Personality and Intelligence: A Meta-Analysis

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Abstract

This study provides a comprehensive assessment of the associations of personality and intelligence. It presents a meta-analysis (N = 162,636, k = 272) of domain, facet, and item-level correlations between personality and intelligence (general, fluid, and crystallized) for the major Big Five and HEXACO hierarchical frameworks of personality: NEO PI-R, Big Five Aspect Scales (BFAS), BFI-2, and HEXACO PI R. It provides the first meta-analysis of personality and intelligence to comprehensively examine (a) facet-level correlations for these hierarchical frameworks of personality, (b) item-level correlations, (c) domain- and facet-level predictive models. Age and sex differences in personality and intelligence, and study-level moderators, are also examined. The study was complemented by four of our own unpublished datasets (N = 26,813) which were used to assess the ability of item-level models to provide generalizable prediction. Results showed that openness (ρ = .20) and neuroticism (ρ = -.09) were the strongest Big Five correlates of intelligence and that openness correlated more with crystallized than fluid intelligence. At the facet-level, traits related to intellectual engagement and unconventionality were more strongly related to intelligence than other openness facets, and sociability and orderliness were negatively correlated with intelligence. Facets of gregariousness and excitement seeking had stronger negative correlations, and openness to aesthetics, feelings, and values had stronger positive correlations with crystallized than fluid intelligence. Facets explained more than twice the variance of domains. Overall, the results provide the most nuanced and robust evidence to date of the relationship between personality and intelligence.

Keywords: general mental ability, Big Five personality, intelligence, cognitive ability, narrow traits

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Public Significance Statement

This meta-analysis provides a comprehensive examination of the relationship between personality traits and general intelligence. It is the first to meta-analytically compare how intelligence relates to domains, facets, and items on the major hierarchical measures of personality. In so doing, it provides a robust empirical basis for informing discussion of the reciprocal pathways through which personality and intelligence interact.

Introduction

Personality and intelligence represent two of the most fundamental domains of individual differences (Deary, 2012; John & Srivastava, 1999; Neisser et al., 1996; Ozer & Benet-Martinez, 2006; Roberts et al., 2007; Roberts & Yoon, 2021). Personality traits capture the stable patterns in how people think, feel, and behave, whereas intelligence represents a general cognitive capacity that manifests most prominently as the common factor of performance on a diverse set of cognitive tests (Carroll, 1993; Jensen, 1998; Johnson et al., 2004; Spearman, 1904). Both personality and intelligence are influenced by genetic factors (Deary et al., 2006; Neisser et al., 1996; Plomin & Von Stumm, 2018; Tucker-Drob et al., 2013) and show substantial stability (Deary, 2012; Sanchez-Roige et al., 2018), yet both also develop and change over the life course (Ackerman, 2014; Roberts & Yoon, 2021). Personality and intelligence also predict major life outcomes including academic outcomes (Poropat, 2009), vocational pursuits (Ackerman & Heggestad, 1997; Barrick et al., 2003; Pässler et al., 2015), job performance (Schmidt & Hunter, 1998), economic prosperity (Ceci & Williams, 1997), psychopathology (Castellanos-Ryan et al., 2016), and subjective well-being (Anglim, Horwood, et al., 2020; Steel et al., 2008).

Given the central importance of personality and intelligence to understanding human behavior, researchers have long sought to understand how they are related (Ackerman & Heggestad, 1997; Cattell, 1963; Chamorro-Premuzic & Furnham, 2014; DeYoung, 2020; DeYoung et al., 2005; Humphreys & Revelle, 1984; Stanek, 2014; Von Stumm & Ackerman, 2013; Wechsler, 1975). Indeed, various theoretical models have been proposed for how personality and intelligence may reciprocally influence each other and how these relationships vary based on whether the focus is on the capacity to learn (i.e., fluid intelligence) or acquired knowledge (i.e., crystallized intelligence). Although a growing body of research suggests that intelligence and personality traits are related in nuanced ways, a comprehensive and detailed mapping of these relationships is needed to provide the empirical basis to evaluate and constrain the propositions of such developmental theories.

Beginning in the 1990s, most research on personality and intelligence has focused on the Big Five traits (Goldberg, 1981, 1990; McCrae & Costa, 1987) of neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. Emerging from decades of research, the widespread adoption of the Big Five has provided a powerful means of synthesizing research on personality correlates (for reviews see Anglim & O'Connor, 2019; John & Srivastava, 1999; Roberts & Yoon, 2021). Nonetheless, the Big Five was intended only to represent one broad level of the personality hierarchy. Indeed, the major frameworks of personality incorporate a range of lower-level traits, including the NEO model with 30 facets (Costa & McCrae, 1992, 2008), the BFI-2 with 15 facets (Soto & John, 2017), and the

intermediate-level Big Five Aspect Scales with 10 aspects (DeYoung et al., 2007). In parallel, the six-factor HEXACO model—which reconfigures the Big Five, adds an honesty-humility factor, and has 25 facets—has become a popular alternative to the Big Five (Ashton et al., 2004; Lee & Ashton, 2004, 2008). There is also emerging interest in examining item-level correlates of personality to better understand why traits correlate with criteria (Elleman et al., 2020; Mõttus et al., 2017; Mõttus et al., 2020; Revelle & Condon, 2015). Similarly, although general intelligence represents the large general factor that emerges from the correlations between a diverse battery of cognitive ability measures (Carroll, 1993; Jensen, 1998; Johnson et al., 2004; Spearman, 1904), cognitive ability is also multifaceted (e.g., Cattell-Horn-Carroll model, McGrew, 2009; Schneider & McGrew, 2012). In particular, the distinction between two broad categories of abilities that have been labelled fluid intelligence (see also non-verbal, abstract reasoning, and performance IQ) and crystallized intelligence (see also verbal ability) is often invoked in theoretical discussions regarding the relationships between personality and intelligence.

Overall, a growing body of research suggests that the relationship between personality and intelligence can best be understood at the facet- rather than domain-level (e.g., DeYoung et al., 2005; Kretzschmar et al., 2018; Moutafi et al., 2003; Rammstedt et al., 2018). To consolidate this rapidly growing research literature, we sought to undertake the most comprehensive meta-analytic investigation of the relations of intelligence with personality to date. In so doing, we aimed to obtain robust estimates of domain-, facet-, and item-level correlates of general, fluid, and crystallized intelligence. Although many hierarchical personality frameworks and measures exist, in this investigation, we focused on the four contemporary hierarchical measures of personality identified above (i.e., NEO, BFAS, BFI-2, and HEXACO) because these are widely used in academic research. Indeed, focusing on a specific set of instruments enables us to obtain the first truly precise meta-analytic estimates of facet-level differences in intelligence correlations, using widely-accepted and consistent facet structures. We complemented this analysis with an examination of third-variables and study moderators that might explain the obtained relationships, and regression models to assess overlap of personality and intelligence at different levels of the personality hierarchy.

Theoretical Connections between Personality and Intelligence

To explain the observed associations between personality and intelligence, numerous theories have been proposed (i.e., Ackerman, 2018; Cattell, 1963; Chamorro-Premuzic & Furnham, 2004; DeYoung, 2020; Rammstedt et al., 2018; Von Stumm & Ackerman, 2013; Ziegler et al., 2012). In particular, Openness has received the most theoretical attention given that it is the Big Five trait with the largest correlation with intelligence and appears to correlate more with crystallized than fluid intelligence (Ackerman & Goff, 1994; Ackerman & Heggestad, 1997; Gignac et al., 2004; MacCann et al., 2017; Reeve et al., 2006; Von Stumm et al., 2009b; Ziegler et al., 2012). Several researchers have proposed that traits related to openness to experience, such as typical intellectual engagement (Goff & Ackerman, 1992) and need for cognition (Cacioppo & Petty, 1982), cause people to invest more effort in intellectual pursuits. Such traits are captured in many hierarchical measures of personality as facets of openness (e.g., openness to ideas, intellectual curiosity,

inquisitiveness). Building on Cattell's (1963) Investment Theory, intellectual effort is theorized to direct the application of one's fluid intelligence and lead to the acquisition of knowledge and greater crystallized intelligence. Ackerman's PPIK Theory (i.e., intelligence-as-Process, Personality, Interests, and intelligence-as-Knowledge) represents a particularly well-developed articulation of these ideas (Ackerman, 1996; Von Stumm & Ackerman, 2013).

Equally, most theories, including PPIK, posit that intelligence causes people to take greater enjoyment from intellectual pursuits. Put simply, people tend to like what they are good at (Ackerman & Rolfhus, 1999; Denissen et al., 2007; Rolfhus & Ackerman, 1996). Interests are related to comprehensibility and optimal complexity (Silvia, 2008), making intellectual activities more engaging for those who are more intelligent. These propositions are also consistent with various theories of person-environment fit (Nye et al., 2012); in particular, society rewards people who focus on their strengths with social and economic rewards. More generally, although interests routinely lead to the allocation of effort and the development of domain-specific skills and knowledge (Ackerman & Kanfer, 2020; Ericsson et al., 1993), increasing a trait as broad as intelligence is a much more challenging undertaking. Gains observed in more modest interventions aimed at increasing intelligence, like brain-training, rarely show sustained benefits or generalization outside the specific skills practiced in the training (Simons et al., 2016). Instead, raising intelligence appears to require dramatic structural changes to lifestyles, especially during childhood (Pietschnig & Voracek, 2015; Ritchie & Tucker-Drob, 2018).

A variation on the idea that intelligence causes intellectual interests is that intelligence should be conceptualized as a component of personality. For instance, DeYoung (2020) proposed that intelligence should be understood as a component of openness (see also, Connelly et al., 2014; Von Stumm & Ackerman, 2013). DeYoung (2020) noted how the overlap between intelligence and personality as constructs is often obscured by the different measurement approaches that are typically adopted. For instance, meta-analytic research indicates that self-reported and ability-based intelligence assessments only correlate around $r = .33$ (Freund & Kasten, 2012). Embodying this perspective, DeYoung et al. (2007) developed the BFAS measure of the Big Five which includes an Intellect scale as an aspect of openness with items measuring self-rated intellect (see also Goldberg, 1992). Nonetheless, the dominant perspective captured in the NEO, HEXACO, and BFI-2 measures is that intelligence is best conceptualized as a separate construct, and that hierarchical representations of personality should avoid self-rated assessments of intelligence. From this perspective, intellectual interests become the most direct interface between intelligence and the facets of openness. Importantly, these debates help to clarify the difference between construct and measurement, and encourage thinking about how intellectual and other abilities may be expressed in personality traits.

It is also theoretically important to understand how personality–intelligence correlations vary across openness facets and across fluid and crystallized intelligence. In particular, if intellectual investment causes crystallized intelligence to develop, we might expect to see stronger correlations for crystallized intelligence with facets assessing intellectual interests. In contrast, if being stronger in crystallized intelligence leads to more artistic and literary interests we might expect to see stronger correlations

between crystallized intelligence and more aesthetic and emotional facets of openness.

In addition to openness, meta-analyses have also highlighted neuroticism as a negative correlate of intelligence. Some researchers argue that neuroticism causes test anxiety which in turn leads observed intelligence scores to underestimate latent ability (Cassady & Johnson, 2002; Hembree, 1988). Such an explanation emphasizes measurement and methodological processes, but there are plausible reasons for why this correlation may reflect substantive processes. In particular, the deficits model of test anxiety (Sommer & Arendasy, 2014) suggests that although neuroticism does contribute to test anxiety, the causal direction is mostly from low ability to test anxiety. Furthermore, most research on personality and intelligence showing a negative correlation between neuroticism and intelligence is conducted in confidential, low-stakes research settings, not in high-stakes settings where anxiety is more likely to induce under-performance in some people. There are also a range of substantive processes which might explain the correlation. In addition to the biological processes that may lead to cognitive deficits and elevated neuroticism (Kliegel & Zimprich, 2005), it is also possible that intelligence is a resource that can make coping with some aspects of life less stressful (Moutafi et al., 2003).

Next, given the fundamental importance of conscientiousness for academic and occupational achievement, the fact that conscientiousness tends to be uncorrelated with intelligence would seem to challenge the investment hypothesis embedded in many theories of intellectual development. One idea is that task-related effort (e.g., self-discipline, deliberation) associated with conscientiousness may be used to compensate for lower intelligence in some domains (DeYoung, 2020; Moutafi et al., 2006). Less intelligent people may also have a greater preference for order, structure, and routine (Moutafi et al., 2006).

Finally, extraversion tends to not correlate with general intelligence, although correlations seem to vary across particular facets of extraversion. There is a body of research showing various performance differences such as extraverts doing better on timed tasks and introverts doing better on tasks requiring reflection (e.g., Rawlings & Carnie, 1989). Wolf and Ackerman (2005) also found a tendency for traits related to dominance to be positively related and traits related to sociability to be negatively related to intelligence.

Altogether, a common theme is that the most theoretically important relationships between personality and intelligence likely occur at the facet-level. Such relationships are obscured when focusing only on major personality dimensions. Understanding the pattern of facet-level correlations and how they vary across fluid and crystallized intelligence provides an important basis for disentangling the complexity of the various causal mechanisms that have been proposed.

Empirical Research on Personality–Intelligence Associations

To date, in addition to a large primary research literature, there have been three main meta-analyses of personality–intelligence relations (i.e., Ackerman & Heggestad, 1997; Judge et al., 2007; Stanek, 2014). Ackerman and Heggestad (1997) provided an early seminal meta-analysis of personality, interests, and intelligence that largely preceded the widespread adoption of dedicated Big Five measures. For instance, correlations of general intelligence with agreeableness, conscientiousness, and openness were based on just 3 to 6 studies. Subsequently, Judge et al. (2007)

provided a meta-analysis of correlations between the Big Five and general intelligence ($38 \leq k \leq 61$; $11{,}190 \leq n \leq 21{,}602$) as part of a study focused on the prediction of self-efficacy and job performance. They found reliability-corrected correlations with intelligence of -.09 (neuroticism), .02 (extraversion), .22 (openness), .00 (agreeableness), and -.04 (conscientiousness). More recently, Stanek (2014) completed a doctoral thesis which provided a meta-analysis of the relations of personality and intelligence using a custom-built taxonomy for categorizing measures of cognitive ability and both broad and narrow personality traits. Other meta-analyses, narrower in focus, have examined relationships between intelligence and extraversion (Wolf & Ackerman, 2005), intelligence and intellect (Von Stumm & Ackerman, 2013), intelligence and openness (Woo et al., 2014), self-rated and objectively scored intelligence (Freund & Kasten, 2012), and whether impression management in high-stakes assessment situations (or simulations thereof) moderates the relationship between intelligence and Big Five personality (Schilling et al., 2021). Finally, beyond the meta-analytic literature, there is an emerging body of primary studies examining how intelligence is related to personality facets of the Big Five (e.g., Ashton et al., 2000; DeYoung et al., 2005; DeYoung et al., 2009; Goff & Ackerman, 1992; Kretzschmar et al., 2018; Moutafi et al., 2003, 2006; Rammstedt et al., 2018; Wainwright et al., 2008) and HEXACO personality frameworks (de Vries et al., 2021; Dunlop et al., 2017; Fiori, 2015; Kajonius, 2014; MacCann et al., 2017; Oh et al., 2014).

In summary, despite a large and expanding body of primary research and some important initial meta-analytic work, a fine-grained and meta-analytically robust understanding of the relationship between personality and intelligence at the facet-level has not yet been realized. The meta-analysis by Ackerman and Heggestad (1997) predated the wide-spread adoption of the Big Five, and the meta-analysis by Judge et al. (2007) was never intended to be a comprehensive examination of the topic. Most importantly, neither meta-analysis investigated facet-level relations. The impressive doctoral thesis of Stanek (2014) provided an assessment of facet-level correlates, however in doing so, it grouped together narrow traits from a very diverse set of personality measures (e.g., 16PF, CPI, Hogan, Eysenck, 15FQ, test anxiety scales, etc.). Although such an approach grants access to data from a wider array of personality measures, it poses similar challenges to those that arose in the early days of the Big Five, where researchers were forced to manually categorize measures that predated the Big Five rather than only combining truly equivalent measures (Block, 1995). Whilst such an approach is understandable when primary data sources are limited, it necessarily results in the combining of measures that differ in potentially important ways. In particular, it is theoretically important to get precise estimates of how correlations between personality and intelligence vary across facets and between fluid and crystallized intelligence.

The approach we adopt in this study is to meta-analyze, separately, relations of intelligence with four of the most widely used hierarchical personality frameworks as operationalized through the NEO PI-R (5 domains, 30 facets), the Big Five Aspect Scales (BFAS; 5 domains, 10 aspects), the BFI-2 (5 domains, 15 facets), and the HEXACO PI R (6 domains, 25 facets). Indeed, the proliferation of research using these measures, particularly over the last 10 years, provides the wealth of primary

studies necessary to allow a more precise and definitive assessment of how personality relates to intelligence. Furthermore, most studies that provide facet-level measurement using one of these frameworks have administered the full measure. Thus, by identifying and combining these studies, it becomes possible to undertake robust meta-analytic comparisons of domain- and facet-level correlations with intelligence. The widespread use of these measures combined with an emerging culture of data sharing (Atherton et al., 2021) also provides the basis for conducting the first large-scale item-level meta-analysis. Even though facet-level correlations may be the most theoretically relevant, examining correlations of intelligence with personality *items* may further help to explain differences in correlations across measures. It may also reveal whether correlations with intelligence generalize across items from a common facet or if the patterns of item-level correlations are more idiosyncratic, possibly suggesting that there might be value in examining relations of intelligence with personality nuances. Finally, we also sought to improve the precision with which differences in correlations between fluid and crystallized intelligence were estimated. By comparing these correlations across only studies that had measured both fluid and crystallized intelligence, we sought to better control for extraneous factors that might confound this comparison (e.g., the nature of personality scales, the degree to which openness is intellect-laden, the reliability of measures, the context of data collection, the degree of range restriction, etc.).

Research Question 1: What are the meta-analytic correlations of the *domains, facets, and items* of the NEO, BFAS, BFI-2, and HEXACO personality frameworks with general, fluid, and crystallized intelligence?

Third-Variables that may Induce Personality–Intelligence Associations: Age and Sex

Beyond reciprocal theories, so-called 'third-variables' have also been proposed to explain observed correlations (Gottfredson & Deary, 2004; Johansen et al., 2013; Moutafi et al., 2003). For instance, various factors that have causal effects on both personality and intelligence such as sex, age, education, race, culture, and health (Hunt, 2010; Neisser et al., 1996) may induce zero-order correlations between personality and intelligence. Notably, age and sex represent two highly salient factors. Sex differences in personality are fairly substantial with composites of facets yielding differences of around one standard deviation (e.g., Lee & Ashton, 2020). In general, males tend to score lower on agreeableness (especially tender mindedness) and neuroticism (Costa et al., 2001; Hyde, 2014), and higher on openness facets related to intellectual curiosity, unconventionality (e.g., Costa et al., 2001; Lee & Ashton, 2020), and intellect (Syzmanowicz & Furnham, 2011).

Literature on sex differences in cognitive ability has a long and contentious history (Hyde, 1990; Neisser et al., 1996). Surprisingly, although there have been meta-analyses of spatial ability (Voyer et al., 1995), verbal ability (Hyde & Linn, 1988), verbal working memory (Voyer et al., 2021), visual-spatial working memory (Voyer et al., 2017), Raven's progressive matrices (Lynn & Irwing, 2004), mathematical achievement (Hyde et al., 1990; Lindberg et al., 2010), and academic grades (Reilly et al., 2015; Voyer & Voyer, 2014), we are not aware of a meta-analysis of sex differences in general intelligence. From the existing literature it is well established that sex differences vary across component abilities with some tests favoring males and others favoring females (Hyde, 2005; Neisser et al., 1996; Nisbett

et al., 2012) and that males show greater variance than females in many abilities (Johnson et al., 2008). Although Lynn's developmental theory (Lynn, 1999), which is not without criticism, proposed that small differences favoring males emerge in late adolescence and plateau in early adulthood at approximately 2 to 5 IQ points, most reviews conclude that there are no sex differences in general intelligence between males and females.

With respect to age, there is evidence that neuroticism declines over adulthood whilst honesty-humility, conscientiousness, agreeableness, and some aspects of extraversion increase (Ashton & Lee, 2016; Roberts & Yoon, 2021). Indicators of crystallized intelligence including verbal ability and general knowledge tend to rise until mid-adulthood and remain fairly stable, only declining at very old age, whilst measures of fluid intelligence tend to decline from around the mid-twenties (Roberts & Yoon, 2021; Verhaeghen & Salthouse, 1997).

Importantly, there has never been a meta-analytic investigation that has examined the extent to which age and sex differences could potentially explain the relationship between personality and intelligence. Sex differences in neuroticism and intellectual aspects of openness align and thus may partially explain observed correlations. Similarly, age-related declines in both neuroticism and intelligence may reduce the observed association between neuroticism and intelligence. More generally, the comprehensiveness of the current meta-analysis also contributes evidence regarding the relationship of age and sex with intelligence (general, fluid, and crystallized) and personality (domains and facets).

Research Question 2: To what extent do age and sex differences in personality and intelligence explain the relationship between personality and intelligence?

Study-Level Moderators

Theory and research also suggest that the relationship between personality traits and intelligence vary based on study characteristics (e.g., Rammstedt et al., 2016). Several potential moderators include methodological factors related to the validity of measurement, the nature of measurement, and range restriction. Examining moderators is important for assessing assumptions about the extent to which empirically obtained correlations are attenuated by measurement and sampling limitations. Other moderators allow for the examination of how the relationship between personality and intelligence varies in different populations. In this investigation, we focus on five potential moderating factors: personality measurement, intelligence measurement, the measurement context (high-stakes versus low-stakes), the mean age of the sample, and the gender composition of the sample.

First, the nature of the personality measurement should impact the relationship between personality and intelligence. The reliability of the measure as indexed by internal consistency and test-retest correlations should influence obtained correlations. We note, however, that we are focusing on very well validated measures that have at least 10 items per domain, and thus would anticipate that reliability will be generally high and not a major source of variation between studies. Of greater relevance is the emphasis of a given personality measure. Whereas the NEO and HEXACO inventories avoid items describing self-rated intellect, the BFAS includes a narrow trait of openness called Intellect which includes many items that reflect self-rated intellect. As such, BFAS openness is likely to correlate more with intelligence than do

other measures of openness.

Second, the nature of general intelligence measurement should influence the correlation between personality and intelligence. In general, cognitive ability scores can be broadly decomposed into variance associated with general intelligence, component abilities, the specific test, and measurement error. In particular, validity of measurement depends on not just test-retest reliability but also the extent to which the latent score is aligned with general intelligence. This is usually aided by administering a broad range of cognitive tests and taking an appropriately weighted composite. Such an approach is best embodied in 'gold standard' measures, such as the WAIS, and is approximated in studies that include large batteries of measures drawing from both verbal and nonverbal domains. In contrast, studies that use measures of intelligence that sample from fewer domains, have component tests lower in reliability, and that have fewer component tests are expected to show weaker relationships of personality and intelligence.

Third, the relationship between personality and intelligence is expected to be most accurate when conscientious and effortful measurement is obtained. Mostly, it is difficult to assess the extent to which personality and ability measures were administered in appropriate and controlled conditions in any given study. Nonetheless, intelligent people may be better at identifying socially desirable responses and they may be more effective at engaging in impression management in settings where it may be rewarded or encouraged (e.g., personnel selection or simulations thereof). A meta-analysis by Schilling et al. (2021) found that correlations in real- and experimentally-simulated selection situations were slightly higher for conscientiousness (r = .07), agreeableness (r = .06), and extraversion (r = .06) than has been obtained in past meta-analyses, although correlations for openness (r = .14) and neuroticism (r = -.10) were of either a smaller or similar magnitude to past meta-analyses. Nonetheless, some of these associations were amplified in studies of simulated job applicant settings where participants are more likely to see impression management as a task requirement. There may also be other administrative aspects to data collection in applied settings that lead to greater noise in measurement related to the diverse testing contexts.

Fourth, the age of the sample may also be relevant to assessing the relationship between personality and intelligence. In particular, older adults are more likely to be experiencing mild cognitive impairment, strokes, and dementia, that are associated with depression (Curtis et al., 2015; Korczyn & Halperin, 2009). These factors could potentially lead to stronger relationships between intelligence and neuroticism.

Finally, it is interesting to consider whether the gender composition of the sample influences the relationship between personality and intelligence. If the correlation between neuroticism and intelligence is driven by sex differences, then this correlation should decline in samples composed mostly of all males or all females. If, as seems more likely, the correlation reflects substantive processes, then the correlation should be equally strong for males and females.

Research Question 3: Is the relationship between personality and intelligence moderated by (i) the type of personality measure, (ii) the type of intelligence measure, (iii) whether measures were obtained in a high-stakes or low-stakes context, (iv) the age of the sample, and (v) the gender composition of the sample?

Overlap of Intelligence and Personality at Domain, Facet, and Item-Levels

Beyond examining bivariate associations, there is value in assessing the extent to which personality and intelligence overlap at different levels of the personality hierarchy. In particular, although many of the facet-level correlations between personality and intelligence are small, the combined effect of these smaller relationships can represent something larger (Götz et al., 2022). Furthermore, showing that facets provide substantial incremental prediction is relevant to justifying the complexity of investigating personality–intelligence associations at the facet level. There is now a large body of primary research where intelligence and hierarchical measures of personality have been measured, and a subset of this literature has examined regression models comparing domain and facet prediction (e.g., DeYoung et al., 2005; Kretzschmar et al., 2018; Moutafi et al., 2003; Rammstedt et al., 2018). There is also theoretical interest in understanding the conditions under which facets provide more, or less, incremental prediction (Anglim & Grant, 2014; Ashton et al., 2014; Christiansen & Robie, 2011; Paunonen, 1998; Salgado et al., 2013). For instance, a common perspective is that broad traits predict broad criteria and narrow traits predict narrow criteria. This perspective has been articulated in discussions of the bandwidth-fidelity dilemma (Cronbach & Gleser, 1957) and Brunswick Symmetry (Ackerman, 2018; Kretzschmar et al., 2018; Rammstedt et al., 2018), but theorizing has mostly moved beyond the available empirical evidence in this area.

There are several reasons to expect that personality facets will, together, provide substantial incremental prediction of intelligence. First, a key feature of incremental prediction is that it occurs when facet–criterion correlations vary substantially within domains. As discussed earlier, this variation appears to be highly likely in the case of intelligence. Second, although, aside from the BFAS, the measures of personality we study here were written with an explicit goal to exclude intelligence from their conceptual focus, a close reading of personality items can highlight how cognitive ability might nonetheless inform the expression of personality (e.g., items capturing social skills, stress management, creative ability, and leadership). Third, both intelligence and personality are fundamental characteristics of people that are influenced by major social, cultural, and demographic factors, and have causal effects on thoughts, feelings, and behavior. As such, there is likely to be a broad and diverse range of correlations of facets with intelligence, but it does not follow that these facets must all share a common factor.

Altogether, meta-analytic research on incremental facet-prediction is in its infancy. This is partly because included studies need to provide a complete facet-level correlation matrix, and publication of these matrices is rare. In particular, the absence of a full facet-level correlation matrix precludes the accurate modeling of multicollinearity between personality facets, and can lead to inaccurate and exaggerated estimates of incremental prediction (for discussion, see Anglim & Grant, 2014; Cheung & Chan, 2005; Sheng et al., 2016). Fortunately, in recent years, a sufficient literature has arisen where complete hierarchical measures of personality have been administered, combined with a growing culture of data sharing. Taking advantage of these trends, the current meta-analysis investigates the following research question:

Research Question 4: To what extent do personality facets provide incremental

prediction over and above personality domains?

There is also now an emerging interest in examining the ability of personality nuances, typically operationalized as personality items, to predict criteria (Mõttus et al., 2017; Mõttus et al., 2019; Speer et al., 2021; Stewart et al., 2022). For instance Mõttus and Rozgonjuk (2019), in a sample of 22,931, obtained a multiple correlation predicting age from personality domains, facets, and items that increased from .28 (Big Five domains) to .44 (30 facets) to .65 (300 items). In the context of intelligence, there are several reasons to expect item-level prediction to be strong. For instance, just as items within a trait may vary in the degree to which they are endorsed by older versus younger people (Mõttus & Rozgonjuk, 2019), items may vary in how they capture aspects of personality expression supported by cognitive ability. For example, some items may assess intellectual engagement or intellectual interest more than others. Some items may also better index social, cultural, and demographic covariates that are related to intelligence; for example, "I like attending the ballet" may relate to aesthetic interests but also to socio-economic status.

Given the large number of items in hierarchical personality assessments (e.g., 100 or 200 for HEXACO PI R; 240 for NEO PI-R), investigation of item-level prediction requires very large sample sizes (10,000 or more). Furthermore, predictive models should be developed in a training set and evaluated in a validation set. Although there exists some early exploratory research with small samples (e.g., Gough, 1953), to our knowledge, there has not yet been a large-sample examination of the capacity of personality items to predict intelligence. Similarly, another unanswered question is whether such models generalize beyond the original sample characteristics and testing context (e.g., high-stakes versus low-stakes testing, different countries, university students versus community samples, translations, etc.). For example, how well does a model that predicts intelligence from items derived from a sample of professional workers from one country perform when used to predict intelligence in an international sample of students, or in a sample of applicants to firefighter positions? As part of our investigation, we examined our own unpublished data of over 20,000 participants who had completed the HEXACO-PI-R and measures of intelligence. We then evaluated the ability of this item-level model to predict intelligence in three other large datasets that we collected, as well as another that was obtained as part of the meta-analytic process.

Research Question 5: To what extent do personality items provide generalizable incremental prediction over and above personality facets?

Summary

Altogether, the current meta-analysis sought to comprehensively assess the relationship between personality and intelligence and substantially advance the study of these associations. Providing up-to-date estimates of domain-level correlations using four well-used personality measures provides a general context for understanding personality–intelligence relations at the higher level. However, the facet-level correlations we estimate provide the most important contribution in clarifying the nature of the overlap between personality and intelligence, advancing theoretical understanding of how the two influence one another. Indeed, comparing facet-level correlates across crystallized and fluid intelligence is also necessary for assessing various theoretical models of how personality and intelligence develop and

reciprocally influence each other, and represents another major contribution of this work. We also examined a set of study-level moderators, shedding new light onto the methodological conditions that may attenuate observed correlations. In particular, examination of age and sex covariates also helps to assess the weight that should be given to third-variable explanations for observed relationships. Our predictive models further highlight the relative importance of different levels of the personality hierarchy for understanding the overlap between personality and intelligence. And finally, for completeness, we present numerous additional analyses in the online supplement including an examination of quadratic relationships and of correlations with the general factor of personality. Altogether, a strength of our approach is that we sought and obtained *raw* data, or failing that, complete correlation matrices for a large number of the studies in the meta-analysis. This approach supported a range of novel analyses including estimating item-level correlations, study-level regression models, and estimating personality–intelligence associations covarying for age and sex. As such, we sought to apply several innovations in meta-analytic approach to provide unique insights into the relationship between personality and intelligence.

Method

Transparency and Openness

Data, analysis scripts, and study materials are available on the OSF at https://osf.io/72zp3 (Anglim et al., 2022). Aside from the raw data that was shared with us by other researchers, all data in this investigation is shared. Where available or where computable, complete correlation matrices between study variables are also provided in the online repository. The meta-analysis in this study is based on analysis of correlation matrices rather than raw data, and the online scripts for these analyses are fully reproducible.

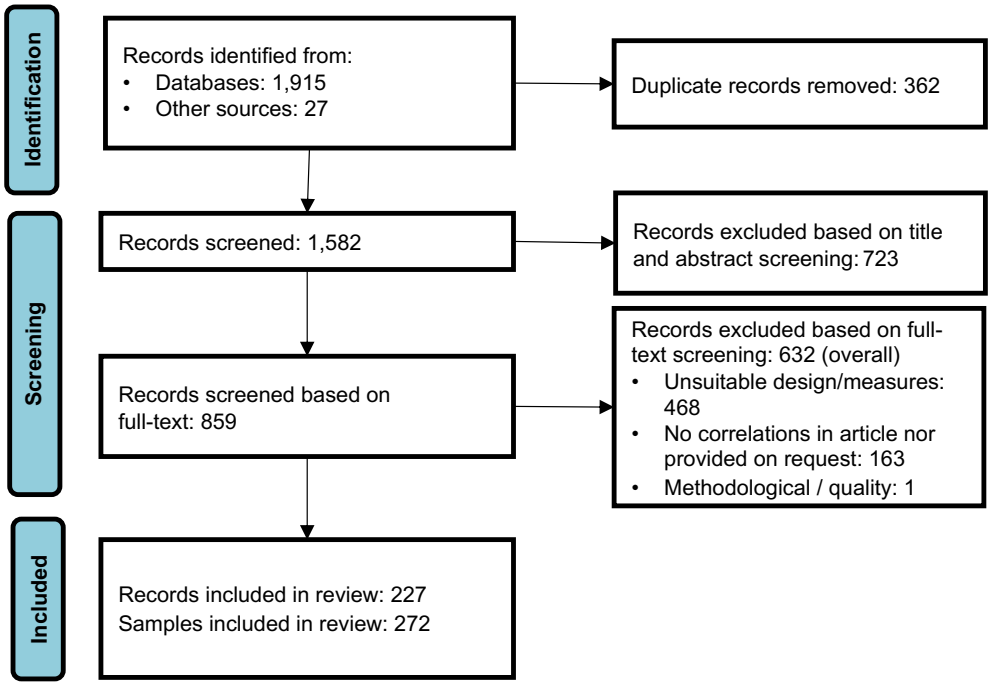
Literature Search

The meta-analysis sought to identify all studies with correlations of the domains or facets of NEO, BFAS, BFI-2, and HEXACO personality with measures of general intelligence or component scales from which general intelligence could be derived. First, the primary strategy involved conducting searches in Scopus and PsycInfo in April 2021. We searched the databases for articles and dissertations that satisfied two sets of criteria: one set for personality and one for intelligence. The personality-search criteria required the article to (a) include a relevant personality keyword in the abstract (e.g., "NEO", "BFAS", "Big Five Aspects", "BFI-2", "HEXACO, "honesty-humility", "facets"), or (b) cite one of the standard references that accompany descriptions of the NEO, BFAS, BFI-2 or HEXACO (i.e., test manuals and canonical references; Scopus specific), or (c) the Tests and Measures field, in PsycInfo, indicated that the NEO, BFAS, BFI-2, or HEXACO was measured. The intelligence-search criteria required the article to (a) include an intelligence-related keyword (e.g., "intelligence", "general mental ability", "cognitive ability", "test battery", "Wonderlic", "WAIS", "ICAR") or (b) the Tests and Measures field, in PsycInfo, indicated that intelligence was measured. Second, we identified several past meta-analyses and narrative reviews and searched them for additional references (i.e., Ackerman & Heggestad, 1997; Curtis et al., 2015; DeYoung, 2020; Judge et al., 2007; Lee et al., 2019; Mammadov, 2021; Rikoon et al., 2016; Stanek, 2014). Third, a small

number of additional studies were identified by other researchers in response to our request for additional information on their studies. These additional studies generally did not appear in the primary database search because they were either unpublished studies or the published study did not mention that the relevant variables were measured. Fourth, we also included four of our own unpublished datasets.

Figure 1 outlines the flow of articles through the phases of the meta-analysis. After merging the above sources and removing duplicates, the combined dataset consisted of 1,582 articles. Following title and abstract screening, the full text was examined for 859 (54.3%) articles. Of these, 193 articles reported one or more relevant correlations, and a further 198 articles measured relevant personality and intelligence variables but did not report relevant correlations. The corresponding authors of each article (i.e., the 193 reporting correlations and the 198 not reporting correlations) were sent an email inviting them to provide additional information. We requested either the correlation matrix or the anonymized raw data for personality, intelligence, age, and sex. Our preferred format was item-level personality data, scale-level intelligence data including measures related to crystallized and fluid intelligence, and age and sex. If an article provided some relevant data (e.g., correlations for domains but not facets), we enquired about the availability of more data. Although pairwise correlations between personality and intelligence permitted estimation of meta-analytic correlations, full correlation matrices permitted regression analysis, and scale-level raw data allowed for the examination of quadratic effects. In addition, some studies that did report correlations did not report on age, sex, facets, domains, or subtests. When a working corresponding author's email could not be found, another author or the thesis supervisor was emailed. Several studies that initially appeared to meet inclusion criteria were ultimately excluded (see exclusion criteria below). The final database consisted of 272 samples from 227 articles with a combined sample size of 162,636. Literature search, correlation extraction, study feature extraction, and data analysis were performed by the first author in consultation with the other authors, and checked by the fifth author.

Figure 1
Flow of Reports into the Review



Eligibility Criteria and Data Coding Procedures

Several criteria needed to be satisfied for inclusion in the study. First, the study needed to include one or more scales from a relevant self-report personality measure, which were (a) NEO (e.g., NEO-FFI, NEO PI-R, NEO PI 1985, NEO PI 3, NEO FFI3) (Costa & McCrae, 2008; McCrae et al., 2005), (b) 100-item BFAS (DeYoung et al., 2007), (c) 60-item BFI-2 (Soto & John, 2017), or (d) HEXACO (i.e., 60, 100, and 200 item versions of the HEXACO-PI-R and their variants) (Ashton & Lee, 2009; Lee & Ashton, 2018). Official versions and their translations were included. Unofficial versions (e.g., IPIP HEXACO and IPIP NEO measures) were excluded (e.g., DeFalco et al., 2019) because (a) they were very rarely used, (b) while highly correlated with their official equivalents they differed substantially from the originals in terms of item content, (c) they often employed self-rated ability items in the openness domain, whereas the official NEO and HEXACO measures do not, and (d) in general, the meta-analysis was executed with the goal of focusing on four well-used frameworks, thus avoiding any ambiguities with respect to manually classifying 'similar' facets. Short forms (i.e., 10 and 15 item versions) of the BFI-2 were also excluded.

Second, to be included, the measure of general intelligence in the study needed to be objectively measured and not self- or other-report (e.g., Judges, 2015). The measure also needed to be sufficiently broad to capture general intelligence. This broad measurement was typically achieved in the primary studies by including (a) a battery of discrete measures that sample from at least two broad ability domains (e.g., verbal, abstract reasoning, numeric, spatial ability, etc.), (b) having a single measure (e.g., WAIS, Culture Fair, Wonderlic, ICAR, Stanford-Binet, etc.) with items or

subtests that draw from a range of cognitive ability domains, or (c) a measure that loads highly on general intelligence such as Raven's Progressive Matrices (Gignac, 2015).

Third, for inclusion, correlations between personality traits and intelligence needed to be available (i.e., reported in the paper, provided by the author, or derived from data). If only correlations based on latent variables or standardized regression coefficients were available, the study was excluded (e.g., Faura, 2016). Fourth, if a sample was included in multiple papers, the study with the more complete set of correlations and larger sample size was retained. Fifth, if data were available, then correlations and sample statistics were derived from the data rather than from the paper. Sixth, although almost all studies were cross-sectional, in the few longitudinal studies, we typically used the correlations of the wave with the largest sample size. However, in cases where raw data were available, we sampled the first wave where a participant provided complete personality and intelligence data.

Finally, for a study to be included in the comparison of crystallized and fluid intelligence, it needed to include measures of both abilities. Studies explicitly labelled crystallized and fluid intelligence were included. In addition, crystallized intelligence measures also included vocabulary, WAIS subscales such as similarities and information, and verbal reasoning ability. Fluid intelligence measures included abstract reasoning, matrix reasoning, performance IQ, block design, culture fair tests, and related scales.

Further detail about the ways that samples overlap across analyses is described in the online supplement.

Data Extraction

For each study, we extracted the following study features: sample size, personality measure, number of items per personality facet, whether the full personality measure was administered, whether a full set of personality correlations is available, proportion female, mean age, standard deviation of age, country of the sample, type of sample (workers, students, community, clinical, other), whether participants were financially compensated (e.g., Mechanical Turk), whether personality assessment was high-stakes [e.g., personnel selection; note that role play and instructed faking samples were excluded, cf. Schilling et al. (2021)], the source of the correlations (i.e., from paper, from author, from data), reference details, and additional notes. Because we sought to perform meta-analytic regression analyses (Sheng et al., 2016), we sought to obtain complete correlation matrices, including correlations between personality traits. To further identify data entry errors, reporting errors by original authors, problematic studies (i.e., studies that on closer inspection did not meet inclusion criteria or had an overall pattern of results that suggested obvious issues with data validity [as noted in online supplement]), we examined absolute z-scores greater than 2.5 for each correlation for a given pair of variables (e.g., extraversion and intelligence, neuroticism and intelligence, etc.). Besides correcting data-entry and coding errors, and excluding problematic studies, outliers were retained in all analyses.

When raw data was available, we computed correlations, sample size and demographic features directly from the data rather than extracting information from the associated publication. In some cases, intelligence, crystallized intelligence, and

fluid intelligence were obtained as a composite of component measures (i.e., subtests) which involved taking the sum of z-score standardized subtest scores. Personality items were standardized to a 1 to 5 scale and, where necessary, domain and facets were scored as the item mean after relevant reversal and domains were scored as the mean of relevant facets. The OSF repository includes a spreadsheet for each raw dataset explaining how composite variables were derived and how original data variable names were mapped to a common data dictionary. Listwise deletion was performed over personality and intelligence scale scores.

Additional Primary Studies

This study also incorporates four new primary datasets labelled (a) Industry, (b) MOOC, (c) Student, and (d) Firefighter (see online supplement for full details). Each sample provided a measure of general intelligence and a measure of HEXACO personality. The **Industry Sample** (n = 20,939; 59% female, mean age = 38.6 years, SD = 10.9) comprised applicants to various jobs in various sectors in Australia, who completed the 200-item HEXACO-PI-R and ACER measures of verbal, numerical, and abstract reasoning ability. The **MOOC Sample** (n = 4,286; 69% female; age M = 34.7 years, SD = 10.1 years) were an international sample (131 countries, especially US, India, UK, Australia, and Canada) of psychology students who completed the HEXACO-100 and the 16-item ICAR (Condon & Revelle, 2014) as part of an online Coursera Massive Open Online Course (MOOC) run by an Australian university. The **Student Sample** comprised 647 psychology students (83% Female, 17% Male, 1% Other; Age M = 28.61, SD = 9.37) enrolled in an Australian university who completed 100-item HEXACO PI R, 50-item IPIP NEO, and the 16-item ICAR. The **Firefighter Sample** (n = 941; mean age = 29.42, SD = 5.76; 8% Male) completed the 200-item HEXACO PI R and a battery of ability measures as part of application to Firefighter academy positions in Australia. Some data from the Firefighter Sample (Djurre et al., 2021) and the Student Sample (Wood et al., 2021) have been previously reported. The four datasets were also used in conjunction with a pre-existing Dutch sample (de Vries et al., 2021) to assess item-level predictive models. The **Dutch Sample** was obtained as part of the previously mentioned requests for data and consisted of 1,330 (75% female; age M = 20.64, SD = 2.84) Dutch-speaking university students who completed the official Dutch translation of the HEXACO-208 and a 24-item version of the ICAR.

Data Analytic Approach

Meta-analytic correlations were estimated using a random-effects model with the **`metafor`** package in *R* (Viechtbauer, 2010). The standard deviation of the estimated population correlations (i.e., τ) was estimated using restricted maximum-likelihood estimation. Meta-analytic estimates were obtained using both observed correlations and correlations corrected for measurement error. Reliability estimates for personality traits for a given measure and number of items per scale were generally obtained from test manuals and related materials. The mean estimated reliability was 0.85 (SD = 0.05) for personality domains and 0.77 (SD = 0.07) for personality facets. Reliability of ability measures were derived from Stanek (2014) with .88 for general intelligence, 0.87 for verbal fluid intelligence, and 0.78 for nonverbal crystallized intelligence. The online supplement provides details for alphas and their sources. Where a study reported correlations separately for fluid and crystallized intelligence,

raw data was not available, and the correlation between personality and general intelligence was not reported, the correlation between personality and general intelligence was calculated as the average of the component correlations. The study also made substantial use of the **lavaan** (Rosseel, 2012) and **psych** (Revelle, 2017) packages.

Consistent with past meta-analyses (e.g., Ackerman & Heggestad, 1997; Judge et al., 2007; Stanek, 2014), we did not perform a correction for range restriction (Sackett & Yang, 2000; Thorndike, 1949). Sample variance in intelligence and personality is influenced by the broad range of sampling strategies used in studies (e.g., university students, general population, Mechanical Turk, workers, older adults, etc.). Even though some samples show less variance on intelligence (e.g., university students, workers in a particular occupation), this reduction in variance in intelligence is likely small (see Sackett & Ostgaard, 1994). In general, the information required to perform corrections to estimate the correlations in a hypothetical representative population is rarely available and would require making various subjective assumptions. Instead, we sought to model range restriction in the context of study moderators.

Several strategies were employed to compare the magnitude of personality–intelligence correlations across traits. The statistical significance of a difference between two correlations depends on (a) the size of the two correlations, (b) the standard errors of the two correlations, (c) the extent to which the sample comes from the same set of studies, (d) if the correlations come from a common set of studies, the correlation between the two traits being compared, and (e) the significance threshold. When comparing correlations that are derived from different sets of studies, differences in correlations greater than approximately 2.8, 3.6, and 4.7 standard errors are significant at $\alpha = .05$, .01, and .001, respectively (Revelle, 2017).

In order to statistically compare correlations drawn from overlapping sets of studies (e.g., the correlation of extraversion and intelligence to the correlation of openness and intelligence), we conducted multilevel meta-analysis using the **metafor** package in *R* (Viechtbauer, 2010). A vast majority of studies provided correlations between personality traits, which enabled computation of study-specific variance-covariance matrices of sampling error (Olkin & Finn, 1995). Where correlations between traits were not available, the average personality-intercorrelation matrices were used. Further details of the rationale behind our approach are provided in the online supplement, along with a table of key pairwise comparisons of correlations. The results of multilevel modelling presented in the online supplement also provided a robustness check of the univariate meta-analytic estimates reported in the body. In particular, there is extensive discussion in the meta-analytic literature of the implications of analyzing dependent effect sizes (Cheung, 2014, 2019; Hedges et al., 2010; Scammacca et al., 2014). Of note, however, we found that the meta-analytic point estimates and standard errors of correlations from the multilevel model were almost identical to the univariate estimates reported in the body of this manuscript (i.e., the majority were the same to 2 decimal places). This is consistent with the fact that although most samples in this meta-analysis contributed many correlations to the meta-analysis (e.g., a full set of correlations between the Big Five and intelligence), each meta-analytic estimate (e.g., openness and intelligence) analyzes a set of

correlations, where each correlation comes from a different sample. Accordingly, modelling the dependency is most relevant when seeking to compare correlations to one another.

Supplementary analyses examining quadratic relationships between personality and intelligence (Ackerman, 2018; Austin et al., 1997; Austin et al., 2002; Eysenck & White, 1964; Major et al., 2014) and the correlation between intelligence and the general factor of personality (Dunkel, 2013; Dunkel et al., 2014; Irwing et al., 2012; MacCann et al., 2017; Schermer & Vernon, 2010) were also conducted, and are presented in the online supplement. In summary, we found minimal evidence of quadratic relationships, and that the correlation between intelligence and the general factor of personality was r = .06 (95% CI [.04, .08], k = 76, n = 55,169).

Meta-analytic correlation matrices between personality, intelligence (general, crystallized, and fluid) and sex are also presented in the online supplement for the Big Five, and separately for the NEO, BFAS, BFI-2, and HEXACO. Given the large number of complete facet and domain-level correlation matrices, these meta-analytic correlation matrices may be useful for researchers seeking to understand domain- and facet-level correlations of popular measures. Of interest, mean correlations between facets within a given domain were r = .40 (NEO), r = .46 (BFAS), r = .57 (BFI2) and r = .40 (HEXACO). Mean within-domain facet-level intercorrelations for neuroticism, extraversion, openness, agreeableness, and conscientiousness respectively were as follows: .50, .37, .30, .35, .51 (NEO); .60, .46, .34, .45, .44 (BFAS); and .67, .52, .51, .54, .61 (BFI-2). Although there is variation across measures, there was a trend by which openness facets had weaker facet intercorrelations and neuroticism had larger facet intercorrelations. Mean facet intercorrelations for HEXACO were .35 (honesty-humility), .34 (emotionality), .47 (extraversion), .44 (agreeableness), .39 (conscientiousness), .40 (openness).

Results

Study Characteristics

Details for each included study are tabled in the online supplement (sorted by author and personality measure); additional study details are provided in the OSF repository. Table 1 presents a summary of study characteristics. Understandably, given its long history, the most commonly used personality measure was the NEO, followed by the HEXACO, BFAS, and the recently-developed BFI-2. Overall, the number of relevant studies grew dramatically in recent years with only 15 articles pre-2000, and more than half the included studies published since 2010. The mean and standard deviation of the age of samples is consistent with the most common sample types: high school students, university students, workers, job applicants, targeted older adult samples, paid online panels, and community samples. In general, only a small number of studies showed standard deviations for age greater than 10 years, which would be consistent with the standard deviation of the adult population in most developed countries. The sex composition of the studies included a relatively even mix of balanced (defined as 40 to 59% female), male-majority, and female-majority samples. Contrary to our expectations, females were not more likely to be research participants. Whilst there were fewer male-majority studies than female-majority studies, the male-majority studies tended to have larger sample sizes than the female-majority studies. In particular, small-scale studies of psychology students generally

had female-majority samples, whereas large-sample studies were more likely to have either balanced samples (e.g., large well-funded studies seeking representative samples or workers in gender-balanced occupations) or male-majority samples (e.g., workers in traditionally male-majority domains including management and the military).

Table 1

Combined Sample Size and Number of Studies by Study Characteristic

Category	*n*	*k*
Entire Sample	162,636	272
Personality Framework		
NEO	121,289	217
BFAS	6,683	23
BFI-2	1,848	6
HEXACO	32,816	26
Publication Year		
Pre–2000	3,389	15
2000–2004	8,552	25
2005–2009	22,553	48
2010–2014	35,885	76
2015–April, 2021	92,257	108
Sample Size		
Under 100	2,605	37
100–199	12,884	87
200–299	11,026	46
300–499	17,452	44
500–999	23,617	35
1000 or more	95,052	23
Percentage Female		
0 to 19	30,565	23
20 to 39	26,576	31
40 to 59	71,466	99
60 to 79	25,047	84
80 to 100	4,170	19
Mean Age of Sample		
Under 18	28,289	41
18–29	47,131	138
30-59	71,678	56
60 or over	3,380	8
SD Age of Sample		
Under 2.0	39,654	77
2.0–4.9	16,981	70
5.0–9.9	27,048	41
10 or more	38,044	27
Data Type		
Pairwise correlations	27,392	46
Correlation matrix	79,294	145
Mixed	210	2
Data	55,740	79
Verbal/Fluid intelligence		
Not available	100,719	189
Available	61,917	83

Note. Mixed data type involved correlation matrices for domains and pairwise correlations for facets. Some samples did not provide age or sex information.

Personality and Intelligence Correlations

Various meta-analytic correlations were estimated to assess the relationship between personality traits and intelligence (RQ 1). Observed correlations are presented in the manuscript and reliability-corrected correlations are presented in the online supplement. Big Five correlations are presented in Table 2 with the Big Five analysis being based on correlations from all three eligible Big Five measures (i.e., NEO, BFAS, and BFI-2). Domain and facet-level correlations are presented for each measure in Table 3 (NEO), Table 4 (BFAS), Table 5 (BFI-2), and Table 6 (HEXACO). Meta-analytic correlations between personality items and intelligence are presented in the online supplement for the NEO PI R 240, BFAS 100, BFI-2 60, and HEXACO 200 items. Finally, Table 7 reports the meta-analytic correlations between Big Five domains and NEO facets with measures of crystallized (*Gc*) and fluid (*Gf*) intelligence (see online supplement for BFAS and HEXACO). Because all of the relevant studies included measures of both *Gf* and *Gc*, we were also able to perform a meta-analysis of the difference between trait–*Gf* and trait–*Gc* correlations (*Gc* minus *Gf*). Standard errors for the difference between these dependent correlations in each study were obtained using a modified version of the **`paired.r`** function in the **`psych`** package (Revelle, 2017). Calculating standard errors for the difference between dependent correlations requires knowing the correlation between the common variables (i.e., *Gf*-*Gc*); we used study-level correlations between *Gf* and *Gc* where available or, where not available, we used the average correlation observed across the studies (i.e., $r = .41$).

Table 2

Meta-Analytic Correlations between Big Five Personality and General Intelligence

					95% CI					
Trait	*k*	*N*	$\bar{r}$	(*SE*)	*LL*	*UL*	$\tau_{\bar{r}}$	(*SE*)	*Q*	I^2
Neuroticism	203	116,515	-.08***	(.007)	-.09	-.06	.08	(.031)	843.11***	78.15
Extraversion	198	110,673	-.01*	(.006)	-.03	.00	.06	(.027)	622.43***	68.97
Openness	209	112,737	.17***	(.008)	.15	.18	.10	(.038)	1366.74***	85.73
Agreeableness	196	109,984	.00	(.007)	-.01	.02	.08	(.032)	738.92***	77.87
Conscientiousness	214	120,885	-.02*	(.007)	-.03	.00	.08	(.031)	854.10***	77.15

Note. Includes studies measuring the big five with NEO, BFAS, and BFI-2. *k* is the number of studies. $\bar{r}$ is mean observed correlation estimated from random-effects model and inverse-variance weighting. $\tau_{\bar{r}}$ is the estimated standard deviations of true correlations. Significance tests of pairwise differences between correlations and reliability-corrected correlations are presented in the online supplement.

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

Consistent with the meta-analyses of Judge et al. (2007) and Stanek (2014), openness was the strongest Big Five correlate of intelligence, and neuroticism was the only other notable Big Five correlate. Our results in combination with those of Stanek (2014) also suggest that the typical empirically obtained relationship between openness and intelligence is closer to .20 than .30. While Ackerman and Heggestad (1997) obtained a reliability-corrected correlation of .33, this result was based on only 3 studies, whereas our meta-analysis ($\rho = 20$) and that of Stanek (2014) ($\rho = .23$) were each based on over 200 studies. Finally, the standard deviations of the correlations between personality and intelligence were moderate (e.g., .10 for openness) and consistent with the presence of study-level moderators.

In examining the facet-level correlations in Tables 4 to 7, there was clear

evidence that they varied substantially within domains and often varied across crystallized and fluid intelligence (Table 7). These patterns are described below with emphasis on the NEO facets given that this measure contributed the largest number of studies.

Table 3

Meta-Analytic Correlations of Domains and Facets of NEO Personality with General Intelligence

					95% CI					
Trait	*k*	*N*	$\bar{r}$	(*SE*)	*LL*	*UL*	$\tau_{\bar{r}}$	(*SE*)	*Q*	I^2
NEO Domains										
Neuroticism	186	110,579	**-.08*****	(.007)	-.09	-.06	.08	(.033)	827.51***	80.26
Extraversion	181	104,737	-.01	(.006)	-.03	.00	.06	(.028)	589.28***	70.20
Openness	188	106,052	**.17*****	(.008)	.15	.18	.10	(.039)	1271.90***	86.41
Agreeableness	179	104,048	.00	(.007)	-.01	.02	.08	(.033)	679.70***	77.87
Conscientiousness	197	114,949	-.02	(.007)	-.03	.00	.08	(.032)	827.68***	77.15
NEO Facets										
N1. Anxiety	28	30,026	**-.09*****	(.015)	-.12	-.06	.06	(.041)	101.29***	74.89
N2. Angry hostility	28	30,026	-.06***	(.012)	-.08	-.04	.03	(.029)	46.97**	49.12
N3. Depression	29	30,192	-.06**	(.019)	-.10	-.02	.09	(.053)	132.00***	85.81
N4. Self-consciousness	28	30,026	-.03	(.017)	-.06	.01	.07	(.044)	91.78***	78.45
N5. Impulsiveness	31	31,308	-.02	(.014)	-.05	.01	.06	(.039)	112.30***	72.10
N6. Vulnerability	29	30,192	-.06**	(.020)	-.10	-.02	.09	(.055)	179.55***	87.09
E1. Warmth	28	30,779	-.05***	(.012)	-.07	-.02	.04	(.032)	47.95**	58.09
E2. Gregariousness	28	30,779	**-.08*****	(.012)	-.10	-.06	.04	(.032)	77.20***	58.60
E3. Assertiveness	29	30,945	.04**	(.016)	.01	.07	.07	(.044)	121.28***	79.07
E4. Activity	28	30,779	.00	(.012)	-.02	.03	.04	(.032)	58.67***	59.47
E5. Excitement seeking	29	31,260	-.01	(.017)	-.04	.03	.07	(.046)	122.44***	81.80
E6. Positive emotions	28	30,779	.01	(.014)	-.02	.03	.05	(.037)	73.32***	70.32
O1. Fantasy	35	32,731	**.13*****	(.015)	.10	.16	.06	(.041)	120.47***	75.61
O2. Aesthetics	35	32,731	.06***	(.016)	.03	.09	.07	(.044)	159.43***	78.79
O3. Feelings	35	32,731	.06***	(.016)	.03	.09	.07	(.046)	123.05***	80.83
O4. Actions	35	32,731	**.07*****	(.013)	.05	.10	.05	(.035)	65.65***	65.17
O5. Ideas	36	33,135	**.25*****	(.015)	.22	.28	.07	(.044)	180.90***	81.45
O6. Values	35	32,731	**.16*****	(.018)	.13	.20	.08	(.050)	211.66***	84.74
A1. Trust	26	28,635	.04***	(.006)	.02	.05	.00	(.012)	26.40	0.42
A2. Straightforwardness	26	28,635	-.01	(.016)	-.04	.02	.06	(.042)	67.47***	74.31
A3. Altruism	26	28,635	**-.07*****	(.013)	-.09	-.04	.04	(.032)	46.52**	55.32
A4. Compliance	26	28,635	.00	(.010)	-.02	.02	.02	(.023)	35.49	29.56
A5. Modesty	26	28,635	**-.08*****	(.015)	-.10	-.05	.05	(.038)	62.87***	67.92
A6. Tender-mindedness	26	28,635	-.05***	(.013)	-.08	-.03	.04	(.033)	46.68**	58.23
C1. Competence	30	32,006	.05**	(.017)	.01	.08	.08	(.048)	146.31***	83.14
C2. Order	30	32,006	-.04*	(.018)	-.08	-.01	.08	(.048)	118.81***	83.57
C3. Dutifulness	30	32,006	-.01	(.013)	-.04	.01	.05	(.035)	69.36***	65.17
C4. Achievement striving	31	32,172	-.02	(.014)	-.05	.01	.06	(.039)	98.25***	72.51
C5. Self-discipline	33	34,262	-.04*	(.015)	-.07	-.01	.06	(.042)	108.76***	78.60
C6. Deliberation	31	32,487	-.01	(.015)	-.04	.02	.06	(.042)	100.13***	77.00

Note. Absolute correlations greater than or equal to .07 are bolded.

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

Openness. Consistent with the close connection between intellectual interests and intellectual ability, the openness facets with the largest correlations concerned intellectual interests (i.e., openness to ideas, intellectual curiosity, inquisitiveness) and self-rated intellect (i.e., BFAS Intellect). The second strongest correlate related to having liberal and unconventional views (i.e., NEO openness to values and HEXACO unconventionality). In contrast, facets relating to openness to feelings and aesthetics still correlated positively with intelligence, but the relationships were weaker. Although openness correlated significantly more strongly with crystallized

intelligence than it did with fluid intelligence, the differential pattern varied considerably across the facets of openness. Consistent with crystallized intelligence being related to artistic and literary interests, openness to feelings, values, and aesthetics all correlated more strongly with crystallized intelligence than with fluid intelligence. Contrary to predictions implied by investment theories of intelligence, openness to ideas (i.e., having intellectual interests) correlated similarly with crystallized and fluid intelligence.

Table 4

Meta-Analytic Correlations of Domains and Aspects of Big Five Aspects (BFAS) Personality with General Intelligence

					95% CI					
Trait	*k*	*N*	$\bar{r}$	(*SE*)	*LL*	*UL*	$\tau_{\bar{r}}$	(*SE*)	*Q*	I^2
BFAS Domains										
Neuroticism	13	4,459	**-.07*****	(.015)	-.10	-.04	.00	(.032)	10.93	0.02
Extraversion	13	4,459	-.03	(.025)	-.08	.02	.07	(.057)	30.79**	60.91
Openness	16	4,994	**.25*****	(.024)	.20	.30	.07	(.057)	43.71***	65.21
Agreeableness	13	4,459	.06**	(.024)	.02	.11	.06	(.055)	27.24**	57.21
Conscientiousness	13	4,459	-.06**	(.019)	-.10	-.02	.04	(.043)	16.41	33.57
BFAS Aspects										
N1. Volatility	10	3,044	**-.09****	(.033)	-.16	-.03	.08	(.072)	23.37**	67.13
N2. Withdrawal	10	3,044	-.04	(.024)	-.08	.01	.04	(.051)	14.16	36.2
E1. Enthusiasm	10	3,044	-.02	(.031)	-.08	.04	.07	(.066)	23.57**	59.98
E2. Assertiveness	10	3,044	-.01	(.027)	-.06	.05	.06	(.059)	17.84*	50.12
O1. Intellect	20	5,311	**.26*****	(.027)	.21	.32	.11	(.070)	82.27***	77.54
O2. Openness to Experience	19	5,070	**.13*****	(.021)	.09	.17	.06	(.052)	38.05**	52.59
A1. Compassion	10	3,044	**.10****	(.038)	.03	.18	.10	(.082)	38.66***	75.29
A2. Politeness	10	3,044	.03	(.026)	-.02	.08	.05	(.055)	15.43	43.8
C1. Industriousness	10	3,044	-.06*	(.027)	-.12	-.01	.06	(.057)	16.41	47.35
C2. Orderliness	10	3,044	**-.07****	(.022)	-.11	-.03	.03	(.045)	10.84	22.84

Note. The canonical variable name for BFAS Openness is "Openness/Intellect".
* $p < .05$, ** $p < .01$, *** $p < .001$.

Neuroticism. For the neuroticism domain, facets of anxiety, angry/hostility, depression, and vulnerability showed stronger negative correlations with intelligence than did self-consciousness and impulsiveness. Although HEXACO emotionality differs from Big Five neuroticism, the two facets most similar to Big Five neuroticism—fearfulness and anxiety— correlated more strongly (and negatively) with intelligence than the other two emotionality facets. In contrast to openness, neuroticism correlated slightly more strongly with fluid than it did with crystallized intelligence, although the difference was not statistically significant.

Conscientiousness. In the conscientiousness domain, a desire for organization (i.e., order, routine, structure) showed a consistent negative correlation with intelligence across measures. In contrast, the associations of intelligence with most other conscientiousness facets were close to zero. The small positive correlation for the competence facet of the NEO is consistent with some of the items reflecting self-rated achievement in domains of life that correlate with intelligence.

Extraversion. For extraversion, gregariousness and warmth exhibited negative correlations with intelligence, whereas assertiveness had positive correlations and the other facets had correlations close to zero. Extraversion showed a small negative correlation with crystallized intelligence but a correlation close to zero with fluid intelligence. This overall pattern was largely driven by the extraversion facet of excitement seeking and to a lesser extent gregariousness. That is, crystallized

intelligence is related to being less sociable and engaging in fewer activities characterized by sensation seeking and risk taking.

Table 5

Meta-Analytic Correlations of Domains and Facets of BFI-2 Personality with General Intelligence

					95% CI					
Trait	*k*	*N*	$\bar{r}$	(*SE*)	*LL*	*UL*	$\tau_{\bar{r}}$	(*SE*)	*Q*	I^2
BFI-2 Domains										
Neuroticism	4	1,477	**-.09*****	(.026)	-.14	-.04	.00	(.047)	3.38	0.14
Extraversion	4	1,477	-.05	(.026)	-.10	.00	.00	(.047)	1.74	0.01
Openness	5	1,691	**.17*****	(.030)	.11	.23	.04	(.056)	6.38	36.35
Agreeableness	4	1,477	.03	(.045)	-.06	.11	.07	(.082)	9.64*	66.96
Conscientiousness	4	1,477	-.03	(.035)	-.10	.03	.05	(.063)	5.35	44.79
BFI-2 Facets										
N1. Anxiety	4	1,477	-.08	(.055)	-.18	.03	.10	(.099)	13.45**	77.83
N2. Depression	4	1,477	-.06*	(.026)	-.11	-.01	.00	(.047)	3.14	0.04
N3. Emotional Volatility	4	1,477	**-.10*****	(.026)	-.15	-.05	.00	(.047)	1.54	0.05
E1. Sociability	4	1,477	**-.08****	(.026)	-.13	-.03	.00	(.047)	1.08	0.05
E2. Assertiveness	4	1,477	.01	(.033)	-.05	.08	.04	(.060)	4.84	37.52
E3. Energy Level	4	1,477	-.04	(.031)	-.10	.02	.03	(.056)	4.00	28.07
O1. Intellectual Curiosity	5	1,634	**.21*****	(.030)	.15	.27	.04	(.057)	5.95	37.6
O2. Aesthetic Sensitivity	5	1,634	**.12*****	(.028)	.07	.17	.03	(.052)	4.77	20.34
O3. Creative Imagination	5	1,634	**.14*****	(.024)	.09	.19	.00	(.045)	1.50	0.02
A1. Compassion	4	1,477	.01	(.051)	-.09	.11	.09	(.092)	12.47**	73.96
A2. Respectfulness	4	1,477	.04	(.051)	-.06	.14	.09	(.092)	12.23**	73.88
A3. Trust	4	1,477	.02	(.026)	-.03	.07	.00	(.047)	2.16	0.08
C1. Organization	4	1,477	-.07	(.052)	-.17	.04	.09	(.095)	13.18**	75.59
C2. Productiveness	4	1,477	-.06*	(.026)	-.11	-.01	.00	(.047)	2.61	0.02
C3. Responsibility	4	1,477	.05*	(.026)	.00	.10	.00	(.047)	0.05	0.08

Note. The canonical variable name for BFI-2 Neuroticism is "negative emotionality" and for openness is "open-mindedness".

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

Agreeableness / Honesty-Humility. Facet-level correlations for agreeableness were generally small and less consistent across measures. For NEO agreeableness, altruism, modesty, and tender-mindedness each showed small negative correlations with intelligence, whereas the remaining agreeableness facets showed near-zero correlations. For HEXACO honesty-humility, correlations were very close to zero, with only greed avoidance showing a small positive association.

Item-level correlations. Item-level correlations, presented in a spreadsheet contained in the online supplement, generally reinforced the patterns observed at the facet-level but also highlighted a few subtle ways that items may infuse facet-level correlations. First, items that concerned abilities in other domains such as creativity, assertiveness, and competence in life often correlated positively with intelligence. Second, items related to cleaning and keeping things tidy were some of the stronger (and negative) correlations with intelligence. Third, neuroticism- and related-items concerned with an inability to maintain composure in stressful situations (e.g., easily stressed, overwhelmed, and fearful) showed stronger negative correlations with intelligence than those simply concerned with being tense, worried, or depressed.

In summary, in addressing Research Question 1, the results show that the relationship between personality and intelligence can be best understood at the facet-level. Correlations at the facet-level varied in magnitude, suggesting that the strength

of some of the personality-intelligence relationships could be masked by the more modest domain-level correlations. This result was replicated across each of the major personality frameworks—the NEO, BFAS, BFI-2, and HEXACO.

Table 6

Meta-Analytic Correlations between HEXACO Personality and General Intelligence

					95% CI					
Trait	*k*	*N*	$\bar{r}$	(*SE*)	*LL*	*UL*	$\tau_{\bar{r}}$	(*SE*)	*Q*	I^2
HEXACO Domains										
Honesty-humility	23	32,165	.02	(.014)	-.01	.04	.04	(.036)	42.09**	59.56
Emotionality	20	31,677	**-.07*****	(.006)	-.08	-.06	.00	(.012)	24.80	0.04
Extraversion	21	31,894	-.02	(.016)	-.05	.01	.05	(.039)	52.31***	67.69
Agreeableness	20	31,677	.00	(.015)	-.03	.03	.04	(.037)	73.68***	64.48
Conscientiousness	21	31,894	.00	(.013)	-.02	.03	.03	(.031)	47.94***	49.00
Openness	22	32,180	**.10*****	(.016)	.07	.14	.05	(.041)	58.28***	71.72
HEXACO Facets										
H1: Sincerity	12	29,846	.00	(.015)	-.03	.03	.03	(.031)	21.61*	56.11
H2: Fairness	12	29,846	.01	(.011)	-.01	.03	.02	(.022)	19.59	29.13
H3: Greed-Avoidance	12	29,846	.06**	(.018)	.02	.09	.04	(.038)	31.55***	70.61
H4: Modesty	12	29,846	.01	(.020)	-.03	.05	.05	(.045)	28.60**	79.08
E1: Fearfulness	11	29,659	**-.09*****	(.020)	-.13	-.05	.05	(.042)	50.28***	77.32
E2: Anxiety	11	29,659	-.06***	(.006)	-.07	-.05	.00	(.013)	3.11	0.43
E3: Dependence	11	29,659	-.05*	(.022)	-.10	-.01	.06	(.047)	46.44***	81.82
E4: Sentimentality	11	29,659	-.04**	(.015)	-.07	-.01	.03	(.031)	22.43*	58.05
X1: Social Self-Esteem	11	29,659	.03*	(.015)	.00	.06	.03	(.031)	18.43*	58.13
X2: Social Boldness	11	29,659	.02	(.020)	-.02	.06	.05	(.043)	55.59***	78.18
X3: Sociability	11	29,659	-.06**	(.020)	-.10	-.03	.05	(.042)	35.69***	76.86
X4: Liveliness	11	29,659	-.02**	(.006)	-.03	-.01	.00	(.013)	12.57	0.14
A1: Forgiveness	11	29,659	.01	(.016)	-.02	.04	.04	(.034)	30.88***	63.45
A2: Gentleness	11	29,659	-.01	(.021)	-.06	.03	.05	(.046)	112.74***	81.13
A3: Flexibility	11	29,659	-.05***	(.012)	-.07	-.02	.02	(.024)	15.08	36.34
A4: Patience	11	29,659	.06***	(.016)	.03	.10	.04	(.034)	31.11***	64.71
C1: Organization	11	29,659	**-.07*****	(.019)	-.11	-.03	.05	(.041)	54.12***	76.34
C2: Diligence	11	29,659	.02**	(.008)	.01	.04	.01	(.016)	9.12	10.45
C3: Perfectionism	11	29,659	.04	(.022)	-.01	.08	.06	(.046)	49.50***	81.36
C4: Prudence	11	29,659	.05**	(.020)	.02	.09	.05	(.042)	45.42***	76.85
O1: Aesthetic Appreciation	11	29,659	.01	(.024)	-.04	.06	.07	(.053)	51.66***	85.84
O2: Inquisitiveness	11	29,659	**.14*****	(.017)	.10	.17	.04	(.035)	39.03***	68.07
O3: Creativity	13	29,910	.04***	(.006)	.02	.05	.00	(.013)	15.32	0.15
O4: Unconventionality	11	29,659	**.11*****	(.020)	.07	.15	.05	(.042)	48.20***	77.69
I: Altruism	11	29,659	-.01*	(.006)	-.02	.00	.00	(.013)	7.06	0.30
I: Proactive	3	1,873	-.05	(.041)	-.13	.03	.05	(.073)	4.48	54.60

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

Table 7

Meta-Analytic Correlations of Big Five Personality (NEO, BFAS, BFI-2) with Crystallized and Fluid Intelligence

			Crystallized			Fluid			Difference		
Trait	*k*	*N*	$\bar{r}$	*SE*	$\tau_{\bar{r}}$	$\bar{r}$	*SE*	$\tau_{\bar{r}}$	$\overline{\Delta r}$	*SE*	$\tau_{\Delta\bar{r}}$
Big Five											
Neuroticism	62	35,790	-.075***	(.014)	.087	-.102***	(.014)	.084	.021	(.011)	.054
Extraversion	64	36,884	-.041***	(.011)	.062	.008	(.010)	.054	-.045***	(.009)	.041
Openness	69	36,833	.247***	(.014)	.093	.170***	(.013)	.088	.079***	(.012)	.069
Agreeableness	62	35,790	.024	(.014)	.087	.037**	(.012)	.068	-.012	(.011)	.051
Conscientiousness	62	35,790	-.019	(.010)	.051	-.008	(.012)	.073	-.014	(.011)	.054
NEO Facets											
N1. Anxiety	12	14,648	-.060*	(.026)	.076	-.086***	(.024)	.068	.026	(.027)	.074
N2. Angry hostility	12	14,648	-.041	(.026)	.073	-.065**	(.020)	.048	.022	(.027)	.075
N3. Depression	12	14,648	-.029	(.038)	.118	-.075*	(.031)	.092	.040	(.031)	.090
N4. Self-consciousness	12	14,648	-.008	(.031)	.095	-.036	(.020)	.048	.023	(.024)	.064
N5. Impulsiveness	13	15,129	-.019	(.023)	.066	-.034	(.021)	.059	.009	(.017)	.037
N6. Vulnerability	12	14,648	-.054*	(.026)	.075	-.070**	(.022)	.060	.015	(.027)	.075
E1. Warmth	13	15,421	-.034	(.019)	.048	-.026*	(.010)	.011	-.017	(.015)	.028
E2. Gregariousness	13	15,421	-.114***	(.012)	.018	-.063***	(.016)	.035	-.047***	(.013)	.020
E3. Assertiveness	13	15,421	.048	(.028)	.087	.034	(.018)	.046	.012	(.022)	.060
E4. Activity	13	15,421	.011	(.020)	.055	.010	(.017)	.040	-.002	(.017)	.039
E5. Excitement seeking	14	15,902	-.103***	(.022)	.068	.020	(.021)	.063	-.120***	(.029)	.093
E6. Positive emotions	13	15,421	-.014	(.017)	.041	.019	(.013)	.024	-.034	(.019)	.047
O1. Fantasy	19	14,715	.143***	(.023)	.076	.136***	(.020)	.061	.019	(.017)	.039
O2. Aesthetics	19	14,715	.116***	(.020)	.062	.063**	(.021)	.064	.047***	(.009)	.001
O3. Feelings	19	14,715	.096***	(.027)	.095	.026	(.020)	.060	.074***	(.012)	.016
O4. Actions	19	14,715	.076***	(.016)	.037	.096***	(.019)	.053	-.012	(.018)	.043
O5. Ideas	20	15,119	.271***	(.029)	.113	.253***	(.020)	.069	.018	(.027)	.100
O6. Values	19	14,715	.223***	(.030)	.111	.153***	(.024)	.083	.069**	(.025)	.085
A1. Trust	11	13,277	.024	(.022)	.053	.028*	(.013)	.015	-.012	(.026)	.066
A2. Straightforwardness	11	13,277	.021	(.032)	.091	.009	(.020)	.046	.011	(.032)	.088
A3. Altruism	11	13,277	-.078***	(.024)	.058	-.027	(.014)	.020	-.043*	(.022)	.048
A4. Compliance	11	13,277	-.035	(.018)	.037	.023	(.024)	.058	-.059*	(.029)	.075
A5. Modesty	11	13,277	-.038	(.030)	.085	-.052**	(.019)	.040	.005	(.023)	.054
A6. Tender-mindedness	11	13,277	-.032	(.021)	.049	-.041***	(.012)	.012	-.005	(.016)	.024
C1. Competence	12	13,823	.082**	(.030)	.088	.059***	(.016)	.033	.026	(.018)	.039
C2. Order	12	13,823	-.029	(.024)	.066	-.016	(.021)	.052	-.013	(.026)	.072
C3. Dutifulness	12	13,823	.019	(.022)	.055	.008	(.018)	.038	.013	(.016)	.027
C4. Achievement striving	12	13,823	-.004	(.022)	.059	-.020	(.016)	.030	.013	(.019)	.039
C5. Self-discipline	15	16,079	-.021	(.021)	.063	-.025	(.017)	.044	.003	(.018)	.046
C6. Deliberation	13	14,304	.004	(.021)	.056	.023	(.019)	.049	-.019*	(.009)	.002

Note. All studies included in this analysis included measures of both crystallized and fluid intelligence. Comparisons of remaining scales are presented in online supplement. $\overline{\Delta r}$ represents crystallized correlation minus fluid correlation. Meta-analysis of the difference in correlation were based directly on study-level differences and thus differ slightly from the difference between the difference between meta-analyses of crystallized and fluid intelligence.
* $p < .05$, ** $p < .01$, *** $p < .001$.

Age and Sex Differences in Personality and Intelligence

Research Question 2 sought to assess whether age and sex differences in both personality and intelligence might induce observed correlations between personality

and intelligence. To examine this question, we first examined bivariate relationships of these demographic factors with personality and intelligence. We then examined whether partial correlations, controlling for age and sex, reduced or altered the correlations between personality and intelligence.

Graphs of the relationships between age, Big Five personality, intelligence, and crystallized and fluid intelligence are presented in the online supplement for samples with age standard deviations greater than 5 years using generalized additive models to capture non-linear relations. They show the well-established pattern whereby fluid intelligence rises until the mid-20s and then declines, and crystallized intelligence rises over the course of adult life. As a result of these two countervailing trends, general intelligence was fairly stable until about age 50 after which it gradually declined as the decline in fluid intelligence became more rapid than the rise in crystallized intelligence. For Big Five personality, extraversion and neuroticism declined with age, agreeableness and conscientiousness increased with age, and openness rose until the mid-20s and then mostly declined.

A meta-analysis of sex differences in personality and intelligence is also presented in the online supplement. The analysis is based on the subset of sample that reported or enabled the extraction of sex differences. Sex differences in cognitive ability were small with males scoring slightly higher on general intelligence (d = -0.19; k = 102; n = 82,437, 95% CI [-0.23, -0.15]) and fluid intelligence (d = -0.25, k = 32, n = 34,494, 95% CI [-0.31, -0.19]). Differences for crystallized intelligence were non-significant (d = -0.13, k = 32, n = 34,494, 95% CI [-0.26, 0.01]). Standardized mean differences for the Big Five were all significantly higher for females ($p < .01$) d = 0.28 (neuroticism), d = 0.13 (extraversion), d = 0.08 (openness), d = 0.32 (agreeableness), and d = 0.12 (conscientiousness). A rich profile of facet-level differences is presented in the online supplement. Notably, given the current focus, males scored higher on intellect aspects of openness and females scored higher on aesthetic and emotional aspects of openness. Consistent with previous research (Lee & Ashton, 2020) the emotionality factor of the HEXACO model aligned more with sex differences than did Big Five neuroticism: d =0.31 (honesty-humility), d = 0.88 (emotionality), d = -0.05 (extraversion), d = 0.17 (agreeableness), d = 0.16 (conscientiousness), and d = -0.08 (openness).

Consistent with general intelligence being fairly stable for much of adulthood, partial correlations between personality and general intelligence, covarying for age, did not materially change the observed correlations. A limitation to note with these analyses is that a majority of the studies in the meta-analysis (see Table 1) had age standard deviations insufficiently large to justify inclusion in this analysis. The partial correlation between Big Five personality and intelligence controlling for sex was changed by .012 for neuroticism (i.e., it was a less negative correlation with intelligence) and .022 larger for agreeableness (it was more positive). The difference between zero-order and partial correlations of other traits with intelligence was smaller than .01. Thus, sex-differences appeared to explain, at most, only a small fraction of the obtained correlations.

Study-Level Moderators

Table 8 examines the effect of study-level moderators on the relationship between Big Five personality and intelligence (RQ 3). First, consistent with the

assumption that comprehensive measures of intelligence composed of a diverse array of subtests and typically administered in more controlled settings, the correlation between openness and intelligence was larger when measured using the WAIS. Second, the correlation between personality and intelligence was lower when assessment took place in high-stakes context (i.e., typically a job applicant setting). Third, given that BFAS openness was the only personality measure to include self-rated intelligence items, the correlation was, unsurprisingly, larger than for the other personality measures. Finally, in samples with a mean age over 60, the correlations for openness and neuroticism with intelligence were much stronger.

Table 8

Meta-Analytic Correlations between Big Five Personality and General Intelligence by Study Moderators

			Neuroticism		Extraversion		Openness		Agreeableness		Conscientiousness	
Moderator	min *k*	min *n*	$\bar{r}$	*SE*	$\bar{r}$	*SE*	$\bar{r}$	*SE*	$\bar{r}$	*SE*	$\bar{r}$	*SE*
Personality												
NEO	179	104,048	-.08***	(.008)	-.01	(.007)	.16***	(.009)	.00	(.008)	-.01	(.007)
BFAS	13	4,459	-.07***	(.015)	-.03	(.025)	.25***	(.024)	.06**	(.024)	-.06**	(.019)
BFI2	4	1,477	-.09***	(.026)	-.05	(.026)	.17***	(.030)	.03	(.045)	-.03	(.035)
Intelligence												
Composite	55	29,110	-.09***	(.013)	-.01	(.010)	.19***	(.016)	.00	(.014)	-.02	(.012)
Wonderlic	26	4,450	-.06**	(.022)	.01	(.021)	.11***	(.023)	.00	(.019)	-.01	(.024)
WAIS	16	3,189	-.12***	(.032)	-.03	(.018)	.27***	(.020)	.12***	(.033)	.00	(.022)
Matrix	42	15,939	-.07***	(.015)	.02	(.013)	.13***	(.019)	.02	(.013)	.01	(.013)
Other	57	57,296	-.06***	(.012)	-.03**	(.012)	.16***	(.014)	-.02	(.013)	-.03*	(.013)
Stakes												
Low stakes	178	79,122	-.08***	(.008)	-.01	(.007)	.18***	(.009)	.01	(.008)	-.01	(.007)
High stakes	11	13,974	-.05	(.030)	-.01	(.025)	.06	(.034)	-.02	(.019)	.01	(.031)
Age Mean												
Under 18	20	14,179	-.06**	(.022)	-.02	(.017)	.12***	(.026)	.02	(.023)	.03*	(.013)
18 to 59	146	81,621	-.07***	(.008)	-.02*	(.008)	.16***	(.010)	.00	(.008)	-.03***	(.008)
60 plus	5	2,556	-.24***	(.033)	.00	(.020)	.26***	(.018)	-.01	(.071)	.03	(.025)
Female %												
Under 25%	24	39,926	-.07***	(.019)	-.02	(.016)	.13***	(.025)	.02	(.020)	.00	(.022)
25 to 75%	140	63,652	-.08***	(.009)	-.01	(.008)	.17***	(.010)	.01	(.009)	-.02*	(.008)
Over 75%	23	4,247	-.09***	(.020)	.00	(.019)	.16***	(.026)	-.02	(.019)	-.02	(.024)

Note. Number of studies and total sample size varies slightly across the Big Five. *k* and *n* reported in this table represent the minimum across the Big Five. More detailed reporting for each correlation is provided in the online supplement along with reporting of meta-regression models.

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

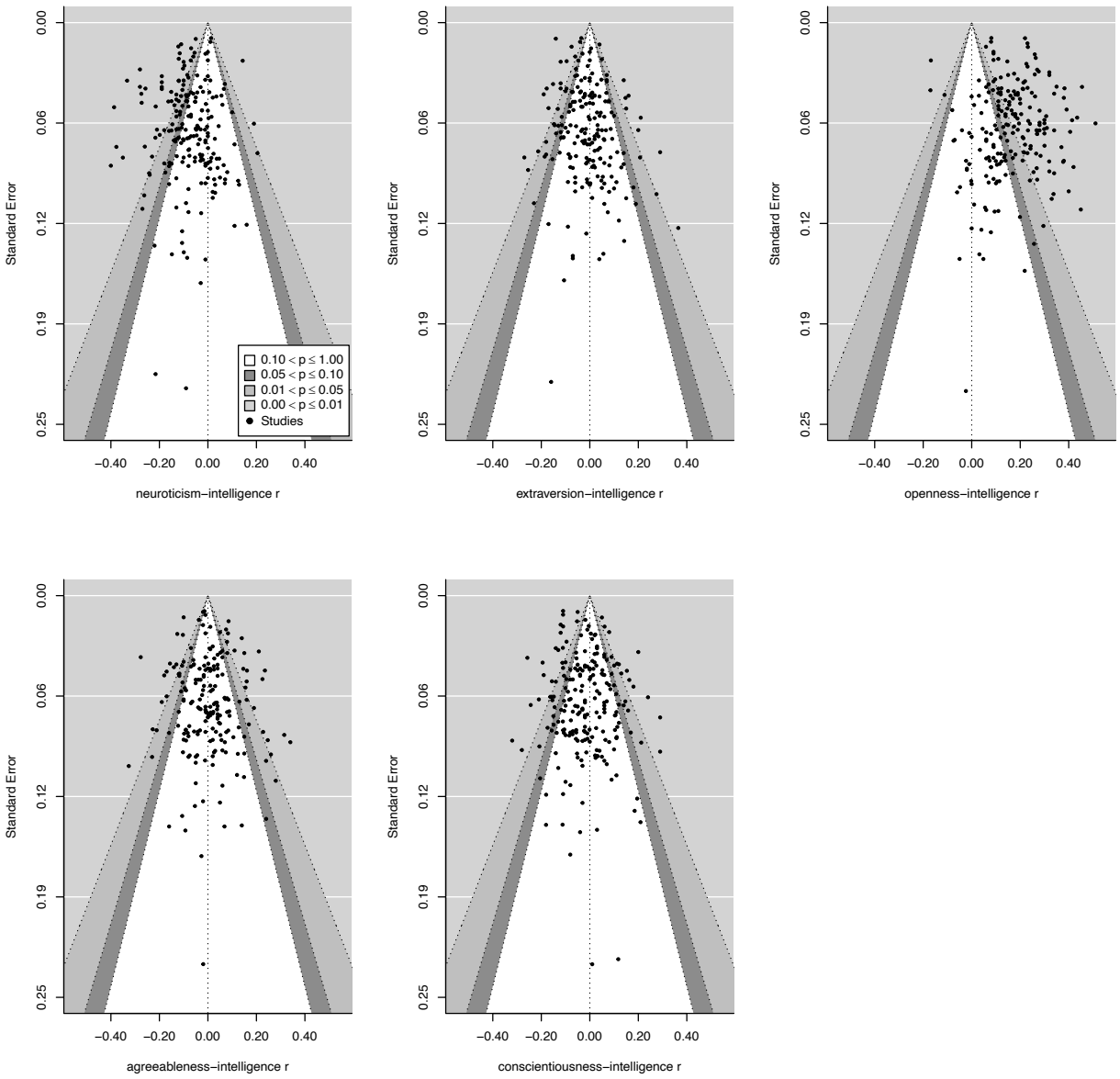
Study Bias Analysis

Overall, in approaching our research questions, we saw little reason to expect that publication bias would substantially influence the results of this meta-analysis. First, most studies in this meta-analysis were not focused on the relationship between personality and intelligence. Second, with the studies that were substantively focused on personality and intelligence, the studies' aims were diverse and were generally focused on interpreting the overall pattern of results; that is, it was not clear how the study's likelihood of publication would be contingent on a particular set of correlations being statistically significant. Given these baseline expectations, care is required when interpreting publication bias analyses. In particular, study sample size is related to methodologies which may moderate obtained correlations. Nonetheless, a

publication bias analysis involving funnel plots and trim and fill analysis were performed. Contour-enhanced funnel plots of correlations between Big Five personality and intelligence are shown in Figure 2, and a complete trim and fill analysis (Duval & Tweedie, 2000) is presented in the online supplement. The funnel plots suggest that sample correlations are distributed close to symmetrically around the meta-analytic estimate. Consistent with the meta-analytic tau values and the moderator analyses, the funnel plots highlight how variance in sample correlations are caused by more than just sampling error. The trim and fill analysis suggests that observed estimates were not materially affected.

Figure 2

Contour-Enhanced Funnel Plots for Correlations between Big Five and Intelligence



Domain, Facet, and Item-Level Overlap with Intelligence

To assess the extent to which composite models of personality can predict intelligence and to assess the incremental prediction of personality facets over domains (RQ 4), a meta-analysis of regression models was performed. Studies were included in this analysis if we had complete intercorrelation matrices for the relevant personality traits and intelligence (i.e., from the relevant article, provided by the author, or derived from data). Regression models were estimated separately for each study-level correlation matrix using **`lavaan`** (Rosseel, 2012). The sample size for each study is consistent with the values shown in Table 1. These were based on (a) the study reported sample size, (b) the smaller of the reported sample sizes where a study reported multiple sample sizes, or (c) the listwise-deleted sample size where the correlations were derived from data. Adjusted multiple *R* was obtained for each study-specific regression model, and it was used to capture the square root of variance explained in intelligence accounted for by domains, facets, and incrementally by facets over domains. For each study, the adjusted multiple *R* was calculated as the square root of adjusted R^2, or set to zero if adjusted R^2 was less than zero. Adjusted multiple *R* was used for meta-analytic synthesis as it allows for comparison with domain and facet-level correlations. The standard error of adjusted multiple *R* was estimated based on the study sample size. These study-level estimates of adjusted multiple *R* and their associated standard errors where then used to conduct a random-effects meta-analysis.

Table 9 presents meta-analytic estimates of adjusted multiple *R* for regression models predicting intelligence from domains and facets of personality. Overall, adjusted multiple *R* for the Big Five was .23, which is substantially more than the .17 obtained for Big Five openness alone. For all personality frameworks, facets provided substantially improved prediction of intelligence over domains. For instance, for the NEO framework, the adjusted multiple *R* was .40 (adjusted $R^2 = .16$) for facets and .22 (adjusted $R^2 = .05$) for domains; i.e., approximately triple the variance explained. Incremental prediction of narrow traits over and above Big Five domains was slightly less for BFAS aspects and BFI-2 facets, but still large in absolute terms, especially considering the smaller number of narrow traits per domain (i.e., 2 aspects per domain for BFAS and 3 facets per domain for BFI-2), and that the BFAS has more intellect-related content in its openness domain scores.

Table 9

Meta-Analytic estimates of Adjusted Multiple R for Regression Models Predicting General Intelligence from Domains and Facets

						95% CI					
Trait	*P*	*k*	*N*	$\bar{r}$	(*SE*)	*LL*	*UL*	$\tau_{\bar{r}}$	(*SE*)	*Q*	I^2
Big 5 (NEO, BFI-2, BFAS)	5	162	86,786	.23***	(.009)	.21	.24	.10	(.04)	865.90***	84.49
NEO Domains	5	149	82,375	.22***	(.010)	.20	.24	.10	(.04)	837.94***	85.68
NEO Facets	30	23	18,131	.40***	(.023)	.35	.44	.10	(.06)	212.11***	87.77
BFAS Domains	5	10	3,299	.26***	(.022)	.22	.30	.04	(.05)	17.33*	40.13
BFAS Aspects	10	7	1,884	.36***	(.036)	.29	.44	.08	(.07)	16.15*	67.45
BFI-2 Domains	5	3	1,112	.28***	(.032)	.22	.35	.03	(.06)	2.85	24.30
BFI-2 Facets	15	3	1,112	.36***	(.036)	.29	.43	.04	(.06)	3.85	47.96
HEXACO Domains	6	17	30,846	.14***	(.025)	.09	.19	.09	(.06)	104.62***	88.86
HEXACO Facets	25	10	29,496	.28***	(.022)	.24	.32	.06	(.05)	76.85***	85.87

Note. P = number of predictors (e.g., 30 NEO Facets) in the relevant model. Only studies with complete correlation matrices between personality traits and intelligence were included. Big 5 combines all measures of Big 5 domains. Analyses are a random effects meta-analysis of adjusted multiple *R* of regression models predicting intelligence from relevant traits. "HEXACO Facets" excludes the less commonly measured "proactive" facet.

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

To evaluate the capacity of item-level models to predict intelligence (RQ5), we turned to the four large-sample primary data sources that we had collected (i.e., industry, MOOC, student, and firefighter) as well as the Dutch sample from de Vries et al. (2021). In each dataset, three regression models were estimated predicting intelligence from the following sets of predictors: (1) the six HEXACO domains, (2) the 25 HEXACO facets, (3) the 100 items of the HEXACO-PI-R 100. For this analysis, domains and facets were scored using the 100 items from the HEXACO-PI-R 100, which were common to all five datasets. We note that the HEXACO was designed to exclude items measuring self-rated ability and thus avoids issues of criterion contamination. Models were compared on three indices. First, unbiased estimates of population-level prediction were obtained using adjusted multiple *R* to correct for the different number of predictors. Second, to assess within-sample model robustness, k-fold ($k = 10$) cross-validated multiple *R* was obtained. This approach involves dividing a sample into a training set (90% of cases) and a testing set (10%). A regression model is estimated with the training set. The regression weights from that 'training set' model are used to predict intelligence scores in the testing set, and the correlation between predicted and actual intelligence scores (multiple *R*) is recorded. This process is completed ten times, with different portions of the sample being allocated to the training and testing sets each time. Finally, the mean of the 10 observed multiple correlations, the "Cross-Validated R", was calculated. To assess the cross-sample generalizability, we assessed the ability of a regression model obtained from the largest sample (i.e., the Industry sample) to predict the other four samples. This was quantified as the correlation between the model-predicted and observed intelligence in these samples ("Industry Model *R*"). Finally, we calculated sample-weighted averages for the estimates that were derived from each approach. The online supplement presents a corresponding set of analyses that also include the demographic variables of age and sex.

Results are shown in Table 10 and several observations can be made. First, items provided much greater prediction of intelligence than facets with sample-

weighted average adjusted multiple *R*. Prediction increased from .17 (domains) to .32 (facets) to .44 (items). Second, consistent with what is expected given large sample sizes, same-sample cross-validated estimates of adjusted multiple *R* were only slightly lower than adjusted multiple *R*. Third, the pattern of improved prediction at facet and item-levels persisted when the regression model from the industry sample was applied to the other four samples with *Industry model R* of .06 (domains), .17 (facets), and .29 (items). Given the variation in measures of intelligence (ICAR versus composite measure), sample type (age, gender balance, country), language (English and Dutch), and testing context (low-stakes versus high-stakes), the ability of item-level models to predict well in different samples is particularly noteworthy. Finally, as shown in the supplement, age and sex provided only modest prediction of intelligence and did not substantially alter the relative importance of domains, facets, and items.

Table 10

Predicting General Intelligence from Domains, Facets, and Items

Sample / Predictors	*P*	Industry Sample (*n* = 20,939)	MOOC Sample (*n* = 4,286)	Firefighter Sample (*n* = 941)	Student Sample (*n* = 647)	Dutch Sample (*n* = 1,330)	Weighted Average All Samples	Weighted Average Validation Samples
Adjusted Multiple *R*								
Domains	6	.19	.11	.11	.24	.12	.17	.12
Facets	25	.33	.27	.20	.34	.26	.32	.27
Items	100	.45	.41	.34	.42	.38	.44	.40
Cross-Validated *R*								
Domains	6	.19	.10	.08	.21	.09	.17	.10
Facets	25	.33	.26	.15	.30	.22	.31	.24
Items	100	.45	.38	.23	.31	.31	.42	.34
Industry Model *R*								
Domains	6	—	.06	.10	.06	.01	—	.06
Facets	25	—	.21	.19	.19	.05	—	.17
Items	100	—	.34	.28	.22	.19	—	.29

Note. *P* = number of predictors. Adjusted Multiple *R* is square root of the adjusted R^2 of the model applied to the sample. Cross-validated *R* is the square root of the 10-fold cross-validated R^2 estimate. Industry model *R* is the correlation between observed intelligence in the sample and predicted intelligence obtained by applying the regression model developed from the Industry sample to the corresponding sample. Domain, facet, and item predictors were the 6 domains, 25 facets, and 100 items from the HEXACO PI-R.

Discussion

The current study provides the most extensive and nuanced meta-analytic investigation of the relationship between intelligence and personality to date. Several key findings emerged. First, at the domain-level, openness was the strongest positive correlate of intelligence, neuroticism was a modest negative correlate, and agreeableness, extraversion, conscientiousness, and honesty-humility were generally unrelated to intelligence. Second, facet-level correlations provided a richer picture of the links between personality and intelligence, clarifying the aspects of openness that were relatively strongly related (i.e., intellectual interests), moderately related (unconventionality, creativity) and less related to intelligence (openness to emotions and aesthetics). Third, although unrelated to intelligence at the domain-level, facet-level correlations with intelligence varied across extraversion (sociability negative;

assertiveness positive) and conscientiousness (order negative; competence positive). Fourth, personality–intelligence correlations varied across measures of crystallized and fluid intelligence. Although openness correlated more with crystallized than fluid intelligence, neuroticism correlated similarly with both. At the facet-level, sociability and excitement seeking had stronger negative correlations with crystallized than with fluid intelligence, and openness to aesthetics, feelings, and values had stronger positive correlations with crystallized than with fluid intelligence. Fifth, only a few sex differences partially aligned with the personality-intelligence associations, suggesting that overall age and sex are unlikely to be inducing the correlations between personality and intelligence. Sixth, across the personality frameworks we investigated, facets collectively explained more than double the variance in intelligence than did domains. Finally, item-level predictive models yielded considerably greater prediction of intelligence than facet-level models and much greater prediction than domain-level models.

Personality and Intelligence

The overall pattern of results suggests that, although correlations between self-report personality and objectively assessed intelligence are generally small, they are theoretically meaningful. This is particularly true given that observed correlations are likely to be substantially attenuated due to imperfections in self-rated assessments of personality and that typical intelligence assessment falls well short of gold standard assessments such as the WAIS. In particular, results highlight the fundamental importance of examining the relationship between personality and intelligence at the facet-level. Indeed, important variation in facet-level correlations were obscured at the domain-level for extraversion, conscientiousness, and openness. Correlations also varied in theoretically meaningful ways across fluid and crystallized intelligence. Collectively these results have a wide range of theoretical implications that highlight important avenues for future research.

Openness. Overall, the pattern of correlations of openness facets with intelligence supports a representation of openness as a spectrum where one pole is closely associated with intelligence and the other pole captures openness to experience (DeYoung et al., 2012) with mixed facets such as a preference for unconventional ideas and creativity in the middle. Interestingly, correlations between intelligence and intellectual interests (i.e., openness to ideas) were not that much smaller than those seen in a meta-analysis examining self-rated intelligence (Freund & Kasten, 2012). Thus, although the designers of the NEO and the HEXACO made an arguably sensible decision to exclude self-rated ability items from their measures, the empirical distinction between broad interests and aptitude may be more subtle (Silvia & Sanders, 2010). More generally, intelligence correlated progressively less with personality facets as the relevance of cognition to the facet declined. Consistent with research that finds that intelligence is negatively correlated with conservative values (Anglim et al., 2019; Onraet et al., 2015), intelligence was correlated fairly substantially with interest in unconventional people and ideas (unconventionality in HEXACO and openness to values in NEO). This suggests that relatively more intelligent people derive greater value from novel perspectives, whereas less intelligent people may prefer established ways of doing things. Finally, aesthetic and emotional openness had some of the weaker correlations with intelligence. Although

intelligence might facilitate the intellectual appreciation of art, there may be a range of other social and cultural norms that influence such interests, and presumably many people enjoy art, nature, and music without necessarily intellectualizing the experience.

Of particular theoretical importance were the ways in which facets of openness differentially correlated with crystallized and fluid intelligence. It seems that the frequently discussed tendency for openness to correlate more with crystallized than fluid intelligence (DeYoung, 2020) is driven by openness to aesthetics, emotions, and values rather than the openness to ideas. The lack of an elevated correlation with openness to ideas partially conflicts with investment theories, given that openness to ideas represents intellectual engagement. An alternative interpretation is that openness facets represent a spectrum of interests from the more artistic and literary (i.e., openness to aesthetics, emotion, values) to the more logical, scientific, and quantitative (i.e., openness to ideas) and that these differences align with differences in the cognitive ability domain whereby crystallized reflects more verbal ability and fluid intelligence aligns more with mathematical and logical reasoning ability. Naturally, such an explanation could then be reconciled either with theories of domain-specific investment in learning or with theories that aptitude breeds interest.

Neuroticism. The other broad domain of personality that was clearly related to intelligence was (lower) neuroticism. Given the size of the correlation and that it is the only other meaningful Big Five correlate of intelligence (after openness), it is surprising that it has not received more theoretical attention. It may be that intelligence provides a cognitive resource that assists people in managing challenging external situations. Intelligence can also lead to greater access to opportunities to earn more money and other outcomes that reduce exposure to enduring threats (e.g., financial insecurity, homelessness, street crime) (Cheung & Lucas, 2015). Equally, various health and cognitive disorders may simultaneously cause lower intelligence and increased neuroticism (Waggel et al., 2015). This is one possible explanation for the noticeably stronger negative relationship between neuroticism and intelligence among the samples of older adults, where there is likely to be more variance in health-related factors. By contrast, alternative causal explanations, based on testing anxiety (i.e., that neuroticism causes test anxiety, which causes underperformance on cognitive tests) seem unlikely given that the vast majority of research in this meta-analysis took place in low-stakes research contexts, and the correlations between neuroticism and intelligence were not larger in high-stakes settings.

Conscientiousness. Although intelligence and conscientiousness were unrelated at the domain-level (cf. Rikoon et al., 2016), intelligence was associated with a lower preference for order, structure, and routine and a slightly greater sense of competence. Mostly, conscientiousness appears to be an independent factor that leads to greater performance in academic (Poropat, 2009) and work (Hurtz & Donovan, 2000) settings through the allocation of diligent effort. Importantly, given that conscientiousness is associated with applying effort in education, and education has a causal influence on intelligence (Ritchie & Tucker-Drob, 2018), the lack of a correlation between conscientiousness and intelligence is theoretically interesting. While investment theories of intelligence often emphasize the role of openness in promoting intellectual exploration and intellectual growth, conscientiousness should

garner similar benefits if greater dedication to education and work lead to a subsequent increase in learning and intelligence. However, the absence of a correlation between conscientiousness and intelligence and lack of an elevated correlation with crystallized intelligence suggests that these effects may be too subtle to manifest in a correlation. Equally, the intellectual benefits of conscientiousness may be offset by compensatory processes (Ackerman & Rolfhus, 1999; DeYoung, 2020; Moutafi et al., 2006; Rammstedt et al., 2018). Specifically, conscientiousness is characterized by greater allocation of effort to tasks. On average, people who are less intelligent need to put in more time and effort to achieve comparable performance outcomes on novel and cognitively demanding tasks than those who are more intelligent.

Extraversion. Building on past work on extraversion (Wolf & Ackerman, 2005) and occupational interests (Pässler et al., 2015), the correlation between extraversion and intelligence was effectively zero, but the facet of sociability was a small negative correlate and assertiveness was a small positive correlate. Interestingly, the facet of sensation seeking and to a lesser extent sociability emerged as particularly strong negative correlates of crystallized intelligence. With regards to assertiveness, it may be that intelligence permits people to have more reasoned opinions and be more capable of presenting these arguments with confidence. The negative association with sociability may suggest that intelligent people have a slight tendency to adopt a more ideas-oriented rather than people-oriented lifestyle.

Agreeableness and Honesty-Humility. Both Big Five agreeableness and HEXACO's honesty-humility were unrelated to intelligence. Within the NEO, there were some small negative correlations for modesty, altruism, and tender-mindedness. Within the HEXACO model, greed avoidance and patience showed small positive correlations, but modesty and altruism were unrelated to intelligence. A close examination of the item-level correlations with intelligence from the two modesty scales suggests that although intelligent people are more likely to regard themselves as better than some others, this tendency does not extend to the more extreme forms of narcissism and arrogance. Thus, although the HEXACO and the NEO modesty scales both have many items indicative of socially undesirable narcissism that are mostly uncorrelated with intelligence, the NEO modesty scale has a few items that overlap with socially acceptable forms of self-belief that correlate positively with intelligence. This pattern of findings is consistent with meta-analytic correlations of intelligence with the dark triad, for which obtained correlations are close to zero (O'Boyle et al., 2013). Thus, overall, our results suggest that intelligence is relatively unrelated to whether someone is a kind and moral person.

Broader Theoretical Considerations

While acknowledging the limitations of cross-sectional data, it is intriguing to consider how many of the above findings can be interpreted through a lens of intelligence influencing personality traits. From this perspective, objective intelligence causes people to develop a self-concept as intelligent (i.e., BFAS Intellect). Intelligence involves a greater capacity to perform and benefit from cognitively demanding activities, which in turn enables people to enjoy relatively more intellectually demanding activities (i.e., openness to ideas, intellectual curiosity, inquisitiveness). Furthermore, differential aptitudes (e.g., crystallized versus fluid)

feed into different academic, life, and career interests. Intelligence also leads to a greater willingness to entertain novel and unconventional ideas and embrace change (i.e., openness to values, unconventionality) which again likely requires more cognitive resources than dealing with conventional ideas and people, or people with similar values. On the conscientiousness-facets front, the intelligence-as-cause perspective also implies that lower intelligence drives a relatively elevated desire for structure and routine as a means of managing the complexity of life whereas higher intelligence leads people to seek out activities and occupations where their intellect can be applied to novel challenges (e.g., negative correlation with order). Explaining the near zero correlation of intelligence with the conscientiousness domain, higher intelligence also allows people to achieve performance outcomes in some settings with relatively less effort, reducing a need for, or the benefit from, higher conscientiousness. Intelligence might also lead to cognitive confidence which in turn prompts relatively greater assertiveness and higher performance in work and academic settings, mapping on to general feelings of competence. Intelligence could also drive lower modesty among some people, because its social and occupational consequences provide one small basis by which people might judge their relative self-worth. Intelligence also acts as a resource that helps people to manage daily life with less stress. And in more extreme cases cognitive deficits associated with aging and brain injury can be a source of stress and anxiety (i.e., neuroticism).

Nonetheless, the associations observed in this meta-analysis could be explained by a range of mechanisms. Human agency is important in influencing life choice, and personality is an important factor in shaping human experience. Personality traits such as conscientiousness are meaningful correlates of academic performance (Poropat, 2009) and job performance (Hurtz & Donovan, 2000). Thus, although intelligence represents a general cognitive capacity that can be successfully applied towards academic and occupational success, these applications are nonetheless underpinned by sustained effort, which in turn is supported by interests and conscientiousness. Furthermore, generational changes in technology, nutrition, medicine, social structure, and education have led to changes in personality (Brandt et al., 2022) and the well-documented improvements in intelligence (Flynn, 2007; Trahan et al., 2014). Finally, a key contribution of PPIK theory (Ackerman & Kanfer, 2020) is that it focusses attention on how personality, intelligence, and interests contribute to the growth of knowledge, skills, and abilities throughout adulthood. Most of this intellectual growth reflects the development of domain-specific expertise that is not captured by typical measures of crystallized intelligence, which instead typically rely on assessing vocabulary and general knowledge.

Do Age and Sex Differences Explain Personality–Intelligence Associations?

It is interesting to consider how age-related developmental processes and the environmental and biological effects of sex influence the development of personality and intelligence—and potentially induce correlations between personality and intelligence. Regardless of whether their cause is biological or environmental, such processes also provide insights into topics including the diversity–validity trade-off in employee selection (Pyburn Jr et al., 2008; Sackett et al., 2001), occupational segregation (McCabe et al., 2020), the gender pay gap (Joshi et al., 2015), and other gender differences such as the tendency for women to live longer (Marais et al., 2018)

and men to commit more violent crimes (Heidensohn & Silvestri, 2012).

Because of its focus on the relations of personality and intelligence, a full systematic review of the literature on sex differences in general intelligence was out of scope for this research. Nonetheless, it remained possible to undertake a meta-analysis of sex differences as they were observed in the studies that were in-scope for the systematic review we conducted. In that respect, based on studies of adult and older adolescent samples, we observed very small sex differences favoring males of d = -.19 in general intelligence. These sex differences showed the commonly observed pattern of males being relatively stronger in measures of fluid intelligence (d = -.25) than measures of crystallized intelligence (d = -.13, ns). However, there are several reasons to exercise caution in generalizing these results to the wider population. Component studies in the meta-analysis rarely sought to obtain nationally representative samples; in particular, research suggests that less intelligent males tend to be under-represented in research samples (Dykiert et al., 2009). In addition, the composition of component tests used in the studies we examined will likely moderate the obtained estimates.

The examination of sex-differences in personality broadly converged with other meta-analytic and large sample estimates (Ashton & Lee, 2016; Roberts & Yoon, 2021). Specifically, females were notably higher on neuroticism (d = 0.28) and agreeableness (d = 0.32), and HEXACO emotionality (d = 0.88). Sex differences also varied substantially across facets within the broad domains (e.g., females were relatively higher on anxiety and vulnerability facets of neuroticism; females were also higher on warmth, gregariousness, and positive emotions, but lower on excitement seeking facets of extraversion). Of particular relevance to the aims of the current paper, males were higher on intellectual facets of openness and lower on aesthetic and emotional aspects of openness. These results may reflect a mixture of the general tendency for males to provide higher self-rated estimates of intelligence (d = .37 in a meta-analysis by Syzmanowicz & Furnham, 2011) and report greater interest in investigative vocational interests including science and mathematics (Su et al., 2009).

In general, data on age-related trends in this meta-analysis was not as comprehensive as that provided for sex differences because only a few studies provided a large age range from which to extract age related trends in intelligence and personality. Nonetheless, the data—albeit cross-sectional—support the idea that adult development is characterized by rising crystallized intelligence, declining fluid intelligence, and maturation of personality (rising conscientiousness and agreeableness and falling neuroticism) (Bleidorn, 2015; Roberts et al., 2008). Consistent with rising conservatism and consolidation of world views over time, openness also generally showed declines with age, albeit with some fluctuations. Overall, these analyses suggest that age and sex differences may explain, at best, only a small part of the observed correlations between personality traits and intelligence. Ultimately, sex-differences explained only about one-fifth of the correlation between neuroticism and intelligence. Finally, the subset of studies that provided reasonable variation in age suggest that controlling for age in adulthood did not alter or explain the correlations between personality and intelligence. Overall, the results suggest that age and sex do not confound the observed associations between personality and intelligence; rather, the role of age and sex in adult development appears to be best described as driving individual differences in personality and cognitive abilities.

Study-Level Moderators

The research also revealed several study-level moderators. With regards to the measurement of general intelligence, the choice of measure mostly moderated the magnitude but not the pattern of the observed correlations of openness and neuroticism with intelligence. Studies that used the WAIS showed the strongest correlations whereas the ICAR, Culture Fair, Wonderlic and the Raven's showed weaker correlations. A common theme of measures showing stronger correlations was that they contained multiple discrete subtests that combined both verbal and non-verbal components. This is consistent with these measures being more *g*-loaded and having less test-specific variance and error variance.

Interestingly, the correlations between personality and intelligence were lower in high-stakes research contexts than in low-stakes contexts, although this pattern was not as clear for the HEXACO. Our analyses appear not to replicate the observation that high-stakes assessment contexts are associated with inflated correlations between intelligence and conscientiousness (Schilling et al., 2021). That pattern of inflated correlations is hypothesized to be caused by more intelligent people being better able to manage their impression on personality measures. We note, however, several possible reasons for why our results diverge from those of Schilling et al. (2021). First, Schilling et al. (2021) were focused specifically on personnel selection assessment settings. Second, their analysis included laboratory studies that often involve strong 'fake-good' manipulations that tend to dramatically affect the structure of personality profiles (Schmit & Ryan, 1993). Third, Schilling et al. (2021) also included proxies of intelligence such as the SAT and ACT, and had classified traits into the Big Five rather than selecting from a pre-defined set of measures. Interestingly, in our study, neuroticism did not correlate more with intelligence in high-stakes settings, as would be expected if test anxiety had a causal effect on test scores in high-stakes settings. This finding reinforces our expectation that the correlation between neuroticism and intelligence reflects a substantive relationship between latent constructs rather than simply an issue of measurement.

We also examined whether sample age and sex moderated personality–intelligence correlations. The correlations between personality and intelligence appeared to be amplified in samples of older adults (i.e., 60 or over), particularly for neuroticism. This may reflect age-related declines in cognitive ability co-occurring with elevated levels of neuroticism (Kliegel & Zimprich, 2005). In particular, a range of disorders associated with cognitive decline that are more prevalent in older ages such as Alzheimer's disease and stroke are associated with anxiety, depression, and cognitive decline (Wium-Andersen et al., 2020).

In contrast, there were no differences in correlations based on the gender composition of the sample. This lack of difference reinforces the general finding that the relationship between neuroticism and intelligence is only very slightly explained by gender differences in neuroticism. In particular, correlations did not appear to be attenuated in samples that were predominantly male or female. Instead, it suggests that the relationships between intelligence and neuroticism is substantive. It is consistent with the idea that intelligence may provide a resource for managing anxiety and fear for men and women alike.

Quantifying the Overlap between Intelligence and Personality

Meta-analytic regression models predicting intelligence from personality highlighted how their is extensive overlap between personality and intelligence. In particular, facets afforded much greater prediction of intelligence than did domains. For instance, the meta-analytic multiple adjusted *R* for NEO domains increased from .22 to .40 or from 5% to 16% of variance explained. The scale of this incremental prediction by facets is also much larger than has been seen with other psychological criteria such as well-being (Anglim, Horwood, et al., 2020), workplace deviance (Pletzer et al., 2020), trait emotional intelligence (Anglim, Morse, et al., 2020), and personal values (Anglim et al., 2017). The present finding is more akin to sex-differences in personality which are moderate at the domain-level, but are quite substantial when taking composites of personality facets (e.g., Costa et al., 2001; Lee & Ashton, 2020).

There are several reasons why facets may provide such substantial prediction of intelligence. First, whereas many other outcomes mentioned are often measured via self-report and have close conceptual alignment with personality traits (i.e., well-being, personal values, trait emotional intelligence), or can be understood as domain-specific contextualized expressions of personality (e.g., workplace deviance), intelligence is objectively measured thereby reducing effects related to common method bias. Second, many personality frameworks such as the HEXACO and the NEO exclude self-reported intelligence from their measures, and when items related to intellectual interests are included, they tend to align more with narrow traits of openness rather than the broader domain. Third, intelligence is a powerful determinant of many important life outcomes including academic achievement (Poropat, 2009), job performance (Schmidt & Hunter, 1998), health (Calvin et al., 2011), and income (Ceci & Williams, 1997). Such outcomes may have a diverse range of independent, often small effects on personality development, such as through the effect of income on well-being, education on openness, and occupational experiences on personality. Finally, several demographic factors are theorized to influence both intelligence and personality, and these effects on personality likely vary across facets within a domain. For instance, the current meta-analysis found that, for openness, females were more open to emotions and aesthetics whereas males were more open to ideas. Similarly, for neuroticism, women were more likely than men to report anxiety but not more hostility. Thus, facet-level predictive models allow for the subtle incorporation of a diverse range of demographic predictors of intelligence.

We also discovered dramatic improvements in prediction when employing items to predict intelligence. The average adjusted multiple correlation of .44 was larger than the meta-analytic correlation of about .33 that has been obtained between self-ratings of intelligence and objectively measured intelligence (Freund & Kasten, 2012). Indeed, we observed improved prediction of intelligence with item-level models after applying both within-sample cross-validation, and between-sample cross-validation. The extent of the between-sample cross-validation of our item-level prediction model was particularly striking given that (a) the nature of the cross-validation samples (i.e., a highly homogeneous group of mostly male firefighter applicants, a multinational cohort of MOOC students, a mostly female sample of psychology students, and a Dutch sample of students) was markedly different from the

training sample (i.e., a large sample of job applicants from mixed industries), (b) the intelligence measures were different across the samples, (c) the assessment stakes varied across the samples, and (d) the language of the personality measure varied. Altogether, we take away from these cross-validation analyses a very high degree of confidence that the item-level models are not simply capitalizing on idiosyncrasies in the samples or the measures (i.e., over-fitting), but instead reflect true associations between combinations of items and intelligence. These findings reinforce claims by Mõttus and colleagues (Mõttus et al., 2017; Mõttus et al., 2019) that personality measures include meaningful and reliable variance at the item-level, which can yield improved prediction of criteria. Indeed, many of the reasons why facets should outperform factors in predicting outcomes would also apply to item-level prediction. In particular, there are potentially various ways of expressing domains and facets in items that will correlate differently with major aspects of people's lives such as age, sex, cultural background, and intelligence. Such subtle variation should contribute to stronger item-level prediction.

Limitations and Future Research

Despite the unique strengths of this meta-analysis, several limitations highlight the substantial opportunity for future research. First, the meta-analysis focused on cross-sectional associations, which limits the potential to uncover causal processes underlying the relationship between personality and intelligence. It would be particularly valuable for future research to examine changes in means and correlations using large longitudinal samples with facet-level assessment of personality and comprehensive assessment of cognitive abilities.

Second, observed personality-intelligence correlations are likely to substantially underestimate latent correlations between personality and intelligence. Although the present meta-analysis reports standard reliability-corrected personality–intelligence correlations (see supplement), future research could explore the implications of making more substantial corrections. Some of the factors expected to attenuate the correlations reported in this meta-analysis include (a) the use of self-report personality assessments, (b) many studies using shorter-form measures of cognitive ability, (c) the need in a small number of studies to estimate personality correlates of general intelligence by averaging personality–ability correlations of component abilities, (d) some studies using unproctored data collection where not all participants allocate maximal effort to the ability assessments (Duckworth et al., 2011), and (e) range restriction from non-representative samples. Notably, although all personality measures used in this meta-analysis had high-levels of internal-consistency reliability, interrater reliability of personality measures is substantially lower. When correlating personality with objectively assessed criteria such as intelligence, it is likely that it is the objective aspects of personality that infuse self-report ratings which drive correlations with objective criteria (for relevant theoretical perspectives, see Funder, 1995; McAbee & Connelly, 2016; Vazire, 2010). The capacity of self-report personality to assess objectively true personality is more modest as indicated by self–other agreement on personality measures, with meta-analytic estimates ranging from r = .32 to .43 (Connelly & Ones, 2010). Furthermore, typical measures of intelligence used in empirical research rarely achieve the rigor of a gold-standard test battery such as the WAIS. As such, the correlation between empirically obtained measures of

intelligence and latent *g* is less than the test-retest and split-half reliability estimates reported in test manuals. Future research could obtain aggregates of multiple other raters of personality and investigate the assumption that true personality–intelligence correlations are substantially attenuated by the limitations of self-report measurement. Future research could also combine such measurements with large and representative samples using comprehensive ability assessments in order to provide upper bounds of empirically obtainable correlations between personality and intelligence.

Third, although the current meta-analytic correlations have small standard errors, we must recognize that the generalizability of the observed estimates is limited to the representativeness of the studies in the literature. Indeed, the studies involved the use of certain measures, contexts, and samples more than others. For instance, relatively more common samples included university students (especially psychology students), high school students, workers (especially employee selection samples and white collar workers completing assessments for professional development), older samples (researchers studying aging), convenience samples, and online panels (e.g., Mechanical Turk). In contrast, nationally representative samples of the adult population were rare, as were samples that combined teenagers and older adults. Notably, people with lower levels of intelligence were relatively underrepresented in many of these samples. Furthermore, while the literature on personality–associations is internationally diverse, most samples were obtained from developed countries, especially North America, Europe, Australasia, and East Asia. In the context of ability assessments, many studies measured intelligence with shorter measures, such as combining single measures of verbal and abstract reasoning ability. In addition, measures labelled crystallized intelligence typically focused on vocabulary and verbal reasoning and less commonly on broader measures of acquired knowledge. By contrast, fewer studies administered comprehensive batteries of ability measures. In addition to attenuating correlations through range restriction, measurement error, and test-specific variance, some sample and design characteristics may moderate obtained correlations. We therefore encourage future researchers to examine the relationship between personality and intelligence in samples underrepresented in the literature. In particular, more research is needed on how the relationship between personality and intelligence varies (a) across cultures, and (b) in groups with particular medical conditions related to cognitive ability or personality.

Fourth, the results highlight the need for more research on how intelligence is expressed in personality. Item-level analysis highlighted how items within a given facet vary in their correlation with intelligence. This is consistent with the idea that intelligence influences both the levels of personality traits and also the stylistic expression of traits. However, more research is needed to articulate and measure such variation in stylistic expression.

Finally, our meta-analysis reflects but one—albeit important—paradigm for developing a complete model of the connections between personality and intelligence. Deeper understanding of these connections requires continued research on (a) developmental perspectives, (b) the effects of generational and societal changes, (c) evolutionary, cross-species, and paleontological perspectives, (d) genetic studies using a range of current (e.g., twin, genome-wide association studies) and emerging methodologies (for critical discussion, see Friedman et al., 2021; Tam et al., 2019), (e)

biological and neurological models of personality and intelligence, (f) behavioral and cognitive representations of real time expression of cognitive ability and personality, (g) cross-cultural comparisons, (h) experimental investigation of measurement issues and the effect of context, (i) invention and investigation of novel measurement tools, and (j) broader integration of the role of personality and intelligence into idiographic representations of people, including interests, values, characteristic adaptations and life histories.

Conclusion

Overall, the current research provides the most precise picture to date of how personality and intelligence are related at different levels of the personality hierarchy. In particular, it provides the first meta-analytic assessment of how the domains and facets of four of the most scientifically popular hierarchical measures of personality relate to intelligence. Major strengths of the approach included the use of consistent measures and the large-scale use of complete correlation matrices, raw data, and item-level data. Overall, the results show that the relationship between personality and intelligence is more nuanced than implied by the Big Five domains and is best understood at the facet-level. When these facet-level correlations are considered in aggregate, it becomes clear that personality and intelligence are more strongly related than may be commonly understood. Importantly, having a precise understanding of how facet-level correlations vary within domains of the Big Five and across crystallized and fluid intelligence provides important constraints for a unified conception of personality and intelligence.

Online Supplement

Additional Acknowledgements

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Item-level Datasets

The study reports on four new primary datasets labelled (a) Industry, (b) MOOC, (c) Student, and (d) Firefighter. All four samples provided measures of general intelligence and HEXACO personality. The Industry sample was the largest and also enabled an examination of personality correlates for verbal, abstract, and numeric reasoning. The MOOC sample was drawn from a multi-national population of online Coursera Massive Open Online Course (MOOC) students, the Student sample was Australian, and the Firefighter sample was an Australian sample of job applicants to firefighter positions.

Industry Sample: Data were collected by an Australian human resource consulting company through their online portal over a period of several years. Participants (n = 20,939; 59% female, mean age = 38.6 years, SD = 10.9) were job applicants who were applying for jobs in Australia. Participants completed a personality inventory along with measures of verbal, abstract reasoning, and numeric ability as part of their applications to various positions across a wide range of client companies that used the consultancy as a third-party service provider. Intelligence was measured using three measures of cognitive ability developed by the Australian Council for Educational Research (ACER). The ACER MQ is a 34 item, 20-minute timed and unsupervised measure of numerical reasoning (α = .90). The ACER ML is a 34-item, 15-minute timed and unsupervised measure of verbal reasoning (α= .85). The ACER APTS Abstract Reasoning Test is a 20-item untimed unsupervised test of non-verbal reasoning ability (α=.68). General intelligence was operationalized as the sum of the three ability measures after first z-score standardizing each measure. Personality was measured using the 200-item HEXACO PI-R (Lee & Ashton, 2018). The HEXACO PI-R measures six broad domains of personality (honesty-humility, emotionality, extraversion, agreeableness, conscientiousness, and openness) and 25 narrow facets (four per domain as well as one interstitial facet, all measured with eight items). Responses were collected on a scale from 1 = *strongly disagree*, to 5 = *strongly agree*.

MOOC Sample: Data were collected as part of a Coursera MOOC on the topic of Organizational Psychology, developed by an Australian university. The course content was in English. In the five years the unit was running, students could enroll from anywhere in the world, and in total 131 countries were represented (the largest numbers were from the US, India, the UK, Australia, and Canada). Participants (n = 4,286; 69% female; age M = 34.7 years, SD = 10.1 years) completed the personality and intelligence measures online along with other psychological assessments as part of their learning in the unit. They received automated feedback on their responses. Over 80% of this sample reported having completed at least a

Bachelor-level qualification prior to the MOOC. Intelligence was measured using a 16-item untimed measure of the International Cognitive Ability Resource (ICAR; Condon & Revelle, 2014). The ICAR comprised four sets of questions: (1) verbal reasoning, (2) letter and number series, (3) matrix reasoning, and (4) three-dimensional rotation. The 16 items are shown in the supplementary materials of Condon and Revelle (2014). An overall measure of intelligence was extracted as the total number of items correct. HEXACO personality was measured using the 100-item version of the measure that permitted domain and facet measurement of the 24 HEXACO facets plus the interstitial altruism facet.

Firefighter sample: Data for the Firefighter sample (n = 941; mean age = 29.42, SD = 5.76; 8% Male) were collected from applicants to positions within the Firefighter Academy at an Australian State Department. Applicants to this position were invited to complete the 200-item HEXACO-PI-R and two cognitive ability tests online, unproctored. Participants were aware that the online assessment results could be used by the hiring organization for selection decision-making. The two cognitive assessments were the Swift Comprehension and Swift Technical, published by Saville Consulting. The Swift Comprehension test comprises three subtests, measuring verbal, numerical, and checking ability, whereas the Swift Technical test comprises three subtests measuring abstract, mechanical, and spatial ability.

Student Sample: Data were collected in an undergraduate psychology unit at an Australian University. Students (n = 647; 83% Female; Age M = 28.61, SD = 9.37) completed Big Five and HEXACO personality assessments in one session and then, a few weeks later, they completed a measure of intelligence. Data collection took place between July 2019 and September 2020. The assessments were integrated into the unit. Intelligence was measured using the ICAR as described for the MOOC sample. HEXACO personality domains and facets were measured using the 100-item HEXACO PI-R (four items per facet). Big Five personality factors were measured using the 50-item IPIP NEO (Goldberg, 1999; Goldberg et al., 2006). All items were rated on a five-point *strongly disagree* to *strongly agree* scale.

Comparing Big Five to HEXACO

We also used the student sample to compare HEXACO and Big Five correlations. Table S1 presents the intercorrelations among demographics, HEXACO and Big Five personality, and intelligence. Openness, conscientiousness, and extraversion all correlated strongly (r > .70) between HEXACO and Big Five versions. HEXACO agreeableness combines elements of neuroticism and agreeableness and emotionality was the least well captured by the Big Five. Regression models were estimated predicting intelligence from (a) HEXACO personality domains (R_{adj} = .24; adj. R^2_{adj} = .056), (b) Big Five personality domains (R_{adj} = .24; R^2_{adj} = .056), and (c) both sets of personality domains (R_{adj} = .27; R^2_{adj} = .075). Thus, both models of personality explained a similar amount of variance (i.e., 5.6%). The combination of the two models explained significantly more variance than either model on its own (p = .004).

Table S1

HEXACO and Big Five Personality Correlates of Intelligence

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Intelligence													
2. Age	.12												
3. Male	.13	.07											
Big Five													
4. Neuroticism	-.03	-.15	-.14										
5. Extraversion	-.16	-.03	.00	**-.28**									
6. Agreeableness	.09	.04	-.04	**-.41**	.11								
7. Conscientiousness	-.03	.04	-.05	**-.38**	.17	.19							
8. Openness	.12	.12	.06	-.03	.18	.07	-.01						
HEXACO													
9. Honesty-humility	.08	.20	-.03	**-.21**	-.11	***.39***	**.20**	.10					
10. Emotionality	-.14	**-.21**	**-.34**	***.42***	.05	.03	-.10	-.06	-.09				
11. Extraversion	-.13	.03	.04	**-.56**	***.82***	**.28**	**.32**	.14	-.02	-.10			
12. Agreeableness	.08	.05	.11	**-.49**	.07	***.65***	.15	.12	.36	**-.25**	**.27**		
13. Conscientiousness	.03	.05	-.10	**-.27**	.06	.16	***.77***	-.03	.19	-.01	.19	.12	
14. Openness	.14	.19	.13	-.07	.11	.03	-.02	***.76***	.08	-.17	.10	.13	-.06

Note. Correlations based on Student Sample (N = 647). Absolute correlations above .20 are in bold and nominally aligned personality traits are italicized. Absolute correlations greater than .08, .11, and .13 are significant at .01, .01, and .001.

Fluid and Crystallized intelligence

Table S2 shows the and fluid intelligence correlations with personality domains, aspects, and facets, along with the differences between the crystallized and fluid correlations. Note that differences in correlations are estimated directly from sample differences between personality–Gc and personality–*Gf* correlations. As such, they differ slightly from taking the difference in meta-analytic estimates of personality–*Gc* and personality–*Gf* correlations. Study sample sizes are also arguably too small for generating robust conclusions for the HEXACO, BFAS, and BFI-2, but are presented here for completeness. The HEXACO analysis here should also be treated with caution given the small number of studies combined with one sample with a very large sample size.

Table S2

Meta-Analytic Correlations of Domains and Facets (NEO, BFAS, HEXACO) with and Fluid Intelligence

						Fluid			Difference		
Trait	*k*	*N*	$\bar{r}$	*SE*	$\tau_{\bar{r}}$	$\bar{r}$	*SE*	$\tau_{\bar{r}}$	$\overline{\Delta r}$	*SE*	$\tau_{\Delta\bar{r}}$
NEO Domains											
Neuroticism	56	34,311	-.068***	(.015)	.090	-.104***	(.015)	.088	.027**	(.011)	.048
Extraversion	58	35,405	-.045***	(.012)	.063	.010	(.011)	.054	-.049***	(.009)	.036
Openness	62	35,202	.244***	(.015)	.097	.167***	(.014)	.086	.081***	(.010)	.050
Agreeableness	56	34,311	.022	(.015)	.089	.038**	(.013)	.072	-.013	(.011)	.054
Conscientiousness	56	34,311	-.016	(.011)	.053	-.001	(.013)	.071	-.019	(.011)	.049
BFAS Domains											
Neuroticism	4	749	-.107**	(.039)	.027	-.107*	(.044)	.050	.000	(.053)	.069
Extraversion	4	749	-.017	(.051)	.070	.041	(.036)	.000	-.068	(.040)	.000
Openness	5	901	.277***	(.051)	.090	.261***	(.044)	.067	.025	(.090)	.184
Agreeableness	4	749	.098*	(.047)	.060	.069	(.036)	.002	.023	(.040)	.001
Conscientiousness	4	749	-.078*	(.036)	.002	-.042	(.045)	.053	-.035	(.051)	.062
BFAS Aspects											
N1. Volatility	4	749	-.153***	(.040)	.038	-.132**	(.045)	.054	-.020	(.050)	.059
N2. Withdrawal	4	749	-.036	(.039)	.025	-.064	(.050)	.068	.024	(.051)	.062
E1. Enthusiasm	4	749	.000	(.042)	.043	.000	(.037)	.001	-.003	(.040)	.002
E2. Assertiveness	4	749	-.029	(.052)	.074	.075*	(.036)	.002	-.117**	(.040)	.001
O1. Intellect	5	901	.291***	(.035)	.036	.284***	(.036)	.041	.010	(.053)	.088
O2. Openness to Experience	5	901	.153*	(.064)	.122	.139**	(.049)	.080	.022	(.109)	.231
A1. Compassion	4	749	.131*	(.052)	.073	.119**	(.039)	.032	.016	(.061)	.092
A2. Politeness	4	749	.034	(.036)	.001	.000	(.037)	.001	.034	(.040)	.001
C1. Industriousness	4	749	-.060	(.036)	.001	-.033	(.040)	.034	-.029	(.050)	.058
C2. Orderliness	4	749	-.073*	(.036)	.001	-.043	(.039)	.026	-.027	(.043)	.029
HEXACO											
Honesty-humility	6	21,925	.051**	(.016)	.018	-.017*	(.007)	.002	.059**	(.022)	.027
Emotionality	6	21,925	-.032***	(.007)	.001	-.065***	(.007)	.001	.033***	(.007)	.002
Extraversion	6	21,925	-.068	(.048)	.098	.002	(.033)	.055	-.052	(.053)	.108
Agreeableness	6	21,925	-.055	(.031)	.049	.038	(.028)	.042	-.097***	(.007)	.000
Conscientiousness	6	21,925	-.016	(.040)	.074	.030	(.044)	.087	-.042	(.050)	.099
Openness	6	21,925	.177**	(.064)	.142	.105***	(.007)	.001	.086	(.045)	.086
HEXACO Facets											
H1: Sincerity	3	21,177	-.025***	(.007)	.001	-.028***	(.007)	.002	.003	(.007)	.001
H2: Fairness	3	21,177	.019**	(.007)	.000	.008	(.007)	.000	.011	(.007)	.000
H3: Greed-Avoidance	3	21,177	.087***	(.007)	.001	-.009	(.007)	.001	.096***	(.007)	.002
H4: Modesty	3	21,177	.091***	(.007)	.003	-.023**	(.007)	.002	.114***	(.007)	.002
E1: Fearfulness	3	21,177	-.124***	(.007)	.000	-.073	(.052)	.067	-.027	(.040)	.046
E2: Anxiety	3	21,177	-.020**	(.007)	.002	-.057***	(.007)	.002	.038***	(.008)	.003
E3: Dependence	3	21,177	.018	(.033)	.037	.022**	(.007)	.001	.009	(.007)	.001
E4: Sentimentality	3	21,177	.038***	(.007)	.001	-.005	(.007)	.002	.023	(.034)	.038
X1: Social Self-Esteem	3	21,177	.027***	(.007)	.001	.019	(.032)	.035	.001	(.028)	.030
X2: Social Boldness	3	21,177	.075***	(.007)	.001	.042***	(.007)	.002	.033***	(.007)	.002
X3: Sociability	3	21,177	-.057***	(.007)	.002	-.048	(.060)	.082	-.014	(.062)	.084
X4: Liveliness	3	21,177	-.061***	(.007)	.001	-.022	(.038)	.043	.020	(.074)	.106
A1: Forgiveness	3	21,177	-.029	(.050)	.064	-.006	(.007)	.001	-.060**	(.018)	.018
A2: Gentleness	3	21,177	-.094	(.062)	.084	-.013	(.035)	.040	-.126***	(.007)	.001
A3: Flexibility	3	21,177	-.072***	(.007)	.001	.002	(.044)	.054	-.059	(.035)	.039
A4: Patience	3	21,177	-.023***	(.007)	.000	.050***	(.007)	.000	-.073***	(.007)	.002

C1: Organization	3	21,177	-.151**	(.047)	.059	-.056***	(.007)	.002	-.136***	(.007)	.000
C2: Diligence	3	21,177	-.027***	(.007)	.003	.055***	(.007)	.001	-.041	(.049)	.060
C3: Perfectionism	3	21,177	-.073***	(.007)	.002	.038***	(.007)	.001	-.110***	(.012)	.010
C4: Prudence	3	21,177	.024	(.083)	.126	.118	(.125)	.204	-.066***	(.007)	.002
O1: Aesthetic Appreciation	3	21,177	.133***	(.008)	.003	.034***	(.007)	.001	.099***	(.007)	.000
O2: Inquisitiveness	3	21,177	.196***	(.007)	.002	.134***	(.007)	.002	.063***	(.007)	.002
O3: Creativity	3	21,177	.069	(.046)	.058	.041***	(.007)	.001	.028	(.024)	.025
O4: Unconventionality	3	21,177	.225***	(.050)	.064	.128***	(.007)	.002	.101***	(.029)	.031
I: Altruism	3	21,177	.018*	(.007)	.002	-.024***	(.007)	.001	.042***	(.007)	.002

Note. All studies included in this analysis included measures of both verbal and non-verbal intelligence.

Associations of Intelligence with the General Factor of Personality

Background. Although research on personality tends to focus on the domain-level—especially the Big Five—various higher-order factors (i.e., one and two-factor models) have also been proposed. Indeed, the Big Five tend to exhibit non-zero inter-correlations, and when the first factor is extracted from personality trait data, a "general factor of personality" (GFP) typically emerges that aligns with the socially desirable poles of the Big Five: low neuroticism, high extraversion, high agreeableness, high conscientiousness, and high openness. Although some researchers consider the GFP to be a methodological artefact of response biases (for a critical review, see Revelle & Wilt, 2013), others interpret the GFP as a substantive higher-order trait indicative of social adjustment and well-being (Musek, 2007; Rushton & Irwing, 2008; van der Linden et al., 2016). Combining these perspectives, Anglim, Morse, et al. (2020) suggested that although Big Five correlations can be inflated by rater biases, the composite represented by the GFP is still indicative of social functioning and well-being. Indeed, the variables that define the GFP align closely with well-being (Anglim, Horwood, et al., 2020) and trait emotional intelligence (van der Linden et al., 2017). Building on the proposition that the GFP and general intelligence represent social-emotional and cognitive adaptations several researchers have examined whether the GFP correlates with intelligence (Dunkel, 2013; Dunkel et al., 2014; Irwing et al., 2012; MacCann et al., 2017; Schermer & Vernon, 2010). For instance, correlations were obtained between intelligence and the GFP of $r = .23$ using the MMPI in a sample of soldiers Irwing et al. (2012), and around $r = .27$ using the Personality Research Form (Schermer & Vernon, 2010). In contrast, some other research where GFPs are derived from measures of the Big Five have found minimal correlations between the GFP and intelligence (e.g., Schermer et al., 2012). Despite the ongoing interest in this relationship, to our knowledge, there has never been a meta-analytic examination of this relationship.

Results. The general factor of personality (GFP) was calculated in each dataset as the first unrotated factor of a maximum likelihood factor analysis of personality domain scores. All participant-level datasets with a full set of domain scores were used to calculate the GFP. To ensure a consistent orientation, the GFP was always aligned so that it correlated positively with extraversion. The meta-analytic correlation of the GFP with intelligence was small but statistically significant, $\bar{r} = .06$ ($SE = .011$, $p < .001$, $k = 76$, $n = 55{,}169$, $\tau_{\bar{r}} = .07$, CI 95% [.04, .08]). This correlation is somewhat similar in magnitude to the correlation of intelligence with neuroticism (albeit

opposite in sign), a domain that often negatively correlates relatively highly with the GFP.

Discussion. We obtained a small meta-analytic correlation between the general factor of personality and intelligence of .06. Although this correlation was statistically significant, it is smaller than the correlation for neuroticism, and much smaller than the multiple correlation obtained from regression models with all the Big Five (i.e., an optimal weighting for predicting intelligence). Given the importance of openness in personality–intelligence correlations and that the GFP is typically concerned more with social adjustment and wellbeing, it is perhaps unsurprising that the GFP was only weakly related to intelligence. Several factors are also likely to influence the magnitude of the correlation between the GFP and intelligence and may explain why a few studies have obtained larger correlations (e.g., Irwing et al., 2012; Schermer & Vernon, 2010). First, intellectance is more socially desirable than general openness. Thus, openness factors containing intellect components (e.g., BFAS) are both more likely to load highly on the GFP and relate to intelligence, thus increasing the GFP-intelligence relation. Second, as is discussed later, there may be special cases where neuroticism, and possibly the GFP more generally, correlate with intelligence. In particular, older adult samples where a substantial subset are experiencing severe cognitive decline and functional impairment, may exhibit elevated correlations between intelligence and neuroticism, and possibly other Big Five traits. Similarly, there may be elevated correlations between the GFP and intelligence in samples related to forensic and psychopathology populations where having a more normal functional personality may be associated with intelligence (Schermer & Vernon, 2010).

Quadratic Relationships

Background. There has also been interest in examining whether personality traits and intelligence are non-linearly related (Ackerman, 2018; Austin et al., 1997; Austin et al., 2002; Eysenck & White, 1964; Major et al., 2014). For instance, Ackerman (2018) suggested that for many bipolar personality traits such as introversion–extraversion, "good" personality levels may be located towards the center and away from the extremes, and therefore intelligence, as an enabling capacity, may be more associated with this mid-point than the extremes. Indeed, Major et al. (2014) found some support for an inverted-U effect of intelligence on sociability, and some research suggests that gifted individuals may have personality profiles partially consistent with nonlinear effects (Zeidner & Shani-Zinovich, 2011). Importantly, to the extent that quadratic relations exist, the traditional focus of researchers on linear personality–intelligence relations would conceal the strength of association. Nonetheless, quadratic effects have never been meta-analytically evaluated and quadratic relations are almost never reported in primary studies. Thus, by incorporating a large number of raw datasets from which quadratic effects can be estimated, the current meta-analysis provides the first comprehensive assessment of these relations.

Results. We meta-analytically examined quadratic effects of personality on intelligence and quadratic effects of intelligence on personality for the samples that provided raw data. For each dataset, quadratic variables were calculated for NEO personality domains and intelligence. This involved centering on the sample mean and

then squaring the variable. This quadratic variable was then correlated with the relevant linear variable (e.g., quadratic extraversion with standard linear intelligence, quadratic intelligence with standard linear extraversion). This was done for all relevant datasets and meta-analytic estimates were obtained for these correlations (n = 22,706–22,559; k = 54–55). Meta-analytic correlations are shown in Table S3. Quadratic intelligence correlations with linear personality ranged from -.03 to .03. Quadratic Big Five correlations with linear intelligence ranged from .00 to .05. The largest quadratic correlations were observed for quadratic extraversion ($\bar{r}$ = .05, 95% CI [.04, .06]) and quadratic openness ($\bar{r}$ = .04, 95% CI [.01, .06]), which suggests a very slight u-shaped relations of extraversion and openness with intelligence. That said, although a few of the associations reached statistical significance, they were all fairly small.

Table S3 shows the meta-analytic correlations for quadratic personality with intelligence and quadratic intelligence with personality.

Table S3

Meta-Analytic Correlations of Quadratic Personality with Intelligence and Quadratic Intelligence with Personality

					95% CI					
Trait	k	N	$\bar{d}$	(SE)	LL	UL	$\tau_{\bar{d}}$	(SE)	Q	I^2
Intelligence										
NEO Neuroticism Quadratic	54	22,559	.00	(.010)	-.01	.02	.04	(.029)	82.03**	33.06
NEO Extraversion Quadratic	54	22,559	.05***	(.007)	.03	.06	.01	(.018)	73.60*	5.16
NEO Openness Quadratic	54	22,559	.04**	(.014)	.01	.06	.07	(.043)	130.87***	67.61
NEO Agreeableness Quadratic	54	22,559	.01	(.011)	-.02	.03	.05	(.032)	84.65**	44.44
NEO Conscientiousness Quadratic	55	22,706	.02***	(.007)	.01	.04	.00	(.016)	63.72	0.08
Quadratic Intelligence										
NEO Neuroticism	54	22,559	.03**	(.009)	.01	.05	.03	(.027)	67.07	27.47
NEO Extraversion	54	22,559	-.03**	(.010)	-.05	-.01	.04	(.029)	78.88*	35.25
NEO Openness	54	22,559	-.03**	(.011)	-.05	-.01	.04	(.032)	94.43***	42.09
NEO Agreeableness	54	22,559	-.02*	(.008)	-.04	.00	.02	(.023)	78.31*	15.97
NEO Conscientiousness	55	22,706	.00	(.007)	-.01	.01	.00	(.016)	52.94	0.01

Discussion. In all cases, the relationships of personality with intelligence appeared to be best represented as linear. Indeed, this study provides the first meta-analytic estimates of quadratic relationships between personality traits and intelligence and we found little evidence for such patterns, with the largest quadratic correlation, out of the ten examined, being r = .05. Interestingly, this quadratic effect suggests that people who are most introverted and most extraverted are more intelligent than those with more moderate levels of extraversion. This effect is in the opposite direction to that implied by theory (i.e., that the ideal level of extraversion is at the mid-point). Overall, even though the argument that quadratic relationships might conceal important relationships between personality and intelligence was plausible (Ackerman, 2018), it does not appear to be the case to any meaningful degree.

Domain, Facet, and Item-Level Prediction

Table S4

Predicting General Intelligence from HEXACO Domains, Facets, and Items including Demographics (Age and Gender)

Sample / Predictors	*k*	Industry Sample (*n* = 20,939)	MOOC Sample (*n* = 4,286)	Firefighter Sample (n = 941)	Student Sample (*n* = 647)	Dutch Sample (*n* = 1,330)	Weighted Average All Samples	Weighted Average Validation Samples
Adjusted Multiple *R*								
Demographics	2	.16	.12	.06	.16	.06	.15	.10
Demographics + Domains	8	.25	.18	.12	.25	.14	.23	.17
Demographics + Facets	27	.36	.30	.20	.34	.26	.34	.28
Demographics + Items	102	.47	.42	.34	.41	.39	.45	.41
Cross-Validated *R*								
Demographics	2	.16	.12	.01	.15	.03	.14	.09
Demographics + Domains	8	.25	.17	.09	.24	.12	.23	.15
Demographics + Facets	27	.36	.28	.15	.30	.23	.33	.25
Demographics + Items	102	.47	.39	.25	.27	.31	.43	.34
Industry Model *R*								
Demographics	2	—	.12	.07	.05	.07	—	.10
Demographics + Domains	8	—	.11	.12	.03	.03	—	.09
Demographics + Facets	27	—	.22	.19	.16	.04	—	.18
Demographics + Items	102	—	.36	.28	.21	.20	—	.31

Note. Adjusted Multiple R is square root of the adjusted R-squared of the model applied to the sample. *k* = number of predictors in model. Cross-validated R is the k-fold cross-validated multiple correlation estimate. Industry model *R* is the correlation between intelligence and predicted intelligence where the prediction is obtained by applying the regression model developed in the industry sample. Domain, facet, and item predictors were the 6, domains, 25 facets, and 100 items from the HEXACO PI R. Demographic predictors were age and gender.

Relations of Intelligence and Personality with Age

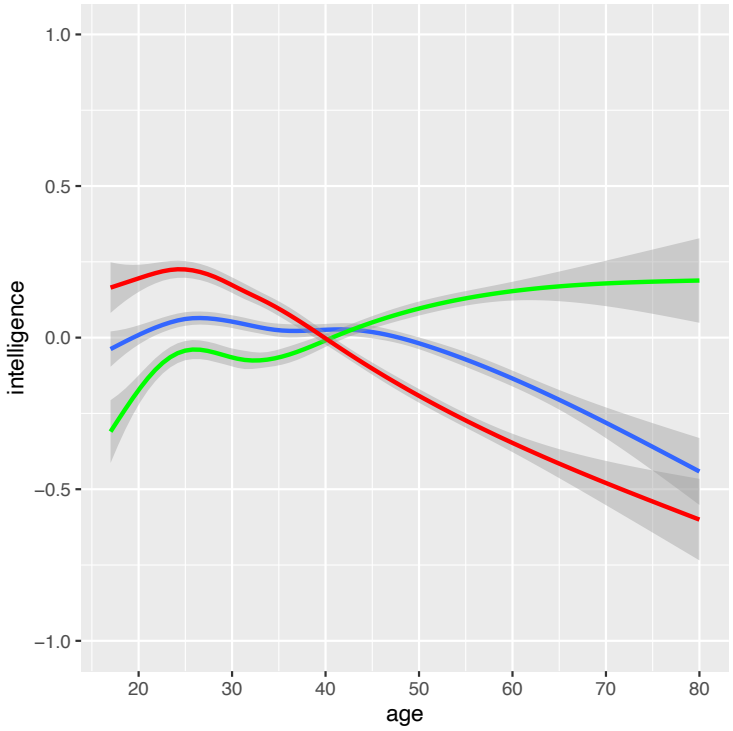
Figures show the relationship between age and intelligence (Figure S1), and age and Big Five personality (Figure S2) based on raw data from the studies. Intelligence and Big Five personality were *z*-score standardized within studies. Only studies with a sample age standard deviation greater than 5 were included in the analysis to limit the effect of range restriction. Ages between 17 and 80 were retained as these had sufficient sample sizes for modelling. Although there were participants under 17 years of age, they were often derived from samples of school students with very small sample standard deviations for age. Line of best fits were estimated using generalized additive models.

Figure S1 shows several clear patterns. First, general intelligence rose slightly from 17 to about 25 years of age. It then remained fairly stable with age, with only slight declines to above 45, after which it started to decline. The pattern of the relationship for general intelligence seems to partially reflect the distinct patterns observed for fluid and crystallized intelligence. In general, crystallized intelligence increases throughout the lifetime but the rate of increase slows over time. In contrast, fluid intelligence rises until approximately 25 years of age before it declines. The rate of decline in fluid intelligence is steeper than the rise in crystallized intelligence.

With regards to personality (Figure S2), extraversion and neuroticism declined with age and conscientiousness and agreeableness increased. Openness rose until the mid-20, after which it mostly declined.

Figure S1

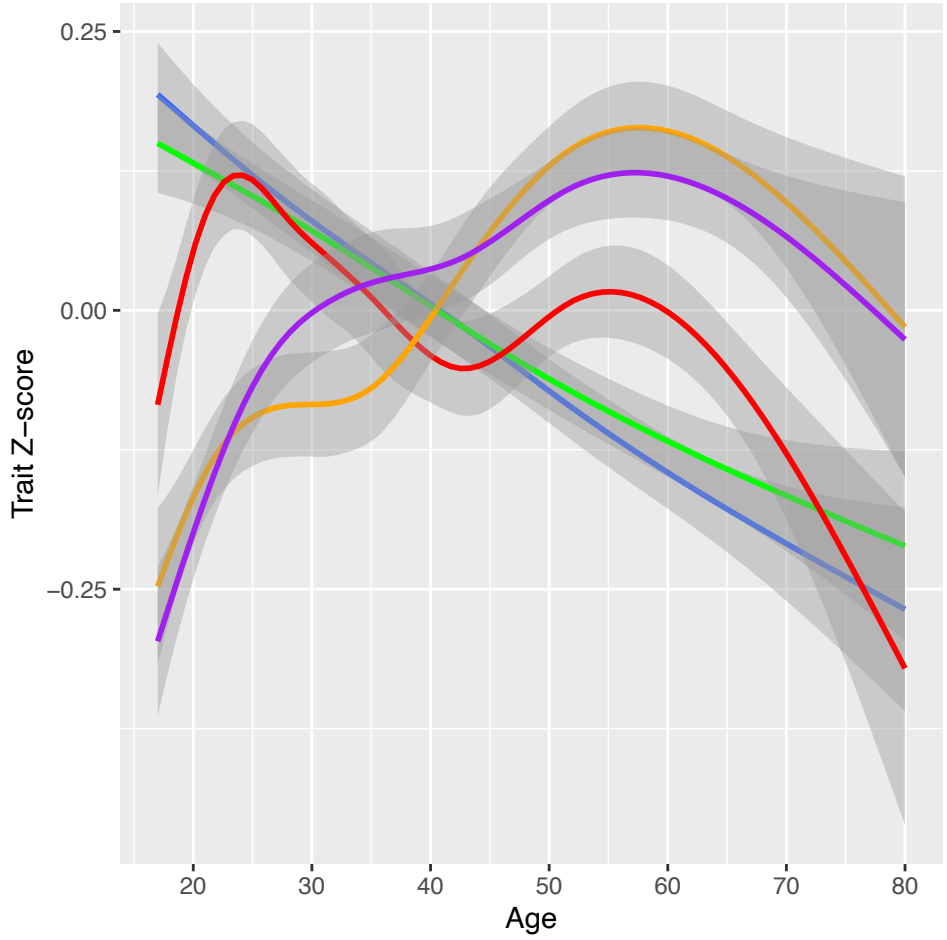
Relationship between Age and Intelligence (blue), Intelligence (green), and Fluid Intelligence (red)



Note. Intelligence is z-score standardized within studies. Intelligence analysis is based on raw data from 27 studies and n = 36,275. Sample size was 24,469 for intelligence and 24,454 for fluid intelligence.

Figure S2

Relationship between Age and Big Five Traits: Neuroticism (blue), Extraversion (green), Openness (red), Agreeableness (Orange), and Conscientiousness (Purple)



Note. Personality traits are z-score standardized within studies. Analysis is based on raw data from 19 studies and n = 9,678.

Sex Differences in Intelligence and Personality

Table S5 presents meta-analytic estimates of standardized mean differences between males and females. Studies were included from the primary meta-analysis if (a) they reported the correlation between sex and personality/intelligence or the authors provided raw data from which this correlation could be computed, and (b) the gender split in the sample was no more extreme than 90–10 (i.e., a sample needed at least 10% males and at least 10% females), and (c) the male and female sample size could be determined either from direct reporting or by multiplying the proportion male/female by the total sample size. Standardized mean differences were derived using a standard point biserial r to d conversion formula:

$$d = \frac{r\sqrt{h}}{\sqrt{1 - r^2}},$$

where $h = m/n_0 + m/n_1$, $m = n_0 + n_1 - 2$, and n_0 and n_1 are the number of 0's and 1's respectively.

The above formula is taken from and quoted from Wolfgang Viechtbauer (2021): https://stats.stackexchange.com/a/526809/183 . Study-specific standard errors for standardized mean differences were obtained by assuming equal variances in males and females.

Table S5

Meta-Analytic Standardized Mean Differences between Males and Females on Measures of Personality and Cognitive Ability

					95% CI					
Trait	*k*	*N*	$\bar{d}$	(*SE*)	*LL*	*UL*	$\tau_{\bar{d}}$	(*SE*)	*Q*	I^2
Cognitive Ability										
General Intelligence	102	82,437	-.19***	(.020)	-.23	-.15	.15	(.07)	709.71***	78.80
Crystallized Intelligence	32	34,494	-.13	(.068)	-.26	.01	.35	(.19)	681.70***	95.15
Fluid Intelligence	32	34,494	-.25***	(.032)	-.31	-.19	.12	(.09)	72.88***	69.34
Big Five										
Neuroticism	77	48,629	.28***	(.028)	.23	.34	.20	(.10)	276.95***	82.60
Extraversion	77	48,629	.13***	(.023)	.09	.18	.15	(.08)	212.89***	72.62
Openness	82	50,140	.08**	(.026)	.03	.13	.18	(.09)	427.85***	80.19
Agreeableness	77	48,629	.32***	(.036)	.25	.39	.28	(.13)	426.53***	90.19
Conscientiousness	83	50,957	.12***	(.023)	.07	.16	.15	(.08)	368.42***	73.38
NEO Domains										
Neuroticism	68	46,167	.30***	(.029)	.24	.36	.19	(.10)	235.56***	82.85
Extraversion	68	46,167	.14***	(.025)	.09	.19	.16	(.08)	200.49***	75.76
Openness	70	47,143	.08**	(.029)	.02	.14	.19	(.10)	400.99***	82.53
Agreeableness	68	46,167	.30***	(.036)	.23	.37	.25	(.12)	342.53***	89.11
Conscientiousness	74	48,495	.11***	(.024)	.07	.16	.15	(.08)	339.63***	73.43
NEO Facets										
N1. Anxiety	19	18,015	.29***	(.058)	.18	.41	.21	(.14)	73.00***	85.32
N2. Angry hostility	19	18,015	.07	(.042)	-.01	.15	.13	(.10)	48.14***	69.17
N3. Depression	19	18,015	.12**	(.038)	.04	.19	.11	(.09)	43.38***	61.85
N4. Self-consciousness	19	18,015	.13***	(.031)	.07	.19	.07	(.07)	28.68	41.52
N5. Impulsiveness	21	18,816	.17***	(.041)	.09	.25	.14	(.10)	59.41***	71.04
N6. Vulnerability	19	18,015	.32***	(.051)	.22	.42	.18	(.13)	52.45***	80.04
E1. Warmth	19	18,015	.32***	(.057)	.20	.43	.21	(.14)	79.53***	84.43
E2. Gregariousness	19	18,015	.25***	(.047)	.15	.34	.16	(.12)	49.45***	75.68
E3. Assertiveness	19	18,015	-.07	(.043)	-.15	.02	.14	(.11)	47.69***	71.47
E4. Activity	19	18,015	.16**	(.050)	.06	.26	.17	(.12)	61.89***	79.45
E5. Excitement seeking	19	18,015	-.21***	(.044)	-.29	-.12	.14	(.11)	53.69***	72.21
E6. Positive emotions	19	18,015	.33***	(.074)	.19	.47	.29	(.18)	124.13***	91.24
O1. Fantasy	18	16,644	.02	(.054)	-.08	.13	.18	(.13)	81.96***	78.91
O2. Aesthetics	18	16,644	.30***	(.072)	.16	.45	.27	(.18)	97.92***	88.74
O3. Feelings	18	16,644	.38***	(.080)	.22	.53	.31	(.20)	129.32***	91.10
O4. Actions	18	16,644	.21***	(.047)	.12	.30	.15	(.11)	46.50***	70.24
O5. Ideas	18	16,644	-.23***	(.051)	-.33	-.13	.17	(.12)	65.60***	75.76
O6. Values	18	16,644	.12*	(.055)	.02	.23	.19	(.14)	51.49***	79.49
A1. Trust	18	16,644	.19***	(.040)	.11	.26	.11	(.10)	34.89**	56.94

A2. Straightforwardness	18	16,644	.37***	(.072)	.23	.51	.27	(.18)	122.19***	88.61
A3. Altruism	18	16,644	.27***	(.068)	.14	.40	.25	(.17)	91.60***	87.35
A4. Compliance	18	16,644	.15***	(.038)	.08	.23	.10	(.09)	28.18*	51.92
A5. Modesty	18	16,644	.24***	(.060)	.12	.36	.21	(.15)	57.70***	83.36
A6. Tender-mindedness	18	16,644	.27***	(.056)	.16	.37	.19	(.14)	63.90***	79.84
C1. Competence	19	16,791	-.04	(.039)	-.11	.04	.11	(.09)	43.86***	55.71
C2. Order	19	16,791	.13**	(.049)	.03	.23	.16	(.12)	60.32***	73.62
C3. Dutifulness	19	16,791	.12*	(.058)	.00	.23	.21	(.14)	136.48***	82.25
C4. Achievement striving	19	16,791	.09	(.066)	-.04	.22	.25	(.16)	98.04***	86.84
C5. Self-discipline	20	18,162	.13**	(.042)	.05	.21	.14	(.10)	67.16***	69.22
C6. Deliberation	19	16,791	.00	(.051)	-.10	.10	.17	(.13)	88.93***	76.34
BFAS Domains										
Neuroticism	7	1,813	.12	(.095)	-.06	.31	.20	(.19)	18.20**	67.72
Extraversion	7	1,813	.10	(.060)	-.02	.22	.07	(.12)	7.99	21.50
Openness	10	2,348	.04	(.071)	-.10	.18	.17	(.15)	21.62*	57.59
Agreeableness	7	1,813	.45*	(.192)	.08	.83	.48	(.38)	82.99***	92.01
Conscientiousness	7	1,813	.09	(.094)	-.10	.27	.20	(.19)	18.02**	67.10
BFAS Aspects										
N1. Volatility	6	1,686	.06	(.090)	-.12	.24	.17	(.17)	12.39*	61.06
N2. Withdrawal	6	1,686	.11	(.114)	-.11	.33	.24	(.22)	19.92**	75.48
E1. Enthusiasm	6	1,686	.21**	(.081)	.05	.37	.14	(.16)	10.24	51.67
E2. Assertiveness	6	1,686	-.08	(.090)	-.26	.10	.17	(.17)	12.20*	60.89
O1. Intellect	11	2,695	-.11	(.092)	-.29	.07	.27	(.20)	38.68***	78.74
O2. Openness to Experience	11	2,695	.19**	(.074)	.05	.34	.19	(.16)	31.18***	66.25
A1. Compassion	6	1,686	.35	(.198)	-.04	.74	.46	(.38)	63.28***	91.84
A2. Politeness	6	1,686	.46*	(.188)	.09	.83	.44	(.37)	59.55***	90.89
C1. Industriousness	6	1,686	.09	(.067)	-.04	.22	.09	(.13)	6.69	31.25
C2. Orderliness	6	1,686	.14	(.104)	-.07	.34	.21	(.20)	17.25**	70.66
BFI-2 Domains										
Neuroticism	2	649	.21*	(.087)	.04	.38	.05	(.15)	1.17	14.85
Extraversion	2	649	.15	(.159)	-.16	.47	.19	(.27)	3.90*	74.35
Openness	2	649	.17*	(.080)	.02	.33	.00	(.14)	0.26	0.00
Agreeableness	2	649	.39***	(.080)	.23	.55	.00	(.14)	0.00	0.00
Conscientiousness	2	649	.34***	(.080)	.18	.50	.00	(.14)	0.14	0.00
BFI-2 Facets										
N1. Anxiety	2	649	.27*	(.119)	.04	.50	.12	(.20)	2.17	53.98
N2. Depression	2	649	.07	(.079)	-.09	.22	.00	(.14)	0.15	0.00
N3. Emotional Volatility	2	649	.23*	(.092)	.05	.41	.06	(.16)	1.32	24.01
E1. Sociability	2	649	.24	(.145)	-.04	.53	.17	(.24)	3.25	69.26
E2. Assertiveness	2	649	-.05	(.087)	-.22	.12	.05	(.15)	1.20	16.60
E3. Energy Level	2	649	.19	(.176)	-.15	.54	.22	(.30)	4.75*	78.95
O1. Intellectual Curiosity	2	649	.03	(.079)	-.13	.19	.00	(.14)	0.76	0.00
O2. Aesthetic Sensitivity	2	649	.38***	(.080)	.22	.54	.00	(.14)	0.92	0.00
O3. Creative Imagination	2	649	-.03	(.079)	-.19	.12	.00	(.14)	0.30	0.00
A1. Compassion	2	649	.52***	(.097)	.33	.71	.08	(.16)	1.43	30.19
A2. Respectfulness	2	649	.33***	(.080)	.18	.49	.00	(.14)	0.92	0.00
A3. Trust	2	649	.11	(.079)	-.04	.27	.00	(.14)	0.41	0.00
C1. Organization	2	649	.25**	(.080)	.09	.41	.00	(.14)	0.25	0.00
C2. Productiveness	2	649	.30***	(.080)	.15	.46	.00	(.14)	0.01	0.00
C3. Responsibility	2	649	.33***	(.080)	.17	.48	.00	(.14)	0.00	0.00
HEXACO Domains										
Honesty-humility	13	29,476	.31***	(.068)	.18	.44	.21	(.16)	81.04***	91.43
Emotionality	14	29,876	.88***	(.063)	.75	1.00	.20	(.14)	204.51***	89.49
Extraversion	14	29,876	-.05	(.029)	-.11	.00	.06	(.06)	25.30*	42.18
Agreeableness	14	29,876	-.17***	(.031)	-.23	-.11	.06	(.07)	29.70**	48.41
Conscientiousness	14	29,876	.16***	(.049)	.07	.26	.14	(.11)	77.49***	82.77
Openness	14	29,876	-.08	(.057)	-.20	.03	.18	(.13)	54.90***	87.93
HEXACO Facets										
H1: Sincerity	9	28,555	.13*	(.056)	.02	.23	.13	(.12)	24.77**	84.62
H2: Fairness	9	28,555	.34***	(.077)	.19	.49	.20	(.16)	118.30***	92.79
H3: Greed-Avoidance	9	28,555	.25**	(.091)	.07	.42	.25	(.19)	46.97***	95.04
H4: Modesty	9	28,555	.39***	(.063)	.26	.51	.15	(.13)	59.65***	88.19

E1: Fearfulness	9	28,555	.62***	(.053)	.51	.72	.12	(.11)	39.67***	82.30
E2: Anxiety	9	28,555	.57***	(.058)	.45	.68	.14	(.12)	87.65***	85.30
E3: Dependence	9	28,555	.48***	(.072)	.34	.62	.18	(.15)	189.63***	91.36
E4: Sentimentality	9	28,555	.71***	(.064)	.58	.84	.16	(.14)	67.33***	88.61
X1: Social Self-Esteem	9	28,555	-.10**	(.038)	-.17	-.02	.07	(.07)	30.81***	62.72
X2: Social Boldness	9	28,555	-.19***	(.027)	-.24	-.14	.04	(.05)	13.86	34.00
X3: Sociability	9	28,555	.06***	(.012)	.03	.08	.00	(.03)	5.04	0.04
X4: Liveliness	9	28,555	.04	(.025)	-.01	.09	.04	(.05)	15.47	28.01
A1: Forgiveness	9	28,555	-.17***	(.041)	-.25	-.09	.08	(.08)	23.19**	68.64
A2: Gentleness	9	28,555	.01	(.022)	-.03	.05	.03	(.04)	6.08	20.39
A3: Flexibility	9	28,555	-.07*	(.031)	-.13	-.01	.05	(.06)	17.05*	47.77
A4: Patience	9	28,555	-.19***	(.029)	-.25	-.13	.05	(.06)	14.27	41.66
C1: Organization	9	28,555	.25***	(.051)	.15	.35	.12	(.10)	31.57***	81.00
C2: Diligence	9	28,555	.14*	(.066)	.01	.27	.17	(.14)	81.82***	89.70
C3: Perfectionism	9	28,555	.24***	(.055)	.13	.35	.13	(.11)	50.64***	84.17
C4: Prudence	9	28,555	-.05	(.047)	-.15	.04	.10	(.10)	28.94***	76.96
O1: Aesthetic Appreciation	9	28,555	.23***	(.032)	.17	.29	.06	(.06)	16.05*	49.97
O2: Inquisitiveness	9	28,555	-.46***	(.049)	-.55	-.36	.11	(.10)	21.61**	78.32
O3: Creativity	9	28,555	-.03	(.077)	-.18	.12	.20	(.16)	76.35***	92.93
O4: Unconventionality	9	28,555	-.16	(.089)	-.33	.02	.24	(.19)	70.93***	94.82
I: Altruism	9	28,555	.45***	(.065)	.32	.58	.16	(.14)	50.70***	89.07

Note. Positive values of d indicated that observed scores for females were higher than males.

Publication Bias Analysis

Trim and Fill Analysis was applied to the meta-analytic correlations. The `trimandfill` function in the `metafor` package using the "L0" algorithm from Duval and Tweedie (2000) was employed. Meaningful interpretation of the trim and fill algorithm is based on the assumption that asymmetry in funnel plots is caused by publication bias. That assumption is most likely false in the present context because: (a) correlations between personality and intelligence are rarely the focus (and therefore basis of publication) for studies measuring personality and intelligence, (b) even where correlations between personality and intelligence are of interest, it is unlikely there is a specific pattern of correlations that would be of substantive interest across papers, and (c) it is likely that study features (e.g., choice of measures, type of sample) might be at least weakly related to sample size and that this, in addition to random sampling, could explain any asymmetry. Nonetheless, the trim and fill analysis is presented for completeness and as a robustness check. The main noteworthy resultant difference between the original and trim and fill analyses (seen in Table S6), is that the latter analysis estimated slightly stronger correlations between neuroticism and intelligence (r = -.10) and openness and intelligence (r = .20).

Table S6

Trim and Fill Analysis

Trait	*k*	*k*0	*k*0*SE*	Trim and Fill			
				TF $\bar{r}$	TF $\Delta\bar{r}$	TF $\tau_{\bar{r}}$	TF $\Delta\tau_{\bar{r}}$
Big Five							
Neuroticism	203	31	9.3	-.10	-.02	.09	.01
Extraversion	198	27	9.1	-.03	-.02	.08	.02
Openness	209	32	9.4	.20	.03	.13	.03
Agreeableness	196	0	8.1	.00	.00	.08	.00
Conscientiousness	214	0	8.5	-.02	.00	.08	.00
NEO Domains							
Neuroticism	186	31	8.9	-.10	-.02	.10	.02
Extraversion	181	25	8.7	-.03	-.02	.08	.02
Openness	188	29	8.9	.19	.03	.13	.03
Agreeableness	179	1	7.9	.00	.00	.08	.00
Conscientiousness	197	0	8.2	-.01	.00	.08	.00
NEO Facets							
N1. Anxiety	28	0	2.8	-.09	.00	.06	.00
N2. Angry hostility	28	0	3.2	-.06	.00	.03	.00
N3. Depression	29	0	3.2	-.06	.00	.09	.00
N4. Self-consciousness	28	6	3.5	-.05	-.02	.09	.02
N5. Impulsiveness	31	0	3.3	-.02	.00	.06	.00
N6. Vulnerability	29	4	3.6	-.08	-.02	.10	.01
E1. Warmth	28	6	3.5	-.07	-.02	.05	.01
E2. Gregariousness	28	3	3.5	-.09	-.01	.05	.01
E3. Assertiveness	29	0	3.1	.04	.00	.07	.00
E4. Activity	28	2	3.4	.00	.00	.04	.00
E5. Excitement seeking	29	7	3.6	-.04	-.03	.10	.03
E6. Positive emotions	28	7	3.5	-.02	-.03	.06	.01
O1. Fantasy	35	0	3.6	.13	.00	.06	.00
O2. Aesthetics	35	3	3.8	.05	-.01	.08	.01
O3. Feelings	35	0	3.5	.06	.00	.07	.00
O4. Actions	35	8	3.9	.05	-.02	.07	.02
O5. Ideas	36	1	3.7	.26	.01	.07	.00
O6. Values	35	5	3.9	.14	-.02	.11	.03
A1. Trust	26	1	3.2	.04	.00	.00	.00
A2. Straightforwardness	26	0	3.1	-.01	.00	.06	.00
A3. Altruism	26	0	3.1	-.07	.00	.04	.00
A4. Compliance	26	2	3.3	-.01	-.01	.02	.00
A5. Modesty	26	3	3.4	-.09	-.01	.06	.01
A6. Tender-mindedness	26	7	3.4	-.07	-.02	.06	.02
C1. Competence	30	0	3.3	.05	.00	.08	.00
C2. Order	30	0	3.4	-.04	.00	.08	.00
C3. Dutifulness	30	0	3.3	-.01	.00	.05	.00
C4. Achievement striving	31	0	3.4	-.02	.00	.06	.00
C5. Self-discipline	33	6	3.8	-.06	-.02	.09	.03
C6. Deliberation	31	5	3.7	-.03	-.02	.08	.02
BFAS Domains							
Neuroticism	13	0	2.3	-.07	.00	.00	.00
Extraversion	13	2	2.5	-.05	-.02	.08	.01
Openness	16	2	2.7	.23	-.02	.08	.01
Agreeableness	13	1	2.4	.07	.01	.07	.01
Conscientiousness	13	4	2.4	-.08	-.02	.05	.01
BFAS Aspects							
N1. Volatility	10	0	1.8	-.09	.00	.08	.00
N2. Withdrawal	10	1	2.2	-.03	.01	.05	.01
E1. Enthusiasm	10	0	2.1	-.02	.00	.07	.00
E2. Assertiveness	10	2	2.2	-.03	-.02	.07	.01
O1. Intellect	20	2	3.0	.28	.02	.12	.01
O2. Openness to Experience	19	0	2.7	.13	.00	.06	.00
A1. Compassion	10	0	2.1	.10	.00	.10	.00

A2. Politeness	10	2	2.2	.05	.02	.06	.01
C1. Industriousness	10	0	2.1	-.06	.00	.06	.00
C2. Orderliness	10	3	2.1	-.10	-.03	.06	.03
BFI-2 Domains							
Neuroticism	4	0	1.6	-.09	.00	.00	.00
Extraversion	4	0	1.4	-.05	.00	.00	.00
Openness	5	1	1.7	.19	.02	.06	.02
Agreeableness	4	1	1.6	.05	.02	.07	.00
Conscientiousness	4	1	1.6	-.01	.02	.05	.00
BFI-2 Facets							
N1. Anxiety	4	0	1.6	-.08	.00	.10	.00
N2. Depression	4	0	1.4	-.06	.00	.00	.00
N3. Emotional Volatility	4	1	1.6	-.11	-.01	.00	.00
E1. Sociability	4	2	1.5	-.06	.02	.00	.00
E2. Assertiveness	4	0	1.6	.01	.00	.04	.00
E3. Energy Level	4	1	1.6	-.03	.01	.04	.01
O1. Intellectual Curiosity	5	2	1.5	.25	.04	.06	.02
O2. Aesthetic Sensitivity	5	1	1.7	.14	.02	.05	.02
O3. Creative Imagination	5	0	1.7	.14	.00	.00	.00
A1. Compassion	4	0	1.6	.01	.00	.09	.00
A2. Respectfulness	4	0	1.6	.04	.00	.09	.00
A3. Trust	4	1	1.6	.03	.01	.00	.00
C1. Organization	4	0	1.6	-.07	.00	.09	.00
C2. Productiveness	4	1	1.6	-.04	.02	.01	.01
C3. Responsibility	4	0	1.6	.05	.00	.00	.00
HEXACO Domains							
Honesty-humility	23	5	3.2	.04	.02	.06	.02
Emotionality	20	2	3.0	-.07	.00	.00	.00
Extraversion	21	1	3.0	-.01	.01	.05	.00
Agreeableness	20	0	2.7	.00	.00	.04	.00
Conscientiousness	21	0	2.8	.00	.00	.03	.00
Openness	22	1	3.0	.11	.01	.05	.00
HEXACO Facets							
H1: Sincerity	12	1	2.4	.00	.00	.03	.00
H2: Fairness	12	1	2.4	.01	.00	.02	.00
H3: Greed-Avoidance	12	0	2.2	.06	.00	.04	.00
H4: Modesty	12	0	2.2	.01	.00	.05	.00
E1: Fearfulness	11	1	2.3	-.09	.00	.05	.00
E2: Anxiety	11	1	2.3	-.06	.00	.00	.00
E3: Dependence	11	6	2.0	.00	.05	.09	.03
E4: Sentimentality	11	4	2.2	-.02	.02	.05	.02
X1: Social Self-Esteem	11	3	2.2	.05	.02	.04	.01
X2: Social Boldness	11	0	2.2	.02	.00	.05	.00
X3: Sociability	11	3	2.3	-.04	.02	.06	.01
X4: Liveliness	11	0	2.1	-.02	.00	.00	.00
A1: Forgiveness	11	2	2.3	.00	-.01	.04	.00
A2: Gentleness	11	3	2.3	-.03	-.02	.06	.01
A3: Flexibility	11	0	2.0	-.05	.00	.02	.00
A4: Patience	11	0	2.1	.06	.00	.04	.00
C1: Organization	11	0	2.1	-.07	.00	.05	.00
C2: Diligence	11	0	2.2	.02	.00	.01	.00
C3: Perfectionism	11	3	2.2	.01	-.03	.08	.02
C4: Prudence	11	0	2.1	.05	.00	.05	.00
O1: Aesthetic Appreciation	11	2	2.3	.03	.02	.09	.02
O2: Inquisitiveness	11	0	2.1	.14	.00	.04	.00
O3: Creativity	13	0	2.3	.04	.00	.00	.00
O4: Unconventionality	11	1	2.3	.11	.00	.05	.00
I: Altruism	11	1	2.2	-.01	.00	.00	.00
I: Proactive	3	2	1.5	-.10	-.05	.08	.03

Note. k = number samples in meta-analysis, k0 = number of samples simulated by trim and fill analysis, k0SE = standard error of number of samples estimated by trim and fill analysis, TF $\bar{r}$=

Trim and Fill estimated mean meta-analytic correlations, TF $\Delta\bar{r}$ = difference between meta-analytic estimate and trim and fill estimate (trim and fill minus original), TF $\tau_{\bar{r}}$ = trim and fill estimate of standard deviation of true effect size, TF $\Delta\tau_{\bar{r}}$= difference between meta-analytic estimate and trim and fill estimate.

Relations of Intelligence and Personality, Excluding Raven's Matrices

Although the Raven's matrices test is a commonly used measure of cognitive ability, the argument could be made that it has insufficient g-loading to be included in a meta-analysis of general intelligence. Table S7 presents a meta-analysis of Big Five personality meta-analytic correlations with intelligence excluding samples that used Raven's as the sole measure of general intelligence. The results are essentially unchanged from the analyses where the Raven's is included.

Table S7

Meta-Analytic Correlations between Big Five Personality and General Intelligence Excluding Raven's Matrices

					95% CI					
Trait	*k*	*N*	$\bar{r}$	(*SE*)	*LL*	*UL*	$\tau_{\bar{r}}$	(*SE*)	*Q*	I^2
Neuroticism	165	101,559	-.08***	(.008)	-.09	-.06	.08	(.033)	675.52***	79.09
Extraversion	160	95,717	-.02**	(.007)	-.03	-.01	.06	(.029)	500.86***	69.48
Openness	169	96,846	.18***	(.009)	.16	.19	.10	(.039)	1016.24***	85.44
Agreeableness	158	95,028	.00	(.009)	-.02	.02	.08	(.035)	634.84***	80.84
Conscientiousness	175	105,717	-.02**	(.008)	-.04	-.01	.08	(.033)	703.21***	78.92

Note. Includes studies measuring the Big Five with NEO, BFAS, and BFI-2. *k* is the number of studies. $\bar{r}$ is mean observed correlation estimated from random-effects model and inverse-variance weighting. $\tau_{\bar{r}}$ is the estimated standard deviations of true correlations.

Reliability-Corrected Meta Analyses

Table S8

Meta-Analytic Correlations between Personality and Intelligence Corrected for Reliability

					95% CI					
Trait	*k*	*N*	$\bar{\rho}$	(*SE*)	*LL*	*UL*	$\tau_{\bar{\rho}}$	(*SE*)	*Q*	I^2
Big Five										
Neuroticism	203	116,515	-.09***	(.008)	-.11	-.07	.10	(.037)	1222.19***	85.30
Extraversion	198	110,673	-.01	(.008)	-.03	.00	.08	(.033)	860.31***	79.79
Openness	209	112,737	.20***	(.010)	.18	.22	.13	(.045)	2012.91***	90.39
Agreeableness	196	109,984	.01	(.009)	-.01	.02	.10	(.039)	1091.32***	85.83
Conscientiousness	214	120,885	-.02*	(.008)	-.03	.00	.10	(.036)	1138.10***	83.83
NEO Domains										
Neuroticism	186	110,579	-.09***	(.009)	-.11	-.07	.10	(.040)	1202.86***	86.74
Extraversion	181	104,737	-.01	(.008)	-.03	.00	.09	(.035)	815.45***	80.78
Openness	188	106,052	.19***	(.011)	.17	.21	.13	(.046)	1882.78***	90.87
Agreeableness	179	104,048	.00	(.009)	-.02	.02	.11	(.040)	1009.70***	86.36
Conscientiousness	197	114,949	-.01	(.009)	-.03	.00	.10	(.037)	1101.94***	85.01
NEO Facets										
N1. Anxiety	28	30,026	-.11***	(.019)	-.15	-.07	.08	(.052)	150.48***	85.63
N2. Angry hostility	28	30,026	-.07***	(.015)	-.10	-.04	.06	(.040)	72.61***	73.01
N3. Depression	29	30,192	-.07**	(.023)	-.12	-.03	.11	(.064)	191.49***	90.84
N4. Self-consciousness	28	30,026	-.03	(.022)	-.07	.01	.10	(.059)	158.26***	88.92
N5. Impulsiveness	31	31,308	-.02	(.018)	-.06	.01	.08	(.050)	185.22***	84.47
N6. Vulnerability	29	30,192	-.07**	(.025)	-.12	-.02	.12	(.069)	275.34***	92.33
E1. Warmth	28	30,779	-.06***	(.015)	-.09	-.03	.06	(.039)	75.33***	73.87
E2. Gregariousness	28	30,779	-.10***	(.016)	-.13	-.06	.07	(.044)	124.54***	80.16
E3. Assertiveness	29	30,945	.05**	(.019)	.02	.09	.09	(.054)	183.41***	86.87

E4. Activity	28	30,779	.01	(.017)	-.03	.04	.07	(.045)	107.03***	80.68
E5. Excitement seeking	29	31,260	-.01	(.023)	-.05	.04	.11	(.065)	220.77***	91.63
E6. Positive emotions	28	30,779	.01	(.017)	-.02	.04	.07	(.046)	116.12***	81.40
O1. Fantasy	35	32,731	.16***	(.019)	.13	.20	.09	(.053)	190.16***	86.73
O2. Aesthetics	35	32,731	.08***	(.020)	.04	.12	.10	(.058)	240.37***	88.53
O3. Feelings	35	32,731	.08***	(.022)	.04	.12	.11	(.064)	225.59***	91.10
O4. Actions	35	32,731	.11***	(.019)	.07	.15	.09	(.055)	128.47***	87.38
O5. Ideas	36	33,135	.30***	(.019)	.26	.34	.09	(.054)	277.21***	89.11
O6. Values	35	32,731	.22***	(.024)	.17	.27	.13	(.069)	389.89***	92.82
A1. Trust	26	28,635	.04***	(.007)	.03	.06	.01	(.015)	38.29*	7.64
A2. Straightforwardness	26	28,635	-.01	(.020)	-.05	.03	.09	(.055)	110.17***	86.32
A3. Altruism	26	28,635	-.09***	(.016)	-.12	-.05	.06	(.042)	71.55***	75.00
A4. Compliance	26	28,635	-.01	(.015)	-.04	.02	.05	(.040)	69.27***	71.88
A5. Modesty	26	28,635	-.10***	(.020)	-.13	-.06	.08	(.053)	110.96***	85.70
A6. Tender-mindedness	26	28,635	-.06**	(.020)	-.10	-.02	.08	(.054)	96.99***	85.94
C1. Competence	30	32,006	.06**	(.023)	.02	.11	.11	(.064)	255.88***	91.29
C2. Order	30	32,006	-.05*	(.023)	-.10	-.01	.11	(.064)	209.07***	91.53
C3. Dutifulness	30	32,006	-.02	(.019)	-.06	.02	.08	(.051)	129.73***	85.37
C4. Achievement striving	31	32,172	-.02	(.019)	-.06	.02	.09	(.053)	169.58***	86.60
C5. Self-discipline	33	34,262	-.04*	(.019)	-.08	-.01	.09	(.055)	167.31***	88.57
C6. Deliberation	31	32,487	-.02	(.019)	-.05	.02	.09	(.054)	162.40***	87.21
BFAS Domains										
Neuroticism	13	4,459	-.08***	(.015)	-.11	-.05	.00	(.032)	14.09	0.07
Extraversion	13	4,459	-.03	(.029)	-.09	.03	.09	(.067)	41.74***	71.23
Openness	16	4,994	.29***	(.028)	.24	.34	.09	(.067)	61.56***	76.17
Agreeableness	13	4,459	.07**	(.028)	.02	.13	.08	(.064)	37.82***	69.40
Conscientiousness	13	4,459	-.07**	(.022)	-.11	-.02	.05	(.049)	22.35*	47.63
BFAS Aspects										
N1. Volatility	10	3,044	-.10**	(.040)	-.18	-.03	.11	(.086)	31.91***	77.67
N2. Withdrawal	10	3,044	-.04	(.028)	-.10	.01	.06	(.061)	19.35*	54.20
E1. Enthusiasm	10	3,044	-.02	(.035)	-.09	.05	.09	(.076)	33.54***	70.60
E2. Assertiveness	10	3,044	.00	(.031)	-.06	.06	.08	(.068)	24.06**	62.35
O1. Intellect	20	5,311	.31***	(.032)	.24	.37	.13	(.082)	122.75***	85.00
O2. Openness to Experience	19	5,070	.16***	(.026)	.11	.21	.09	(.065)	58.58***	70.20
A1. Compassion	10	3,044	.12**	(.044)	.03	.21	.12	(.095)	53.38***	81.98
A2. Politeness	10	3,044	.03	(.031)	-.03	.09	.08	(.068)	23.84**	62.48
C1. Industriousness	10	3,044	-.07*	(.031)	-.13	-.01	.07	(.067)	23.28**	61.99
C2. Orderliness	10	3,044	-.08**	(.025)	-.13	-.03	.05	(.054)	15.52	43.00
BFI-2 Domains										
Neuroticism	4	1,477	-.10***	(.029)	-.15	-.04	.03	(.053)	4.28	23.07
Extraversion	4	1,477	-.05*	(.026)	-.10	.00	.00	(.047)	2.26	0.11
Openness	5	1,691	.20***	(.035)	.13	.26	.06	(.065)	8.71	53.90
Agreeableness	4	1,477	.03	(.052)	-.07	.13	.09	(.094)	13.17**	75.06
Conscientiousness	4	1,477	-.04	(.039)	-.12	.04	.06	(.071)	7.01	56.38
BFI-2 Facets										
N1. Anxiety	4	1,477	-.09	(.066)	-.22	.04	.12	(.119)	19.63***	84.84
N2. Depression	4	1,477	-.07*	(.029)	-.13	-.02	.03	(.053)	4.25	21.43
N3. Emotional Volatility	4	1,477	-.11***	(.026)	-.16	-.06	.00	(.047)	2.10	0.33
E1. Sociability	4	1,477	-.09***	(.026)	-.15	-.04	.00	(.047)	1.45	0.18
E2. Assertiveness	4	1,477	.02	(.040)	-.06	.09	.06	(.073)	7.08	57.78
E3. Energy Level	4	1,477	-.06	(.037)	-.13	.02	.05	(.067)	6.17	51.25
O1. Intellectual Curiosity	5	1,634	.27***	(.037)	.20	.34	.06	(.069)	10.51*	59.55
O2. Aesthetic Sensitivity	5	1,634	.14***	(.033)	.08	.21	.05	(.061)	6.85	43.22
O3. Creative Imagination	5	1,634	.17***	(.024)	.12	.22	.00	(.045)	2.26	0.13
A1. Compassion	4	1,477	.01	(.064)	-.12	.14	.12	(.117)	20.93***	83.87
A2. Respectfulness	4	1,477	.05	(.063)	-.07	.17	.12	(.114)	19.63***	83.26
A3. Trust	4	1,477	.02	(.028)	-.03	.08	.02	(.051)	3.43	13.67
C1. Organization	4	1,477	-.08	(.060)	-.20	.04	.11	(.109)	17.77***	81.58
C2. Productiveness	4	1,477	-.07*	(.031)	-.13	-.01	.03	(.055)	3.91	27.80
C3. Responsibility	4	1,477	.07**	(.026)	.02	.12	.00	(.047)	0.09	0.02

HEXACO Domains										
Honesty-humility	23	32,165	.01	(.018)	-.02	.05	.07	(.047)	56.97***	77.94
Emotionality	20	31,677	-.09***	(.014)	-.12	-.06	.04	(.033)	33.13*	56.47
Extraversion	21	31,894	-.02	(.019)	-.06	.01	.07	(.047)	69.46***	78.98
Agreeableness	20	31,677	.00	(.018)	-.04	.03	.06	(.043)	96.20***	74.49
Conscientiousness	21	31,894	.00	(.015)	-.02	.03	.04	(.036)	64.15***	61.55
Openness	22	32,180	.12***	(.021)	.08	.16	.08	(.052)	78.29***	83.89
HEXACO Facets										
H1: Sincerity	12	29,846	.00	(.019)	-.04	.03	.05	(.041)	32.39***	73.98
H2: Fairness	12	29,846	.00	(.016)	-.03	.04	.04	(.035)	27.01**	64.92
H3: Greed-Avoidance	12	29,846	.06**	(.022)	.02	.11	.06	(.048)	43.18***	82.26
H4: Modesty	12	29,846	.01	(.027)	-.05	.06	.08	(.060)	41.85***	89.24
E1: Fearfulness	11	29,659	-.10***	(.024)	-.15	-.06	.06	(.051)	73.30***	85.38
E2: Anxiety	11	29,659	-.07***	(.006)	-.08	-.06	.00	(.013)	4.38	0.25
E3: Dependence	11	29,659	-.07**	(.025)	-.12	-.02	.07	(.055)	67.10***	87.16
E4: Sentimentality	11	29,659	-.05**	(.017)	-.08	-.02	.04	(.037)	31.26***	69.80
X1: Social Self-Esteem	11	29,659	.03	(.019)	.00	.07	.05	(.040)	24.87**	74.59
X2: Social Boldness	11	29,659	.02	(.023)	-.02	.07	.06	(.051)	76.95***	84.61
X3: Sociability	11	29,659	-.08***	(.022)	-.12	-.03	.06	(.049)	48.30***	83.38
X4: Liveliness	11	29,659	-.02***	(.006)	-.03	-.01	.00	(.013)	17.33	0.01
A1: Forgiveness	11	29,659	.01	(.018)	-.02	.05	.04	(.039)	42.29***	72.62
A2: Gentleness	11	29,659	-.02	(.025)	-.06	.03	.07	(.054)	173.80***	86.79
A3: Flexibility	11	29,659	-.06***	(.015)	-.09	-.03	.03	(.031)	25.32**	58.28
A4: Patience	11	29,659	.08***	(.019)	.04	.11	.05	(.040)	43.46***	75.00
C1: Organization	11	29,659	-.08***	(.023)	-.12	-.03	.06	(.049)	70.77***	83.92
C2: Diligence	11	29,659	.02*	(.010)	.00	.04	.02	(.020)	12.78	25.59
C3: Perfectionism	11	29,659	.04	(.025)	-.01	.09	.07	(.056)	73.70***	87.51
C4: Prudence	11	29,659	.07*	(.032)	.01	.14	.09	(.070)	72.16***	92.61
O1: Aesthetic Appreciation	11	29,659	.01	(.029)	-.05	.07	.08	(.064)	72.49***	90.89
O2: Inquisitiveness	11	29,659	.16***	(.019)	.12	.20	.05	(.041)	56.08***	76.72
O3: Creativity	13	29,910	.04***	(.006)	.03	.05	.00	(.013)	21.64*	0.00
O4: Unconventionality	11	29,659	.13***	(.025)	.08	.18	.07	(.054)	78.15***	86.94
I: Altruism	11	29,659	-.01*	(.006)	-.03	.00	.00	(.013)	10.71	0.54
I: Proactive	3	1,873	-.05	(.047)	-.14	.04	.06	(.082)	6.00*	64.02

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

Analysis of Extent and Impact of Sample Overlap

Because studies of personality typically involve the measurement of multiple traits in a single sample, and because studies that measure personality facets are generally also, by default, measuring the parent personality domains, many of our meta-analytic estimates are derived from overlapping sets of studies. For example, most studies that measure extraversion using the BFI2 will also have measured conscientiousness (and the remaining Big Five domains). Thus, a sample from a study like this will contribute to our meta-analytic estimates of the relations of intelligence with *both* extraversion and conscientiousness (and indeed, in most cases, also the remaining Big Five domains, and the BFI2 facets). This section provides an overview of how samples overlapped across the various meta-analyses.

- Most studies (81%) included in the meta-analysis administered a full personality measure. The measure of personality might be a domain or facet-level measure. And in most cases, where complete measurement was provided, we have complete correlations (i.e., intercorrelations among personality measures and with intelligence, either reported or derived from data) at least at the domain-level. Although many studies used a facet-level measure, facet correlations or a complete set of facet-level correlations were relatively rarely reported.

- Where facet correlations were available, corresponding domain correlations were almost always also available. Thus, for many samples, we could access the full set of domain and facet intercorrelations and correlations with intelligence. In some studies, however, facets for only a particular domain were measured in full (e.g., Dunlop et al., 2017, reported only correlations for the openness facets of the HEXACO). In these cases, we still used the correlations involving those facets.
- Altogether, among the Big Five domains, the openness facets of the NEO and openness aspects of the BFAS were applied disproportionately more as stand-alone measures in studies reporting personality-intelligence correlations.
- There were only three studies where more than one of the personality frameworks we studied were measured; thus there was almost no sample overlap across the different measures.
- The samples examining g_f and g_c correlations all include measures of g_f, g_c, and general intelligence.
- All samples included in regression models included complete correlation matrices for the personality measure (i.e., all intercorrelations among personality scales).
- The five item-level HEXACO samples are a subset of the HEXACO studies in the main meta-analytic investigation.

An anonymous reviewer raised the question of whether the overlapping samples could potentially affect the statistical comparisons of correlations of intelligence and one personality trait (whether domain or facet), and the correlation of intelligence with another. For example, does the fact that many of the same samples that contributed to the intelligence-extraversion meta-analytic correlation also contributed to the intelligence-conscientiousness meta-analytic correlation mean that comparing these two correlations *to each other* involves a dependency that must be taken into account?

Overall, two key observations can be made. First, estimates of the differences between correlations of 'common sets' of traits with intelligence will be more accurate. By common sets, we refer to comparing (a) Big Five correlations, (b) Domain correlations within a measure, and (c) facet correlations within a measure. The comparisons of correlations within common sets are more accurate because they are based on mostly overlapping studies, and therefore, study-level moderators are less likely to have differential effects on the correlations. This degree of overlap is even greater when comparing facets within a domain (e.g., comparing intelligence of the six NEO openness facets), because studies that measure one facet in a domain almost always measure the full set.

Second, generally, having greater proportions of overlapping samples will lead to smaller standard errors of the differences between pairs of correlations, with this reduction being directly related to the size of the correlations of the variables in common. Take the example of comparing facet–intelligence correlations from facets within a personality domain (e.g., comparing intelligence correlations for the NEO openness facets). Mean facet intercorrelations, where those facets are from the same factor, ranged from .40 to around.56, depending on the measure. The precision of estimating differences in two paired correlations (i.e., X with Y1 versus X with Y2) improves as the correlation between Y1 and Y2 increases. For instance, the standard error of the difference between these two correlations is approximately 30% smaller

for dependent correlations (assuming a correlation of common variables of r = .40) than for independent correlations. By contrast, the benefits to precision of this dependency decline somewhat when comparing correlations of intelligence with facets from different domains, because the intercorrelations of facets from different domains are closer to zero.

Moderator Analysis

A more detailed examination of study moderators is provided below. Table S9 presents five meta-regression models examining the prediction of the correlation between personality and intelligence for each Big Five Trait (we excluded HEXACO from these analyses). The five moderator variables (personality measure, intelligence measure, assessment stakes, sample mean age, sample proportion female) were dummy coded with the first category shown in Table S8 as the reference category. Studies were excluded from the moderator analysis if they had missing data on a moderator used in the analysis. Meta-regression models were estimated using the `metafor` package in R. The parameters in the table can be interpreted much like any typical regression analysis. The dependent variable is the size of the meta-analytic correlation of the trait in question with intelligence. The estimate for a given type of study can be derived by adding the intercept parameter to the parameters that correspond to the features of the study in question. For example, the estimate of the relation of neuroticism and intelligence for a study using the BFI-2 to measure personality, the Wonderlic to measure intelligence, conducted in a low-stakes setting, with a sample of a mean age between 18-59, and a female proportion between 25-75% would be: –.090 – .013 + .008 + .000 – .007 + .024 = -0.078. Statistically significant parameters are those for which the study feature (i.e., moderator) affects the observed meta-analytic estimate to a statistically significant extent, relative to the reference feature.

As Table S9 shows, moderators explained significant variance in the associations of intelligence with neuroticism, openness, and agreeableness. The most prominent coefficient for neuroticism was the age of the sample. Specifically, the negative relationship between neuroticism and intelligence was notably stronger in samples with mean age over 60. With regards to intelligence measures and settings, the correlation of openness with intelligence was weaker in high stakes assessment contexts and when using the Wonderlic. Several other study features approached statistical significance. For instance, studies using the WAIS tended to show higher correlations of openness with intelligence and those using older samples tended to show a stronger correlation between openness and intelligence. Finally, the correlation between agreeableness and intelligence were stronger when the WAIS was used and when using the BFAS.

Table S10 provides additional detailed reporting of the correlations between each Big Five trait and intelligence. Table S11 presents moderator regression models separately for each moderator. These models were designed to complement the combined regression models and provide a bivariate assessment of these moderator effects. They also report the moderator effect of sample mean age and sample proportion female using a continuous variable in addition to a categorical approach.

Table S9

Moderator Meta-Regression Predicting Relationship Between Big Five Personality Trait and Intelligence from Study Moderators

Coefficients	Neuroticism	Extraversion	Openness	Agreeableness	Conscientiousness
Intercept	-.090** (.031)	-.040 (.032)	.137*** (.040)	.027 (.036)	.040 (.030)
Personality					
NEO					
BFAS	.000 (.029)	-.013 (.027)	.075* (.031)	.066* (.030)	-.028 (.029)
BFI-2	-.013 (.053)	-.037 (.050)	-.039 (.056)	-.010 (.056)	-.036 (.054)
Intelligence					
Composite					
Wonderlic	.008 (.027)	.027 (.026)	-.068* (.032)	.008 (.029)	-.001 (.027)
WAIS	-.006 (.031)	-.031 (.031)	.068 (.035)	.096** (.033)	.014 (.031)
Matrix	.006 (.021)	.038 (.020)	-.043 (.025)	.008 (.023)	.031 (.021)
Other	.012 (.019)	-.028 (.019)	-.004 (.023)	-.041 (.021)	-.021 (.019)
Stakes					
Low stakes					
High Stakes	.014 (.029)	.025 (.031)	-.112** (.040)	.009 (.035)	.032 (.029)
Mean Age					
Under 18					
18 to 59	-.007 (.021)	.019 (.021)	.035 (.026)	-.018 (.023)	-.043* (.020)
60 plus	-.165*** (.044)	.061 (.044)	.096 (.054)	-.038 (.049)	.008 (.041)
Proportion Female					
< 25%					
25 to 75%	.024 (.024)	.009 (.025)	.011 (.032)	-.007 (.028)	-.023 (.024)
> 75%	.015 (.033)	.015 (.033)	-.004 (.041)	-.036 (.037)	-.033 (.033)
Model Statistics					
N	90030	83415	85699	83013	93758
k	172	166	176	164	181
tau	0.071	0.063	0.092	0.076	0.072
I^2	69.821	62.752	78.832	70.909	69.656
H^2	3.314	2.685	4.724	3.437	3.296
R^2	14.167	8.369	19.683	9.473	9.077
Q Model	21.227*	16.865	41.112***	25.972**	19.593

Note. Moderators were dummy coded. First category shown is the reference category.

Table S10

Detailed Meta-Analytic Correlations between Big Five Personality and General Intelligence by Study Moderators

						95% CI					
Moderator	Trait	*k*	*N*	$\bar{\rho}$	(*SE*)	*LL*	*UL*	$\tau_{\bar{\rho}}$	(*SE*)	*Q*	I^2
Personality											
NEO	N	186	110,579	-.08***	(.008)	-.09	-.06	.08	(.03)	827.38***	80.24
BFAS	N	13	4,459	-.07***	(.015)	-.10	-.04	.00	(.03)	10.93	0.02
BFI2	N	4	1,477	-.09***	(.026)	-.14	-.04	.00	(.05)	3.38	0.14
Intelligence											
Composite	N	59	34,899	-.09***	(.013)	-.12	-.06	.08	(.04)	203.52***	78.02
Wonderlic	N	27	4,470	-.06**	(.022)	-.11	-.02	.08	(.06)	50.38**	50.06
WAIS	N	17	3,796	-.12***	(.032)	-.18	-.06	.10	(.08)	59.12***	69.92
Matrix	N	43	16,054	-.07***	(.015)	-.10	-.04	.08	(.05)	170.58***	68.81
Other	N	57	57,296	-.06***	(.012)	-.09	-.04	.07	(.04)	228.86***	82.31
Stakes											
Low stakes	N	183	80,153	-.08***	(.008)	-.10	-.07	.08	(.03)	614.92***	72.53
High stakes	N	13	19,474	-.05	(.030)	-.11	.01	.10	(.07)	97.29***	92.27
Age Mean											
Under 18	N	21	16,853	-.06**	(.022)	-.10	-.02	.09	(.06)	143.32***	85.56
18 to 59	N	152	85,357	-.07***	(.008)	-.08	-.05	.07	(.03)	443.21***	70.20
60 plus	N	6	3,163	-.24***	(.033)	-.30	-.17	.06	(.06)	15.21**	67.49
Female %											
Under 25%	N	28	43,187	-.07***	(.019)	-.11	-.04	.08	(.05)	169.05***	89.97
25 to 75%	N	143	67,388	-.08***	(.009)	-.09	-.06	.08	(.04)	557.42***	75.89
Over 75%	N	24	4,267	-.09***	(.020)	-.13	-.05	.06	(.05)	36.14*	38.33
Personality											
NEO	E	181	104,737	-.01	(.007)	-.02	.00	.06	(.03)	589.42***	70.22
BFAS	E	13	4,459	-.03	(.025)	-.08	.02	.07	(.06)	30.79**	60.91
BFI2	E	4	1,477	-.05	(.026)	-.10	.00	.00	(.05)	1.74	0.01
Intelligence											
Composite	E	56	29,718	-.01	(.010)	-.03	.01	.05	(.03)	127.89***	55.85
Wonderlic	E	27	4,531	.01	(.021)	-.03	.05	.07	(.06)	49.27**	45.73
WAIS	E	16	3,189	-.03	(.018)	-.07	.00	.00	(.04)	13.74	0.01
Matrix	E	42	15,939	.02	(.013)	-.01	.04	.06	(.04)	93.94***	53.99
Other	E	57	57,296	-.03**	(.012)	-.06	-.01	.07	(.04)	271.69***	83.19
Stakes											
Low stakes	E	180	79,811	-.01	(.007)	-.02	.00	.07	(.03)	577.22***	65.52
High stakes	E	11	13,974	-.01	(.025)	-.06	.04	.06	(.05)	37.19***	79.48
Age Mean											
Under 18	E	21	14,952	-.02	(.017)	-.06	.01	.06	(.04)	74.01***	73.41
18 to 59	E	148	82,023	-.02*	(.008)	-.03	.00	.07	(.03)	483.94***	70.39
60 plus	E	5	2,556	.00	(.020)	-.04	.04	.00	(.04)	2.43	0.02
Female %											
Under 25%	E	24	39,926	-.02	(.016)	-.06	.01	.06	(.04)	141.54***	82.37
25 to 75%	E	142	64,054	-.01	(.008)	-.03	.00	.07	(.03)	394.43***	67.61
Over 75%	E	23	4,247	.00	(.019)	-.04	.04	.05	(.05)	30.17	30.47
Personality											
NEO	O	188	106,052	.16***	(.009)	.14	.18	.10	(.04)	1277.11***	86.56
BFAS	O	16	4,994	.25***	(.024)	.20	.30	.07	(.06)	43.71***	65.21
BFI2	O	5	1,691	.17***	(.030)	.11	.23	.04	(.06)	6.38	36.35
Intelligence											
Composite	O	60	29,934	.19***	(.016)	.16	.22	.10	(.05)	382.51***	84.85
Wonderlic	O	26	4,450	.11***	(.023)	.06	.15	.08	(.06)	55.43***	54.88
WAIS	O	18	3,393	.27***	(.020)	.23	.31	.04	(.05)	25.06	23.86
Matrix	O	44	16,874	.13***	(.019)	.09	.17	.11	(.06)	304.01***	82.25
Other	O	61	58,086	.16***	(.014)	.14	.19	.10	(.05)	447.96***	89.43
Stakes											
Low stakes	O	191	81,875	.18***	(.009)	.16	.19	.10	(.04)	1079.72***	82.63
High stakes	O	11	13,974	.06	(.034)	-.01	.12	.10	(.07)	58.26***	90.20

Age Mean										
Under 18	O	21	15,015	.12***	(.026)	.07	.17	.11	(.07)	281.74***	89.24
18 to 59	O	156	83,401	.16***	(.010)	.14	.18	.10	(.04)	829.90***	84.40
60 plus	O	6	2,626	.26***	(.018)	.23	.30	.00	(.03)	5.10	0.03
Female %										
Under 25%	O	24	39,926	.13***	(.025)	.08	.18	.10	(.07)	230.79***	94.14
25 to 75%	O	151	66,274	.17***	(.010)	.15	.19	.10	(.04)	910.38***	82.41
Over 75%	O	24	4,311	.16***	(.026)	.10	.21	.10	(.07)	84.96***	66.09
Personality										
NEO	A	179	104,048	.00	(.008)	-.02	.01	.08	(.03)	680.38***	78.41
BFAS	A	13	4,459	.06**	(.024)	.02	.11	.06	(.06)	27.24**	57.21
BFI2	A	4	1,477	.03	(.045)	-.06	.11	.07	(.08)	9.64*	66.96
Intelligence										
Composite	A	55	29,110	.00	(.014)	-.03	.02	.08	(.04)	236.43***	76.17
Wonderlic	A	26	4,450	.00	(.019)	-.03	.04	.05	(.05)	34.38	32.02
WAIS	A	16	3,189	.12***	(.033)	.05	.18	.10	(.08)	50.04***	66.31
Matrix	A	42	15,939	.02	(.013)	-.01	.04	.06	(.04)	100.75***	54.05
Other	A	57	57,296	-.02	(.013)	-.05	.01	.09	(.04)	265.80***	87.21
Stakes										
Low stakes	A	178	79,122	.01	(.008)	-.01	.02	.08	(.03)	696.10***	75.48
High stakes	A	11	13,974	-.02	(.019)	-.06	.01	.04	(.04)	22.98*	64.25
Age Mean										
Under 18	A	20	14,179	.02	(.023)	-.02	.07	.09	(.06)	116.75***	84.81
18 to 59	A	146	81,621	.00	(.008)	-.02	.02	.08	(.03)	502.93***	75.69
60 plus	A	5	2,556	-.01	(.071)	-.15	.13	.15	(.13)	22.51***	90.59
Female %										
Under 25%	A	24	39,926	.02	(.020)	-.02	.06	.08	(.05)	80.10***	89.02
25 to 75%	A	140	63,652	.01	(.009)	-.01	.02	.08	(.04)	593.55***	75.54
Over 75%	A	23	4,247	-.02	(.019)	-.06	.02	.05	(.05)	32.94	28.04
Personality										
NEO	C	197	114,949	-.01	(.007)	-.03	.00	.08	(.03)	827.60***	78.73
BFAS	C	13	4,459	-.06**	(.019)	-.10	-.02	.04	(.04)	16.41	33.57
BFI2	C	4	1,477	-.03	(.035)	-.10	.03	.05	(.06)	5.35	44.79
Intelligence										
Composite	C	60	35,229	-.02	(.012)	-.05	.00	.07	(.04)	184.80***	74.64
Wonderlic	C	29	4,996	-.01	(.024)	-.06	.03	.10	(.07)	69.12***	62.82
WAIS	C	18	3,933	.00	(.022)	-.04	.05	.05	(.05)	26.42	38.72
Matrix	C	44	16,420	.01	(.013)	-.01	.04	.06	(.04)	103.73***	57.14
Other	C	63	60,307	-.03*	(.013)	-.06	.00	.09	(.04)	309.31***	86.99
Stakes										
Low stakes	C	193	84,367	-.01	(.007)	-.03	.00	.07	(.03)	569.39***	70.78
High stakes	C	13	19,474	.01	(.031)	-.05	.07	.10	(.07)	134.51***	92.57
Age Mean										
Under 18	C	26	19,856	.03*	(.013)	.00	.05	.05	(.04)	65.51***	66.19
18 to 59	C	156	86,091	-.03***	(.008)	-.04	-.01	.08	(.03)	569.42***	76.57
60 plus	C	7	3,310	.03	(.025)	-.02	.08	.04	(.05)	11.44	40.78
Female %										
Under 25%	C	29	43,421	.00	(.022)	-.04	.05	.10	(.06)	236.39***	92.43
25 to 75%	C	151	70,882	-.02*	(.008)	-.03	.00	.07	(.03)	476.54***	72.16
Over 75%	C	25	4,423	-.02	(.024)	-.07	.03	.09	(.06)	56.36***	56.93

Note. Trait abbreviations (N = Neuroticism, E = Extraversion, O = Openness, A = Agreeableness, C = Conscientiousness).

Table S11

Meta-Analytic Moderator Regression Models of Big Five Personality and General Intelligence Correlations Estimated Separately for Each Moderator

	Neuroticism	Extraversion	Openness	Agreeableness	Conscientiousness
Personality					
Intercept NEO	-0.076*** (0.008)	-0.011 (0.007)	0.160*** (0.009)	-0.001 (0.008)	-0.012 (0.007)
BFAS	0.004 (0.029)	-0.017 (0.025)	0.090** (0.031)	0.063* (0.029)	-0.042 (0.028)
BFI2	-0.007 (0.048)	-0.038 (0.042)	0.005 (0.052)	0.026 (0.048)	-0.024 (0.047)
N	116515	110673	112737	109984	120885
k	203	198	209	196	214
tau	0.08	0.064	0.101	0.079	0.077
I^2	78.422	69.151	85.273	77.339	77.07
H^2	4.634	3.242	6.79	4.413	4.361
R^2	0	0	3.699	2.949	0.434
Q Model	0.044	1.214	8.502*	5.102	2.385
Intelligence					
Intercept Composite	-0.090*** (0.013)	-0.013 (0.012)	0.195*** (0.015)	-0.003 (0.013)	-0.024 (0.013)
Wonderlic	0.027 (0.025)	0.019 (0.023)	-0.090** (0.029)	0.005 (0.026)	0.011 (0.024)
WAIS	-0.035 (0.030)	-0.021 (0.028)	0.072* (0.033)	0.116*** (0.031)	0.026 (0.029)
Matrix	0.022 (0.020)	0.029 (0.018)	-0.064** (0.023)	0.021 (0.020)	0.038 (0.020)
Other	0.027 (0.018)	-0.023 (0.016)	-0.030 (0.021)	-0.017 (0.018)	-0.007 (0.017)
N	116515	110673	112737	109984	120885
k	203	198	209	196	214
tau	0.077	0.061	0.097	0.076	0.076
I^2	76.873	66.217	83.756	75.454	75.989
H^2	4.324	2.96	6.156	4.074	4.165
R^2	4.088	8.822	11.57	9.722	3.478
Q Model	6.089	10.869*	25.055***	20.229***	6.409
Stakes					
Intercept Low stakes	-0.082*** (0.008)	-0.011 (0.007)	0.178*** (0.009)	0.007 (0.008)	-0.014 (0.007)
High stakes	0.026 (0.027)	-0.001 (0.027)	-0.121*** (0.037)	-0.022 (0.031)	0.022 (0.027)
N	99627	93785	95849	93096	103841
k	196	191	202	189	206
tau	0.079	0.066	0.101	0.082	0.077
I^2	75.435	66.731	83.133	75.701	74.078
H^2	4.071	3.006	5.929	4.115	3.858
R^2	0	0	6.615	0	0
Q Model	0.925	0.001	11.047***	0.495	0.666
Age Mean					
Intercept Under 18	-0.063*** (0.018)	-0.021 (0.018)	0.124*** (0.024)	0.019 (0.021)	0.026 (0.017)
18 to 59	-0.003 (0.020)	0.005 (0.019)	0.038 (0.026)	-0.019 (0.022)	-0.053** (0.019)
60 plus	-0.170*** (0.040)	0.033 (0.042)	0.140** (0.054)	-0.017 (0.049)	0.000 (0.039)
N	105373	99531	101042	98356	109257
k	179	174	183	171	189
tau	0.069	0.065	0.098	0.079	0.072
I^2	73.446	69.898	84.583	77.56	74.658
H^2	3.766	3.322	6.486	4.456	3.946
R^2	19.015	0	4.282	0	8.993
Q Model	21.223***	0.607	6.940*	0.73	9.581**
Female %					
Intercept Under 25%	-0.074*** (0.019)	-0.021 (0.018)	0.128*** (0.025)	0.019 (0.021)	0.000 (0.019)
25 to 75%	-0.002 (0.021)	0.007 (0.020)	0.042 (0.026)	-0.013 (0.023)	-0.018 (0.021)
Over 75%	-0.013 (0.030)	0.020 (0.028)	0.028 (0.036)	-0.044 (0.031)	-0.019 (0.030)
N	114842	108227	110511	107825	118726
k	195	189	199	187	205
tau	0.079	0.065	0.1	0.08	0.079
I^2	78.138	69.498	84.687	77.576	77.628
H^2	4.574	3.278	6.53	4.459	4.47
R^2	0	0	0.848	0	0
Q Model	0.228	0.555	2.571	2.061	0.801
Linear Age					
Intercept	-0.098*** (0.010)	-0.002 (0.010)	0.191*** (0.012)	0.005 (0.011)	-0.014 (0.010)
Scaled Mean Age	-0.021*** (0.006)	0.011* (0.005)	0.024*** (0.007)	0.001 (0.006)	0.002 (0.006)

N	105373	99531	101042	98356	109257
k	179	174	183	171	189
tau	0.073	0.063	0.097	0.079	0.076
I^2	75.043	68.379	83.955	77.312	76.495
H^2	4.007	3.162	6.232	4.408	4.254
R^2	11.554	3.818	8.057	0	0
Q Model	13.625***	4.326*	12.101***	0.052	0.165
Linear Female %					
Intercept	-0.082*** (0.019)	-0.003 (0.018)	0.142*** (0.023)	0.047* (0.020)	0.015 (0.019)
Prop Female	0.009 (0.034)	-0.021 (0.032)	0.039 (0.041)	-0.0028	-0.057 (0.033)
N	114842	108227	110511	107825	118726
k	195	189	199	187	205
tau	0.079	0.065	0.1	0.078	0.078
I^2	78.249	69.798	84.897	77.154	77.401
H^2	4.598	3.311	6.621	4.377	4.425
R^2	0	0	0.275	2.05	0.083
Q Model	0.072	0.42	0.915	5.088*	2.941

Note: Scaled Mean Age was as follows: (Mean Age - 40) / 10 (i.e., the coefficient represents a 10-year increase in mean sample age). Linear Female % was scale 0 = 100% male to 1 = 100% female sample.

Item-Level Meta-Analytic Correlations with Intelligence

Meta-analytic item-level correlations are presented in a spreadsheet in the online supplement. Several common themes emerged for items that correlated more with intelligence (see Table S12 for illustrative items): (1) **Intellectual engagement:** Enjoying and regularly engaging with intellectual complexity, learning new things, intellectual ideas, puzzles, abstract ideas, science, art, and literature; (2) **Unconventionality:** Enjoying unusual ideas, seeing oneself as unconventional, and liking others with unconventional views; (3) **Self-rated intelligence:** Perceiving oneself as quick to learn new things with a rich vocabulary; note that items of this type were from the BFAS Intellect facet, but these were absent from the NEO-PI-R and HEXACO-PI-R, and the BFI-2 has only one item of this form; (4) **Self-rated abilities:** Perceiving oneself as having other abilities such as creativity or the ability to influence others, (5) **Ability to maintain composure:** Ability to avoid becoming stressed out, agitated, overwhelmed, or to feel threatened, (6) **Untidy:** Spending less time keeping home and office tidy with some indicators of less self-discipline and more spontaneity, and (7) **Less sociable:** Less sociable and talkative.

Table S12

Meta-Analytic Correlations for Personality Items Illustrating Item-Level Themes

	Correlation with intelligence	
Sample item	*r*	95% CI
Intellectual engagement		
I like to solve complex problems	.24	[.18, .29]
I am curious about many different things	.18	[.10, .27]
Unconventionality		
I would avoid hanging around with people who have unusual opinions	-.14	[-.18, -.10]
I think that paying attention to radical ideas is a waste of time	-.08	[-.13, -.03]
Self-rated intelligence		
I am quick to understand things	.20	[.14, .27]
I learn things slowly	-.18	[-.23, -.12]
Self-rated abilities		
I am inventive and find clever ways to do things	.09	[.03, .15]
I have little creativity	-.11	[-.18, -.04]
Ability to maintain composure		
I rarely lose my composure	.13	[.01 .26]
I am temperamental, get emotional easy	-.10	[-.16, -.03]
Untidy		
I keep my things tidy and clean*	-.14	[-.17, -.11]
I clean my office or home quite frequently.	-.13	[-.16, -.09]
Less sociable		
I am sometimes shy, introverted	.10	[.03, .17]
I prefer jobs where I can work alone*	-.09	[-.15, -.03]

Note. Complete listing of meta-analytic correlations is provided in the online supplement. Items marked with * are adapted for reasons of copyright.

Multilevel Meta-Analysis and Correlation Comparisons

Multilevel meta-analysis provides another approach to modelling the meta-analytic correlations between personality and intelligence. In particular, most studies in the current meta-analysis provide complete sets of correlations between personality

and intelligence (e.g., all Big Five domains, all HEXACO domains, all NEO facets). As such, multiple correlations are nested within studies and correlation estimates in a given study have some dependency from both shared sampling error and variation in true study-specific effect sizes. In general, this dependency does not impact inference regarding the estimated correlation between a given a trait and intelligence. Further, in the current meta-analysis we never seek to estimate aggregate correlations where we include multiple correlations (each of a different type) from the same sample. For instance, we did not combine all Big Five correlations to estimate the average correlation between personality traits in general and intelligence, and we also do not combine all openness-facet correlations to model an average openness-facet correlation.

Despite this, there are still several reasons why a multilevel meta-analytic approach is useful. First, because we have complete correlation matrices for most studies (i.e., reported in paper, provided by author, or computed from raw data), we are able to obtain accurate estimates of the study-specific sample-covariance matrices of the personality-intelligence correlations in each study. In contrast, much discussion in the multilevel meta-analytic literature implies that obtaining these accurate estimates is very rare and that assuming sample-covariance matrices of estimators can lead to artificial certainty in the model. Second, multilevel meta-analysis provides a rigorous framework for comparing the size of dependent meta-analytic correlations. For instance, in the main study we often discuss how openness is the strongest Big Five correlate of intelligence, followed by neuroticism. We also compare the magnitude of facet–intelligence correlations (e.g., the NEO facets of openness). An approximation of the standard error of the difference between two correlations can be obtained as the sqrt(var(r_1) + var(r_2)). However, multilevel meta-analysis provides more precise estimates of the standard error that incorporates the specification of the within-study dependencies.

Thus, we present the multilevel meta-analysis results to serve as a formal test of difference between correlations. Further, the fact that the results converge with univariate meta-analytic results also provides a useful robustness check.

In order to estimate multilevel meta-analytic models, we used the `rma.mv` function in the `metafor` package in R. We estimated separate models for Big Five domains, NEO Domains, BFAS domains, BFAS facets, BFI 2 domains, BFI 2 facets, and HEXACO Domains. We also estimated separate models for each set of facets within the NEO and HEXACO frameworks (e.g., one model with the six NEO neuroticism facets, one model with the six NEO extraversion facets, etc.). The general splitting up of models by measures is consistent with the nested nature of the data (i.e., almost all samples contributed correlations for only one personality measure). Fitting the NEO and HEXACO facet-level models in facet sets also aligned with the main facet comparisons of interest: facet comparisons with domains (e.g., comparing the NEO openness facet correlations with intelligence). Although it would have been more consistent to model NEO facets (and HEXACO facets) simultaneously, the splitting of NEO and HEXACO facet models into facet sets was necessary for computational and estimation reasons. Specifically, computational and estimation challenges were related to the size of the sampling variance-covariance matrix and the size of the correlation matrix of random effects. The size of the correlation matrix is

(p^2-p)/2 where p is the number of variables. And the sampling variance-covariance matrix is a k by k matrix where k is the number of studies times the number of personality variables. As recommended in the documentation for rma.mv, we experimented with a range of optimization procedures for speeding up estimation and ensuring convergence. When we varied the number of personality traits included in the model, we found that computational time roughly increased by a factor of 10 for each additional 5 variables. Thus, we projected that it would have taken approximately 50 days to estimate a complete 24-facet HEXACO model, and potentially several hundred days to estimate a complete 30-facet NEO model. Furthermore, the large number of correlations estimated relative to the small number of studies means that the models would have been unlikely to converge, especially given that simpler models (based on 12 instead of 24 or 30 facets) did not always converge.

The variance-covariance matrix of sampling errors was specified using the formulas provided in Olkin and Finn (1995). For studies where the relevant personality trait intercorrelations were not available (i.e., the study only reported pairwise correlations and the correlation matrix or raw data was not available), the average correlations obtained from the available data were used in their place when computing sampling errors for that study. We wrote a set of convenience functions in R (see OSF repository) that computed the relevant standard errors and combined them into the relevant structure required by rma.mv. We then obtained pairwise comparisons of each pair of correlations in each model using the `anova.rma` function.

Table S13 presents the parameter estimates for each personality-intelligence correlation estimated using multilevel meta-analysis. As expected, estimates and standard errors in Table S13 are almost identical to the univariate meta-analytic estimates reported in the body of the manuscript. In most cases, they are identical to two decimal places.

Table S14 presents the pairwise comparison of personality–intelligence correlations. These provide further rigor to the comparisons presented in the manuscript, but in general, they also reinforce the validity of the heuristics presented in the manuscript. In particular, comparison of personality–intelligence correlations tend to have smaller standard errors when personality traits are correlated, as is the case when comparing personality facet correlations within a domain (e.g., comparing correlations with intelligence for the various openness facets of the NEO).

Table S13

Multilevel Meta-Analytic Estimates of Personality–Intelligence Correlations

			95% CI		
Trait	$\bar{r}$	(*SE*)	LL	UL	$\tau_{\bar{r}}$
Big Five					
Neuroticism	-.08***	(.007)	-.09	-.06	.08
Extraversion	-.01*	(.006)	-.02	.00	.06
Openness	.17***	(.008)	.15	.18	.10
Agreeableness	.01	(.007)	-.01	.02	.08
Conscientiousness	-.02*	(.007)	-.03	.00	.08
NEO Domains					
Neuroticism	-.08***	(.007)	-.09	-.06	.08
Extraversion	-.01	(.007)	-.02	.00	.06
Openness	.16***	(.009)	.14	.18	.10

Agreeableness	.00	(.007)	-.01	.02	.08
Conscientiousness	-.01	(.007)	-.03	.00	.08
NEO Facets					
N1. Anxiety	-.10***	(.014)	-.12	-.07	.06
N2. Angry hostility	-.06***	(.010)	-.08	-.04	.04
N3. Depression	-.07***	(.017)	-.10	-.03	.08
N4. Self-consciousness	-.03	(.015)	-.06	.00	.07
N5. Impulsiveness	-.02	(.014)	-.05	.01	.06
N6. Vulnerability	-.06**	(.021)	-.10	-.02	.09
E1. Warmth	-.04***	(.012)	-.06	-.02	.04
E2. Gregariousness	-.07***	(.013)	-.10	-.05	.05
E3. Assertiveness	.04**	(.016)	.01	.07	.06
E4. Activity	.00	(.012)	-.02	.03	.04
E5. Excitement seeking	-.01	(.017)	-.04	.03	.07
E6. Positive emotions	.01	(.014)	-.02	.04	.05
O1. Fantasy	.13***	(.015)	.11	.16	.07
O2. Aesthetics	.07***	(.016)	.04	.10	.07
O3. Feelings	.07***	(.016)	.04	.10	.07
O4. Actions	.08***	(.013)	.05	.10	.06
O5. Ideas	.25***	(.015)	.22	.28	.07
O6. Values	.16***	(.018)	.13	.20	.09
A1. Trust	.03***	(.007)	.02	.04	.01
A2. Straightforwardness	-.01	(.015)	-.04	.02	.06
A3. Altruism	-.07***	(.012)	-.09	-.05	.04
A4. Compliance	-.01	(.009)	-.02	.01	.02
A5. Modesty	-.07***	(.015)	-.10	-.04	.05
A6. Tender-mindedness	-.05***	(.013)	-.08	-.03	.05
C1. Competence	.06***	(.016)	.03	.09	.07
C2. Order	-.04*	(.017)	-.07	-.01	.08
C3. Dutifulness	-.01	(.010)	-.03	.01	.04
C4. Achievement striving	-.02	(.014)	-.04	.01	.06
C5. Self-discipline	-.03*	(.014)	-.05	.00	.06
C6. Deliberation	-.01	(.015)	-.04	.02	.06
BFAS Domains					
Neuroticism	-.07***	(.015)	-.10	-.04	.01
Extraversion	-.02	(.024)	-.07	.03	.07
Openness	.25***	(.023)	.20	.29	.07
Agreeableness	.07**	(.023)	.03	.12	.06
Conscientiousness	-.06**	(.021)	-.10	-.02	.05
BFAS Aspects					
N1. Volatility	-.09**	(.032)	-.15	-.03	.08
N2. Withdrawal	-.04	(.022)	-.08	.01	.05
E1. Enthusiasm	-.03	(.028)	-.09	.02	.08
E2. Assertiveness	-.02	(.023)	-.07	.03	.06
O1. Intellect	.27***	(.027)	.21	.32	.10
O2. Openness to Experience	.13***	(.020)	.09	.17	.06
A1. Compassion	.09**	(.032)	.03	.15	.09
A2. Politeness	.04	(.025)	-.01	.08	.05
C1. Industriousness	-.07*	(.027)	-.12	-.02	.06
C2. Orderliness	-.07**	(.023)	-.12	-.03	.04
BFI-2 Domains					
Neuroticism	-.08**	(.031)	-.15	-.02	.04
Extraversion	-.05*	(.028)	-.11	.00	.02
Openness	.17***	(.031)	.11	.23	.04
Agreeableness	.01	(.048)	-.08	.10	.08
Conscientiousness	-.04	(.040)	-.12	.03	.06
BFI-2 Facets					
N1. Anxiety	-.08	(.053)	-.19	.02	.10
N2. Depression	-.06	(.032)	-.12	.00	.04
N3. Emotional Volatility	-.09**	(.028)	-.15	-.04	.03
E1. Sociability	-.08**	(.027)	-.13	-.03	.02
E2. Assertiveness	.02	(.039)	-.05	.10	.06

E3. Energy Level	-.05	(.033)	-.11	.02	.04
O1. Intellectual Curiosity	.21***	(.034)	.15	.28	.05
O2. Aesthetic Sensitivity	.12***	(.031)	.06	.18	.04
O3. Creative Imagination	.14***	(.025)	.09	.19	.01
A1. Compassion	.00	(.051)	-.10	.10	.09
A2. Respectfulness	.03	(.051)	-.07	.13	.09
A3. Trust	.01	(.030)	-.04	.07	.03
C1. Organization	-.07	(.052)	-.17	.03	.10
C2. Productiveness	-.06*	(.031)	-.12	.00	.04
C3. Responsibility	.05*	(.025)	.00	.10	.00
HEXACO Domains					
Honesty-humility	.02	(.013)	-.01	.05	.04
Emotionality	-.08***	(.010)	-.10	-.06	.03
Extraversion	-.01	(.015)	-.04	.02	.06
Agreeableness	.01	(.014)	-.02	.03	.04
Conscientiousness	.00	(.011)	-.02	.02	.03
Openness	.10***	(.016)	.07	.14	.06
HEXACO Facets					
H1: Sincerity	-.01	(.015)	-.04	.02	.04
H2: Fairness	.00	(.011)	-.02	.02	.02
H3: Greed-Avoidance	.06***	(.017)	.02	.09	.04
H4: Modesty	.01	(.019)	-.03	.05	.05
E1: Fearfulness	-.09***	(.018)	-.12	-.05	.04
E2: Anxiety	-.06***	(.006)	-.07	-.04	.00
E3: Dependence	-.05*	(.021)	-.09	-.01	.06
E4: Sentimentality	-.05***	(.013)	-.07	-.02	.03
X1: Social Self-Esteem	.03	(.016)	.00	.06	.03
X2: Social Boldness	.02	(.018)	-.02	.05	.04
X3: Sociability	-.06**	(.020)	-.10	-.02	.05
X4: Liveliness	-.02	(.012)	-.04	.00	.03
A1: Forgiveness	.01	(.014)	-.02	.04	.03
A2: Gentleness	-.02	(.021)	-.06	.02	.05
A3: Flexibility	-.04***	(.009)	-.06	-.03	.02
A4: Patience	.07***	(.011)	.05	.09	.02
C1: Organization	-.07***	(.019)	-.11	-.03	.05
C2: Diligence	.01	(.010)	.00	.03	.02
C3: Perfectionism	.03	(.020)	-.01	.07	.05
C4: Prudence	.05**	(.019)	.01	.09	.05
O1: Aesthetic Appreciation	.01	(.025)	-.04	.06	.07
O2: Inquisitiveness	.13***	(.016)	.10	.16	.04
O3: Creativity	.04***	(.008)	.02	.05	.02
O4: Unconventionality	.12***	(.018)	.08	.15	.05

Table S14

Pairwise Comparison Multilevel Meta-Analytic Estimates of Personality–Intelligence Correlations

Hypothesis	$\overline{\Delta r}$	$SE\,\overline{\Delta r}$	95% CI *LL*	95% CI *UL*
Big 5				
neuroticism - extraversion = 0	-.064***	(.011)	-.085	-.085
neuroticism - openness = 0	-.243***	(.012)	-.266	-.266
extraversion - openness = 0	-.178***	(.010)	-.198	-.198
neuroticism - agreeableness = 0	-.083***	(.011)	-.105	-.105
extraversion - agreeableness = 0	-.019*	(.008)	-.035	-.035
openness - agreeableness = 0	.159***	(.009)	.141	.141
neuroticism - conscientiousness = 0	-.061***	(.012)	-.083	-.083
extraversion - conscientiousness = 0	.004	(.007)	-.010	-.010
openness - conscientiousness = 0	.182***	(.011)	.160	.160
agreeableness - conscientiousness = 0	.023**	(.008)	.006	.006
NEO Domains				
neo neuroticism - neo extraversion = 0	-.066***	(.011)	-.088	-.088
neo neuroticism - neo openness = 0	-.235***	(.013)	-.260	-.260
neo extraversion - neo openness = 0	-.169***	(.011)	-.190	-.190
neo neuroticism - neo agreeableness = 0	-.078***	(.012)	-.101	-.101
neo extraversion - neo agreeableness = 0	-.012	(.009)	-.029	-.029
neo openness - neo agreeableness = 0	.157***	(.010)	.137	.137
neo neuroticism - neo conscientiousness = 0	-.064***	(.013)	-.088	-.088
neo extraversion - neo conscientiousness = 0	.002	(.008)	-.013	-.013
neo openness - neo conscientiousness = 0	.171***	(.012)	.148	.148
neo agreeableness - neo conscientiousness = 0	.014	(.009)	-.003	-.003
NEO Facets				
neo n1 anxiety - neo n2 hostility = 0	-.032**	(.011)	-.053	-.053
neo n1 anxiety - neo n3 depression = 0	-.029**	(.010)	-.049	-.049
neo n2 hostility - neo n3 depression = 0	.003	(.010)	-.017	-.017
neo n1 anxiety - neo n4 selfconsciousness = 0	-.069***	(.008)	-.085	-.085
neo n2 hostility - neo n4 selfconsciousness = 0	-.037***	(.009)	-.055	-.055
neo n3 depression - neo n4 selfconsciousness = 0	-.040***	(.006)	-.052	-.052
neo n1 anxiety - neo n5 impulsiveness = 0	-.077***	(.013)	-.103	-.103
neo n2 hostility - neo n5 impulsiveness = 0	-.045***	(.011)	-.066	-.066
neo n3 depression - neo n5 impulsiveness = 0	-.048***	(.012)	-.072	-.072
neo n4 selfconsciousness - neo n5 impulsiveness = 0	-.008	(.013)	-.033	-.033
neo n1 anxiety - neo n6 vulnerability = 0	-.039*	(.015)	-.068	-.068
neo n2 hostility - neo n6 vulnerability = 0	-.007	(.015)	-.036	-.036
neo n3 depression - neo n6 vulnerability = 0	-.009	(.014)	-.038	-.038
neo n4 selfconsciousness - neo n6 vulnerability = 0	.030*	(.013)	.005	.005
neo n5 impulsiveness - neo n6 vulnerability = 0	.039*	(.020)	.000	.000
neo e1 warmth - neo e2 gregariousness = 0	.029*	(.014)	.002	.002
neo e1 warmth - neo e3 assertiveness = 0	-.085***	(.015)	-.113	-.113
neo e2 gregariousness - neo e3 assertiveness = 0	-.114***	(.018)	-.148	-.148
neo e1 warmth - neo e4 activity = 0	-.044***	(.009)	-.061	-.061
neo e2 gregariousness - neo e4 activity = 0	-.073***	(.015)	-.103	-.103
neo e3 assertiveness - neo e4 activity = 0	.040***	(.011)	.018	.018
neo e1 warmth - neo e5 excitementseeking = 0	-.035*	(.017)	-.068	-.068
neo e2 gregariousness - neo e5 excitementseeking = 0	-.065***	(.012)	-.088	-.088
neo e3 assertiveness - neo e5 excitementseeking = 0	.049*	(.020)	.010	.010
neo e4 activity - neo e5 excitementseeking = 0	.009	(.019)	-.028	-.028
neo e1 warmth - neo e6 positiveemotion = 0	-.050***	(.010)	-.069	-.069
neo e2 gregariousness - neo e6 positiveemotion = 0	-.080***	(.012)	-.104	-.104
neo e3 assertiveness - neo e6 positiveemotion = 0	.034*	(.017)	.002	.002
neo e4 activity - neo e6 positiveemotion = 0	-.006	(.013)	-.032	-.032
neo e5 excitementseeking - neo e6 positiveemotion = 0	-.015	(.016)	-.047	-.047
neo o1 fantasy - neo o2 aesthetics = 0	.065***	(.012)	.042	.042
neo o1 fantasy - neo o3 feelings = 0	.068***	(.009)	.050	.050

neo o2 aesthetics - neo o3 feelings = 0	.002	(.015)	-.027	-.027
neo o1 fantasy - neo o4 actions = 0	.056***	(.015)	.027	.027
neo o2 aesthetics - neo o4 actions = 0	-.009	(.015)	-.039	-.039
neo o3 feelings - neo o4 actions = 0	-.012	(.018)	-.046	-.046
neo o1 fantasy - neo o5 ideas = 0	-.114***	(.016)	-.146	-.146
neo o2 aesthetics - neo o5 ideas = 0	-.180***	(.012)	-.203	-.203
neo o3 feelings - neo o5 ideas = 0	-.182***	(.015)	-.212	-.212
neo o4 actions - neo o5 ideas = 0	-.171***	(.020)	-.210	-.210
neo o1 fantasy - neo o6 values = 0	-.030	(.016)	-.061	-.061
neo o2 aesthetics - neo o6 values = 0	-.095***	(.018)	-.130	-.130
neo o3 feelings - neo o6 values = 0	-.098***	(.016)	-.129	-.129
neo o4 actions - neo o6 values = 0	-.086***	(.017)	-.119	-.119
neo o5 ideas - neo o6 values = 0	.085***	(.018)	.049	.049
neo a1 trust - neo a2 straightforwardness = 0	.036*	(.017)	.003	.003
neo a1 trust - neo a3 altruism = 0	.099***	(.011)	.077	.077
neo a2 straightforwardness - neo a3 altruism = 0	.063***	(.011)	.042	.042
neo a1 trust - neo a4 compliance = 0	.035***	(.008)	.020	.020
neo a2 straightforwardness - neo a4 compliance = 0	.000	(.015)	-.029	-.029
neo a3 altruism - neo a4 compliance = 0	-.064***	(.009)	-.080	-.080
neo a1 trust - neo a5 modesty = 0	.101***	(.017)	.068	.068
neo a2 straightforwardness - neo a5 modesty = 0	.066***	(.017)	.033	.033
neo a3 altruism - neo a5 modesty = 0	.002	(.016)	-.029	-.029
neo a4 compliance - neo a5 modesty = 0	.066***	(.016)	.034	.034
neo a1 trust - neo a6 tendermindedness = 0	.082***	(.015)	.053	.053
neo a2 straightforwardness - neo a6 tendermindedness = 0	.046***	(.013)	.020	.020
neo a3 altruism - neo a6 tendermindedness = 0	-.017	(.013)	-.042	-.042
neo a4 compliance - neo a6 tendermindedness = 0	.046**	(.014)	.019	.019
neo a5 modesty - neo a6 tendermindedness = 0	-.019	(.014)	-.047	-.047
neo c1 competence - neo c2 order = 0	.097***	(.014)	.069	.069
neo c1 competence - neo c3 dutifulness = 0	.067***	(.010)	.048	.048
neo c2 order - neo c3 dutifulness = 0	-.030*	(.013)	-.056	-.056
neo c1 competence - neo c4 achievementstriving = 0	.075***	(.011)	.054	.054
neo c2 order - neo c4 achievementstriving = 0	-.022	(.015)	-.051	-.051
neo c3 dutifulness - neo c4 achievementstriving = 0	.008	(.011)	-.013	-.013
neo c1 competence - neo c5 selfdiscipline = 0	.086***	(.011)	.064	.064
neo c2 order - neo c5 selfdiscipline = 0	-.011	(.011)	-.032	-.032
neo c3 dutifulness - neo c5 selfdiscipline = 0	.019	(.011)	-.002	-.002
neo c4 achievementstriving - neo c5 selfdiscipline = 0	.011	(.007)	-.003	-.003
neo c1 competence - neo c6 deliberation = 0	.065***	(.011)	.045	.045
neo c2 order - neo c6 deliberation = 0	-.032*	(.013)	-.058	-.058
neo c3 dutifulness - neo c6 deliberation = 0	-.001	(.012)	-.024	-.024
neo c4 achievementstriving - neo c6 deliberation = 0	-.010	(.014)	-.037	-.037
neo c5 selfdiscipline - neo c6 deliberation = 0	-.021	(.012)	-.044	-.044
BFAS Domains				
bfas neuroticism - bfas extraversion = 0	-.053	(.030)	-.112	-.112
bfas neuroticism - bfas openness = 0	-.318***	(.030)	-.376	-.376
bfas extraversion - bfas openness = 0	-.265***	(.022)	-.308	-.308
bfas neuroticism - bfas agreeableness = 0	-.143***	(.028)	-.197	-.197
bfas extraversion - bfas agreeableness = 0	-.090***	(.022)	-.132	-.132
bfas openness - bfas agreeableness = 0	.176***	(.026)	.125	.125
bfas neuroticism - bfas conscientiousness = 0	-.016	(.027)	-.068	-.068
bfas extraversion - bfas conscientiousness = 0	.037	(.022)	-.006	-.006
bfas openness - bfas conscientiousness = 0	.303***	(.030)	.243	.243
bfas agreeableness - bfas conscientiousness = 0	.127***	(.022)	.083	.083
BFASFacets				
bfas n1 volatility - bfas n2 withdrawal = 0	-.052	(.028)	-.108	-.108
bfas n1 volatility - bfas e1 enthusiasm = 0	-.055	(.044)	-.142	-.142
bfas n2 withdrawal - bfas e1 enthusiasm = 0	-.003	(.034)	-.070	-.070
bfas n1 volatility - bfas e2 assertiveness = 0	-.067	(.041)	-.147	-.147
bfas n2 withdrawal - bfas e2 assertiveness = 0	-.015	(.033)	-.080	-.080
bfas e1 enthusiasm - bfas e2 assertiveness = 0	-.012	(.022)	-.055	-.055
bfas n1 volatility - bfas o1 intellect = 0	-.353***	(.042)	-.436	-.436

bfas n2 withdrawal - bfas o1 intellect = 0	-.300***	(.032)	-.363	-.363
bfas e1 enthusiasm - bfas o1 intellect = 0	-.298***	(.031)	-.358	-.358
bfas e2 assertiveness - bfas o1 intellect = 0	-.285***	(.026)	-.336	-.336
bfas n1 volatility - bfas o2 opennesstoexperience = 0	-.218***	(.036)	-.288	-.288
bfas n2 withdrawal - bfas o2 opennesstoexperience = 0	-.165***	(.024)	-.213	-.213
bfas e1 enthusiasm - bfas o2 opennesstoexperience = 0	-.163***	(.026)	-.213	-.213
bfas e2 assertiveness - bfas o2 opennesstoexperience = 0	-.150***	(.022)	-.193	-.193
bfas o1 intellect - bfas o2 opennesstoexperience = 0	.135***	(.021)	.093	.093
bfas n1 volatility - bfas a1 compassion = 0	-.177***	(.047)	-.268	-.268
bfas n2 withdrawal - bfas a1 compassion = 0	-.124***	(.032)	-.187	-.187
bfas e1 enthusiasm - bfas a1 compassion = 0	-.122***	(.021)	-.163	-.163
bfas e2 assertiveness - bfas a1 compassion = 0	-.109***	(.030)	-.168	-.168
bfas o1 intellect - bfas a1 compassion = 0	.176***	(.032)	.113	.113
bfas o2 opennesstoexperience - bfas a1 compassion = 0	.041	(.028)	-.013	-.013
bfas n1 volatility - bfas a2 politeness = 0	-.123**	(.043)	-.208	-.208
bfas n2 withdrawal - bfas a2 politeness = 0	-.071*	(.034)	-.137	-.137
bfas e1 enthusiasm - bfas a2 politeness = 0	-.068*	(.029)	-.125	-.125
bfas e2 assertiveness - bfas a2 politeness = 0	-.056	(.034)	-.123	-.123
bfas o1 intellect - bfas a2 politeness = 0	.229***	(.038)	.154	.154
bfas o2 opennesstoexperience - bfas a2 politeness = 0	.094**	(.031)	.033	.033
bfas a1 compassion - bfas a2 politeness = 0	.053*	(.027)	.000	.000
bfas n1 volatility - bfas c1 industriousness = 0	-.019	(.051)	-.119	-.119
bfas n2 withdrawal - bfas c1 industriousness = 0	.034	(.041)	-.047	-.047
bfas e1 enthusiasm - bfas c1 industriousness = 0	.036	(.029)	-.020	-.020
bfas e2 assertiveness - bfas c1 industriousness = 0	.049	(.029)	-.007	-.007
bfas o1 intellect - bfas c1 industriousness = 0	.334***	(.038)	.259	.259
bfas o2 opennesstoexperience - bfas c1 industriousness = 0	.199***	(.034)	.133	.133
bfas a1 compassion - bfas c1 industriousness = 0	.158***	(.033)	.094	.094
bfas a2 politeness - bfas c1 industriousness = 0	.105***	(.025)	.056	.056
bfas n1 volatility - bfas c2 orderliness = 0	-.017	(.037)	-.090	-.090
bfas n2 withdrawal - bfas c2 orderliness = 0	.035	(.031)	-.025	-.025
bfas e1 enthusiasm - bfas c2 orderliness = 0	.038	(.027)	-.015	-.015
bfas e2 assertiveness - bfas c2 orderliness = 0	.050	(.026)	.000	.000
bfas o1 intellect - bfas c2 orderliness = 0	.336***	(.033)	.271	.271
bfas o2 opennesstoexperience - bfas c2 orderliness = 0	.201***	(.027)	.147	.147
bfas a1 compassion - bfas c2 orderliness = 0	.160***	(.031)	.099	.099
bfas a2 politeness - bfas c2 orderliness = 0	.106***	(.025)	.057	.057
bfas c1 industriousness - bfas c2 orderliness = 0	.002	(.025)	-.047	-.047
BFI2 Domains				
bfi2 neuroticism - bfi2 extraversion = 0	-.029	(.051)	-.130	-.130
bfi2 neuroticism - bfi2 openness = 0	-.255***	(.046)	-.346	-.346
bfi2 extraversion - bfi2 openness = 0	-.226***	(.031)	-.287	-.287
bfi2 neuroticism - bfi2 agreeableness = 0	-.095	(.055)	-.203	-.203
bfi2 extraversion - bfi2 agreeableness = 0	-.066	(.051)	-.165	-.165
bfi2 openness - bfi2 agreeableness = 0	.160***	(.039)	.083	.083
bfi2 neuroticism - bfi2 conscientiousness = 0	-.040	(.050)	-.137	-.137
bfi2 extraversion - bfi2 conscientiousness = 0	-.010	(.044)	-.096	-.096
bfi2 openness - bfi2 conscientiousness = 0	.216***	(.036)	.145	.145
bfi2 agreeableness - bfi2 conscientiousness = 0	.056	(.030)	-.004	-.004
BFI2 Facets				
bfi2 n1 anxiety - bfi2 n2 depression = 0	-.024	(.041)	-.105	-.105
bfi2 n1 anxiety - bfi2 n3 emotionalvolatility = 0	.009	(.056)	-.102	-.102
bfi2 n2 depression - bfi2 n3 emotionalvolatility = 0	.033	(.028)	-.022	-.022
bfi2 n1 anxiety - bfi2 e1 sociability = 0	-.002	(.061)	-.121	-.121
bfi2 n2 depression - bfi2 e1 sociability = 0	.021	(.049)	-.075	-.075
bfi2 n3 emotionalvolatility - bfi2 e1 sociability = 0	-.011	(.044)	-.097	-.097
bfi2 n1 anxiety - bfi2 e2 assertiveness = 0	-.105	(.085)	-.272	-.272
bfi2 n2 depression - bfi2 e2 assertiveness = 0	-.081	(.061)	-.201	-.201
bfi2 n3 emotionalvolatility - bfi2 e2 assertiveness = 0	-.113*	(.047)	-.207	-.207
bfi2 e1 sociability - bfi2 e2 assertiveness = 0	-.102*	(.040)	-.181	-.181
bfi2 n1 anxiety - bfi2 e3 energylevel = 0	-.038	(.057)	-.149	-.149
bfi2 n2 depression - bfi2 e3 energylevel = 0	-.014	(.055)	-.121	-.121

bfi2 n3 emotionalvolatility - bfi2 e3 energylevel = 0	-.046	(.053)	-.151	-.151
bfi2 e1 sociability - bfi2 e3 energylevel = 0	-.035	(.028)	-.090	-.090
bfi2 e2 assertiveness - bfi2 e3 energylevel = 0	.067	(.051)	-.033	-.033
bfi2 n1 anxiety - bfi2 o1 intellectualcuriosity = 0	-.296***	(.046)	-.387	-.387
bfi2 n2 depression - bfi2 o1 intellectualcuriosity = 0	-.272***	(.047)	-.365	-.365
bfi2 n3 emotionalvolatility - bfi2 o1 intellectualcuriosity = 0	-.305***	(.052)	-.406	-.406
bfi2 e1 sociability - bfi2 o1 intellectualcuriosity = 0	-.294***	(.037)	-.366	-.366
bfi2 e2 assertiveness - bfi2 o1 intellectualcuriosity = 0	-.192***	(.058)	-.305	-.305
bfi2 e3 energylevel - bfi2 o1 intellectualcuriosity = 0	-.259***	(.030)	-.317	-.317
bfi2 n1 anxiety - bfi2 o2 aestheticsensitivity = 0	-.200**	(.066)	-.328	-.328
bfi2 n2 depression - bfi2 o2 aestheticsensitivity = 0	-.176***	(.052)	-.277	-.277
bfi2 n3 emotionalvolatility - bfi2 o2 aestheticsensitivity = 0	-.209***	(.046)	-.300	-.300
bfi2 e1 sociability - bfi2 o2 aestheticsensitivity = 0	-.197***	(.036)	-.267	-.267
bfi2 e2 assertiveness - bfi2 o2 aestheticsensitivity = 0	-.095*	(.044)	-.181	-.181
bfi2 e3 energylevel - bfi2 o2 aestheticsensitivity = 0	-.162***	(.036)	-.233	-.233
bfi2 o1 intellectualcuriosity - bfi2 o2 aestheticsensitivity = 0	.097**	(.037)	.024	.024
bfi2 n1 anxiety - bfi2 o3 creativeimagination = 0	-.225***	(.055)	-.334	-.334
bfi2 n2 depression - bfi2 o3 creativeimagination = 0	-.201***	(.043)	-.286	-.286
bfi2 n3 emotionalvolatility - bfi2 o3 creativeimagination = 0	-.234***	(.041)	-.315	-.315
bfi2 e1 sociability - bfi2 o3 creativeimagination = 0	-.223***	(.031)	-.285	-.285
bfi2 e2 assertiveness - bfi2 o3 creativeimagination = 0	-.121**	(.044)	-.206	-.206
bfi2 e3 energylevel - bfi2 o3 creativeimagination = 0	-.188***	(.032)	-.250	-.250
bfi2 o1 intellectualcuriosity - bfi2 o3 creativeimagination = 0	.071*	(.029)	.014	.014
bfi2 o2 aestheticsensitivity - bfi2 o3 creativeimagination = 0	-.026	(.032)	-.089	-.089
bfi2 n1 anxiety - bfi2 a1 compassion = 0	-.087*	(.042)	-.170	-.170
bfi2 n2 depression - bfi2 a1 compassion = 0	-.063	(.059)	-.178	-.178
bfi2 n3 emotionalvolatility - bfi2 a1 compassion = 0	-.096	(.067)	-.226	-.226
bfi2 e1 sociability - bfi2 a1 compassion = 0	-.084	(.050)	-.183	-.183
bfi2 e2 assertiveness - bfi2 a1 compassion = 0	.018	(.079)	-.137	-.137
bfi2 e3 energylevel - bfi2 a1 compassion = 0	-.049	(.040)	-.127	-.127
bfi2 o1 intellectualcuriosity - bfi2 a1 compassion = 0	.209***	(.036)	.140	.140
bfi2 o2 aestheticsensitivity - bfi2 a1 compassion = 0	.113*	(.055)	.006	.006
bfi2 o3 creativeimagination - bfi2 a1 compassion = 0	.139**	(.049)	.043	.043
bfi2 n1 anxiety - bfi2 a2 respectfulness = 0	-.118**	(.043)	-.202	-.202
bfi2 n2 depression - bfi2 a2 respectfulness = 0	-.094	(.059)	-.209	-.209
bfi2 n3 emotionalvolatility - bfi2 a2 respectfulness = 0	-.127	(.069)	-.262	-.262
bfi2 e1 sociability - bfi2 a2 respectfulness = 0	-.116*	(.054)	-.221	-.221
bfi2 e2 assertiveness - bfi2 a2 respectfulness = 0	-.013	(.081)	-.172	-.172
bfi2 e3 energylevel - bfi2 a2 respectfulness = 0	-.081	(.043)	-.164	-.164
bfi2 o1 intellectualcuriosity - bfi2 a2 respectfulness = 0	.178***	(.037)	.105	.105
bfi2 o2 aestheticsensitivity - bfi2 a2 respectfulness = 0	.082	(.058)	-.032	-.032
bfi2 o3 creativeimagination - bfi2 a2 respectfulness = 0	.107*	(.050)	.009	.009
bfi2 a1 compassion - bfi2 a2 respectfulness = 0	-.031	(.024)	-.078	-.078
bfi2 n1 anxiety - bfi2 a3 trust = 0	-.098	(.060)	-.216	-.216
bfi2 n2 depression - bfi2 a3 trust = 0	-.074	(.052)	-.176	-.176
bfi2 n3 emotionalvolatility - bfi2 a3 trust = 0	-.106*	(.050)	-.205	-.205
bfi2 e1 sociability - bfi2 a3 trust = 0	-.095**	(.032)	-.158	-.158
bfi2 e2 assertiveness - bfi2 a3 trust = 0	.007	(.050)	-.092	-.092
bfi2 e3 energylevel - bfi2 a3 trust = 0	-.060*	(.029)	-.117	-.117
bfi2 o1 intellectualcuriosity - bfi2 a3 trust = 0	.199***	(.036)	.128	.128
bfi2 o2 aestheticsensitivity - bfi2 a3 trust = 0	.102**	(.034)	.036	.036
bfi2 o3 creativeimagination - bfi2 a3 trust = 0	.128***	(.034)	.060	.060
bfi2 a1 compassion - bfi2 a3 trust = 0	-.011	(.043)	-.096	-.096
bfi2 a2 respectfulness - bfi2 a3 trust = 0	.020	(.046)	-.069	-.069
bfi2 n1 anxiety - bfi2 c1 organization = 0	-.012	(.042)	-.094	-.094
bfi2 n2 depression - bfi2 c1 organization = 0	.012	(.059)	-.104	-.104
bfi2 n3 emotionalvolatility - bfi2 c1 organization = 0	-.020	(.068)	-.154	-.154
bfi2 e1 sociability - bfi2 c1 organization = 0	-.009	(.054)	-.115	-.115
bfi2 e2 assertiveness - bfi2 c1 organization = 0	.093	(.080)	-.064	-.064
bfi2 e3 energylevel - bfi2 c1 organization = 0	.026	(.044)	-.059	-.059
bfi2 o1 intellectualcuriosity - bfi2 c1 organization = 0	.285***	(.039)	.208	.208
bfi2 o2 aestheticsensitivity - bfi2 c1 organization = 0	.188**	(.059)	.073	.073

bfi2 o3 creativeimagination - bfi2 c1 organization = 0	.214***	(.051)	.113	.113
bfi2 a1 compassion - bfi2 c1 organization = 0	.075*	(.031)	.014	.014
bfi2 a2 respectfulness - bfi2 c1 organization = 0	.107***	(.029)	.049	.049
bfi2 a3 trust - bfi2 c1 organization = 0	.086	(.051)	-.013	-.013
bfi2 n1 anxiety - bfi2 c2 productiveness = 0	-.023	(.053)	-.128	-.128
bfi2 n2 depression - bfi2 c2 productiveness = 0	.001	(.050)	-.097	-.097
bfi2 n3 emotionalvolatility - bfi2 c2 productiveness = 0	-.032	(.051)	-.132	-.132
bfi2 e1 sociability - bfi2 c2 productiveness = 0	-.021	(.035)	-.089	-.089
bfi2 e2 assertiveness - bfi2 c2 productiveness = 0	.082	(.052)	-.021	-.021
bfi2 e3 energylevel - bfi2 c2 productiveness = 0	.015	(.028)	-.041	-.041
bfi2 o1 intellectualcuriosity - bfi2 c2 productiveness = 0	.273***	(.031)	.213	.213
bfi2 o2 aestheticsensitivity - bfi2 c2 productiveness = 0	.177***	(.038)	.102	.102
bfi2 o3 creativeimagination - bfi2 c2 productiveness = 0	.202***	(.032)	.140	.140
bfi2 a1 compassion - bfi2 c2 productiveness = 0	.064	(.042)	-.018	-.018
bfi2 a2 respectfulness - bfi2 c2 productiveness = 0	.095*	(.041)	.014	.014
bfi2 a3 trust - bfi2 c2 productiveness = 0	.075*	(.033)	.009	.009
bfi2 c1 organization - bfi2 c2 productiveness = 0	-.011	(.038)	-.085	-.085
bfi2 n1 anxiety - bfi2 c3 responsibility = 0	-.139*	(.061)	-.259	-.259
bfi2 n2 depression - bfi2 c3 responsibility = 0	-.115*	(.048)	-.208	-.208
bfi2 n3 emotionalvolatility - bfi2 c3 responsibility = 0	-.147**	(.045)	-.236	-.236
bfi2 e1 sociability - bfi2 c3 responsibility = 0	-.136***	(.035)	-.205	-.205
bfi2 e2 assertiveness - bfi2 c3 responsibility = 0	-.034	(.043)	-.119	-.119
bfi2 e3 energylevel - bfi2 c3 responsibility = 0	-.101**	(.036)	-.171	-.171
bfi2 o1 intellectualcuriosity - bfi2 c3 responsibility = 0	.158***	(.039)	.082	.082
bfi2 o2 aestheticsensitivity - bfi2 c3 responsibility = 0	.061	(.037)	-.012	-.012
bfi2 o3 creativeimagination - bfi2 c3 responsibility = 0	.087**	(.032)	.024	.024
bfi2 a1 compassion - bfi2 c3 responsibility = 0	-.052	(.052)	-.154	-.154
bfi2 a2 respectfulness - bfi2 c3 responsibility = 0	-.020	(.051)	-.119	-.119
bfi2 a3 trust - bfi2 c3 responsibility = 0	-.041	(.034)	-.108	-.108
bfi2 c1 organization - bfi2 c3 responsibility = 0	-.127*	(.051)	-.226	-.226
bfi2 c2 productiveness - bfi2 c3 responsibility = 0	-.115***	(.027)	-.168	-.168
HEXACO Domains				
hexaco honestyhumility - hexaco emotionality = 0	.104***	(.013)	.078	.078
hexaco honestyhumility - hexaco extraversion = 0	.033	(.025)	-.016	-.016
hexaco emotionality - hexaco extraversion = 0	-.071***	(.017)	-.105	-.105
hexaco honestyhumility - hexaco agreeableness = 0	.011	(.015)	-.018	-.018
hexaco emotionality - hexaco agreeableness = 0	-.092***	(.018)	-.127	-.127
hexaco extraversion - hexaco agreeableness = 0	-.021	(.025)	-.070	-.070
hexaco honestyhumility - hexaco conscientiousness = 0	.016	(.018)	-.020	-.020
hexaco emotionality - hexaco conscientiousness = 0	-.088***	(.016)	-.120	-.120
hexaco extraversion - hexaco conscientiousness = 0	-.017	(.018)	-.052	-.052
hexaco agreeableness - hexaco conscientiousness = 0	.005	(.010)	-.016	-.016
hexaco honestyhumility - hexaco openness = 0	-.085***	(.014)	-.113	-.113
hexaco emotionality - hexaco openness = 0	-.189***	(.020)	-.228	-.228
hexaco extraversion - hexaco openness = 0	-.118***	(.028)	-.172	-.172
hexaco agreeableness - hexaco openness = 0	-.096***	(.022)	-.140	-.140
hexaco conscientiousness - hexaco openness = 0	-.101***	(.024)	-.147	-.147
HEXACO Facets				
hexaco h1 sincerity - hexaco h2 fairness = 0	-.007	(.024)	-.054	-.054
hexaco h1 sincerity - hexaco h3 greedavoidance = 0	-.061**	(.024)	-.108	-.108
hexaco h2 fairness - hexaco h3 greedavoidance = 0	-.054**	(.017)	-.088	-.088
hexaco h1 sincerity - hexaco h4 modesty = 0	-.016	(.017)	-.049	-.049
hexaco h2 fairness - hexaco h4 modesty = 0	-.008	(.023)	-.053	-.053
hexaco h3 greedavoidance - hexaco h4 modesty = 0	.046*	(.023)	.001	.001
hexaco e1 fearfulness - hexaco e2 anxiety = 0	-.030	(.018)	-.065	-.065
hexaco e1 fearfulness - hexaco e3 dependence = 0	-.033	(.027)	-.085	-.085
hexaco e2 anxiety - hexaco e3 dependence = 0	-.003	(.022)	-.046	-.046
hexaco e1 fearfulness - hexaco e4 sentimentality = 0	-.038	(.022)	-.082	-.082
hexaco e2 anxiety - hexaco e4 sentimentality = 0	-.008	(.014)	-.035	-.035
hexaco e3 dependence - hexaco e4 sentimentality = 0	-.005	(.011)	-.026	-.026
hexaco x1 socialselfesteem - hexaco x2 socialboldness = 0	.013	(.019)	-.025	-.025
hexaco x1 socialselfesteem - hexaco x3 sociability = 0	.089***	(.018)	.053	.053

hexaco x2 socialboldness - hexaco x3 sociability = 0	.076***	(.017)	.042	.042
hexaco x1 socialselfesteem - hexaco x4 liveliness = 0	.049***	(.012)	.026	.026
hexaco x2 socialboldness - hexaco x4 liveliness = 0	.036	(.020)	-.002	-.002
hexaco x3 sociability - hexaco x4 liveliness = 0	-.040**	(.013)	-.066	-.066
hexaco a1 forgiveness - hexaco a2 gentleness = 0	.029	(.018)	-.006	-.006
hexaco a1 forgiveness - hexaco a3 flexibility = 0	.055***	(.015)	.025	.025
hexaco a2 gentleness - hexaco a3 flexibility = 0	.026	(.016)	-.004	-.004
hexaco a1 forgiveness - hexaco a4 patience = 0	-.054***	(.010)	-.074	-.074
hexaco a2 gentleness - hexaco a4 patience = 0	-.083***	(.013)	-.109	-.109
hexaco a3 flexibility - hexaco a4 patience = 0	-.110***	(.009)	-.127	-.127
hexaco c1 organization - hexaco c2 diligence = 0	-.085***	(.020)	-.124	-.124
hexaco c1 organization - hexaco c3 perfectionism = 0	-.104***	(.021)	-.146	-.146
hexaco c2 diligence - hexaco c3 perfectionism = 0	-.019	(.026)	-.069	-.069
hexaco c1 organization - hexaco c4 prudence = 0	-.122***	(.026)	-.173	-.173
hexaco c2 diligence - hexaco c4 prudence = 0	-.037	(.027)	-.090	-.090
hexaco c3 perfectionism - hexaco c4 prudence = 0	-.018	(.018)	-.054	-.054
hexaco o1 aestheticappreciation - hexaco o2 inquisitiveness = 0	-.123***	(.024)	-.170	-.170
hexaco o1 aestheticappreciation - hexaco o3 creativity = 0	-.029	(.022)	-.072	-.072
hexaco o2 inquisitiveness - hexaco o3 creativity = 0	.093***	(.019)	.056	.056
hexaco o1 aestheticappreciation - hexaco o4 unconventionality = 0	-.107***	(.022)	-.149	-.149
hexaco o2 inquisitiveness - hexaco o4 unconventionality = 0	.016*	(.007)	.001	.001
hexaco o3 creativity - hexaco o4 unconventionality = 0	-.077***	(.020)	-.116	-.116

Study Features Table

Table S15 summarizes sample features. Additional information can be obtained from the OSF repository.

Table S15

Summary of Studies Included in Meta-Analysis

Study	*N*	Personality	Complete	Items	Sample	Female %	Age *M*	Age *SD*	Country	Data Type	Data Provision	Data Source	Verbal
Bipp et al. (2008)	160	NEO	C	48	Stud	72	23	23	DE	C	Sc	AU	N
Höft and Bolz (2004) Applicants	533	NEO	C	48	Work	19	21	21	DE	C	So	PA	N
Jauk et al. (2014)	297	NEO	C	48	Comm	66	30	30	AT	C	Sc	AU	Y
Nikolašević et al. (2021)	414	NEO	C	48	Comm	75	24	24	RS	D	Sc	PR	N
Schermer and Furnham (2020)	10748	NEO	C	48	Work	24	41	41	M	C	Sc	AU	N
Sørlie et al. (2020)	1641	NEO	C	48	Work	24	20	20	NO	C	Sc	AU	N
Unsworth et al. (2009)	138	NEO	C	48	Stud	62	19	19	US	C	So	AU	N
Altaras Dimitrijević and Tadić (2007)	131	NEO	C	48	Stud	63			RS	D	It	AU	N
Altaras Dimitrijević and Marjanović (2010)	134	NEO	C	48	Stud	68			RS	D	So	AU	Y
Altaras Dimitrijević (2012)	515	NEO	C	48	Stud	58			RS	D	It	AU	Y
Altaras Dimitrijević et al. (2019)	336	NEO	C	48	Stud	75	22	22	RS	D	So	AU	N
Antonakis et al. (2017)	171	NEO	C	48	Work	27	37	37	M	C	So	PA	N
Barros et al. (2014) Study 2	156	NEO	I	48	Work	77	39	39	CL	C	Sc	PA	N
Bastian et al. (2005)	246	NEO	C	48	Stud	72	20	20	AU	D	So	AU	Y
Bates and Shieles (2003)	64	NEO	I	48	Stud	77	19	19	AU	C	Sc	PA	Y
Beaty and Silvia (2013)	192	NEO	C	48	Stud	71	19	19	AU	D	Sc	AU	Y
Bergold and Steinmayr (2018) Study 2	230	NEO	C	48	Stud	45	16	16	DE	C	Sc	PA	N
Bipp and Kleingeld (2012)	115	NEO	I	48	Stud	13	18	18	NL	C	So	PA	N
Black (2000)	284	NEO	C	48	Work	34	28	28	NZ	C	So	PA	N
Borteyrou et al. (2015)	125	NEO	C	48	Stud	0			FR	C	So	PA	N
Boyatzis et al. (2012)	59	NEO	C	48	Work	12	47	47		D	So	AU	N
Nicholas et al. (2007) Bastian's Data	200	NEO	C	48	Stud	72	52	52	AU	D	Sc	AU	Y
Carless (1999) Study 1	48	NEO	C	48	Work	0	29	29	AU	B	So	PA	Y
Carless (1999) Study 1	91	NEO	C	48	Work	100	29	29	AU	B	So	PA	Y
Carretta and Ree (2018) Sample 1	9641	NEO	C	48	Stud	7	24	24	US	B	Sc	PA	Y
Caselli et al. (2018)	545	NEO	C	48	Comm	72	62	62	US	D	Sc	AU	Y
Chamorro-Premuzic et al. (2005)	181	NEO	C	48	Stud	73	20	20	M	B	Sc	PA	N
Chamorro-Premuzic et al. (2006)	201	NEO	I	48	Stud	67	20	20	UK	C	So	PA	N
Chamorro-Premuzic and Arteche (2008)	473	NEO	C	48	Stud	33	20	20	UK	C	So	PA	Y
Chamorro-Premuzic and Furnham (2008)	158	NEO	C	48	Stud	70	19	19	UK	C	So	PA	N

Clifford et al. (2004) Study 1	101	NEO	C	48	Stud	60	19	19	US	D	So	AU	Y
Clifford et al. (2004) Study 2	105	NEO	C	48	Stud	68	19	19	US	D	Sc	AU	N
De Miguel et al. (2017)	391	NEO	C	48	Stud	74	21	21	ES	D	Sc	AU	Y
DeYoung et al. (2005)	175	NEO	C	48	Stud	68	21	21	CA	C	So	PA	Y
DeYoung et al. (2008)	140	NEO	C	48	Stud	0	16	16	FR	C	So	PA	Y
DeYoung et al. (2012) Study 1	175	NEO	C	48	Stud	68	21	21	CA	C	Sc	PA	N
DeYoung et al. (2012) Study 2	423	NEO	C	48	Comm	59	52	52	US	C	Sc	PA	N
El-Guebaly et al. (2008)	1371	NEO	I	48	Comm	56	38	38	CA	D	Sc	XR	Y
Flegr et al. (2013)	519	NEO	C	48	Work	94	28	28	CZ	D	Sc	AU	Y
Forstmeier et al. (2011)	147	NEO	I	48	Comm	61	74	74	CH	D	So	AU	N
Furnham and Chamorro-Premuzic (2004a)	187	NEO	C	48	Stud	48	20	20	UK	B	So	PA	N
Furnham and Adrian (2005)	100	NEO	C	48	Stud	69	18	18	UK	C	So	PA	Y
Furnham and Chamorro-Premuzic (2006)	108	NEO	C	48	Stud	44	20	20	UK	C	So	PA	N
Furnham et al. (2007)	1821	NEO	C	48	Work	25				B	So	PA	N
Furnham, Jensen, et al. (2008)	2982	NEO	C	48	Work	19	39	39	UK	C	So	PA	N
Furnham and Thorne (2013)	93	NEO	C	48	Stud	87	19	19	UK	B	So	PA	N
Furnham et al. (2013)	6956	NEO	C	48	Work	17	40	40	UK	C	Sc	PA	N
Gregory et al. (2010)	70	NEO	I	48	Comm	63	83	83	AU	C	Sc	PA	Y
Harris and J. (2004)	404	NEO	I	48	Stud	50	20	20	UK	C	Sc	PA	Y
Heinsman et al. (2007)	932	NEO	C	48	Work	36	38	38	NL	C	So	PA	Y
Higgins et al. (2007) Study 1	106	NEO	C	48	Stud	56	20	20	US	D	So	AU	Y
Higgins et al. (2007) Study 2	141	NEO	C	48	Stud	69	21	21	CA	D	So	AU	Y
Ibáñez et al. (2016)	222	NEO	C	48	Stud	62			ES	D	Sc	AU	N
Iliescu et al. (2012) Sample 2	223	NEO	C	48	Work	67	34	34	RO	C	So	PA	N
Iliescu et al. (2012) Sample 2	61	NEO	C	48	Work	23	52	52	RO	C	So	PA	N
Kretzschmar et al. (2018)	682	NEO	C	48	Stud	67	21	21	DE	B	Sc	PA	Y
Lee et al. (2011)	460	NEO	C	48	Work	29	28	28	CH	C	So	PA	N
LePine and Van (2001)	276	NEO	C	48	Stud		20	20	US	C	So	PA	N
Lievens and Coetsier (2002)	529	NEO	C	48	Stud	62	18	18	BE	C	So	PA	N
Luciano et al. (2006)	546	NEO	C	48	Comm		20	20	AU	C	So	PA	Y
Martin and James (2003)	20	NEO	I	48	Stud	80	21	21	US	B	Sc	PA	N
McCrae and Robert (1993)	67	NEO	I	48	NA					B	Sc	PA	Y
Miller et al. (2003)	481	NEO	I	48	Comm		21	21	US	B	Sc	PA	Y
Monnot (2017)	166	NEO	I	48	Stud	43	22	22	US	C	Sc	PA	N
Moutafi et al. (2003)	900	NEO	C	48	Work	20	42	42	UK	B	So	PA	N
Moutafi et al. (2006)	2658	NEO	C	48	Work	19	44	44		B	So	PA	N
Neuman and Wright (1999)	316	NEO	C	48	Work	54	33	33	US	C	So	PA	N
Ono et al. (2011)	131	NEO	C	48	Work	24	28	28	US	C	So	PA	N
Osmon et al. (2018)	140	NEO	C	48	Clin				US	D	Sc	AU	Y
Perunicic and Knezevic (2018) High School	318	NEO	C	48	Stud	36	19	19	RS	D	So	AU	N
Perunicic and Knezevic (2018) University	96	NEO	C	48	Stud	84	23	23	RS	D	It	AU	N
Pincombe et al. (2007)	773	NEO	C	48	Comm		16	16	AU	B	So	PA	Y
Purić and Pavlović (2012)	47	NEO	C	48	Stud				RS	D	Sc	AU	N
Danka (2013)	178	NEO	C	48	Stud	79			RS	D	Sc	AU	N
Saggino and Balsamo (2003)	100	NEO	C	48	Comm	55	79	79	IT	B	So	PA	Y
Shenhav et al. (2012) Study 2	321	NEO	I	48	NA	65	20	20	US	B	Sc	PA	Y
Sobkow et al. (2018)	206	NEO	I	48	Comm	68	25	25	PL	C	Sc	PA	Y
von Wittich and Antonakis (2011) Study 1	213	NEO	C	48	Stud	38	21	21	CH	C	So	PA	N
Webb et al. (2013)	65	NEO	C	48	Comm	49	30	30	US	C	So	PA	Y
Weldon et al. (2017)	101	NEO	C	48	Work	43			UK	C	So	PA	N
Yoon and Kuh (1998) Company 1	147	NEO	C	48	Work	0			KR	B	So	PA	N
Yoon and Kuh (1998) Company 2	79	NEO	C	48	Work	0	34	34	KR	B	So	PA	N
Ziegler et al. (2012)	180	NEO	I	48	Stud	74	24	24	DE	C	Sc	PA	Y
Allik and Realo (1997) 1997 Applicants	241	NEO	C	36	Stud	71	19	19	EE	C	Sc	AU	N
Allik and Realo (1997) 1998 Applicants	583	NEO	C	36	Stud	71	19	19	EE	C	Sc	AU	N
Allik and Realo (1997) 1999 Applicants	534	NEO	C	36	Stud	71	19	19	EE	C	Sc	AU	N
Allik and Realo (1997) 2000 Applicants	336	NEO	C	36	Stud	71	19	19	EE	C	Sc	AU	N
Allik and Realo (1997) Reported Applicants	381	NEO	C	36	Stud	71	19	19	EE	B	Sc	PA	N
Furnham et al. (2005)	90	NEO	C	18	Work	100	51	51	DE	C	Sc	PA	N
Holland et al. (1995)	85	NEO	C	18	Comm	34	34	34	US	B	So	PA	Y
Zysberg (2012)	120	NEO	C	18	Work	44	32	32	IL	C	Sc	PA	N
Ackerman and Rolfhus (1999)	135	NEO	C	12	Comm	69	40	40	US	B	Sc	AU	N
Ackerman and Wolman (2007)	142	NEO	C	12	Stud	42	21	21	US	B	Sc	AU	Y
Ackerman and Ellingsen (2014)	193	NEO	C	12	Stud	41			US	B	Sc	AU	N
Benedek et al. (2012)	104	NEO	C	12	Stud	76	24	24	AT	C	Sc	AU	Y
Benedek et al. (2014)	240	NEO	C	12	Stud	68	23	23	AT	C	Sc	AU	N
Burt et al. (2016)	1791	NEO	C	12	Comm	52	15	15	M	C	Sc	AU	Y
Diedrich et al. (2018) Dataset 1	136	NEO	C	12	Stud	50	26	26	AT	C	Sc	AU	N
Diedrich et al. (2018) Dataset 2	165	NEO	C	12	Stud	55	26	26	AT	C	Sc	AU	Y
Elfenbein et al. (2008)	149	NEO	C	12	Stud	32	29	29	US	C	Sc	AU	N

Greengross et al. (2012)	394	NEO	C	12	Work	90	39	39	US	C	Sc	PA	N
Greengross et al. (2012)	39	NEO	C	12	Stud	50	21	21	US	C	Sc	AU	Y
Hashimoto et al. (2015)	774	NEO	C	12	Stud	44	21	21	JP	B	Sc	AU	N
Miller et al. (2002) Study 3	483	NEO	C	12	Stud	52	19	19	US	C	Sc	AU	N
Mõttus et al. (2012)	1919	NEO	C	12	Stud	0	15	15	EE	C	Sc	PA	N
Preckel et al. (2006)	99	NEO	I	12	Stud	49	14	14	DE	C	Sc	AU	N
Rolfhus and Ackerman (1996)	203	NEO	C	12	Stud	53	20	20	US	B	Sc	AU	N
Rolfhus and Ackerman (1999)	143	NEO	C	12	Stud	66	19	19	US	B	Sc	AU	N
Teovanović et al. (2015)	240	NEO	I	12	Stud	91	20	20	RS	D	Sc	AU	Y
Teovanović (2019)	236	NEO	C	12	Stud	91	20	20	RS	C	Sc	PA	Y
Allik et al. (2004) Grade 10	676	NEO	C	12	Stud	54	16	16	EE	C	Sc	PA	N
Allik et al. (2004) Grade 12	488	NEO	C	12	Stud	54	18	18	EE	C	Sc	PA	N
Allik et al. (2004) Grade 6	749	NEO	C	12	Stud	54	12	12	EE	C	Sc	PA	N
Allik et al. (2004) Grade 8	737	NEO	C	12	Stud	54	14	14	EE	C	Sc	PA	N
Altaras Dimitrijević et al. (2020)	262	NEO	C	12	Comm	45	40	40	RS	D	Sc	AU	Y
Austin et al. (2002) Edinburgh	401	NEO	C	12	Comm				UK	B	Sc	PA	N
Bangerter et al. (2014)	62	NEO	C	12	Stud	27	23	23	CH	C	Sc	PA	N
Barbey et al. (2014)	145	NEO	C	12	Clin	0	58	58	US	C	Sc	PA	Y
Bartels et al. (2012) Study 1 and Study 3	758	NEO	C	12	Comm	54	18	18	NL	B	Sc	PA	Y
Bartels et al. (2012) Study 2	227	NEO	C	12	Comm	62	18	18	NL	B	Sc	PA	N
Beauducel et al. (2007)	789	NEO	C	12	Stud	63	18	18	DE	C	Sc	PA	Y
Bergner and Sabine (2020) Study 2	123	NEO	C	12	Work	50	40	40	AT	C	Sc	PA	N
Bergold and Steinmayr (2018) Study 1	408	NEO	C	12	Stud	49	16	16	DE	C	Sc	PA	N
Blickle et al. (2011)	210	NEO	C	12	Comm	71	42	42	DE	C	Sc	PA	N
Richard and Kylie (2016)	47	NEO	C	12	Work				M	D	Sc	PA	N
Bratko et al. (2012)	654	NEO	C	12	Comm	57	19	19	HR	D	Sc	AU	N
Bratko et al. (2012) DZ Twins	468	NEO	C	12	Comm	58	18	18	HR	C	Sc	PA	N
Bratko et al. (2012) MZ Twins	210	NEO	C	12	Comm	58	18	18	HR	C	Sc	PA	N
Castellanos-Ryan et al. (2016)	2232	NEO	C	12	Stud	49	14	14	M	C	Sc	PA	Y
Chapman and Hayslip (2005)	292	NEO	C	12	Stud	74	20	20	US	C	Sc	PA	Y
Christopher et al. (2010)	364	NEO	C	12	Stud	56	19	19	M	C	Sc	PA	N
Cole et al. (2003)	99	NEO	C	12	Stud	51	23	23	US	C	Sc	PA	N
Craig et al. (2009)	791	NEO	C	12	Comm	53	35	35	M	D	Sc	AU	N
de Haro et al. (2013)	130	NEO	C	12	Comm	64	26	26	ES	C	Sc	PA	N
Egan et al. (2000)	53	NEO	C	12	Clin	2	31	31	UK	D	Sc	AU	N
Van Essen et al. (2013)	1197	NEO	C	12	Comm	54	29	29	M	D	It	PR	N
Flunger et al. (2017)	1649	NEO	I	12	Stud	52	14	14	CH	C	Sc	PA	N
Freund and Holling (2011)	189	NEO	C	12	Stud	77	22	22	DE	D	Sc	AU	N
Furnham and Chamorro-Premuzic (2004b)	74	NEO	C	12	Stud	62	20	20	UK	C	Sc	PA	N
Furnham, Swami, et al. (2008)	101	NEO	C	12	Stud	77	19	19	UK	C	Sc	PA	N
Furnham, Taylor, et al. (2008)	108	NEO	C	12	Work	32	37	37	UK	C	Sc	PA	N
Furnham and Monsen (2009)	334	NEO	C	12	Stud	42	16	16	UK	C	Sc	PA	N
Furnham et al. (2009)	212	NEO	C	12	Stud	58	16	16	UK	C	Sc	PA	N
Furnham et al. (2011)	90	NEO	C	12	Stud	58	20	20	UK	C	Sc	PA	N
Gannon and Ranzijn (2005)	187	NEO	C	12	Comm	67	36	36	AU	C	Sc	PA	N
Gonzatti et al. (2017)	72	NEO	C	12	Comm	76	69	69	BR	D	Sc	AU	N
Guerin et al. (2011)	109	NEO	C	12	Comm	44			US	D	It	AU	Y
Hess et al. (2005)	151	NEO	C	12	Comm	50	54	54	US	C	Sc	PA	N
Hess and Kotter-Grühn (2011)	190	NEO	C	12	Comm	51	44	44	US	D	Sc	AU	N
Hogan et al. (2012) 1921 Cohort	124	NEO	C	12	Comm	52			UK	D	Sc	AU	Y
Hogan et al. (2012) 1936 Cohort	437	NEO	C	12	Comm	52			UK	D	Sc	AU	Y
Johansen et al. (2013)	5385	NEO	C	12	Comm	33	55	55	DK	C	Sc	PA	N
Jung et al. (2010)	72	NEO	C	12	Stud	44	22	22	US	C	Sc	PA	N
Kasten et al. (2020) Study 1	137	NEO	I	12	Stud	20	23	23	DE	C	Sc	PA	N
Kathleen et al. (2016)	191	NEO	C	12	Stud	83	25	25	US	D	Sc	AU	Y
Kliegel and Zimprich (2005)	607	NEO	C	12	Comm	48	63	63	DE	C	Sc	PA	N
Kluemper and Donald (2008)	180	NEO	C	12	Work	42	27	27	US	C	Sc	PA	N
Kluemper et al. (2015)	81	NEO	I	12	Work	51	25	25	US	C	Sc	PA	N
Kramer et al. (2014)	184	NEO	C	12	Stud	64	24	24	US	C	Sc	PA	N
Kretzschmar et al. (2018) Study 2	413	NEO	C	12	Mixe	56	22	22	DE	B	Sc	PA	Y
Ku and Ho (2010)	137	NEO	I	12	Stud	71	21	21	CN	C	Sc	PA	N
Kulas and Stachowski (2013)	122	NEO	C	12	Stud				US	C	Sc	PA	N
Laberge et al. (2013)	110	NEO	C	12	Clin	65	44	44	CA	D	Sc	AU	Y
Li et al. (2018)	528	NEO	C	12	Stud	59	17	17	CN	D	Sc	AU	N
Littlefield et al. (2021)	410	NEO	C	12	Stud	54	18	18	US	C	Sc	PA	Y
Lyusin and Ovsyannikova (2016)	20	NEO	C	12	Stud	90	20	20	RU	D	Sc	AU	N
Mussel and Patrick (2013)	320	NEO	C	12	Work	32	19	19	DE	C	Sc	PA	N
Nusbaum et al. (2014)	140	NEO	C	12	Stud	72	20	20	US	D	It	AU	N
Srikanth (2020)	140	NEO	I	12	Work	28	32	32	IN	C	Sc	PA	N
Pasupathi and Staudinger (2001)	220	NEO	C	12	Comm	41	45	45	DE	C	Sc	PA	Y

Pauls and Crost (2005)	123	NEO	C	12	Stud	86	21	21	DE	B	Sc	PA	N
Peeters and Lievens (2005)	293	NEO	C	12	Stud	81	21	21	BE	C	Sc	PA	N
Peterson et al. (2009)	370	NEO	I	12	Stud	63	24	24	US	B	Sc	PA	N
Polczyk (2005)	76	NEO	C	12	Stud	30	22	22	PL	D	Sc	AU	N
Prochazka et al. (2018)	184	NEO	C	12	Stud	23	22	22	CZ	D	Sc	AU	N
Pullmann et al. (2006)	1705	NEO	C	12	Stud	59	16	16	EE	C	Sc	AU	N
Rahafar et al. (2017)	269	NEO	I	12	Stud	55	17	17	DE	C	Sc	PA	N
Reichard et al. (2011)	95	NEO	C	12	Comm	44	17	17	US	C	Sc	PA	N
Sato et al. (2016)	49	NEO	C	12	Comm	47	22	22	JP	D	Sc	AU	Y
Schretlen et al. (2010) Combined	335	NEO	C	12	Comm	56	54	54	US	B	Sc	PA	Y
Schulte et al. (2004)	102	NEO	C	12	Mixe	52	31	31	US	C	Sc	PA	N
Silvia (2007)	226	NEO	C	12	Stud	79	19	19	US	D	It	AU	N
Silvia and Beaty (2012)	133	NEO	C	12	Stud	69			US	D	Sc	AU	N
Silvia et al. (2013)	131	NEO	C	12	Stud	84	20	20	US	D	Sc	AU	Y
Simon et al. (2020) Commercial trainees	2826	NEO	I	12	Work	58	18	18	DE	C	Sc	PA	N
Simon et al. (2020) Line managers	345	NEO	I	12	Work	6	41	41	DE	C	Sc	PA	N
Simon et al. (2020) Technical trainees	2674	NEO	I	12	Work	13	17	17	DE	C	Sc	PA	N
Simon et al. (2020) Top managers	127	NEO	I	12	Work	24	40	40	DE	C	Sc	PA	N
Snoek et al. (2021) ID1000	924	NEO	C	12	Stud	52	23	23	NL	D	Sc	PR	Y
Snoek et al. (2021) PIOP2	225	NEO	C	12	Stud	57	22	22	NL	D	Sc	PR	N
Stadler et al. (2019)	483	NEO	C	12	Stud	59	16	16	DE	C	Sc	PA	N
Stanciu and Papasteri (2018)	229	NEO	C	12	Stud	82	21	21	RO	C	Sc	PA	N
Steinmayr et al. (2010)	580	NEO	C	12	Stud	61	17	17	DE	C	Sc	PA	Y
Steinmayr et al. (2011)	509	NEO	C	12	Stud	58	17	17	DE	C	Sc	PA	N
Steinmayr and Kessels (2017) Adults	207	NEO	C	12	Comm	51	33	33	DE	C	Sc	PA	N
Steinmayr and Kessels (2017) Students	236	NEO	C	12	Stud	60	17	17	DE	C	Sc	PA	N
Stoll et al. (2017)	4405	NEO	C	12	Comm	56			DE	D	It	AU	Y
Strobel et al. (2019)	290	NEO	C	12	Stud	80	21	21	DE	C	Sc	PA	N
Strohhecker and Größler (2013)	126	NEO	C	12	Stud	25			DE	D	Sc	AU	N
Trautwein et al. (2009) Study 1	571	NEO	I	12	Stud	52	15	15	DE	C	Sc	PA	N
Trautwein et al. (2009) Study 2	415	NEO	I	12	Stud	59	13	13	DE	C	Sc	PA	N
Von Stumm et al. (2009a) Females	199	NEO	C	12	Stud	100	20	20	ES	B	Sc	PA	Y
Von Stumm et al. (2009a) Males	47	NEO	C	12	Stud	0	20	20	ES	B	Sc	PA	Y
Von Stumm (2013)	189	NEO	I	12	Comm	52	35	35	UK	B	Sc	PA	Y
von Hippel et al. (2016) Study 1	177	NEO	C	12	Stud					D	Sc	PR	N
Wach et al. (2016)	620	NEO	C	12	Stud	63	21	21	DE	C	Sc	PA	N
Wainwright et al. (2008)	555	NEO	C	12	Comm		20	20	AU	C	So	PA	Y
Wang et al. (2019)	148	NEO	C	12	Stud	41	18	18	CN	D	Sc	AU	N
Wettstein et al. (2020)	1002	NEO	C	12	Comm	48	63	63	DE	C	Sc	PA	Y
williams (2014)	3894	NEO	C	12	Comm	55	46	46	US	D	It	XR	N
Wirthwein et al. (2019) Gifted	97	NEO	C	12	Stud	27	17	17	DE	C	Sc	PA	Y
Wirthwein et al. (2019) Non-gifted	97	NEO	C	12	Stud	27	17	17	DE	C	Sc	PA	Y
Zajenkowski and Gignac (2018)	303	NEO	I	12	Stud	68	24	24	PL	B	Sc	PA	N
Zhang and Wu (2014)	212	NEO	I	12	Work	0	30	30	CN	C	Sc	PA	N
Zhang et al. (2019)	836	NEO	I	12	Stud	49	15	15	CN	B	Sc	PA	N
Čukić et al. (2015)	837	NEO	C	12	Comm	49	70	70	UK	C	Sc	PA	N
Austin et al. (2002) SATSA	486	NEO	I	10	Comm				SE	B	Sc	PA	N
Allen et al. (2020)	198	BFA	C	20	Clin	50	39	39	US	C	Sc	AU	N
Diedrich et al. (2018) Dataset 3	99	BFA	I	20	Stud	68	24	24	AT	C	Sc	AU	N
Diedrich et al. (2018) Dataset 6	152	BFA	I	20	Stud	56	24	24	AT	C	Sc	AU	Y
Moorman and Samuel (2018)	403	BFA	I	20	Stud	42	19	19	US	B	Sc	PA	N
Zajenkowski et al. (2020) Study 2	241	BFA	I	20	Mixe	51	23	23	PL	C	Sc	PA	N
Bainbridge et al. (2019) BFAS	157	BFA	I	20	Stud	63	19	19	CA	C	Sc	PA	N
Bainbridge et al. (2019) Study 1	140	BFA	C	20	Stud	67	20	20	US	D	It	PR	N
Bainbridge et al. (2019) Study 1	559	BFA	C	20	Stud	67	20	20	AU	D	It	PR	N
Civai et al. (2016)	243	BFA	C	20	Comm	49	26	26	US	D	Sc	AU	Y
DeYoung et al. (2014) Sample 1	125	BFA	C	20	Stud	74	19	19	CA	B	Sc	PA	Y
DeYoung et al. (2014) Sample 2	191	BFA	C	20	Comm	0	24	24	US	B	Sc	PA	Y
Dunlop et al. (2017) Study 2 BFAS	241	BFA	I	20	Comm	69	26	26	DE	C	Sc	AU	N
Grazioplene et al. (2016)	233	BFA	I	20	Comm	47	26	26	US	C	Sc	PA	N
Jach and Smillie (2019) BFAS	284	BFA	I	20	Onli	39	36	36	US	D	It	PR	N
Jauk et al. (2019) Study 2	190	BFA	C	20	Stud	60	22	22	AT	D	Sc	AU	Y
Kaufman et al. (2016)	844	BFA	C	20	Mixe	50			M	B	Sc	PA	N
McLoughlin et al. (2022)	127	BFA	C	20	Stud	52	12	12	UK	D	Sc	AU	N
Nusbaum and Silvia (2011)	142	BFA	C	20	Stud	77	19	19	US	D	Sc	AU	N
Sutu et al. (2021) Study 2	412	BFA	C	20	Onli	20	22	22	I	D	It	PR	N
Xu et al. (2013) Study 1	486	BFA	C	20	Onli	58	35	35	US	C	So	PA	N
Xu et al. (2013) Study 2	540	BFA	C	20	Onli	52	34	34	US	C	So	PA	N
Xu et al. (2013) Study 3	460	BFA	C	20	Onli	57	35	35	US	C	So	PA	N
Zajenkowski and Matthews (2019) Study 2	216	BFA	I	20	Stud	52	23	23	PL	C	Sc	PA	N

Rammstedt et al. (2018)	365	BFI	C	12	Comm	50	43	43	DE	B	Sc	AU	Y
Bainbridge et al. (2019) BFI2	157	BFI	I	12	Stud	63	19	19	CA	C	Sc	PA	N
Fayn et al. (2019)	214	BFI	C	12	Stud	69	20	20		C	So	PA	N
Jach and Smillie (2019) BFI2	284	BFI	C	12	Onli	39	36	36	US	D	It	PR	N
Schmidt et al. (2020)	365	BFI	C	12	Onli	50	43	43	DE	D	It	PR	Y
Sutu et al. (2021) Study 1	463	BFI	C	12	Onli					D	It	PR	N
Kajonius (2014)	187	HEX	I	32	Stud	62	25	25	SE	C	Sc	PA	N
Current Industry Sample	20939	HEX	C	32	Work	59	39	39	AU	D	It	AU	Y
Barends et al. (2022) Study 1	75	HEX	C	32	Comm	40	24	24	NL	D	It	AU	Y
de Vries et al. (2021)	1330	HEX	C	32	Stud	75	21	21		D	Sc	AU	N
Current Firefighter Sample	941	HEX	C	16	Work	8	29	29	AU	D	It	AU	N
Marković (2017)	268	HEX	C	16	Stud	82	20	20	RS	B	So	PA	Y
Međedović and Đorđević (2017) Painters	132	HEX	I	16	Stud	62	20	20	RS	C	Sc	PA	N
Međedović and Đorđević (2017) Students	119	HEX	I	16	Stud	69	19	19	RS	C	Sc	PA	N
Current Student Sample	647	HEX	C	16	Stud	83	29	29	AU	D	It	AU	N
Current MOOC Sample	4286	HEX	C	16	Stud	69	35	35	I	D	It	AU	N
Dunlop et al. (2017) Study 2 HEXACO	241	HEX	C	16	Comm	64	42	42	DE	D	Sc	AU	N
Dunlop et al. (2017) Study 3	302	HEX	C	16	Onli	53	36	36	US	D	Sc	AU	N
Goffin and Spring (2016)	198	HEX	I	16	Onli	53	35	35	I	C	Sc	PA	N
Hilbig et al. (2014)	397	HEX	C	16	Comm	78	33	33	DE	D	So	AU	N
MacCann (2013)	163	HEX	C	16	Stud	73			AU	B	Sc	PA	Y
Marcus et al. (2016)	338	HEX	C	16	Work	15	20	20	NL	D	So	AU	N
Oh et al. (2014)	217	HEX	C	16	Stud	10	19	19	KR	C	So	PA	N
Fiori and Marina (2015)	98	HEX	C	12	Stud	64			CH	D	Sc	AU	N
Kleinlogel et al. (2018) Study 1	195	HEX	C	12	Stud	52	21	21	CH	C	Sc	PA	N
Kleinlogel et al. (2018) Study 2	350	HEX	C	12	Stud	35	22	22	CH	C	Sc	PA	N
Barbaro et al. (2019)	29	HEX	C	10	Comm		23	23	US	D	It	AU	N
Tiarn et al. (2019)	202	HEX	C	10	Stud				AU	D	It	PR	Y
Goecke et al. (2020)	286	HEX	I	10	Stud	72	24	24	DE	C	So	PR	N
Husbands et al. (2015)	198	HEX	C	10	Stud	56	18	18	UK	C	Sc	PA	N
Weiss et al. (2021) Study 2	278	HEX	C	10	Comm	72	25	25	DE	C	Sc	PA	Y
Udayar et al. (2018)	400	HEX	C	4	Stud	46	21	21	CH	C	So	PA	N

Note. Complete: C = Administered complete measure, I = Administered incomplete measure; Items is items per domain (e.g., NEO 48 corresponds to NEO PI R/3; NEO 12 corresponds to NEO FFI); Sample: Stud = Students, Comm = Community, Work = Workers or Job Applicants, Clin = clinical sample, Onli = Paid online panel (e.g., Mechanical Turk, Prolific, etc.). Country is the 2-digit ISO country code, "I" = multi-country English-speaking Internet sample, M = mixed country sample. Data Type: C = correlation matrix, D = Data, B = Bivariate Pairwise Correlations; Data Provision: Sc = All scales, So = some scales, It = Items; Data Source: AU = Author, PA = From paper, PR = Public Repository, XR = Protected Repository; Verbal: Y = has measures of verbal and fluid intelligence, and N = does not have such measures. Further details about the nature of the sample in each study are provided in the online repository that accompanies this paper.

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