.1093/workar/waaa017
- Penningroth, S. L., & Scott, W. D. (2012). Age-related differences in goals: Testing predictions from selection, optimization, and compensation theory and socioemotional selectivity theory. *The International Journal of Aging and Human Development*, 74(2), 87–111. doi:10.2190/AG.74.2.a
- Pletzer, J. L. (2021). Why older employees engage in less counterproductive work behavior and in more organizational citizenship behavior: Examining the role of the HEXACO personality traits. *Personality and Individual Differences*, 173, 110550. doi:10.1016/j.paid.2020.110550
- Pletzer, J. L., Bentvelzen, M., Oostrom, J. K., & De Vries, R. E. (2019). A meta-analysis of the relations between personality and workplace deviance: Big Five versus HEXACO. *Journal of Vocational Behavior*, 112, 369–383. doi:10.1016/j.jvb.2019.04.004
- Pletzer, J. L., Oostrom, J. K., Bentvelzen, M., & De Vries, R. E. (2020). Comparing domain- and facet-level relations of the HEXACO personality model with workplace deviance: A meta-analysis. *Personality and Individual Differences*, 152, 109539. doi:10.1016/j.paid.2019.109539
- Pletzer, J. L., Oostrom, J., & De Vries, R. (2021). HEXACO personality and organizational citizenship behavior: A domain- and facet-level meta-analysis. *Human Performance*, 34(2), 1–22. doi:10.1080/08959285.2021.1891072
- Porath, C., & Pearson, C. (2013). The price of incivility. *Harvard Business Review*, 91(1-2), 114–121.
- Porter, L. W., & Steers, R. M. (1973). Organizational, work, and personal factors in employee turnover and absenteeism. *Psychological Bulletin*, 80(2), 151–176. doi:10.1037/h0034829
- Rhodes, S. R. (1983). Age-related differences in work attitudes and behavior: A review and conceptual analysis. *Psychological Bulletin*, 93(2), 328–367. doi:10.1037/0033-2909.93.2.328
- Roberts, B. W., Luo, J., Briley, D. A., Chow, P. I., Su, R., & Hill, P. L. (2017). A systematic review of personality trait change through intervention. *Psychological Bulletin*, 143(2), 117–141. doi:10.1037/bul0000088
- Roberts, B. W., & Mroczek, D. (2008). Personality trait change in adulthood. *Current Directions in Psychological Science*, 17(1), 31–35. doi:10.1111/j.1467-8721.2008.00543.x
- 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), 1–25. doi:10.1037/0033-2909.132.1.1
- Roberts, B. W., & Wood, D. (2006). Personality development in the context of the neo-socioanalytic model of personality. In D. K. Mroczek & T. D. Little (Eds.), *Handbook of personality development*. Lawrence Erlbaum Associates Publishers.
- 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(1), 166–184. doi:10.1016/j.jrp.2004.08.002
- Robinson, S. L., & Bennett, R. J. (1995). A typology of deviant workplace behaviors: A multidimensional scaling study. *Academy of Management Journal*, 38(2), 555–572. doi:10.2307/256693
- Rosseel, Y. (2012). lavaan: An R package for structural equation modeling. *Journal of Statistical Software*, 48(2), 1–36. doi:10.18637/jss.v048.i02
- Rotundo, M., & Sackett, P. R. (2002). The relative importance of task, citizenship, and counterproductive performance to global ratings of job performance: A policy-capturing approach. *Journal of Applied Psychology*, 87(1), 66–80. doi:10.1037/0021-9010.87.1.66
- Sackett, P. R. (2002). The structure of counterproductive work behaviors: Dimensionality and relationships with facets of job performance. *International Journal of Selection and Assessment*, 10(1-2), 5–11. doi:10.1111/1468-2389.00189
- Salgado, J. F. (2002). The Big Five personality dimensions and counterproductive behaviors. *International Journal of Selection and Assessment*, 10(1-2), 117–125. doi:10.1111/1468-2389.00198
- Sampson, R. J., & Laub, J. H. (1992). Crime and deviance in the life course. *Annual Review of Sociology*, 18(1), 63–84. doi:10.1146/annurev.so.18.080192.000431

- Scheibe, S., & Carstensen, L. L. (2010). Emotional aging: Recent findings and future trends. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 65B(2), 135–144. doi:10.1093/geronb/gbp132
- Scheibe, S., Sheppes, G., & Staudinger, U. M. (2015). Distract or re-appraise? Age-related differences in emotion-regulation choice. *Emotion*, 15(6), 677–681. doi:10.1037/a0039246
- Scheibe, S., & Zacher, H. (2013). A lifespan perspective on emotion regulation, stress, and well-being in the workplace. *Research in Occupational Stress and Well Being*, 11, 163–193. doi:10.1108/S1479-3555(2013)0000011010
- Schreiber, A., & Marcus, B. (2020). The place of the “Dark Triad” in general models of personality: Some meta-analytic clarification. *Psychological Bulletin*, 146(11), 1021–1041. doi:10.1037/bul0000299
- Shallcross, A. J., Ford, B. Q., Floerke, V. A., & Mauss, I. B. (2013). Getting better with age: The relationship between age, acceptance, and negative affect. *Journal of Personality and Social Psychology*, 104(4), 734–749. doi:10.1037/a0031180
- Soto, C. J., John, O. P., Gosling, S. D., & Potter, J. (2011). Age differences in personality traits from 10 to 65: Big Five domains and facets in a large cross-sectional sample. *Journal of Personality and Social Psychology*, 100(2), 330–348. doi:10.1037/a0021717
- Spector, P. E., & Fox, S. (2002). An emotion-centered model of voluntary work behavior: Some parallels between counterproductive work behavior and organizational citizenship behavior. *Human Resource Management Review*, 12(2), 1–24. doi:10.1016/S1053-4822(02)00049-9
- Stieger, M., Wepfer, S., Rügger, D., Kowatsch, T., Roberts, B. W., & Allemand, M. (2020). Becoming more conscientious or more open to experience? Effects of a two-week smartphone-based intervention for personality change. *European Journal of Personality*, 34(3), 345–366. doi:10.1002/per.2267
- Tasselli, S., Kilduff, M., & Landis, B. (2018). Personality change: Implications for organizational behavior. *Academy of Management Annals*, 12(2), 467–493. doi:10.5465/annals.2016.0008
- Terracciano, A., McCrae, R. R., Brant, L. J., & Costa, P. T. (2005). Hierarchical linear modeling analyses of NEO-PI-R scales in the Baltimore Longitudinal Study of Aging. *Psychology and Aging*, 20(3), 493–506. doi:10.1037/0882-7974.20.3.493
- Tett, R. P., & Burnett, D. D. (2003). A personality trait-based interactionist model of job performance. *Journal of Applied Psychology*, 88(3), 500–517. doi:10.1037/0021-9010.88.3.500
- Tett, R. P., Hundley, N. A., & Christiansen, N. D. (2017). Meta-analysis and the myth of generalizability. *Industrial and Organizational Psychology: Perspectives on Science and Practice*, 10(3), 421–456. doi:10.1017/iop.2017.26
- Thielmann, I., Moshagen, M., Hilbig, B., & Zettler, I. (2021). On the comparability of basic personality models: Meta-analytic correspondence, scope, and orthogonality of the Big Five and HEXACO dimensions. *European Journal of Personality*, 1–95. doi:10.1177/08902070211026793
- Thrasher, G. R., Krenn, D. K., & Marchiondo, L. A. (2020). Are counter-productive workplace behaviors and workplace deviance parallel constructs? A meta-analytic test of a common practice. *Occupational Health Science*, 4(3), 239–270. doi:10.1007/s41542-020-00065-2
- van der Linden, D., te Nijenhuis, J., & Bakker, A. B. (2010). The General Factor of Personality: A meta-analysis of Big Five intercorrelations and a criterion-related validity study. *Journal of Research in Personality*, 44(3), 315–327. doi:10.1016/j.jrp.2010.03.003
- Van Katwyk, P. T., Fox, S., Spector, P. E., & Kelloway, E. K. (2000). Using the Job-Related Affective Well-being Scale (JAWS) to investigate affective responses to work stressors. *Journal of Occupational Health Psychology*, 5(2), 219–230. doi:10.1037//1076-8998.5.2.219
- Viechtbauer, W. (2010). Conducting meta-analyses in R with the metafor package. *Journal of Statistical Software*, 36(3), 1–48. doi:10.1103/PhysRevB.91.121108
- Viswesvaran, C., & Ones, D. S. (1995). Theory testing: Combining psychometric meta-analysis and structural equation modeling. *Personnel Psychology*, 48(4), 865–885. doi:10.1111/j.1744-6570.1995.tb01784.x
- Warr, P. (2008). Work values: Some demographic and cultural correlates. *Journal of Occupational and Organizational Psychology*, 81, 751–775. doi:10.1348/096317907X263638
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54(6), 1063–1070. doi:10.1037/0022-3514.54.6.1063
- Welbourne, T. M., Johnson, D. E., & Erez, A. (1998). The role-based performance scale: Validity analysis of a theory-based measure. *Academy of Management Journal*, 41(5), 540–555. doi:10.2307/256941
- Whitener, E. M. (1990). Confusion of confidence intervals and credibility intervals in meta-analysis. *Journal of Applied Psychology*, 75(3), 315–321. doi:10.1037/0021-9010.75.3.315
- Wiernik, B. M., & Dahlke, J. A. (2020). Obtaining unbiased results in meta-analysis: The importance of correcting for statistical artefacts. *Advances in Methods and Practices in Psychological Science*, 3(1), 94–123. doi:10.1177/2515245919885611
- Yu, J. J., Downes, P. E., Carter, K. M., & O’Boyle, E. H. (2016). The problem of effect size heterogeneity in meta-analytic structural equation modeling. *Journal of Applied Psychology*, 101(10), 1457–1473. doi:10.1037/apl0000141
- Zijlstra, F. R. H., Roe, R. A., Leonora, A. B., & Krediet, I. (1999). Temporal factors in mental work: Effects of interrupted activities. *Journal of Occupational and Organizational Psychology*, 72(2), 163–185. doi:10.1348/096317999166581