Original Manuscript

Personality and Social Psychology Review
1–27

DOI: 10.1177/10888683251377227
pspr.sagepub.com
Sage

Openness/Intellect: A Unique Trait Requires Unique Considerations

Ted Schwaba[1] and Amber Gayle Thalmayer[2,3]

Abstract

Openness/intellect often stands apart from the other Big Few personality traits. Here, we interrogate some of the many qualities that make openness/intellect unique. First, we describe this trait's unique history, highlighting unresolved controversies critical to its modern interpretation. Second, we identify three major research questions where openness/intellect is unique among the Big Few: trait associations with outcomes are often moderated, it is often irrelevant to mental health, and it is the rarest target of volitional change; we develop theories to confirm and explain these phenomena. Third, we synthesize etic (imported) and emic (local) cross-cultural evidence to argue that openness/intellect is the least cross-culturally portable Big Few trait. We hypothesize that variation in individualism, looseness, and complexity modify its relevance and coherence around a potentially universal core. Throughout, we argue that understanding these unique qualities is required to cohesively interpret past openness/intellect findings and expand future research on this trait.

Public Abstract

Most researchers study personality using five or six broad traits. One of these traits is called openness/intellect, which describes people who are imaginative, knowledgeable, nontraditional, creative, and often unusual. Here, we explore how the trait itself is often unique compared to other broad personality traits. For example, most people want to change their personality, but they rarely want to change in openness/intellect. And, although openness/intellect is important for people living in North America and Europe, in other cultures it seems less relevant. In some cultures, its specific components don't go together: nontraditional people aren't more imaginative. In some languages, words like "creative" don't exist. Even so, some indicators of openness/intellect, like wisdom and experiencing goosebumps from music, are found among humans everywhere. We develop theories to explain these unique qualities of openness/intellect; testing them will allow us to further understand how, why, and among whom individual differences in this trait are important.

Keywords

openness to experience, intellect, culture/ethnicity, personality structure

Researchers typically model personality structure in terms of a few broad, overarching traits. For example, the popular Big Five includes extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience (John et al., 2008), and the Big Six HEXACO includes honesty/humility, emotionality, extraversion, agreeableness, conscientiousness, and openness to experience (Ashton & Lee, 2020). In these models, henceforth collectively referred to as Big Few (Mõttus et al., 2020; we employ specific terms like the Big Five or HEXACO when appropriate), one trait often stands out from the others as unique: Openness/intellect. Beyond describing people who are unconventional and quirky (in common parlance, unique), empirical patterns that characterize the other traits often don't apply to openness/intellect, and it also appears to be the least applicable cross-culturally. But because researchers often dedicate equivalent theoretical consideration and manuscript space to each trait (e.g., Bleidorn et al., 2022; DeYoung, 2015a; Soto, 2019; Wrzus & Roberts, 2017), the unique qualities of openness/intellect and their theoretical explanations and implications have yet to be assembled together and sufficiently explored.

In this paper, we give the unique qualities of openness/intellect close attention. In Part I, we review its history, including initial conceptualizations of openness and intellect and their "marriage of convenience." Unresolved friction between the openness and intellect portions of this trait remain centrally relevant in modern personality research,

[1]Michigan State University, East Lansing, USA
[2]University of Zurich, Switzerland
[3]University of the Free State, South Africa

Corresponding Author:
Ted Schwaba, Department of Psychology, Michigan State University, East Lansing, MI 48824, USA.
Email: tedschwaba@gmail.com

and their consideration helps explain many of this trait's unique qualities. In Part II, we explore three focal topics in personality psychology today where results pertaining to openness/intellect stand apart from those for the other Big Few. Associations between openness/intellect and life outcomes seem to be moderated more frequently, openness/intellect is less obviously relevant to mental health, and openness/intellect is less often a target of volitional change efforts. We develop testable explanations for these points of discrepancy, for which there is currently a paucity of theory. Finally, in Part III, we delve into a unique pattern in cross-cultural research: studies outside of Western cultural contexts often fail to identify or replicate this trait, especially compared to the other Big Few. To explain these results, we develop theory on how variation in specific aspects of culture may shape the expression of openness/intellect. Despite this cross-cultural variation, we propose a universally relevant core of openness/intellect that may hold across human cultures, and even across species, and we argue for continued consideration of this trait in personality research.

Our goal in this review is to provide epistemic iteration for the trait of openness/intellect, including a path toward consensus about terminology, measurement, and research goals, as called for to address the theory crisis in psychology (Eronen & Bringmann, 2021; Leising et al., 2022). This means first attending to the many ways in which openness/intellect is unique among the Big Few and then developing theoretical explanations for these points of uniqueness. We aim to motivate researchers to conduct confirmatory tests for these qualities in future studies, and we illuminate a path to clarify the definition, structure, and correlates of openness/intellect.

Positionality and Citations Statements

Before beginning the substantive portion of this review, it is important to relate our own positions to the topic at hand. Both authors identify with high openness/intellect as core to our own personalities and life choices. This personal connection to the trait has attuned us to its research and led to particular interest in its details and contradictions, which we believe strengthens the paper. This can also, however, bias us toward wanting to see openness/intellect as a coherent trait, contrary to some of the evidence we review, and to finding value in this trait, especially its humanistic elements (discussed further in Part II). There is also a substantial cross-cultural element to this paper, making our cultural identities as White Americans relevant. Much of cross-cultural personality psychology has been a project of identifying traits and covariance patterns in the West and exporting them throughout the rest of the world, brushing over problems in portability (see Part III). As much as possible, we have sought to be reflexively cognizant of the pitfalls of using Western perspectives of personality as the default, and to bring in and cite research from and about other world regions. This is assisted by the second author's extensive research and life experience outside the United States, and by our personality-influenced desires to be open to new ideas. Our educations and formative life experiences in the United States unavoidably shape our perspectives. In the spirit of openness/intellect, we welcome clarification, refutation, or expansion of cross-cultural claims we make throughout the paper.

Part I: Openness/Intellect: A Bifurcated History

Typically, psychological reviews begin by introducing a construct and then articulating a clear definition for it. This presents an immediate challenge. Although the construct we are reviewing, which we refer to as openness/intellect, has been assessed in tens of thousands of studies, there is a unique lack of consensus on a name that accurately encompasses its content. Commonly-used omnibus personality questionnaires have labeled it openness to experience (Costa & McCrae, 1992; Lee & Ashton, 2004), intellect (Goldberg, 1992), openness/intellect (DeYoung et al., 2007), open-mindedness (Soto & John, 2017), and even originality/talent (Thalmayer et al., 2011). These differences in nomenclature are not superficial; they illustrate a lack of consensus on the core elements of this construct. For example, when developing the Big Five Inventory 2, Soto and John (2017) identified an "anchor" facet that describes content at the core of every other Big Five trait. Only for openness/intellect they could not, citing *"considerable disagreement regarding [its] defining features and optimal label*" (p. 122). In this paper we therefore use the term "openness/intellect" as shorthand for what we have to come to think of as the "openness and intellect extended universe," a transtheoretical umbrella label that hierarchically integrates broad and narrow components across questionnaires and theoretical conceptions that purport to measure this personality trait (Condon et al., 2021; Mõttus et al., 2020). This is a deliberate balancing act aimed at being maximally transtheoretical (DeYoung, 2015b) and cognizant of the trait's history we describe here (interested readers may also enjoy DeYoung, 2015b, John et al., 2008, and McCrae, 1993 for additional openness/intellect history).

For our purposes, we define openness/intellect transtheoretically, as a personality dimension that encompasses relatively stable individual differences in breadth, depth, and permeability of consciousness (McCrae & Costa, 1997), in ability and motivation to engage in cognitive and perceptual exploration (DeYoung, 2015b), in originality and wisdom (Goldberg, 1990), and in flexibility and interconnectedness of mental associations (Christensen et al., 2018; Nettle, 2007). These definitions articulated by past theorists differ in scope and content, though they share a common emphasis on individual differences in cognition, in contrast to the other Big Few, which are more behaviorally- or affectively-oriented (Wilt & Revelle, 2015). Defining openness/intellect in this maximally-broad way allows us to write about theory

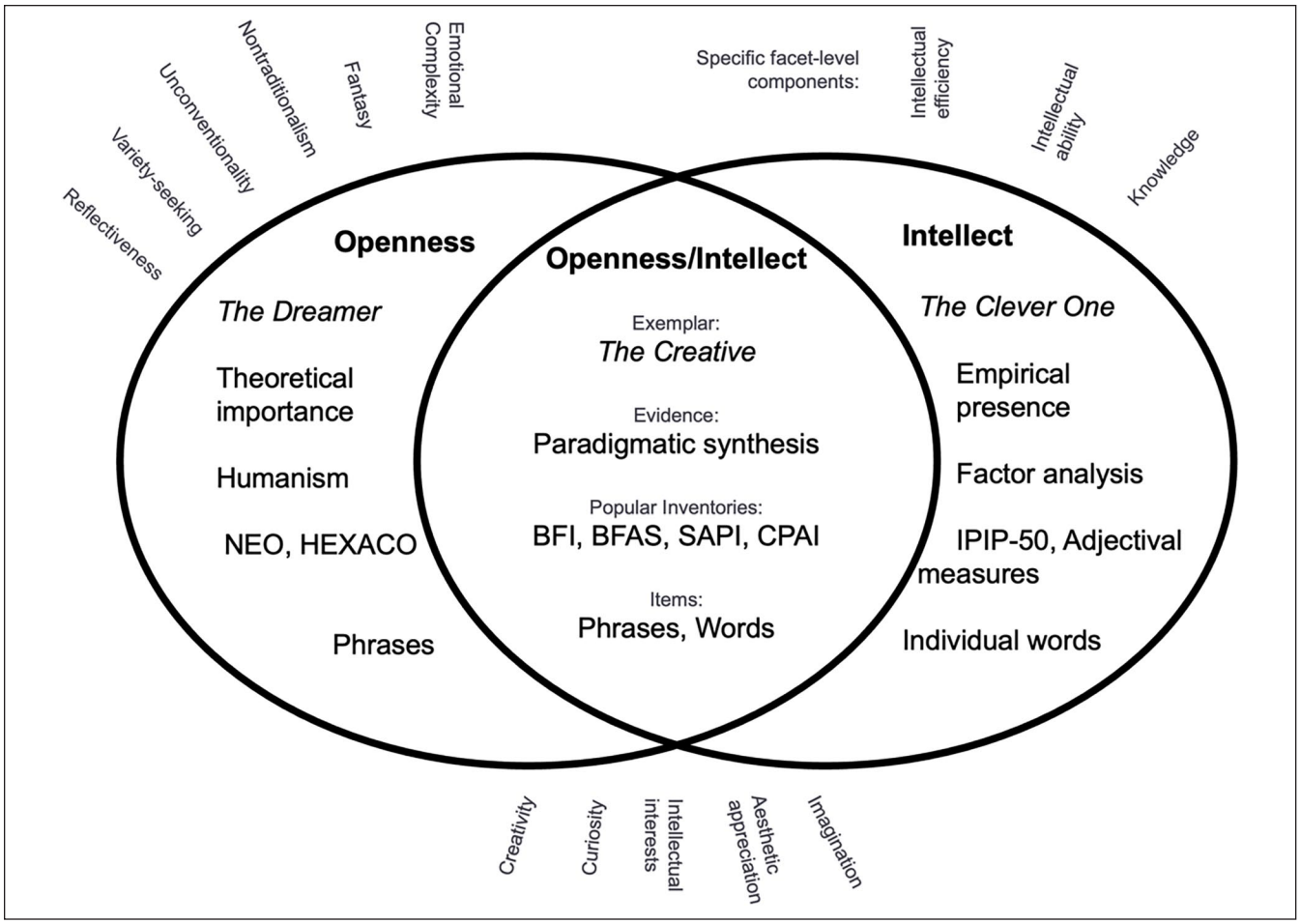

Figure 1. The Openness/Intellect Extended Universe.
Note. Components labeled surrounding the Venn diagram are drawn from research synthesizing multiple openness/intellect questionnaires: Condon et al. (2017), Woo et al. (2014), Christensen et al. (2019), and Saucier et al. (2014). HEXACO = Honesty Emotionality eXtraversion Agreeableness Conscientiousness Openness; BFI = Big Five Inventory; BFAS = Big Five Aspects Scales; SAPI = South African Personality Inventory; CPAI = Chinese Personality Assessment Inventory; IPIP = International Personality Item Pool

and research across approaches that target the same general theorized trait, acknowledging both its common core as well as facet-level components specific to particular measures or theories (Condon et al., 2017; Irwing et al., 2024; Saucier et al., 2014; Schwaba et al., 2020; Woo et al., 2014). We provide a visual representation of the openness/intellect extended universe in Figure 1. Having settled on a label and definition of this trait, we now describe the bifurcated history of openness/intellect, to provide important context for understanding its modern conceptualizations.

The History of Openness

One conceptualization of this trait emerged from the humanistic psychology movement in Europe and North America. This line of psychological thought, popular in the mid-20th century, emphasized curiosity and aesthetic appreciation, reflectiveness, and nontraditionalism, among other traits (Figure 1 upper-left) as key components in the process of self-actualization. Rogers (1959) described openness to new experiences as an essential ingredient of mental health and responsiveness to therapy, Maslow (1964) discussed the tendency of some individuals to have awe-filled, transformative oceanic experiences, and Coan (1972) developed openness-to-experience scales that measured individual differences in traits like imagination and daydreaming. Related to these positive conceptions of openness were contemporaneous concerns about authoritarian and fascist tendencies among those closed to new and novel experiences, raised by those at the Frankfurt school (Adorno et al., 2019). In this humanistic conceptualization of openness/intellect, the prototypically open person might be best described as *The Dreamer*: someone who loves to read and write, is moved by art, and reflects on the state of the world and what it could be (e.g., McCrae & Sutin, 2009).

These theory-driven conceptions of openness were integrated into omnibus personality inventories courtesy of Costa and McCrae, developers of the NEO inventories

(NEO-PI, NEO-PI-R, and NEO-PI-3; Costa & McCrae, 1976, 1992; McCrae et al., 2005). In deciding on an exhaustive set of traits and phrases to incorporate into a structural model for human personality, Costa and McCrae were influenced by humanistic theorists, including in choosing their name for the factor (Costa & McCrae, 2008, p. 180). The openness to experience scale of their initial NEO inventory thus emphasized fantasy-proneness, non-traditionalism, and imagination, among other qualities (Costa & McCrae, 1976, 1980). Contrary to popular belief, the initial NEO inventory, which measured three factors (neuroticism, extraversion, and openness to experience), was developed as its own omnibus structural model of personality. Only later were these three factors synthesized into a five-factor model (the NEO-PI-R), integrated with the lexically-shaped Big Five (Costa & McCrae, 2008).

A similar humanistic conception of openness was shared by Ashton and Lee, developers of the six-factor HEXACO inventories, of which the last letter stands for openness to experience. Initial lexical research by Ashton and Lee, which compared adjectival trait terms across languages, loosely identified a factor that they termed intellect/imagination (Ashton & Lee, 2001). When this six-factor model was later refined into the HEXACO inventory, however, the authors edited the content and label of this factor. They argued that intelligence, or intellectual ability, is a "non-personality construct" (Lee & Ashton, 2004, p. 337), which should be excluded from personality inventories. In their resultant HEXACO openness to experience factor, they thus minimized intellectual ability-related content identified in earlier lexical analyses and decided to assess the trait with short phrases rather than adjectives, decisions shared by Costa and McCrae when developing their openness to experience scale. Thus, the humanistic NEO and HEXACO scales query individual differences in intellectual interests (I like solving complex puzzles) rather than directly measuring a person's self-reported intellectual ability (e.g. I am good at solving puzzles). This contrasts with the intellect scales derived from lexically-based research, which often include intellectual ability-related terms, as we describe in the next section.

As Loevinger (1957) asserted, a psychological test is a theory that operationalizes a researcher's conceptualization of what a construct is and how it should be measured. Choices in the content and wording of the NEO and HEXACO inventories thus reveal the underlying theory of humanistic approaches to openness. One tenet is that openness is seen not just in individual differences in cognitive patterns, but in affective and behavioral tendencies as well. For example, humanistic inventories of openness to experience incorporate abstract, cognitive emotions like awe and interest (Fayn et al., 2015, 2019). Consider the evocative HEXACO item, *"Sometimes I just like to watch the wind blow through the trees*." Western research using these humanistic openness inventories has shown that high scorers tend to experience a wider range of emotions and perceive finer distinctions in their valence and intensity (Terracciano et al., 2003). Likewise, the behavioral qualities of this trait (McCrae, 1996) are exemplified by NEO items that index whether a person develops new hobbies, tries novel cuisine, and follows varied routes when going someplace.

Another important tenet of the top-down humanistic conceptualization of openness to experience is that full phrases are required to measure many components of the trait, as its features aren't well captured in single-adjective trait terms (McCrae, 1990; Trapnell, 1994, c.f Saucier, 1992). For example, there aren't common English words that describe interest in the beauty of the world ("aesthetically sensitive" comes close but is neither a single word nor a common phrase) or a tendency to experience complex emotions ("emotionally differentiated"?) As we discuss in detail later, this may be a major reason why lexical studies have not found a personality factor resembling openness to experience – even English-language dictionary-based studies do not extract many of the affective and behavioral qualities emphasized by the humanist tradition.

The History of Intellect

An alternate conceptualization of this factor was identified in the same historical timeframe but with content derived more empirically and atheoretically. Researchers beginning with Fiske (1949) and Tupes and Christal (1961) factor analyzed responses to various English-language omnibus personality questionnaires and natural-language descriptors to identify a parsimonious higher-order structure for personality variation. Generally, these studies indicated five-factor solutions, with the fourth or fifth factor capturing elements of cultural refinement and intellectual curiosity. Later, researchers categorized trait terms found in dictionaries (Norman, 1963) based on the lexical hypothesis, which is that the most salient concepts to differentiate personality variation will be encoded into single words in a language (Allport & Odbert, 1936). Factor analyses of trait terms in American, German, and Dutch samples during the 1980s and early 1990s provided additional evidence for a five-factor solution, called by then the Big Five, whose fifth factor resembled that identified by Fiske and Tupes and Christal (Angleitner et al., 1990; De Raad et al., 1992; Goldberg, 1981, 1990), although its content and interpretation varied somewhat across studies (discussed further in Part III). This lexically-derived fifth factor of the Big Five was termed intellect, a label later employed in personality measures based on these lexical results such as the Mini-Markers (Goldberg, 1992; Saucier, 1994). This intellect factor included traits like knowledge, intellectual interests, and creativity, among others (Figure 1, upper-right). Further lexical investigation of adjectival trait terms identified an extremely similar intellect factor in a wider array of European languages, especially when allowing for a six-factor lexical model (Ashton et al., 2004). According to this line of research, a prototypical person high

on the trait may be described as *The Clever One*: someone who is quick-witted, knowledgeable, and imaginative.

Here too, one can investigate the content and wording of questionnaires, as well as the process of their construction, to understand the underlying theory of the intellect pole of openness/intellect. We focus on adjectival personality measures (e.g., Ashton et al., 2006; Ashton & Lee, 2001; Goldberg, 1992; McCrae & Costa, 1985) as well as some of the International Personality Item Pool (IPIP) scales (e.g., the IPIP-50; Goldberg, 1999), where we observe a few important discrepancies from the humanistic tradition. As mentioned above, when extracting a language's lexicon of personality concepts, some researchers explicitly allowed ability descriptors in studies of personality terminology (e.g., Angleitner et al., 1990), while others did not (e.g., Ashton et al., 2004). Some of the adjectives core to intellect scales, like "*bright*" and "*smart*," turn out to also indicate high intellectual ability. This choice thus aligned intellect scales much more with intelligence measures than humanistic-tradition openness scales (*r* about .10 higher; Anglim et al., 2022). The focus on single adjectives also reduced the scope of intellect questionnaires to focus on individual differences in cognition over behavior or affect. For example, IPIP intellect inventories do not contain any items measuring aesthetic sensitivity, nor do questionnaires in this tradition include emotional or interpersonal aspects of the trait, which are not well-captured with single adjectives or short phrases.

The bottom-up approach of the lexical tradition means that it is less centered on Western theoretical conceptualizations. The humanistic theory of openness begins with the premise that this trait, derived from the insights of Western researchers studying mostly Western samples, is universally important. Lexically-derived intellect is more content agnostic. By proceeding from dictionaries rather than theory, lexical studies highlight whichever trait concepts are relevant in a given language and society, ultimately identifying the most universal content through empirically-based cross-language regularities that researchers then interpret (Goldberg, 1981). Across Western samples, one lexical regularity appears to be intellect, at least when trait terms relevant to intellectual ability are included in a lexical study. When these terms are omitted, a factor more relevant to humanistic openness is typically identified (De Raad, 1994; Ashton et al., 2004). Outside the West, lexical studies have revealed serious limitations in the relevance of both openness and intellect, as we review in Part III. Some languages include few terms relevant to these traits among frequently used person descriptors (Thalmayer et al., 2020, 2021).

A Modern Synthesis Between Openness and Intellect?

So, how did these two competing conceptualizations get resolved? They didn't. As the Big Five model of personality grew exponentially in popularity (John et al., 2008), a fifth factor involving both openness AND intellect was enshrined as paradigmatic, though its content varied across studies and theories, and there was no real resolution agreeing upon its optimal name, scope, or overlapping components (e.g., De Raad & Mlačić, 2020; DeYoung, 2010; Saucier, 1994). This marriage of convenience – and resulting ambiguity – continues today, as openness-focused questionnaires, intellect-focused questionnaires, and questionnaires that synthesize the two are all in common use and are typically treated as interchangeable.

We believe that this rapprochement was probably necessary to allow the field to move beyond debates about the structural units of personality and onto studying its antecedents and consequences (Roberts & Yoon, 2022). Among Western samples, the lexically-shaped IPIP-50 intellect scale and the more humanistic NEO-PI-R openness to experience scale correlate around $r = .60$ (McCrae & Costa, 1985; Thalmayer et al., 2011), meaning that findings that apply to one often apply reasonably well to the other. As McCrae and Costa (1985) wrote, *"Although our version of the five-factor model differs in some details from* Norman's (1963), *the similarities are far more remarkable than the differences."* (p. 720). A .60 correlation also implies considerable non-shared variance, which can systematically influence results, especially if researchers are not aware of this discrepancy. Knowing the history and differences between openness and intellect questionnaires can aid researchers in selecting the scale that most appropriately addresses the theory underlying their research question and being attentive to how they describe and compare results. (Here it is important to note that although openness/intellect has been given uniquely many labels among the Big Few, all Big Few traits differ in content to some extent across questionnaires. For example, conscientiousness scales measure varying combinations of industriousness, responsibility, and order, among other components; Roberts et al., 2005).

Four modern questionnaires synthesize openness and intellect; each measures traits like curiosity, imagination, aesthetic appreciation, and intellectual interests (Figure 1, bottom), as part of their idiosyncratic measurement of the openness/intellect extended universe. The Big Five Aspects Scales measure openness and intellect in separate scales, explicitly acknowledging their differential content and correlations (DeYoung, 2015a). The developers of the Big Five Inventory (BFI; John et al., 1991) and its successor, the BFI-2 (Soto & John, 2017), instead took a transtheoretical approach that balances content from the two traditions, seeking to measure their intersection (Benet-Martínez & John, 1998). And finally, the Chinese Personality Assessment Inventory (CPAI; Cheung et al., 2003, 2008) and South African Personality Inventory (SAPI; Fetvadjiev et al., 2015) were both derived through synthetic approaches that blended bottom-up incorporation of local, more intellect-based person descriptors, and top-down incorporation of openness content from the Western Big Five model (as we describe more in Part III). We do not assert that these integrated

inventories are superior to those developed primarily through the top-down (openness) or bottom-up (intellect) approaches, but they do afford research that bridges the divide between the two to explore their differences. For example, the openness and intellect aspect scales of the BFAS differentially predict scientific and artistic outcomes (Kaufman et al., 2016) and the unconventionality, intellect, and aesthetic components of the BFI differentially predict various academic outcomes (Schwaba et al., 2019). At the intersection of these synthetic approaches is the prototype we describe as *The Creative*: someone who is curious, intellectually interested, and imaginative.

Moving from the present to the future, if recent research into lower-level personality trait structure is any indication (Condon et al., 2021; Irwing et al., 2024; Schwaba et al., 2020), future understandings of openness/intellect's structure will involve greater appreciation of hierarchy within the openness/intellect extended universe (Mõttus et al., 2020). Breaking the trait apart has the potential to reveal and obviate many of the problematic quirks of openness/intellect's bifurcated history. For example, instead of treating NEO-PI-R openness to experience and BFI-2 open-mindedness as the same construct, a researcher focused on lower-level structure can appreciate that both questionnaires measure components of aesthetic sensitivity but only the NEO measures values. This more granular approach would afford clarification of openness/intellect's nomological network across aspects, facets, and items, reducing problems caused by variation in labeling and content for the Big Few.

In summary, the history of openness/intellect helps explain why the construct is difficult to pin to a single paradigmatic conceptualization and reminds us that its presence in Big Few models is, contrary to a commonly-held assumption, not predominantly based on robust convergent empirical evidence across diverse lexical studies. Rather, this trait is the result of a bifurcated theory-driven and empirical history based on differing decisions about how to best measure personality structure that have produced overlapping but distinct trait conceptualizations. In Parts II and III, as we identify and explore the many ways in which openness/intellect is unique among the Big Few traits, this historically-informed, multifaceted conceptualization of openness/intellect will prove an indispensable tool for resolving current challenges in understanding this trait.

Part II: Research Questions Where Openness/Intellect Requires Unique Consideration

Some findings in personality apply across all Big Few traits. Each are similarly heritable (Vukasović & Bratko, 2015), similarly stable over time (Bleidorn et al., 2022), and predictive of life outcomes (Borghans et al., 2016), which permits theoretical treatment of these research questions in terms of personality traits as a set. But for some other research questions, findings for openness/intellect tend to be discrepant from the other Big Few. This variation presents both a challenge and an opportunity for further development of personality theory, as it requires the development of more fine-grained trait-specific explanations. Resolving these theories will promote a deeper mechanistic understanding of openness/intellect, both on its own and as it relates to the other Big Few traits. For example, past theory and research have investigated openness/intellect's unique main effects on cognitive ability, positing that elements of cognitive engagement unique to this trait lead a person to enriching environments that in turn promote fluid intelligence (DeYoung, 2015a; Ziegler et al., 2018).

In the following section, we identify and explore three important research areas where findings for openness/intellect are discrepant from the other Big Few, in ways that we believe have not received sufficient attention: moderated prediction, links between personality and mental health, and volitional personality change. We argue that trait-specific considerations are required to understand how individual differences in openness/intellect are relevant to these questions. In Table 1, we summarize evidence for these discrepancies into novel falsifiable propositions and theoretical explanations that can be tested in future research.

Openness/Intellect May Be the Least Straightforward Predictor of Behaviors and Life Outcomes

One of the most important contributions of personality science is demonstrating that personality traits predict consequential behaviors (e.g., voting, volunteering, criminality) and outcomes (e.g., life events, academic achievement, mental and physical health diagnoses, longevity) across life domains (Borghans et al., 2016; Roberts et al., 2007; Soto, 2019). These effects are generally robust and straightforward: extraverted people tend to have more friends regardless of the extraverted person's age, education, gender, or cultural context, that is, there are few moderation effects (Soto, 2021; Wang et al., 2022).

In the cases where the association between a personality trait and a behavior or life outcome *is* subject to moderation across groups of people, our review of recent large-sample, multi-outcome studies indicates that openness/intellect associations are moderated most frequently. One example of this comes from Beck and Jackson (2022), who tested moderators of Big Five-outcome relationships across 10 samples of primarily Western participants. Although not noted by the study authors, their results (Beck and Jackson, 2022, see their Table 3) showed that openness/intellect-outcome associations were moderated more frequently across groups of people than those of other Big Five traits, most commonly by education and income level. (Specifically, 13 openness/intellect associations were moderated across groups, with conscientiousness the next most frequently moderated, at

Table 1. Three Research Questions Where Understanding Openness/Intellect Requires Separate Consideration.

Research question	Openness/intellect	Other Big Few traits
1) How do personality traits predict life outcomes?	• Main effects common • Moderation across groups somewhat common • Associations sometimes contingent on context	• Main effects common • Moderation across groups uncommon • Associations generally robust across contexts
Proposition 1: Of the Big Few, associations between openness/intellect and life outcomes are most frequently subject to moderation across groups and contextual variation.		
Explanation 1: Whether an outcome is relevant to openness/intellect is, more so than other traits, contingent on its cognitive meaning, which varies across people: what is novel, creative, and intellectually challenging to one group may be familiar, mundane, and fluent to another, moderating associations.		
2) How are personality traits relevant to mental health?	• Null associations with psychiatric symptoms • Null associations with psychiatric diagnoses • Associations differ across facets, methodologies, and definitions of mental health	• Generally negative associations with psychiatric symptoms • Generally negative associations with psychiatric diagnoses • Associations generally consistent across facets, methodologies, and definitions of mental health.
Proposition 2: Of the Big Few, openness/intellect is least strongly associated with positive components of mental health (e.g., life satisfaction) and symptoms of psychopathology (e.g., major depressive disorder diagnosis).		
Explanation 2: Compared to the other Big Few, associations require greater specificity: facets of openness/intellect (nontraditionalism, fantasy) are correlated with variation in narrow components of mental health (psychological richness and schizotypy), and at sub-symptomatic levels (c.f. genetic vs. phenotypic correlations).		
3) Do people want to change their personality traits?	• In free responses and interventions, few desire change • On questionnaires, many desire increases • No perceived deficit reduction: Low and high scorers desire similar change	• In free responses and interventions, many desire increases • On questionnaires, many desire increases • Perceived deficit reduction: Lower scorers desire increases more than high scorers
Proposition 3: Most people want to change their personality, but few people want to change in openness/intellect.		
Explanation 3: People across varying levels of openness/intellect value their current trait level and see little value to change (trait-contentedness). Additionally or alternately, people consider openness/intellect less malleable than other traits (trait-entity theory).		

11). Second, Soto (2021), also in a large multi-trait multi-outcome study, tested the robustness of Big Five-behavior/outcome correlations across age, gender, ethnicity (Hispanic vs. non-Hispanic), and race (Black vs. White) (see Soto, 2021, Supplemental Tables S3, S6, and S9). Overall, 74 of 340 openness/intellect associations were moderated by one of these variables; the next most commonly-moderated trait was neuroticism, with 43 instances of moderation. Finally, in a more specific investigation, Ayoub and colleagues (2018), in a multimillion-participant sample, found that higher openness/intellect predicted higher educational attainment and social class more strongly among people who were born with lower socioeconomic status (SES), an association we note was moderated more strongly for openness/intellect than the other Big Five (see also Shanahan et al., 2014). However, moderation of trait-outcome associations across groups can sometimes be so infrequent that comparisons among traits are precluded. For example, Wright and Jackson (2023) studied the extent to which changes in each of the Big Five predicted 13 outcomes, yet they only found three total instances of significant moderation (See Wright and Jackson, 2023, Supplemental Tables S55–S56).

We theorize that associations between openness/intellect and behaviors/outcomes may be moderated especially frequently because openness/intellect's relevance to a given behavior (and, in the long term to a life outcome) is likely to vary across people. As mentioned in Part I, openness/intellect is especially reflective of individual differences in cognition, moreso than behavior (Wilt & Revelle, 2015). In effect, then, the associations between openness/intellect and behavior are typically filtered through their cognitive implications, which often vary across groups. Based on age and contextual experiences, a behavior that is indicative of breadth of knowledge to one group of people may be common sense to another group, a creative solution to one person may be highly familiar to another, and a traditional behavior among some may be novel or even radical among others. (In Part III, we elaborate how these differential associations may impact the cross-cultural structure of openness/intellect). This is unique to openness/intellect: among the Big Five, other scales typically reflect individual differences in behavior and affect (Wilt & Revelle, 2015), which we posit provides more direct links to behavior and less leeway for cross-group moderation. For instance, if one is interested in the relationship between conscientiousness and chores, responses to the

extremely behaviorally direct conscientiousness item "*get chores done right away*," provides a tautological answer whose answer is less likely to mean different things to different groups of people.

To illustrate this argument with a specific example, multiple studies have found that people in Western contexts who score higher on openness/intellect tend to use the internet more frequently, but this link is much stronger among older adults than younger adults (Correa et al., 2010; Schwaba & Bleidorn, 2021). We believe that this pattern can be explained by variation in the extent to which internet use is driven by curiosity, intellectual engagement, and enjoyment of novelty, three components within the openness/intellect extended universe. For younger adults, the internet is ubiquitous, and unrelated to a person's standing on these traits. In contrast, for current cohorts of older adults, who grew up before the internet was invented, computer use may be influenced by attitudes toward a behavior that is perceived as novel and intellectually challenging (Vroman et al., 2015). Curious, intellectual older adults appear to be more likely to use the internet and use it more frequently, whereas the traditional and unintellectual tend to avoid it.

An alternate explanation for especially frequent moderation of associations involving openness/intellect is that personality-behavior/outcome findings may vary across SES, and because openness/intellect is the Big Few trait most relevant to SES (Ayoub et al., 2018, although meta-analytic correlations are only $r = .14$), it proxies these SES effects. This suggests a trait-specific instantiation of the "resource substitution hypothesis" articulated by Shanahan and colleagues (2014), who theorize that personality traits are more relevant to life outcomes among people with lower SES, for whom they allow people to overcome (or fall prey to) a lack of resources. In other words, a person from a low-SES background who scores high on openness/intellect may be especially driven by these personal characteristics toward attending college despite background disadvantage. This explanation is potentially compatible with ours; it may be that SES in particular shapes the cognitive implications of many behaviors in ways that make them more or less relevant to openness/intellect (e.g., college attendance may be especially indicative of cognitive exploration for a first-generation student).

A major caveat to this hypothesized pattern is that it does not appear to apply to behavioral or outcome indicators of mental health. Research on the Big Five has not found that associations between openness/intellect and personality disorders (Samuel & Widiger, 2008; Soto, 2021), loneliness (Buecker et al., 2020), or affective disorders (Lyon et al., 2021) are moderated especially frequently. Our explanation for this, discussed more fully in the next section, is based on the low relevance of openness/intellect at the broad trait level to mental health broadly: few significant associations exist to be moderated.

It is important to acknowledge that our proposition here is tentative. Our reading of the literature suggests that openness/intellect associations are moderated more frequently, though moderation overall can be infrequent (Beck & Jackson, 2022; Wright & Jackson, 2023), and no studies to date have explicitly compared the frequency of moderation across traits. Confirmatory replication tests are needed to falsify, strengthen, or refine this theory. For example, testing moderation across various demographic variables (e.g., age, SES, birth cohort) will provide greater clarity on the mechanisms underlying moderation, and testing classes of behaviors and outcomes (e.g., work versus interpersonal) will refine where moderation is more or less common.

Openness/Intellect Is Less Relevant to Mental Health

A second major research question in the study of personality traits is their role in mental health (Kotov et al., 2017). A vast literature has shown that people who score higher on neuroticism, and lower on extraversion, conscientiousness, agreeableness, and honesty/humility, are more likely to report lower levels of well-being, experience psychopathology symptoms, and receive psychiatric-disorder diagnoses (Anglim et al., 2020; Kotov et al., 2010, 2017; Malouff et al., 2005; Mann et al., 2020; Muris et al., 2022; Samuel & Widiger, 2008; although associations with narrower personality traits are sometimes more complicated; Watson et al., 2019). Just as consistently, this research (so far entirely conducted with Western samples) has found that variation in openness/intellect does not correspond with symptoms or diagnoses. This discrepancy on the part of openness/intellect has hampered efforts to integrate the Big Few with psychopathology (Widiger & Crego, 2019).

A few more nuanced lines of evidence suggest that openness/intellect is indeed relevant to mental health, but in complex ways that require standalone consideration. One of these lines of evidence returns us to the bifurcated history of openness/intellect. Widiger and Crego (2019) point out that thought disorders are specifically relevant to the unconventionality components of openness/intellect. As discussed in section one, unconventionality is often measured in openness scales, but rarely in intellect scales, despite the fact that this content was salient in early lexical studies (De Raad, 1994). Other research adds a theoretical component to this distinction. DeYoung and Krueger (2018) conceptualize deficits in reality testing—discriminating patterns that are real and useful from false patterns that should be discarded—as a major component of Schizophrenia. They argue that openness-relevant components like daydreaming, absorption, and fantasy-proneness, are nonclinical manifestations of false-pattern perception that are highly relevant to understanding thought disorders (See also DeYoung et al., 2012). Importantly, these connections are masked by contrasting associations with the intellect-relevant components in the other "half" of the trait. People who are intellectual, quick-witted, and wise can reduce false pattern perception by relying on their knowledge

and intelligence. The conclusion is that openness/intellect may fit into an integrative model of personality and psychopathology, representing nonclinical variation in cognition and behavior relevant to thought disorders, but only if specific content, especially that relevant to the openness half of the trait, is measured (Blain et al., 2020, DeYoung et al., 2007).

A second line of evidence that indicates relevance to mental health comes from molecular genetic research, which has recently identified substantial positive overlap between aggregated genetic variants that confer risk for thought disorders like schizophrenia and bipolar disorder and aggregated genetic variants predictive of openness/intellect (genetic $r \sim .35$; Lo et al., 2017; Grotzinger et al., 2022; Schwaba et al., 2025). This correlation is strikingly high compared to the nonsignificant or negative associations between openness/intellect and thought disorders observed in non-genetic studies (e.g., Camisa et al., 2005). For nearly all traits, patterns of phenotypic and genetic correlations across variables are similar in magnitude (Turkheimer et al., 2014), so this difference across methodologies is notable. Our proposed reason for this discrepancy has to do with the distribution of thought disorder symptoms versus genetic risk. Thought disorders are rare, so most genetic variations in liability differentiate between people who have no symptoms. Two people with no symptoms of thought disorders may vary in their degree of genetic risk, and it may be variation in this sub-threshold risk that is especially relevant to openness/intellect. These emerging findings point to a quotidian version of the "mad genius"—everyday people who score highly on various components of openness/intellect and have inherited a genetic profile linked to greater thought disorder liability (but who do not suffer any thought disorder symptoms) (Power et al., 2015).

A final line of evidence for openness/intellect's relevance to mental health comes from research on the psychologically rich life (McCrae & Costa, 1980; Oishi & Westgate, 2022; Ryff, 1989). Most research on mental health focuses on positive or negative emotions, and indeed openness/intellect is less relevant than the other Big Few to both. Echoing historical humanistic perspectives that inspired early conceptions of openness, however, recent research suggests that leading a psychologically rich, varied life is also important to mental health for many people, and openness/intellect is highly related to this component (Oishi & Westgate, 2022). A rich inner life, a varied cultural "diet," and the ability to introspect and express one's emotions are core components of openness/intellect, and if one considers them important to mental health (Rogers, 1959), then the trait is certainly relevant. In fact, when asked to rate the personality traits of the prototypically psychologically-healthy person, personality psychologists, positive psychologists, and undergraduate students each rated openness to emotions as the most important of all 30 NEO-PI-R facets (Bleidorn et al., 2020).

In sum, openness/intellect may initially appear to be irrelevant to mental health, especially compared to other Big Few traits. But when considering narrower fulcrums of investigation, associations emerge that suggest nuanced connections. This leads us to our second proposition: that associations between openness/intellect and mental health, particularly thought disorders, are robust with regards to specific components of openness rather than intellect, methods that index sub-threshold levels of disorder risk, and an expanded definition of mental health. Our explanation is that meaningfully linking openness/intellect to mental health requires specificity—otherwise, theory-relevant signal is overwhelmed by the noise of null associations or contrasting associations with different trait components. As the development of a synthetic nosology of personality and psychopathology continues (Kotov et al., 2017), future research can take advantage of these considerations to better situate openness/intellect in mental health.

Few People Want to Change in Openness/Intellect

We close this section by identifying and theorizing about one more way in which openness/intellect is unique among the Big Few: Compared to other traits, people rarely desire to change in openness/intellect. About two-thirds of people in Western contexts hold volitional goals to change their traits, and when asked open-ended questions about the ways in which they wish to change, people frequently mention becoming more extraverted, conscientious, agreeable, and emotionally stable (Hudson et al., 2020; Miller, 2021). A perceived deficit-reduction relationship to this valuation is also observed: people who are especially low on honesty/humility, for example, are especially likely to desire higher honesty/humility, whereas people who already score high are not as interested in changing (Thielmann & de Vries, 2021).

These patterns are not found for openness/intellect. When asked open-ended questions about which personality traits they would like to change (e.g., "*what aspect of your personality are you trying to change?*"; Baranski et al., 2021), by far the least common Big Five trait mentioned is openness/intellect (Miller, 2021; Miller et al., 2019), a finding replicated in student samples from 55 countries (Baranski et al., 2021). This is also seen when people take concrete steps to change their personalities. In a smartphone intervention study in which German subjects selected a Big Five trait to change, openness/intellect was the least frequently chosen and the only trait that did not respond to the intervention (Stieger et al., 2021). Furthermore, unlike other Big Few traits, there is no deficit-reduction effect for volitional openness/intellect change: in a meta-analysis, the correlation between current levels of openness/intellect and desire to change among over 13,000 participants was perfectly null, $r = .00$ (Thielmann & de Vries, 2021).

Other methods of measuring volitional personality change, however, lead to different results. When asked about trait change goals In *Likert-type scale* format (e.g., "*I want to*

be inventive" on a scale from "*Much less than I currently am*" to "*Much more than I currently am*"), people indicate they want to increase in openness/intellect to the same extent as the other Big Five (Hudson & Fraley, 2015; Hudson & Roberts, 2014; Miller, 2021). We note that much of this Likert-type scale research uses the Change Goals Big Five Inventory, which emphasizes positive qualities of openness/intellect (originality, curiosity, inventiveness) and contains only a single negatively-keyed item ("*I want to be someone who prefers work that is routine.*"). In addition, when asked in Likert-type scale format about which traits they value in a significant other, people in Western contexts do emphasize openness/intellect-related traits (Bleidorn et al., 2020; Botwin et al., 1997, Liu & Ilmarinen, 2020). These indicators suggest that people value at least some aspects of higher openness/intellect in themselves and others, and they just do not hold salient goals to change this trait.

Research on volitional change in personality is a hot topic in personality psychology, yet to our knowledge, there has been little attention paid to differences in volitional change across personality-relevant constructs (c.f. Sun & Goodwin, 2020; Thielmann & de Vries, 2021). Here, then, is another domain in which we see particular value in attending to the findings unique to openness/intellect. We provide two potential explanations why people rarely desire to change in this trait. First, it may be that people tend to perceive change in openness/intellect as less feasible than change in other traits, substantiating that people tend to hold a trait-specific entity theory (Dweck et al., 1995) of volitional change. If someone believes that becoming more curious and creative would pay dividends in life, but does not think anything can be done to change these cognitive tendencies, they may devalue volitional change in this trait and instead pursue change in traits perceived as more malleable.

A second explanation for why people do not choose openness/intellect as a target for change is that people may tend to be content with their current trait level, feeling it defines them in a fundamental way. Indeed, openness/intellect is the Big Few trait with the greatest ideological relevance, in Western contexts (McCrae, 1996; Sibley & Duckitt, 2010). Presented with a no-cost hypothetical option to increase their own or close others' openness/intellect, in Likert-type scale questionnaires that emphasize trait positives, people across the openness/intellect spectrum tend to respond "yes". But people who are low on openness/intellect may see few downsides to being conservative, traditionally minded, and lacking complexity, and changing these parts of themselves may be perceived as changing a core part of their identity. In contrast, low levels of the other Big Few traits may (a) have more immediate, salient downsides (e.g., a highly disagreeable person may frequently experience punishing arguments and interpersonal stressors; Roberts & Wood, 2006) and (b) may seem less core to one's personality. Trait-contentedness could explain why openness/intellect does not exhibit a deficit-reduction relationship in volitional change research, as well as the low rate of participants who spontaneously mention desired trait change in free-responses or choose this trait as an intervention target. To adjudicate between these explanations (trait-entity theory and trait-contentedness) requires testing the extent to which people believe volitional change in different traits is feasible, the extent to which different traits are seen as core to their identities, and the extent to which people want to change in trait components at the low pole of openness/intellect.

We conclude this section on volitional change with a reflexive point about the value of openness/intellect. We believe that a potential reason why this trait is centrally positioned in personality psychology despite its inconsistencies is that psychology researchers themselves (and academics in general) tend to be highly open and intellectual (Lounsbury et al., 2012) and place special emphasis on these qualities. From the days of the psychoanalysts and humanists to the new study of psychological richness (Oishi & Westgate, 2022), academics might tend to emphasize the importance of a trait that captures our favorite things about ourselves, or "who we are" (Miller, 1991). But there are costs to high openness/intellect too (Nettle, 2007). For example, high openness/intellect is associated with having a smaller social circle (Thalmayer et al., 2011), a greater likelihood of divorce (Solomon & Jackson, 2014), more career changes (Schwaba et al., 2019), and less financial stability in later life (Helson & Mitchell, 2020). These costs have been identified in individualistic cultural contexts—elsewhere, it may be even more problematic to deviate from the crowd (we address this in Part III). So although we, as highly open/intellectual academics, derive much meaning and connection in ways related to this trait, and although openness/intellect is associated with desirable qualities like higher intelligence (Stanek & Ones, 2023), we should be careful when assuming there are concrete and objective benefits to higher openness/intellect and receptive when individuals or samples indicate that they do not wish to increase in this trait.

Having now explored openness/intellect's unique position among the Big Few in moderated prediction, mental health, and volitional personality change, in Part III, we provide a comprehensive discussion of a further fundamental way in which openness/intellect is unique among the Big Few: its weaker cross-cultural applicability.

Part III: Openness/Intellect Is Uniquely Sensitive to Cultural Variation

Constraints on Generality

For decades, researchers have compared personality traits across cultural contexts to identify human universals versus cultural specifics in personality structure and to compare patterns of findings between populations. Time and time again, these studies are challenged by a certain Big Few trait: openness/intellect. Across study designs, measures, and research

questions, this trait has limited cross-cultural applicability outside of the Western contexts in which it was developed (Ashton et al., 2006; Ashton & Lee, 2001; Benet-Martínez & John, 1998; Church et al., 2011; Rossier et al., 2017; Saucier et al., 2005; Thalmayer et al., 2020, 2021; Zeinoun et al., 2018). To date, there have been few attempts to explain why this is so frequently the case (c.f. Cheung et al., 2008; De Raad, 1994). In Part III, we first review the findings of etic studies in which researchers have sought to validate openness/intellect across cultural contexts, and then we review the findings of emic studies in which researchers have assessed where openness/intellect emerges as a relevant and salient personality trait. We compare these results to patterns found for other Big Few traits. Third, we use these findings to develop a set of theoretical explanations for the cross-cultural limitations of openness/intellect. Alongside the unique qualities of openness/intellect explored in Part II, we believe that testing these hypotheses will clarify theory on this trait in particular, and the ways in which culture shapes the expression and structure of personality traits in general. Finally, we close Part III by positing a potentially universal, coherent core to openness/intellect, even if what coheres around that core is culturally variable. Effectively, this entire third part of the manuscript functions as a constraints on generality statement for openness/intellect.

Etic Research: Measurement Invariance

One method for investigating the universality of personality structure is to develop a questionnaire in one context and examine its validity when administered in others. Ideally, researchers do this using measurement invariance testing, a general method to formally examine patterns of measurement similarity across participant groups, like gender, age, or nationality (Vandenberg & Lance, 2000; Fischer & Karl, 2019).

In measurement invariance testing, a researcher sequentially tests patterns of group similarity. Here, we provide an accessible introduction to the basic logic of these tests. The first-level test of similarity across groups is for configural invariance—whether items designed to measure a construct like openness/intellect are generally associated with it in each group. The second level, metric invariance, is established by showing that the patterns of intercorrelation among items in a scale are *similar* across groups. For example, do items measuring creativity, reflectiveness, and curiosity correlate among each other in similar ways across samples from two different cultural contexts? If so, one can meaningfully compare *correlations* of the aggregate scale scores between the groups—whether openness/intellect is more strongly correlated with an outcome in one group or the other. If metric invariance is satisfied, one can test for scalar invariance, whether item scores relate to *aggregate scale scores* in the same way across groups. Do people who score high on openness/intellect tend to do so because they are both creative and reflective, in both groups? If this is satisfied, one can compare *mean scores* between the groups—whether one group tends to be more open/intellectual on average than the other.

Within Western contexts, openness/intellect and the other Big Few traits seem to function comparably across groups spanning various socio-demographic contexts, typically satisfying all three tests of measurement invariance. For example, scalar measurement invariance for openness/intellect scales has been established across age groups (Olaru et al., 2019; Oltmanns et al., 2020; Schwaba et al., 2018), and across income and education levels in the United States, after adjusting for a few non-invariant items ("*Prefers work that is routine*" and "*values artistic, aesthetic experiences*"; Hughes et al., 2021). Little research has examined measurement invariance across racial and ethnic backgrounds within Western contexts, however. One study established scalar comparability of mean scores for an adjectival Big Five measure between Black and White job applicants, although two of the four items with differential fit involved openness/intellect (Collins & Gleaves, 1998), and a study that compared European- and Asian-American college students found that mean levels of openness/intellect on the NEO-PI-3 were comparable only after adjusting for scalar non-invariance in openness to action (Lui et al., 2020). Future research is needed to comprehensively establish the comparability of the Big Few generally and openness/intellect specifically across socio-demographic groups in Western contexts.

This initial evidence for the comparability of personality trait scores across groups within Western contexts enables researchers to draw meaningful inferences about group similarities and differences in openness/intellect, for example, when testing how correlations may be moderated by SES (see Part II Section 1) or how scores change over the lifespan. It also sets the stage for etic research, which tests measurement invariance across groups from different cultural contexts.

Etic studies of openness/intellect across geographically-based cultural groups (e.g., between residents of different nations) have shown much more limited measurement invariance. Groups often respond to questionnaires in dissimilar ways. This is common across Big Few inventories: cross-cultural personality research has not yet established measurement invariance for any trait at the scalar level that allows for a comparison of mean scores across groups (Church et al., 2011; García et al., 2022; Laajaj et al., 2019; Steyn & Ndofirepi, 2022; Thalmayer & Saucier, 2014; Thielmann et al., 2020). For example, Church and colleagues (2011) compared translations of the NEO-PI-R among college students in the United States, the Philippines, and Mexico. Despite holding age and education constant, a majority of openness/intellect items failed scalar measurement invariance tests that would permit cross-sample mean comparisons.[1]

But openness/intellect's cross-cultural problems tend to be worse than those of the other traits, extending beyond

issues of metric non-invariance. Openness/intellect scales typically demonstrate the lowest item intercorrelations and least congruent factors across groups from different cultural contexts (McCrae et al., 2005). For example, in a sample of Chinese college students (Cheung et al., 1996), openness/intellect items were the least intercorrelated of the Big Five, and the facets of actions, values, and ideas could not be coerced into the openness factor. Notably weak intercorrelations were also reported in studies of French-speaking Africans (Rossier et al., 2017) and Spanish university students (Benet-Martínez & John, 1998). Sometimes, differences in item correlations across groups leads openness/intellect scales to fail less-restrictive tests for metric invariance that would permit correlational comparisons: In Church and colleagues' (2011) study, items measuring the openness/intellect facet scales for values and actions (plus the agreeableness facet, tender-mindedness) consistently failed these tests of metric invariance.

Further insight into this problem can be gleaned from a comprehensive study of personality structure among people living in 23 low- and middle-income countries (Laajaj et al., 2019). In this study, BFI openness to experience showed major configural deviations from the intended Big Five factor structure, though in this case not to a greater extent than agreeableness or conscientiousness. Interestingly, these deviations were more pervasive in data collected through face-to-face interviews of representative samples, whereas online survey methodology using convenience samples led to much smaller discrepancies in factor structure. Commenting on this study, Henrich (2020) noted that participants in these online surveys were younger, more educated, literate, and more likely to speak English, typical of online cross-national studies. Methods that sample people with these demographic characteristics seem to comport best with the Big Few structure.

Taken together, these findings illustrate the limitations of the etic strategy to export openness/intellect. They also reveal the cultural malleability of personality structure and present a strong argument that the Big Few as derived in Western, student samples is not a one-size-fits-all personality solution that can be exported worldwide (Thalmayer et al., 2022).

Thankfully, there are workarounds that allow for cross-cultural comparison even when scale scores are not directly commensurate. Statistically, if a researcher uses structural equation modeling to estimate openness/intellect as a latent variable (rather than a composite or sum score) and can identify "anchor" items that function similarly across groups, they can establish partial measurement invariance and compare the anchored latent scores across cultures (Byrne et al., 1989, Nye & Drasgow, 2011, Putnick & Bornstein, 2016). For example, Olaru and Danner (2021) found that although the full BFI-2 openness/intellect scale was not invariant across five Western nations, an invariant three-item subset could be extracted (including "*Values art and beauty*," "*Has little interest in abstract ideas*" [reverse-scored], and "*Is original, comes up with new ideas*"). Thalmayer and Saucier (2014) used measurement invariance across 26 samples to define the five best-possible items for a cross-cultural Big Six inventory ("*I have difficulty understanding abstract ideas* [reverse-scored]," "*I have a rich vocabulary*," "*I am considered to be a wise person*," "*I am an extraordinary person*," and "*I can handle a lot of information*"). Finally, Kura and colleagues (in press) found a five-item metric-invariant scale of Big Six/HEXACO marker terms for openness/intellect across three African samples (*clever*, *creative*, *gifted*, *intellectual*, and *sharp*). Although these strategies permit comparisons across cultural contexts, there is a cost. To the extent that they pare down scales to a smaller subset of items, they assess a narrower conceptualization of the openness/intellect extended universe that omits some of its components.

Emic Research: Locally-Derived Inventories

A second approach to understanding personality structure is to build a local personality structure from the ground up. This provides the strongest test of the social relevance of specific personality constructs in a population. For example, lexical personality-description research identifies the most commonly used terms to distinguish between people in a given language and society and an optimal local structural model based on patterns of covariation among these terms (e.g., Goldberg, 1981, 1990). This strategy was the primary source of evidence in Western cultures for the intellect half of openness/intellect (Ashton & Lee, 2001; Goldberg, 1990; Hofstee et al., 1997). While many initial lexical studies focused on identifying small sets of broad factors, in part because they assumed these would be most likely to replicate across cultures (Thalmayer et al., 2022), lexical studies have the potential to yield quite varied many-trait emic structures that can elucidate interesting local configurations of personality (e.g., Saucier & Iurino, 2020; Thalmayer et al., 2021). The degree to which these emic factors replicate etic factors proposed to be universal can be tested by adding key marker terms for Big Few scales. Often, even in cultures in which the best-fitting factor structure looks quite different from the Big Five, correlations between emic factors and Big Five markers indicate that at least some factors across the two structural models are compatible—but if any are not, openness/intellect tends to be among them (Benet-Martínez & John, 1998; Church et al., 1997; Saucier et al., 2014; Thalmayer et al., 2020, 2021).

Emic studies of personality structure have not converged on a consistent openness/intellect trait, even in Western contexts where this trait was first identified as important. As early as 1994, regarding lexical studies in European nations, De Raad (1994) wrote, "*None of the nominated fifth [openness/intellect] factors . . . has both proceeded from the lexical method and received unquestionable cross-cultural affirmation*." (p. 229). Although lexical research in Indo-European

languages has typically identified an openness/intellect-related factor in both five- and six-factor models of personality, this factor emphasizes different content: for example, intellect (United States, Germany, Poland, and Southern Italy; Ashton et al., 2007; De Raad, 1994; Di Blas & Forzi, 1998; Szarota et al., 2007), (un)conventionality Netherlands, Spain, and Northern Italy; (Benet-Martínez & Waller, 1997; Caprara & Perugini, 1994; Hofstee et al., 1997), or prowess/heroism (Greece; Saucier et al., 2005).

Given this inconsistency in openness/intellect across Western contexts, one may wish to identify which particular instantiation of the trait is *most* generalizable across the West. In theory, this could be used as a point of evidence in the decades-long debate among Big Few structural models (e.g., Ashton et al., 2004; Ashton & Lee, 2020) and inventories. In our review of the literature, however, what appears to be the most important factor in emic tests of generalizability is the methodological choices made by a researcher (De Raad, 1994). Recalling the bifurcated history of openness/intellect in Part I, Western lexical studies that incorporate terms related to intellectual ability have often identified a factor resembling intellect, whereas those that exclude those terms have instead identified a factor more closely resembling unconventionality or openness (Ashton et al., 2004; Hofstee et al., 1997). (Unfortunately it is not always clear whether terms related to intellectual ability were included, especially in publications that predate the internet.) Resultant lexical factors that resemble unconventionality or openness tend to correlate more strongly with marker scales and questionnaires designed in the humanistic tradition that emphasize openness-related content (e.g., Benet-Martínez & Waller, 1997), whereas lexical factors that resemble intellect correlate with these scales and questionnaires less strongly (Ashton et al., 2007; Lee & Ashton, 2008; Szarota et al., 2007). Thus, in practice, emic Western research on openness/intellect does not settle debates about whether a five- or six-factor model of personality is optimal in this cultural region, nor which openness/intellect questionnaire is most generalizable. They instead underscore the critical importance of historical conceptual divisions between openness and intellect.

Differences among Western emic lexical studies are minor compared to results from outside the West, where terms related to openness/intellect are often sparse and do not coalesce into a standalone factor. Consider dictionary-based studies in three African languages representative of the main language groups of Africa (Thalmayer et al., 2020, 2021). In these studies, only a single term clearly relevant to (low) openness (Supyire-Senufo tíí, which corresponds in English to "correct, right, straight, simple, not complex") appeared among the most frequently-used personality descriptors. These studies also considered indicators of cognitive ability, allowing them to identify a few intellect-relevant terms capturing individual differences in knowledge and intelligence (e.g. The Khoekhoe word ≠âi≠uixa corresponds in English to a person who tends to think things out or come up with ideas). Overall, of the 11 emic factors identified in these African-language studies, none correlated above .32 in magnitude with marker scales for Big Five intellect or Six openness (Thalmayer et al., 2021), indicating that these emic models of personality only peripherally capture individual differences in openness/intellect as instantiated in the Big Few.

Other lexical studies outside the West also have failed to replicate Western models of openness/intellect, particularly with respect to the openness portion of the trait. In Chinese, a factor termed intellect/positive valence was identified that included some aspects of unconventionality content (including words corresponding to e.g., *unusual*, *special*, *ordinary*) but lacked other openness content (Zhou et al., 2009). In South Africa (Fetvadjiev et al., 2015; Nel et al., 2012) and in the Arab Levant (Zeinoun et al., 2018), freely-generated personality descriptions were noted to have less content coverage for openness/intellect (openness in particular) than other Big Five traits. Hahn and colleagues (1999), in lexical analyses of Korean personality trait adjectives, identified a four-factor best-fitting model where intellect, rather than forming its own factor, was blended with conscientiousness, and openness-related content was omitted. And Church and colleagues (1997) also identified an intellect factor in Filipino Tagalog that omitted most openness-related content. An interesting exception to this pattern of findings is Turkish (Somer & Goldberg, 1999), where a lexical study identified a fifth factor that captured both intellect and many descriptive terms relevant to openness (including words corresponding to e.g., *experimental, open-minded, artistic*).

Some emic research has been conducted with the applied aim to create a personality questionnaire for local use in a specific cultural context. Doing so requires balancing the emic goal for locally-coherent traits with the etic goal of comparison to paradigmatic five- and six-factor models. In practice, achieving both goals for openness/intellect is difficult. For example, the SAPI (Fetvadjiev et al., 2015) includes measures of openness/intellect and extraversion, even though these traits had a much weaker empirical basis for inclusion than other traits, and we find it hard to imagine these scales being included without the prominence of the Big Five. Similarly, the CPAI measures a trait called interpersonal openness, which was included after a directed effort to identify *any* valid openness/intellect-related scale among Chinese participants (Cheung et al., 2001; 2003; 2008). These examples reveal how inventories that measure openness/intellect in non-English languages may do so partly out of deference to extant Western-centered personality theory rather than compelling empirical evidence—similar to how the humanist tradition has placed special emphasis on trait openness due to *a priori* theoretical importance.

As a final point of evidence against openness/intellect's relevance in emic research, some research has synthesized lexical findings across languages to identify cross-cultural structural models for personality. A two-factor model that

describes personality in terms of agentic and communal traits has replicated well across global languages (Saucier et al., 2014; Thalmayer et al., 2024) as has a three-factor model at least among European languages (with factors labeled affiliation, order, and dynamism, De Raad et al., 2014). The factors in these cross-cultural models omit openness/intellect-related content almost entirely. The single item in these inventories that resembles openness/intellect is "clever," in the agency/dynamism factor of the 45-item Cross Cultural Big Two Inventory (Thalmayer et al., 2024). Furthermore, none of these factors are closely associated with openness/intellect, with a maximum$|r|$ of about .40, between Big Two agency/dynamism and Big Five intellect (Thalmayer et al., 2024).

Overall, the results of global emic studies provide little support for the cross-cultural relevance of openness/intellect. In the West, the core of an openness/intellect factor shifts across studies, and outside the West, openness/intellect is often not identified as a coherent, important personality factor at all, despite efforts to find convergence with the dominant Western model. In contrast, other Big Few traits are more cross-culturally replicable, both in terms of relevance and structure. In the following section, we develop specific hypotheses for why this might be.

Cultural Differences May Affect the Relevance and Coherence of Openness/Intellect

Both etic and emic lines of research indicate that Western conceptualizations of openness/intellect are hampered by severe psychometric challenges in other cultural contexts. Clearly, variation in culture has major effects on this trait. To date, however, little theory has been developed to explain why this is the case. In the following section, we develop two interrelated and falsifiable hypotheses to explain the effect of culture on openness/intellect. Specifically, we first hypothesize how cultural variation affects the relevance of this trait, as indexed by variation in presence in natural language, and thus its limited identification in emic research. Then, we hypothesize how cultural variation affects openness/intellect's coherence, as indexed by variation in correlations among different traits, and thus its limited portability in etic research.

To derive these two hypotheses, we recruit three correlated but conceptually distinct vectors of cultural variation: individualism (versus collectivism), looseness (versus tightness), and complexity (Hofstede, 1980; Triandis, 1989, 1997). Individualism versus collectivism measures the extent to which a society's members prioritize and think in terms of individual identity, coupled with stronger impersonal prosociality, valuing principles of fairness to all—versus thinking in terms of loyalty to, reliance on, and identification with collective in-groups. For various historical reasons, Western cultures tend to be uniquely individualistic (Henrich, 2020). Tightness versus looseness measures the strength of a culture's norms and the tolerance for deviant behavior: how important it is to stick to the script (Torelli & Rodas, 2017). Cultures that are less individualistic often tend to be tighter, though the correlation is imperfect ($r = -.47$; Gelfand et al., 2011). Places where the two vectors diverge illustrate their distinctiveness: Israeli culture has a strong collective identity regarding Jewish religious practice, but deviation from these norms is commonplace, making it relatively loose (Gelfand et al., 2011). Parts of the mountain West in the United States, in contrast, encourage a highly individualistic self-concept (Vandello & Cohen, 1999), but deviation from key norms is severely punished, leading to tight culture; for example, these states are among the most homophobic in the United States (Human Rights Campaign, 2022; https://www.hrc.org/resources/state-equality-index). Finally, complexity (versus simplicity) measures the elaboration of a society's features, like population size, number of occupations, and divisions of political structure (Chick, 1997). Cultures that are more complex tend to be more individualistic and looser (Triandis, 1989). This dimension is less frequently studied in modern cross-cultural psychology, perhaps due to the negative implications of deeming some cultures less complex; we therefore explicitly state that a society's complexity is completely unrelated to its worth.

Individualism and Complexity May Explain Cultural Variation in Openness/Intellect's Relevance. According to the lexical hypothesis (Allport & Odbert, 1936; Goldberg, 1981), trait terms are present in a language to the extent that they describe important vectors of individual difference. This implies that in contexts where a certain trait is especially relevant, there will be more terms to describe differences in that trait, and these terms will be used more frequently, whereas irrelevant traits will be described by fewer or no terms, and the terms that do exist will be used less frequently. In particular, we propose that both individualism and cultural complexity influence the relevance of openness/intellect, affecting whether openness/intellect terms are found in a group's lexicon. Greater individualism emphasizes the importance of trait behavioral variability, and greater cultural complexity may provide more opportunities for niche-picking behavior—both of these may lead over time to the inclusion of relevant single-word openness/intellect terms in the local lexicon (Table 2, rows 1 and 2).

For decades, scholars have theorized about how individualism may make personality traits more salient (Triandis, 1989). People living in more individualistic cultures, where there are fewer situational prescriptions for behavior, tend to attribute a person's behaviors to internal motives (e.g., a person helps someone because they are agreeable, kind, or affiliation motivated), whereas in collectivistic cultures, where situational prescriptions are stronger and more frequently present, people tend to attribute behavioral to situational contingencies (a person helps because an in-group member needs help; Church & Lonner, 1998; Henrich, 2020; Triandis, 2001). We expand on this by theorizing that people in more individualistic cultures

Table 2. Theoretical Propositions for How Cultural Differences Shape Openness/Intellect.

Proposition	Openness/intellect-related English terms	Operationalization
1. Individualistic cultures emphasize **trait descriptors of behavioral variability**, making openness/intellect more *relevant*	High scorers: *adventurous, curious, novelty-seeking, adaptable, versatile, exploratory*	Between languages: Languages spoken in more individualistic cultures should contain more terms for trait behavioral variability than those spoken in more collectivistic cultures.
	Low scorers: *simple, boring, inflexible*	Within languages/cultures/countries[a]: In more individualistic contexts, trait terms for behavioral variability should be used more frequently.
2. Complex cultures provide opportunities for **niche-picking behavior**—a person's selection of work, love, leisure, and values, making openness/intellect more *relevant*	High scorers: *artistic, inquisitive, cultured, deep, pretentious, worldly*	Between languages: Languages spoken in more complex cultures should contain more terms for niche-picking behavior.
	Low scorers: unsophisticated, *uncreative, basic, normal, shallow*	Within languages/cultures/countries: In more complex contexts, terms for niche-picking behavior should be used more frequently.
3. Tight cultures discourage and pathologize **norm-violating behavior**, making openness/intellect less *coherent*	High scorers: *eccentric, unique, odd, peculiar, weird*	Among people living in tighter cultures, associations between traits relevant to norm violation and other components of openness/intellect should be weaker. In tighter cultures, associations between norm violation and maladaptive traits (e.g., low social self-regulation) should be stronger
	Low scorers: *conforming, conventional, traditional, obedient*	
4. Collectivistic and tight cultures locate **value systems** more outside the individual, making openness/intellect less *coherent*	High scorers: *broadminded, free-thinking, progressive, introspective*	Among people living in more collectivistic and tight cultures, inter-item associations within value-relevant trait scales should be weaker, associations between value-relevant trait scales should be weaker, and value-relevant trait scales should correlate less strongly with other components of openness/intellect.
	Low scorers: *traditional, conservative, unreflective*	

[a]Here we refer both to different regions with the same country, e.g., rural and urban, and also to situations in which the same language is used in multiple regions (Cohen, 2009); for example, English is the national or de facto national language in 63 countries, where it has diverged into local forms (World Englishes, e.g., Kirkpatrick, 2010).

may tend to attribute *variability* in a person's behavior to internal traits rather than situational contingencies. Many personality terms that describe differences in behavioral variability, like *adventurous*, *curious*, *novelty-seeking*, *conventional*, and *boring*, are located within the openness/intellect extended universe. These differences are assessed through BFI, HEXACO, and NEO items that ask whether a person enjoys learning about new things, tries new and unfamiliar foods, or prefers routine, and are borne out by research that has shown openness/intellect as the strongest personality predictor of everyday behavioral variability among Western participants (Matz, 2021). Individualistic cultures offer less guidance as to appropriate behavior in specific situations, and fewer situational attributions for variability. In contrast, in collectivistic cultures, engaging in different behaviors across situations may be attributed to situational differences, for example, obviously a person behaves differently with their professor than with their friends (Suh, 2002). In this case, there is little need for trait terms to describe why some people vary more frequently in their behavior.

While individualism may increase the relevance of openness/intellect through emphasizing trait attributions for behavioral variability, cultural complexity may increase the relevance of this trait by encouraging varied niche-picking behavior and personality attributions for this behavior. In the last decade, the niche-diversity hypothesis has been developed to explain differences in personality structure across societies (Durkee et al., 2020; Smaldino et al., 2019). According to this theory, societies with a greater number and variety of social roles promote differentiated personality trait combinations, producing a more complex emergent system of personality traits. We extend this theory by proposing that niche diversity, which is closely related to cultural complexity, is especially relevant to openness/intellect. The BFI, BFAS, NEO, and HEXACO inventories each assess a person's enjoyment of philosophical conversations, interest in the arts, and preference for the abstract over the concrete, related to English-language adjectives like *artistic, inquisitive, cultured*, and *unsophisticated*. These qualities are among the strongest trait indicators of what a person values (Dollinger et al., 1996; Thalmayer et al., 2019) and how they spend their leisure time (Kraaykamp & Van Eijck, 2005; Schwaba et al., 2018), as well as being among the traits most associated with romantic partner selection (Watson et al., 2004; Kandler et al., 2012), political preferences (Gebauer et al., 2014; Kandler et al., 2012; Osborne et al., 2023), and

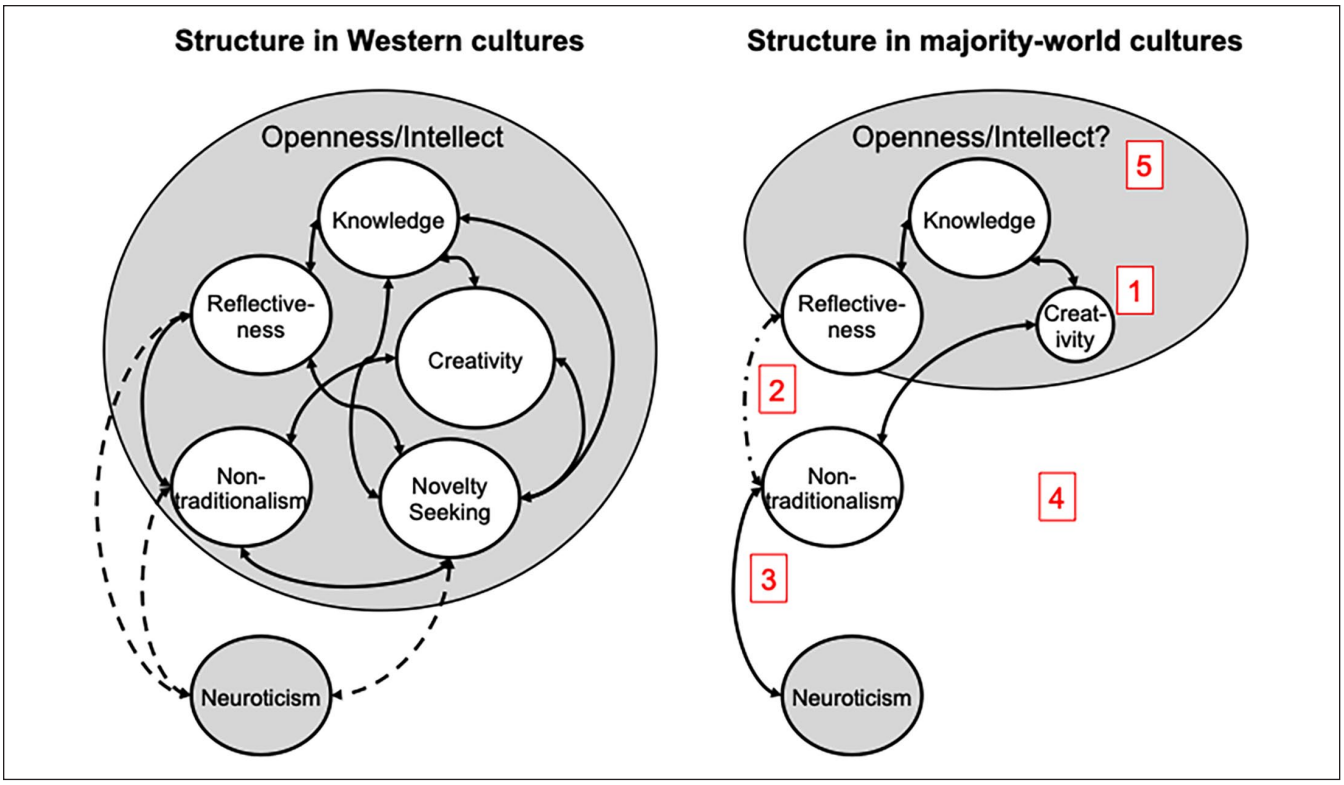

Figure 2. Hypothesized Cultural Differences in the Relevance and Coherence of Openness/Intellect, Visualized.
Note. Circles represent personality traits; larger circles are more relevant and indicated by a larger number of local terms. Double-headed arrows represent covariances. In cultural contexts that are collectivistic, tighter, and less complex, five differences may emerge, which we depict with red numbered squares: (1) Languages in these contexts typically have fewer words for openness/intellect (creativity has a smaller circle). (2) Associations between components are weaker (dashed line between reflectiveness and non-traditionalism), especially associations among ideologically-relevant components. (3) Components may correlate with other Big Few traits. In particular, nonconformity-related traits may be associated with maladaptive traits (e.g., neuroticism). (4) Some components may be completely absent from language (novelty-seeking circle absent), especially words describing trait-like behavioral variation. (5) An openness/intellect-related trait identified in this language may differ substantially in scope and content (broad gray openness/intellect trait is smaller and encompasses fewer components).

education (Schwaba et al., 2019). In other words, in complex cultural contexts that offer many niches, openness/intellect is especially relevant.

By contrast, in less complex cultures, there are fewer niches. For example, Senufo people are well-known for their masks and painting and value artistic skill, but their language contains very few words to describe individual differences in openness/intellect, including aesthetic preferences. In this setting, these trades are passed down through family lines (Diamitani, 1999) rather than chosen by an individual, and there are fewer occupational niches. Thus, individual differences in aesthetic preferences may be less relevant in Senufo society, leading to fewer related trait terms.

If these differences are driven by the theoretical mechanisms we suggest, the relevance of openness/intellect-related trait terms, and thus their presence and frequency of use, should vary not only across broad cultural groups differing in independence and complexity but also across areas of the same country (e.g., urban versus rural; Cohen, 2009), over time (e.g., increasing with economic development), and even within individuals across their lifespans (e.g., spiking in emerging adulthood, when identity exploration is especially salient; Bleidorn & Schwaba, 2017).

In sum, we hypothesize that the relevance of openness/intellect may vary across cultures in tandem with their individualism and complexity. Individualistic cultural contexts emphasize trait attributions for behavioral variability, and cultural complexity provides a diverse set of niches that people select into, both of which promote the creation and use of personality trait terms within the openness/intellect extended universe. If this is true, differences in individualism and complexity both across and within languages should covary with the presence and prevalence of terms related to behavioral variability and niche-picking (Table 2). This may explain why openness/intellect terms occupy a central place in Western lexicons and are often absent in other contexts. We visualize these effects in Figure 2 below, in particular Boxes 1, 4, and 5.

Collectivism and Tightness May Explain Variation in Openness/Intellect's Coherence. Beyond modifying the relevance of openness/intellect, cultural differences may also shape its

structural coherence. Traits within the openness/intellect extended universe that covary strongly in a Western context may not covary as strongly elsewhere or may covary more strongly with other Big Few traits. This would explain the unique problems in establishing measurement invariance across groups in etic research on this trait. In particular, we hypothesize that collectivistic and tighter cultures weaken the coherence of openness/intellect in two ways: they discourage norm violation, introducing negative valence to openness/intellect content, and they locate ideology systems more outside of the individual, reducing correlations between value-relevant components of openness/intellect (Table 2, rows 3 and 4).

Cultures that are more collectivistic tend to emphasize the presence of societal norms, and cultures that are tighter punish deviations from these norms more harshly. Descriptive terms like nonconformist, eccentric, or nontraditional—components of top-down, humanistic conceptions of openness/intellect measured in the HEXACO and NEO inventories—may thus be pathologized. Instead of covarying with other components of the openness/intellect extended universe like curiosity and creativity, or forming their own unconventionality factor, as in some western lexical studies (Ashton et al., 2004; Hofstee et al., 1997), these terms may be associated with maladjustment, neuroticism, or low social self-regulation. Findings from a lexical study of adjectival terms in Korea, a relatively tight culture (Gelfand et al., 2011), support this. Hahn and colleagues (1999) found that a four-factor model for personality structure fit best to their data, but they tested a five-factor model for explicit comparison with the Big Five. In this five-factor model, openness-related terms like eccentric, peculiar, and creative were loaded with low-conscientiousness terms like irresponsible and easygoing to form the low pole of a conscientiousness-dependability factor that was negatively correlated with emotional stability. These openness-related terms did not strongly covary with intellect-related terms, which were part of a separate factor.

Second, in more individualistic and loose cultural contexts, people tend more to choose their own constellation of ideological commitments and value systems, whereas in more collectivistic and tight contexts, there may be strong normative expectations. This may affect associations among traits involved in the formation and expression of ideology and values, including reflection and broadmindedness. In Western contexts, openness, more than intellect, is the strongest personality predictor of political ideology (Osborne et al., 2023; Xu et al., 2021). Researchers of this topic have theorized that someone who is reflective and intellectual may feel more comfortable challenging their own beliefs and thus be more likely to adopt a progressive set of values that embrace diversity. The opposite may occur in a person whose dislike of abstract reflectivity and preference for familiar and the routine pushes them toward a traditional value system that emphasizes societal stability and the maintenance of conventions.

In a collectivistic and tight society, the association between openness and ideology may be weaker: regardless of their standing on traits related to openness/intellect, a person may be more likely to align their ideology with that of their in-group. In other words, variation in ideology would be caused to a lesser extent by personality variation, and to a greater extent by variation shaped by social roles and situational expectancies. Indeed, meta-analytic research has found weaker associations between openness/intellect and values like tradition and conformity in countries with more restrictive social institutions (a proxy for tighter cultures) (Fischer & Boer, 2015). This difference should theoretically lead to weaker associations between ideologically-relevant openness/intellect facets like broadmindedness and less ideologically relevant ones like aesthetic sensitivity. It may also weaken the correlations among the items of ideologically-relevant openness/intellect facets. Support for this hypothesis comes from cross-cultural research using NEO inventories, whose openness/intellect scale contains a values facet that directly indexes liberalism and tolerance for secular viewpoint diversity. In our view, etic research has found this facet to be the least culturally-portable trait within the NEO Big Five (Church et al., 2011; Cheung et al., 1996).

In sum, we hypothesize that two important qualities of cultures, individualism and tightness, can help explain why and how the structural coherence of openness/intellect varies between contexts. In more collectivistic and tighter contexts, openness/intellect components relevant to eccentricity and nonconformity should be correlated less strongly with other openness/intellect components (e.g., imagination, curiosity) and more strongly with maladaptive traits (e.g., neuroticism, low conscientiousness), consistent with discouragement and pathologizing of these behavioral tendencies. Second, in such contexts, the structure of ideologically-relevant personality trait content should be less coherent, reflected in lower inter-item correlations within and between openness/intellect components like nontraditionalism and reflectiveness. As with cultural factors discussed earlier that shape the relevance of openness/intellect terms, these mechanisms should also operate at micro levels, such as across organizational contexts (e.g., in careers with looser expectations, individuals who score high on openness/intellect may act in nonconforming ways, whereas in careers with tighter expectations, openness/intellect may be less relevant to nonconformity). We visualize these effects in Figure 2 above, in Boxes 2, 3, and 5.

We Should Continue to Study Openness/Intellect Cross-Culturally

Though openness/intellect varies so much across cultures and is absent from the lexicons of many, we do not propose that it should be jettisoned from research. Despite these limitations, we present two arguments for why researchers should continue to consider openness/intellect cross-culturally. Across cultures, there may be some universal elements within the openness/intellect extended universe. Careful lexical investigation,

biological commonalities, and evolutionary theory can guide the way here. Second, cross-cultural variation in the structure and relevance of openness/intellect is a feature, not a bug: variation in this trait across societies is valuable for building theory about how cultural forces shape personality traits.

Universal Elements of Openness/Intellect. Even if some languages lack terms for openness-related concepts like imagination or curiosity, lexical terms relevant to intellect appear more pan-linguistic. For example, the originality factor of the 30-item cross-culturally optimized QB6 includes items measuring wisdom, vocabulary, and difficulty with abstract thought (Thalmayer & Saucier, 2014). Furthermore, Saucier and colleagues (2014) identified behavioral propensities related to competence across 12 languages unlikely to have influenced each other, including "*Wise*," "*stupid*," and "*quick*," which are clearly relevant to intellect and invoke a combination of behavioral propensity and cognitive ability. And, although the CPAI developers struggled to identify an openness/intellect factor among Chinese participants (Cheung et al., 2008), other Chinese lexical analyses (Zhou et al., 2009) included person descriptors that, translated to English, correspond to bright, intelligent, and clever (although these descriptors factored with descriptors of positive valence, revealing cultural differences in structure). We believe that perhaps these intellect-focused terms could serve as a cross-cultural anchor for an openness/intellect-like trait centered around knowledge (as depicted in Figure 2) with peripheral elements like aesthetic sensitivity and non-traditionalism incorporated only in contexts where these components correlate with each other and the trait's anchor.

Alternatively, pancultural elements of openness/intellect may be identified by bypassing the lexical hypothesis. Although the lexical hypothesis is useful for identifying which traits are most relevant to which societies, it is limited by its conservative reliance on single-word trait terms. Even in English, many terms for the openness portion of the trait require multi-word person descriptive phrases, as noted in Part I (McCrae, 1990; but see Saucier, 1992, for evidence of some openness-related terms in natural language). Thalmayer and colleagues (2021) asked Namibian Khoekhoe speakers in Khoekhoe "*Do you know anyone who tends to think things out, or tends to come up with ideas?*" also adding the Afrikaans word for *creative*. Although Khoekhoe does not contain any words related to openness, and few related to intellect, most interviewees easily identified a person who fit the trait, and in their responses described people who embody core concepts of openness/intellect, like being artistically or practically inventive. These findings suggest to us that, even in cultural contexts where components of openness/intellect may not be relevant enough to have become encoded into single-word lexical terms, this trait is still something that people can relate to when prompted.

Vectors of biological variation common to all humans may provide another starting point for conceptualizing a universal core of openness/intellect. For one example, about half of all people experience aesthetic chills, the wave of tingling excitement that can accompany meaningful artistic experiences (Goldstein, 1980). This tendency seems to appear across cultures (Beier et al., 2022; McCrae, 2007), and people who often experience aesthetic chills tend to score higher on openness measures (McCrae, 2007). Aesthetic chills are often accompanied by piloerection (goosebumps). Curiously, research on the rare subset of people who can voluntarily achieve piloerection has also found that they score extremely high on BFAS openness/intellect (Cohen's *d* of .90; Heathers et al., 2018). The universality of individual differences in chills and piloerection and their associations with openness/intellect indicates biological differences that might provide a universal basis for individual differences in some components of openness/intellect, especially those relevant to aesthetic sensitivity. For another example, binocular-rivalry suppression indexes the extent to which a person can simultaneously perceive different images presented to each eye at the same time. This ability is associated with openness/intellect in western samples (Antinori et al., 2017), reflecting a tendency toward (over)inclusive cognition hypothesized as core to openness (Blain et al., 2020). We also believe that individual differences in intelligence, whose neuroanatomical features evolved long ago and are conserved across our species (Deary et al., 2022; Penke & Jokela, 2016; Goldstein, 2015), can provide a biological basis for components of intellect, so long as one considers cognitive ability under the umbrella of personality traits (see Part 1). Supporting this proposition, a study of NEO Five Factor Inventory facets among Western participants found that openness to ideas, the facet most strongly correlated with intelligence, was also the most strongly correlated with individual differences in brain morphology (Hyatt et al., 2022). These findings linking individual differences in aesthetic chills, piloerection, binocular-rivalry suppression, and brain morphology to individual differences in openness/intellect suggest to us universal biological underpinnings in some components of this trait. More research is needed to test these speculative patterns, especially studies that tie these biological differences to one another.

Finally, we may be able to use cross-species research to identify openness/intellect-related individual differences less affected by cultural variation (Lilley et al., 2017). All living beings who perceive the world must integrate information varying in certainty in order to make decisions about behavior. The dogma of natural variation states that animals of the same species will differ in how they deal with this uncertainty (DeYoung, 2015a). For example, birds, rats, and fish vary in their trait-like foraging tendencies (Sommer-Trembo et al., 2024; Wilson et al., 1994), trading off safety versus efficiency in ways that echo human variation in familiarity versus novelty-seeking. Research on dolphin "creativity" has found that members of this species tend to vary their behavior to alleviate monotony (Kuczaj & Eskelinen, 2014), suggesting

openness/intellect components like novelty seeking. And, depending on researcher choice to include content relevant to cognitive ability, variation in general intelligence is found across mammalian species, and potentially beyond (Burkart et al., 2017). Perhaps a cross-species, cross-cultural core conceptualization of openness/intellect could be derived from these basics. A more circumscribed label like problem-solving is arguably more descriptive of this core than openness/intellect, as traits like imagination and aesthetic appreciation are not qualities observed yet in nonhuman species.

Openness/Intellect's Uniqueness Is a Feature, Not a Bug. Despite some past predictions about the universality of personality trait structure (e.g., Costa & McCrae, 2005), and the strong appeal of a culturally-universal Big Few model, it appears unequivocal that Western models of openness/intellect are not universally relevant and structurally coherent. In inventories adapted to be more cross-culturally valid, like the QB6, traits resembling openness/intellect omit many of its core Western components, like non-traditionalism and aesthetic appreciation. This is a disappointing conclusion for strong top-down theories about personality structure that require the existence of a set of latent variables with omnipresent, culturally immutable influences on specific trait components, or for inflexible bottom-up theories about personality structure that require similar emergent patterns across all humanity. It also means that we cannot assume that research findings about the antecedents, structure, and consequences of openness/intellect found in Western samples can be assumed to generalize to the rest of the world. But these requirements are not necessarily limiting: Taking a more structurally-pluralistic perspective (Srivastava, 2020) can allow us to appreciate and explore the Westernness of openness/intellect as a feature, rather than as a bug.

Illustrating the value of a structurally-pluralistic perspective, openness/intellect *is* a highly relevant and consequential individual difference in Western cultures (Ashton et al., 2004; Hofstee et al., 1997; McCrae, 1996; Thalmayer et al., 2022), making it worthy of study in these locales. In Western contexts, a person's standing on openness/intellect predicts educational and career outcomes (Schwaba et al., 2019), romantic desires and decisions (Jokela et al., 2011; Solomon & Jackson, 2014), and psychological richness and life meaning (McCrae & Costa, 1980; Lilgendahl et al., 2013). There is no need to ignore a trait that is useful in some cultures because it is not as relevant everywhere. We must simply couch results in awareness that this is a kind of ethnographic, culture-specific research (Klimstra & McLean, 2024; Laher, 2020). Papers on personality constructs less relevant to Western contexts are customarily titled in ways that "other" the samples (e.g., "*Amae*—a key concept for understanding Japanese personality structure"; Doi, 1962; see also Castro Torres & Alburez-Gutierrez, 2022; Kahalon et al., 2022); upfront decentering (Arshad & Chung, 2022) of openness/intellect may be appropriate and refreshingly honest: "*Openness/Intellect*—A key concept for understanding educated members of the individualistic West."

Conclusion

Openness/intellect is a unique, quirky, and sometimes confusing trait. Our goal was to collect and document some of these unique qualities, develop theoretical explanations for them, and inspire researchers to attend to these qualities and work to further disambiguate them in future research. In Part I, we described the unique history of openness/intellect in the West, where its intellect half, identified in lexical studies, was bound to its openness half, based on questionnaires steeped in midcentury humanistic psychology. This history helps explain the tension among instantiations of openness/intellect and its lower-level components and provides a lens for clarifying the unique qualities of openness/intellect throughout the manuscript.

In Part II, we explored three key research questions where openness/intellect stands apart from the other Big Few traits. Compared to other traits, openness/intellect's associations with life outcomes may differ across groups more frequently; we hypothesize this may be because the psychological meaning of a behavior—the extent to which it is novel, cognitively enriching, and unconventional, for example—is especially varying across groups of people. Openness/intellect also appears less relevant than the other Big Few to both positive and negative indicators of mental health; instead, associations are more often found when linking specific trait components to specific indicators of mental health, especially among sub-symptomatic individuals. Finally, volitional personality change research has found that most people want to change other personality traits, but few hold explicit goals to change in openness/intellect. We hypothesize that this may be because people either are content with their current level of openness/intellect or because people do not believe that openness/intellect is as malleable as their other traits. Future research can help clarify each of these many hypotheses.

Finally, in Part III, we explored a common yet underexplored pattern that cuts across decades of cross-cultural research: openness/intellect rarely emerges as an important, coherent personality trait outside of Western contexts. We hypothesize that variation in individualism, tightness, and complexity across cultures modifies both its relevance (i.e., the presence and commonality of language describing this trait) and structure (i.e., the correlations among lower-level traits within the openness/intellect extended universe). Despite these challenges, there are some common cross-cultural patterns of trait-relevant findings that may be used to define a cross-cultural core: Terms relating to variation in knowledge and wisdom, which hew toward the intellect pole of the trait, seem to be more common across cultures, and some biological components of openness/intellect, like aesthetic chills, may be universally human. We also point out that even if Western models of openness/intellect are not

generalizable, they still hold value to describe differences and outcomes in the West and as levers to study how culture and personality interact. Overall, we hope that this interrogation of openness/intellect ties together many filaments of trait-specific findings previously scattered throughout the personality literature, to ignite new interest in more precise and targeted research on this trait.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

ORCID iDs

Ted Schwaba https://orcid.org/0000-0001-5491-5386
Amber Gayle Thalmayer https://orcid.org/0000-0002-1963-1123

Note

1. Recently, some researchers have claimed that measurement invariance tests are overly restrictive and that the validity of cross-cultural comparisons should instead be established using patterns of associations with external variables (Funder & Gardiner, 2024; Welzel et al., 2023). These researchers argue that even if openness/intellect items function differentially in different cultures, evidence that openness/intellect scores predict outcomes similarly across cultures provides sufficient evidence to justify scale score comparisons. For example, Laajaj and colleagues (2019) found consistently positive associations between openness/intellect and income across nations despite extremely inconsistent scale functioning. Our brief refutation of this argument is that measurement invariance tests are designed to identify whether constructs are the same across groups and can explicitly quantify the direction and amount of bias introduced by deviation from perfect congruence (Nye & Drasgow, 2011), whereas this alternate method only establishes whether they are similar using much softer logic. By analogy, if a researcher measures schizophrenia symptoms in one group and anorexia nervosa symptoms in another, they would find that both are associated with lower well-being, but these consistent correlational patterns do not indicate that these two disorders are the same. And though it is valuable to use patterns of external correlations to identify similar constructs (Lawson & Robins, 2021), directly comparing mean scores on similar constructs that do not satisfy measurement invariance tests can be as nonsensical as testing whether one group's anorexia nervosa is more severe than another group's schizophrenia.

References

Adorno, T., Frenkel-Brenswik, E., Levinson, D. J., & Sanford, R. N. (2019). *The authoritarian personality*. Verso Books.

Allport, G. W., & Odbert, H. S. (1936). Trait-names: A psycholexical study. *Psychological Monographs*, *47*(1), i–171.

Angleitner, A., Ostendorf, F., & John, O. P. (1990). Towards a taxonomy of personality descriptors in German: A psycho-lexical study. *European Journal of Personality*, *4*(2), 89–118.

Anglim, J., Dunlop, P. D., Wee, S., Horwood, S., Wood, J. K., & Marty, A. (2022). Personality and intelligence: A meta-analysis. *Psychological Bulletin*, *148*(5–6), 301–336.

Anglim, J., Horwood, S., Smillie, L. D., Marrero, R. J., & Wood, J. K. (2020). Predicting psychological and subjective well-being from personality: A meta-analysis. *Psychological Bulletin*, *146*(4), 279–323.

Antinori, A., Carter, O. L., & Smillie, L. D. (2017). Seeing it both ways: openness to Experience and binocular rivalry suppression. *Journal of Research in Personality*, *68*, 15–22.

Arshad, M., & Chung, J. M. (2022). Practical recommendations for considering culture, race, and ethnicity in personality psychology. *Social and Personality Psychology Compass*, *16*(2), Article e12656.

Ashton, M. C., & Lee, K. (2001). A theoretical basis for the major dimensions of personality. *European Journal of Personality*, *15*(5), 327–353.

Ashton, M. C., & Lee, K. (2020). Objections to the HEXACO model of personality structure: And why those objections fail. *European Journal of Personality*, *34*(4), 492–510.

Ashton, M. C., Lee, K., de Vries, R. E., Perugini, M., Gnisci, A., & Sergi, I. (2006). The HEXACO model of personality structure and indigenous lexical personality dimensions in Italian, Dutch, and English. *Journal of Research in Personality*, *40*(6), 851–875.

Ashton, M. C., Lee, K., Marcus, B., & de Vries, R. E. (2007). German lexical personality factors: Relations with the HEXACO model. *European Journal of Personality*, *21*, 23–43.

Ashton, M. C., Lee, K., Perugini, M., Szarota, P., de Vries, R. E., Di Blas, L., Boies, K., & De Raad, B. (2004). A six-factor structure of personality-descriptive adjectives: Solutions from psycholexical studies in seven languages. *Journal of Personality and Social Psychology*, *86*(2), 356–366.

Ayoub, M., Gosling, S. D., Potter, J., Shanahan, M., & Roberts, B. W. (2018). The relations between parental socioeconomic status, personality, and life outcomes. *Social Psychological and Personality Science*, *9*(3), 338–352.

Baranski, E., Gardiner, G., Lee, D., & Funder, D. C. (2021). Who in the world is trying to change their personality traits? Volitional personality change among college students in six continents. *Journal of Personality and Social Psychology*, *121*(5), 1140–1156.

Beck, E. D., & Jackson, J. J. (2022). A mega-analysis of personality prediction: Robustness and boundary conditions. *Journal of Personality and Social Psychology*, *122*(3), 523–553.

Beier, E. J., Janata, P., Hulbert, J. C., & Ferreira, F. (2022). Do you chill when I chill? A cross-cultural study of strong emotional responses to music. *Psychology of Aesthetics, Creativity, and the Arts*, *16*(1), 74–96.

Benet-Martínez, V., & Waller, N. G. (1997). Further evidence for the cross-cultural generality of the Big Seven factor model: Indigenous and imported Spanish personality constructs. *Journal of Personality*, *65*(3), 567–598.

Benet-Martínez, V., & John, O. P. (1998). Los Cinco Grandes across cultures and ethnic groups: Multitrait-multimethod

analyses of the Big Five in Spanish and English. *Journal of Personality and Social Psychology*, *75*(3), 729–750.

Blain, S. D., Longenecker, J. M., Grazioplene, R. G., Klimes-Dougan, B., & DeYoung, C. G. (2020). Apophenia as the disposition to false positives: A unifying framework for openness and psychoticism. *Journal of Abnormal Psychology*, *129*(3), 279–292.

Bleidorn, W., Hopwood, C. J., Ackerman, R. A., Witt, E. A., Kandler, C., Riemann, R., Samuel, D. B., & Donnellan, M. B. (2020). The healthy personality from a basic trait perspective. *Journal of Personality and Social Psychology*, *118*(6), 1207–1225.

Bleidorn, W., & Schwaba, T. (2017). Personality development in emerging adulthood. In J. Specht (Ed.), *Personality development across the lifespan* (pp. 39–51). Academic Press.

Bleidorn, W., Schwaba, T., Zheng, A., Hopwood, C. J., Sosa, S. S., Roberts, B. W., & Briley, D. A. (2022). Personality stability and change: A meta-analysis of longitudinal studies. *Psychological Bulletin*, *148*(7–8), 588–619.

Borghans, L., Golsteyn, B. H., Heckman, J. J., & Humphries, J. E. (2016). What grades and achievement tests measure. *Proceedings of the National Academy of Sciences of the United States of America*, *113*(47), 13354–13359.

Botwin, M. D., Buss, D. M., & Shackelford, T. K. (1997). Personality and mate preferences: Five factors in mate selection and marital satisfaction. *Journal of Personality*, *65*(1), 107–136.

Buecker, S., Maes, M., Denissen, J. J., & Luhmann, M. (2020). Loneliness and the Big Five personality traits: A meta–analysis. *European Journal of Personality*, *34*(1), 8–28.

Burkart, J. M., Schubiger, M. N., & van Schaik, C. P. (2017). The evolution of general intelligence. *Behavioral and Brain Sciences*, *40*, Article e195.

Byrne, B. M., Shavelson, R. J., & Muthén, B. (1989). Testing for the equivalence of factor covariance and mean structures: The issue of partial measurement invariance. *Psychological Bulletin*, *105*(3), 456–466.

Camisa, K. M., Bockbrader, M. A., Lysaker, P., Rae, L. L., Brenner, C. A., & O'Donnell, B. F. (2005). Personality traits in schizophrenia and related personality disorders. *Psychiatry Research*, *133*(1), 23–33.

Caprara, G. V., & Perugini, M. (1994). Personality described by adjectives: The generalizability of the Big Five to the Italian lexical context. *European Journal of Personality*, *8*(5), 357–369.

Castro Torres, A. F., & Alburez-Gutierrez, D. (2022). North and South: Naming practices and the hidden dimension of global disparities in knowledge production. *Proceedings of the National Academy of Sciences*, *119*(10), Article e2119373119.

Cheung, F. M., Cheung, S. F., Leung, K., Ward, C., & Leong, F. (2003). The English version of the Chinese personality assessment inventory. *Journal of Cross-Cultural Psychology*, *34*(4), 433–452.

Cheung, F. M., Cheung, S. F., Zhang, J., Leung, K., Leong, F., & Huiyeh, K. (2008). Relevance of openness as a personality dimension in Chinese culture: Aspects of its cultural relevance. *Journal of Cross-Cultural Psychology*, *39*(1), 81–108.

Cheung, F. M., Leung, K., Fan, R. M., Song, W. Z., Zhang, J. X., & Zhang, J. P. (1996). Development of the Chinese personality assessment inventory. *Journal of Cross-cultural Psychology*, *27*(2), 181–199.

Cheung, F. M., Leung, K., Zhang, J. X., Sun, H. F., Gan, Y. Q., Song, W. Z., & Xie, D. (2001). Indigenous Chinese personality constructs: Is the five-factor model complete? *Journal of Cross-cultural Psychology*, *32*(4), 407–433.

Chick, G. (1997). Cultural complexity: The concept and its measurement. *Cross-cultural Research*, *31*(4), 275–307.

Christensen, A. P., Cotter, K. N., & Silvia, P. J. (2019). Reopening openness to experience: A network analysis of four openness to Experience inventories. *Journal of Personality Assessment*, *101*(6), 574–588.

Christensen, A. P., Kenett, Y. N., Cotter, K. N., Beaty, R. E., & Silvia, P. J. (2018). Remotely close associations: Openness to experience and semantic memory structure. *European Journal of Personality*, *32*(4), 480–492.

Church, A. T., Alvarez, J. M., Mai, N. T., French, B. F., Katigbak, M. S., & Ortiz, F. A. (2011). Are cross-cultural comparisons of personality profiles meaningful? Differential item and facet functioning in the revised NEO Personality Inventory. *Journal of Personality and Social Psychology*, *101*(5), 1068–1089.

Church, A. T., & Lonner, W. J. (1998). The cross-cultural perspective in the study of personality: Rationale and current research. *Journal of Cross-Cultural Psychology*, *29*(1), 32–62.

Church, A. T., Reyes, J. A. S., Katigbak, M. S., & Grimm, S. D. (1997). Filipino personality structure and the Big Five model: A lexical approach. *Journal of Personality*, *65*(3), 477–528.

Coan, R. W. (1972). Measurable components of openness to experience. *Journal of Consulting and Clinical Psychology*, *39*(2), Article 346.

Cohen, A. B. (2009). Many forms of culture. *American Psychologist*, *64*(3), 194–204.

Collins, J. M., & Gleaves, D. H. (1998). Race, job applicants, and the Five-Factor Model of Personality: Implications for Black psychology, industrial/organizational psychology, and the Five-Factor Theory. *Journal of Applied Psychology*, *83*(4), 531–544.

Condon, D. M., Roney, E., & Revelle, W. (2017). A SAPA project update: On the structure of phrased self-report personality items. *Journal of Open Psychology Data*, *5*(1), Article 3.

Condon, D. M., Wood, D., Mõttus, R., Booth, T., Costantini, G., Greiff, S., Johnson, W., Lukaszewski, A., Murray, A., Revelle, W., Wright, A. G. C., Ziegler, M., & Zimmermann, J. (2021). Bottom up construction of a personality taxonomy. *European Journal of Psychological Assessment*, *36*(6), 923–934.

Correa, T., Hinsley, A. W., & De Zuniga, H. G. (2010). Who interacts on the Web? The intersection of users' personality and social media use. *Computers in Human Behavior*, *26*(2), 247–253.

Costa, P. T., Jr., & McCrae, R. R. (1980). Still stable after all these years: Personality as a key to some issues in adulthood and old age. In E. B. Baltes & O. G. Brim (Eds.), *Life span development and behavior* (Vol. 3, pp. 65–102). Academic Press.

Costa, P. T., Jr., & McCrae, R. R. (1992). *Neo Personality Inventory–Revised (NEO PI-R)*. Psychological Assessment Resources.

Costa, P. T., Jr., & McCrae, R. R. (2008). The revised Neo Personality Inventory (Neo-PI-R). *The SAGE Handbook of Personality Theory and Assessment*, *2*(2), 179–198.

Costa, P. T., Jr., & McCrae, R. R. (1976). Age differences in personality structure: A cluster analytic approach. *Journal of Gerontology*, *31*, 564–570.

Costa, P. T., Jr., & McCrae, R. R. (2005). A Five-Factor Model perspective on personality disorders. In S. Strack (Ed.), *Handbook of personology and psychopathology* (pp. 257–270). John Wiley & Sons.

Deary, I. J., Cox, S. R., & Hill, W. D. (2022). Genetic variation, brain, and intelligence differences. *Molecular Psychiatry*, *27*(1), 335–353.

De Raad, B. (1994). An expedition in search of a fifth universal factor: Key issues in the lexical approach. *European Journal of Personality*, *8*(4), 229–250.

De Raad, B., Barelds, D. P., Timmerman, M. E., De Roover, K., Mlačić, B., & Church, A. T. (2014). Towards a pan–cultural personality structure: Input from 11 psycholexical studies. *European Journal of Personality*, *28*(5), 497–510.

De Raad, B., Hendriks, A. J., & Hofstee, W. K. (1992). Towards a refined structure of personality traits. *European Journal of Personality*, *6*(4), 301–319.

De Raad, B., & Mlačić, B. (2020). The Big Five personality trait factors. In *Oxford research encyclopedia of education*. Oxford University Press.

DeYoung, C. G. (2010). Toward a theory of the Big Five. *Psychological Inquiry*, *21*(1), 26–33.

DeYoung, C. G. (2015a). Cybernetic big five theory. *Journal of Research in Personality*, *56*, 33–58.

DeYoung, C. G. (2015b). Openness/intellect: A dimension of personality reflecting cognitive exploration. In M. Mikulincer, P. R. Shaver, M. L. Cooper, & R. J. Larsen (Eds.), *APA handbook of personality and social psychology: Personality processes and individual differences* (Vol. 4, pp. 369–399). American Psychological Association.

DeYoung, C. G., Grazioplene, R. G., & Peterson, J. B. (2012). From madness to genius: The openness/intellect trait domain as a paradoxical simplex. *Journal of Research in Personality*, *46*(1), 63–78.

DeYoung, C. G., & Krueger, R. F. (2018). A cybernetic theory of psychopathology. *Psychological Inquiry*, *29*(3), 117–138.

DeYoung, C. G., Quilty, L. C., & Peterson, J. B. (2007). Between facets and domains: 10 aspects of the Big Five. *Journal of Personality and Social Psychology*, *93*(5), 880–896.

Diamitani, B. T. (1999). *Identities, Komo societies, and art among the Tagwa-Senufo of Burkina Faso*. The University of Iowa.

Di Blas, L., & Forzi, M. (1998). An alternative taxonomic study of personality-descriptive adjectives in the Italian language. *European Journal of Personality*, *12*(2), 75–101.

Doi, L. T. (1962). AMAE: A key concept for understanding Japanese personality structure. *Psychologia*, *5*(1), 1–7.

Dollinger, S. J., Leong, F. T., & Ulicni, S. K. (1996). On traits and values: With special reference to openness to Experience. *Journal of Research in Personality*, *30*(1), 23–41.

Durkee, P. K., Lukaszewski, A. W., von Rueden, C. R., Gurven, M. D., Buss, D. M., & Tucker-Drob, E. M. (2020). Niche diversity predicts personality structure across 115 nations. *Psychological Science*, *33*(2), 285–298.

Dweck, C. S., Chiu, C. Y., & Hong, Y. Y. (1995). Implicit theories and their role in judgments and reactions: A word from two perspectives. *Psychological Inquiry*, *6*(4), 267–285.

Eronen, M. I., & Bringmann, L. F. (2021). The theory crisis in psychology: How to move forward. *Perspectives on Psychological Science*, *16*(4), 779–788.

Fayn, K., MacCann, C., Tiliopoulos, N., & Silvia, P. J. (2015). Aesthetic emotions and aesthetic people: Openness/intellect predicts sensitivity to novelty in the experiences of interest and pleasure. *Frontiers in Psychology*, *6*, Article 1877.

Fayn, K., Silvia, P. J., Dejonckheere, E., Verdonck, S., & Kuppens, P. (2019). Confused or curious? Openness/intellect/intellect predicts more positive interest-confusion relations. *Journal of Personality and Social Psychology*, *117*(5), 1016.

Fetvadjiev, V. H., Meiring, D., van de Vijver, F. J. R., Nel, J. A., & Hill, C. (2015). The South African Personality Inventory (SAPI): A culture-informed instrument for the country's main ethnocultural groups. *Psychological Assessment*, *27*(3), 827–837.

Fischer, R., & Boer, D. (2015). Motivational basis of personality traits: A meta-analysis of value-personality correlations. *Journal of Personality*, *83*(5), 491–510.

Fischer, R., & Karl, J. A. (2019). A primer to (cross-cultural) multi-group invariance testing possibilities in R. *Frontiers in Psychology*, *10*, Article 1507.

Fiske, D. W. (1949). Consistency of the factorial structures of personality ratings from different sources. *The Journal of Abnormal and Social Psychology*, *44*(3), 329–344.

Funder, D. C., & Gardiner, G. (2024). MIsgivings about measurement invariance. *European Journal of Personality*, *38*(6), 889–895.

García, L. F., Aluja, A., Rossier, J., Ostendorf, F., Glicksohn, J., Oumar, B., Bellaj, T., Ruch, W., Kövi, Z., Ścigała, D., Čekrlija, Đ., Stivers, A. W., Di Blas, L., Valdivia, M., Ben Jemaa, S., Atitsogbe, K. A., & Hansenne, M. (2022). Exploring the stability of HEXACO-60 structure and the association of gender, age, and social position with personality traits across 18 countries. *Journal of Personality*, *90*(2), 256–276.

Gebauer, J. E., Bleidorn, W., Gosling, S. D., Rentfrow, P. J., Lamb, M. E., & Potter, J. (2014). Cross-cultural variations in Big Five relationships with religiosity: A sociocultural motives perspective. *Journal of Personality and Social Psychology*, *107*(6), 1064–1091.

Gelfand, M. J., Raver, J. L., Nishii, L., Leslie, L. M., Lun, J., Lim, B. C., Duan, L., Almaliach, A., Ang, S., Arnadottir, J., Aycan, Z., Boehnke, K., Boski, P., Cabecinhas, R., Chan, D., Chhokar, J., D'Amato, A., Subirats Ferrer, M., Fischlmayr, I. C., & Yamaguchi, S. (2011). Differences between tight and loose cultures: A 33-nation study. *Science*, *332*(6033), 1100–1104.

Goldberg, L. R. (1981). Unconfounding situational attributions from uncertain, neutral, and ambiguous ones: A psychometric analysis of descriptions of oneself and various types of others. *Journal of Personality and Social Psychology*, *41*(3), 517–552.

Goldberg, L. R. (1990). An alternative "description of personality": The Big-Five factor structure. *Journal of Personality and Social Psychology*, *59*(6), 1216–1229.

Goldberg, L. R. (1992). The development of markers for the Big-Five factor structure. *Psychological Assessment*, *4*(1), 26–42.

Goldberg, L. R. (1999). A broad-bandwidth, public domain, personality inventory measuring the lower-level facets of several five-factor models. *Personality Psychology in Europe*, *7*(1), 7–28.

Goldstein, A. (1980). Thrills in response to music and other stimuli. *Physiological Psychology*, *8*(1), 126–129.

Goldstein, S. (2015). The evolution of intelligence. In S. Goldstein, D. Princiotta, & J. A. Naglieri (Eds.), *Handbook of intelligence: Evolutionary theory, historical perspective, and current concepts* (pp. 3–7). Springer.

Grotzinger, A. D., Mallard, T. T., Akingbuwa, W. A., Ip, H. F., Adams, M. J., Lewis, C. M., McIntosh, A. M., Grove, J., Dalsgaard, S., Lesch, K. P., Strom, N., Meier, S. M., Mattheisen, M., Børglum, A. D., Mors, O., Breen, G., & iPSYCH Tourette Syndrome Obsessive Compulsive Disorder Working Group of the Psychiatrics Genetics Consortium Bipolar Disorder Working Group of the Psychiatrics Genetics Consortium Nivard, M. G. (2022). Genetic architecture of 11 major psychiatric disorders at biobehavioral, functional genomic and molecular genetic levels of analysis. *Nature Genetics*, *54*(5), 548–559.

Hahn, D. W., Lee, K., & Ashton, M. C. (1999). A factor analysis of the most frequently used Korean personality trait adjectives. *European Journal of Personality*, *13*(4), 261–282.

Heathers, J. A., Fayn, K., Silvia, P. J., Tiliopoulos, N., & Goodwin, M. S. (2018). The voluntary control of piloerection. *PeerJ*, *6*, Article e5292.

Helson, R. M., & Mitchell, V. (2020). *Women on the river of life: A fifty-year study of adult development*. Univ of California Press.

Henrich, J. (2020). *The WEIRDest people in the world: How the West became psychologically peculiar and particularly prosperous*. Farrar, Straus & Giroux.

Hofstede, G. (1980). Culture and organizations. *International Studies of Management & Organization*, *10*(4), 15–41.

Hofstee, W. K., Kiers, H. A., De Raad, B., Goldberg, L. R., & Ostendorf, F. (1997). A comparison of Big-Five structures of personality traits in Dutch, English, and German. *European Journal of Personality*, *11*(1), 15–31.

Hudson, N. W., & Fraley, R. C. (2015). Volitional personality trait change: Can people choose to change their personality traits? *Journal of Personality and Social Psychology*, *109*(3), 490–507.

Hudson, N. W., Fraley, R. C., Chopik, W. J., & Briley, D. A. (2020). Change goals robustly predict trait growth: A mega-analysis of a dozen intensive longitudinal studies examining volitional change. *Social Psychological and Personality Science*, *11*(6), 723–732.

Hudson, N. W., & Roberts, B. W. (2014). Goals to change personality traits: Concurrent links between personality traits, daily behavior, and goals to change oneself. *Journal of Research in Personality*, *53*, 68–83.

Hughes, B. T., Costello, C. K., Pearman, J., Razavi, P., Bedford-Petersen, C., Ludwig, R. M., & Srivastava, S. (2021). The Big Five across socioeconomic status: Measurement invariance, relationships, and age trends. *Collabra: Psychology*, *7*(1), Article 24431.

Human Rights Campaign. (2022). https://www.hrc.org/resources/state-equality-index

Hyatt, C. S., Sharpe, B. M., Owens, M. M., Listyg, B. S., Carter, N. T., Lynam, D. R., & Miller, J. D. (2022). Searching high and low for meaningful and replicable morphometric correlates of personality. *Journal of Personality and Social Psychology*, *123*(2), 463–480.

Irwing, P., Hughes, D. J., Tokarev, A., & Booth, T. (2024). Towards a taxonomy of personality facets. *European Journal of Personality*, *38*(3), 494–515.

John, O. P., Donahue, E. M., & Kentle, R. L. (1991). *Big Five Inventory (BFI)* [Database record]. APA PsycTests.

John, O. P., Naumann, L. P., & Soto, C. J. (2008). Paradigm shift to the integrative big five trait taxonomy. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of Personality: Theory and Research* (Vol., 3, pp. 114–158). Guilford Press.

Jokela, M., Alvergne, A., Pollet, T. V., & Lummaa, V. (2011). Reproductive behavior and personality traits of the Five Factor Model. *European Journal of Personality*, *25*(6), 487–500.

Kahalon, R., Klein, V., Ksenofontov, I., Ullrich, J., & Wright, S. C. (2022). Mentioning the sample's country in the article's title leads to bias in research evaluation. *Social Psychological and Personality Science*, *13*(2), 352–361.

Kandler, C., Bleidorn, W., & Riemann, R. (2012). Left or right? Sources of political orientation: The roles of genetic factors, cultural transmission, assortative mating, and personality. *Journal of Personality and Social Psychology*, *102*(3), 633–645.

Kaufman, S. B., Quilty, L. C., Grazioplene, R. G., Hirsh, J. B., Gray, J. R., Peterson, J. B., & DeYoung, C. G. (2016). Openness to experience and intellect differentially predict creative achievement in the arts and sciences. *Journal of Personality*, *84*(2), 248–258.

Kirkpatrick, A., (Ed.). (2010). *The Routledge handbook of world Englishes*. Routledge.

Klimstra, T. A., & McLean, K. C. (2024). Reconsidering normative interpretations in personality research. *European Journal of Personality*, *39*(1), 122–134.

Kotov, R., Gamez, W., Schmidt, F., & Watson, D. (2010). Linking "big" personality traits to anxiety, depressive, and substance use disorders: A meta-analysis. *Psychological Bulletin*, *136*(5), 768–821.

Kotov, R., Krueger, R. F., Watson, D., Achenbach, T. M., Althoff, R. R., Bagby, R. M., Brown, T. A., Carpenter, W. T., Caspi, A., Clark, L. A., Eaton, N. R., Forbes, M. K., Forbush, K. T., Goldberg, D., Hasin, D., Hyman, S. E., Ivanova, M. Y., Lynam, D. R., Markon, K., . . .Zimmerman, M. (2017). The Hierarchical Taxonomy of Psychopathology (HiTOP): A dimensional alternative to traditional nosologies. *Journal of Abnormal Psychology*, *126*(4), 454–477.

Kraaykamp, G., & Van Eijck, K. (2005). Personality, media preferences, and cultural participation. *Personality and Individual Differences*, *38*(7), 1675–1688.

Kuczaj, I. I., & Eskelinen, H. C. (2014). The "creative dolphin" revisited: What do dolphins do when asked to vary their behavior? *Animal Behavior and Cognition*, *1*(1), 66–77.

Laajaj, R., Macours, K., Pinzon Hernandez, D. A., Arias, O., Gosling, S. D., Potter, J., Rubio-Codina, M., & Vakis, R. (2019).). Challenges to capture the big five personality traits in non-WEIRD populations. *Science Advances*, *5*(7), Article eaaw5226.

Laher, S. (2020). Psychological assessment in Africa: The time is now!. *African Journal of Psychological Assessment*, *1*(1), 1–3.

Lawson, K. M., & Robins, R. W. (2021). Sibling constructs: What are they, why do they matter, and how should you handle them? *Personality and Social Psychology Review*, *25*(4), 344–366.

Lee, K., & Ashton, M. C. (2004). Psychometric properties of the HEXACO Personality Inventory. *Multivariate Behavioral Research*, *39*(2), 329–358.

Lee, K., & Ashton, M. C. (2008). The HEXACO personality factors in the indigenous personality lexicons of English and 11 other languages. *Journal of Personality*, *76*(5), 1001–1054.

Leising, D., Thielmann, I., Glöckner, A., Gärtner, A., & Schönbrodt, F. (2022). Ten steps toward a better personality science: How quality may be rewarded more in research evaluation. *Personality Science*, *3*(1), e6029. https://doi.org/10.5964/ps.6029

Lilgendahl, J. P., Helson, R., & John, O. P. (2013). Does ego development increase during midlife? The effects of openness/

intellect and accommodative processing of difficult events. *Journal of Personality*, *81*(4), 403–416.

Lilley, M. K., Kuczaj, S. A., & Yeater, D. B. (2017). Individual differences in nonhuman animals: Examining boredom, curiosity, and creativity. *Personality in Nonhuman Animals*, 257–275.

Liu, J., & Ilmarinen, V. J. (2020). Core self-evaluation moderates distinctive similarity preference in ideal partner's personality. *Journal of Research in Personality*, *84*, 103899.

Lo, M. T., Hinds, D. A., Tung, J. Y., Franz, C., Fan, C. C., Wang, Y., Smeland, O. B., Schork, A., Holland, D., Kauppi, K., Sanyal, N., Escott-Price, V., Smith, D. J., O'Donovan, M., Stefansson, H., Bjornsdottir, G., Thorgeirsson, T. E., Stefansson, K., McEvoy, L. K., & Chen, C. H. (2017). Genome-wide analyses for personality traits identify six genomic loci and show correlations with psychiatric disorders. *Nature Genetics*, *49*(1), 152–156.

Loevinger, J. (1957). Objective tests as instruments of psychological theory. *Psychological Reports*, *3*(3), 635–694.

Lounsbury, J. W., Foster, N., Patel, H., Carmody, P., Gibson, L. W., & Stairs, D. R. (2012). An investigation of the personality traits of scientists versus nonscientists and their relationship with career satisfaction. *R&D Management*, *42*(1), 47–59.

Lui, P. P., Samuel, D. B., Rollock, D., Leong, F. T., & Chang, E. C. (2020). Measurement invariance of the five factor model of personality: Facet-level analyses among Euro and Asian Americans. *Assessment*, *27*(5), 887–902.

Lyon, K. A., Elliott, R., Ware, K., Juhasz, G., & Brown, L. J. E. (2021). Associations between facets and aspects of big five personality and affective disorders: A systematic review and best evidence synthesis. *Journal of Affective Disorders*, *288*, 175–188.

Malouff, J. M., Thorsteinsson, E. B., & Schutte, N. S. (2005). The relationship between the five-factor model of personality and symptoms of clinical disorders: A meta-analysis. *Journal of Psychopathology and Behavioral Assessment*, *27*(2), 101–114.

Mann, F. D., Krueger, R. F., & Vohs, K. D. (2020). Personal economic anxiety in response to COVID-19. *Personality and Individual Differences*, *167*, Article 110233.

Maslow, A. (1964). *Religions, values and peak experiences*. Penguin Press.

Matz, S. C. (2021).). Personal echo chambers: Openness-to-experience is linked to higher levels of psychological interest diversity in large-scale behavioral data. *Journal of Personality and Social Psychology*, *121*(6), 1284–1300.

McCrae, R. R. (1990). Traits and trait names: How well is openness represented in natural languages? *European Journal of Personality*, *4*(2), 119–129.

McCrae, R. R. (1993). Openness to experience as a basic dimension of personality. *Imagination, Cognition and Personality*, *13*(1), 39–55.

McCrae, R. R. (1996). Social consequences of experiential openness/intellect. *Psychological Bulletin*, *120*(3), 323–337.

McCrae, R. R. (2007). Aesthetic chills as a universal marker of openness to experience. *Motivation and Emotion*, *31*(1), 5–11.

McCrae, R. R., & Costa, P. T. (1980). Openness to experience and ego level in Loevinger's Sentence Completion Test: Dispositional contributions to developmental models of personality. *Journal of Personality and Social Psychology*, *39*(6), 1179–1190.

McCrae, R. R., & Costa, P. T. (1985). Updating Norman's "adequacy taxonomy": Intelligence and personality dimensions in natural language and in questionnaires. *Journal of Personality and Social Psychology*, *49*(3), 710–721.

McCrae, R. R., & Costa, P. T., Jr. (1997). Conceptions and correlates of openness to experience. In R. Hogan, J. Johnson, & S. Briggs (Eds.), *Handbook of personality psychology* (pp. 825–847). Academic Press.

McCrae, R. R., Costa Jr, P. T., & Martin, T. A. (2005). The NEO–PI–3: A more readable revised NEO personality inventory. *Journal of Personality Assessment*, *84*(3), 261–270.

McCrae, R. R., & Sutin, A. R. (2009). Openness to experience. In M. R. Leary & R. H. Hoyle (Eds.), *Handbook of individual differences in social behavior* (pp. 257–273). Guilford Press.

Miller, T. R. (1991). The psychotherapeutic utility of the five-factor model of personality: A clinician's experience. *Journal of Personality Assessment*, *57*(3), 415–433.

Miller, T. J. (2021). Assessing the desire to change personality across methods. *Journal of Personality Assessment*, *104*(4), 447–457.

Miller, T. J., Baranski, E. N., Dunlop, W. L., & Ozer, D. J. (2019). Striving for change: The prevalence and correlates of personality change goals. *Journal of Research in Personality*, *80*, 10–16.

Mõttus, R., Wood, D., Condon, D. M., Back, M. D., Baumert, A., Costantini, G., Epskamp, S., Greiff, S., Johnson, W., Lukaszewski, A., Murray, A., Revelle, W., Wright, A. G. C., Yarkoni, T., Ziegler, M., & Zimmermann, J. (2020). Descriptive, predictive and explanatory personality research: Different goals, different approaches, but a shared need to move beyond the Big Few traits. *European Journal of Personality*, *34*(6), 1175–1201.

Muris, P., Jeurissen, A., Rooswinkel, M., & Meesters, C. (2022). Good traits, bad traits, and "ugly" behavior: Relations between the dark triad, honesty-humility, other HEXACO personality traits, and externalizing problems in adolescents. *Journal of Child and Family Studies*, *31*(12), 3247–3257.

Nel, J. A., Valchev, V. H., Rothmann, S., Van de Vijver, F. J., Meiring, D., & De Bruin, G. P. (2012). Exploring the personality structure in the 11 languages of South Africa. *Journal of Personality*, *80*(4), 915–948.

Nettle, D. (2007). *Personality: What makes you the way you are*. Oxford University Press.

Norman, W. T. (1963). Toward an adequate taxonomy of personality attributes: Replicated factor structure in peer nomination personality ratings. *Journal of Abnormal and Social Psychology*, *66*, 574–583.

Nye, C. D., & Drasgow, F. (2011). Effect size indices for analyses of measurement equivalence: Understanding the practical importance of differences between groups. *Journal of Applied Psychology*, *96*(5), 966–980.

Oishi, S., & Westgate, E. C. (2022). A psychologically rich life: Beyond happiness and meaning. *Psychological Review*, *129*(4), 790–811.

Olaru, G., & Danner, D. (2021). Developing cross-cultural short scales using ant colony optimization. *Assessment*, *28*(1), 199–210.

Olaru, G., Schroeders, U., Wilhelm, O., & Ostendorf, F. (2019). "Grandpa, do you like roller coasters?": Identifying age–appropriate personality indicators. *European Journal of Personality*, *33*(3), 264–278.

Oltmanns, J. R., Jackson, J. J., & Oltmanns, T. F. (2020). Personality change: Longitudinal self-other agreement and convergence with retrospective-reports. *Journal of Personality and Social Psychology*, *118*(5), 1065–1079.

Osborne, D., Costello, T. H., Duckitt, J., & Sibley, C. G. (2023). The psychological causes and societal consequences of authoritarianism. *Nature Reviews Psychology*, *2*(4), 220–232.

Penke, L., & Jokela, M. (2016). The evolutionary genetics of personality revisited. *Current Opinion in Psychology*, *7*, 104–109.

Power, R. A., Steinberg, S., Bjornsdottir, G., Rietveld, C. A., Abdellaoui, A., Nivard, M. M., Johannesson, M., Galesloot, T. E., Hottenga, J. J., Willemsen, G., Cesarini, D., Benjamin, D. J., Magnusson, P. K. E., Ullén, F., Tiemeier, H., Hofman, A., van Rooij, F. J. A., Walters, G. B., Sigurdsson, E., . . . Stefansson, K. (2015). Polygenic risk scores for schizophrenia and bipolar disorder predict creativity. *Nature Neuroscience*, *18*(7), 953–955.

Putnick, D. L., & Bornstein, M. H. (2016). Measurement invariance conventions and reporting: The state of the art and future directions for psychological research. *Developmental Review*, *41*, 71–90.

Roberts, B. W., Chernyshenko, O. S., Stark, S., & Goldberg, L. R. (2005). The structure of conscientiousness: An empirical investigation based on seven major personality questionnaires. *Personnel Psychology*, *58*(1), 103–139.

Roberts, B. W., Kuncel, N. R., Shiner, R., Caspi, A., & Goldberg, L. R. (2007). The power of personality: The comparative validity of personality traits, socioeconomic status, and cognitive ability for predicting important life outcomes. *Perspectives on Psychological Science*, *2*(4), 313–345.

Roberts, B. W., & Wood, D. (2006). Personality development in the context of the neo-socioanalytic model of personality. In D. Mroczek & T. Little (Eds.), *Handbook of personality development* (pp. 11–39). Lawrence Erlbaum.

Roberts, B. W., & Yoon, H. J. (2022). Personality psychology. *Annual Review of Psychology*, *73*(1), 489–516.

Rogers, C. R. (1959). A theory of therapy, personality and interpersonal relationships, as developed in the client-centered framework. In S. Koch (Ed.), *Psychology, a study of a science: Formulations of the person and the social context* (Vol. 3, pp. 184–256). McGraw-Hill.

Rossier, J., Ouedraogo, A., & Dahourou, D. (2017). Personality structure and assessment in French-speaking African cultures. In A. T. Church (Ed.), *The Praeger handbook of personality across cultures* (Vol. 1, pp. 73–103). Praeger/ABC-CLIO.

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*, *57*(6), 1069–1081.

Samuel, D. B., & Widiger, T. A. (2008). A meta-analytic review of the relationships between the five-factor model and DSM-IV-TR personality disorders: A facet level analysis. *Clinical Psychology Review*, *28*(8), 1326–1342.

Saucier, G. (1992). Openness versus intellect: Much ado about nothing? *European Journal of Personality*, *6*(5), 381–386.

Saucier, G. (1994). Mini-markers: A brief version of Goldberg's unipolar Big-Five markers. *Journal of Personality Assessment*, *63*(3), 506–516.

Saucier, G., Georgiades, S., Tsaousis, I., & Goldberg, L. R. (2005). The factor structure of Greek personality adjectives. *Journal of Personality and Social Psychology*, *88*(5), 856–875.

Saucier, G., & Iurino, K. (2020). High-dimensionality personality structure in the natural language: Further analyses of classic sets of English-language trait-adjectives. *Journal of Personality and Social Psychology*, *119*(5), 1188–1219.

Saucier, G., Thalmayer, A. G., Payne, D. L., Carlson, R., Sanogo, L., Ole- Kotikash, L., Church, A. T., Katigbak, M. S., Somer, O., Szarota, P., Szirmák, Z., & Zhou, X. (2014). A basic bivariate structure of personality attributes evident across nine languages. *Journal of Personality*, *82*(1), 1–14.

Schwaba, T., & Bleidorn, W. (2021). Internet use and cognitive engagement in older adulthood. *Social Psychological and Personality Science*, *13*(5), 968–977.

Schwaba, T., Clapp Sullivan, M. L., Akingbuwa, W. A., Ilves, K., Tanksley, P. T., Williams, C. M., Dragostinov, Y., Liao, W., Ackerman, L. S., Fealy, J. C. M., Hemani, G., de la Fuente, J., Gupta, P., Stein, M. B., Gelernter, J., Levey, D. F., Võsa, U., Ausmees, L., . . .Tucker-Drob, E. M. (2025). Robust inference and widespread genetic correlates from a large-scale genetic association study of human personality. *Biorxiv*. https://www.biorxiv.org/content/10.1101/2025.05.16.648988v1

Schwaba, T., Luhmann, M., Denissen, J. J. A., Chung, J. M., & Bleidorn, W. (2018). Openness to experience and culture-openness transactions across the lifespan. *Journal of Personality and Social Psychology*, *115*(1), 118–136.

Schwaba, T., Rhemtulla, M., Hopwood, C. J., & Bleidorn, W. (2020). A facet atlas: Visualizing networks that describe the blends, cores, and peripheries of personality structure. *PLOS ONE*, *15*(7), Article e0236893.

Schwaba, T., Robins, R. W., Grijalva, E., & Bleidorn, W. (2019). Does openness to Experience matter in love and work? Domain, facet, and developmental evidence from a 24-year longitudinal study. *Journal of Personality*, *87*(5), 1074–1092.

Shanahan, M. J., Bauldry, S., Roberts, B. W., Macmillan, R., & Russo, R. (2014). Personality and the reproduction of social class. *Social Forces*, *93*(1), 209–240.

Sibley, C. G., & Duckitt, J. (2010). Personality geneses of authoritarianism: The form and function of openness to Experience. *Perspectives on Authoritarianism*, *2010*, 169–199.

Smaldino, P. E., Lukaszewski, A., von Rueden, C., & Gurven, M. (2019). Niche diversity can explain cross-cultural differences in personality structure. *Nature Human Behaviour*, *3*(12), 1276–1283.

Solomon, B. C., & Jackson, J. J. (2014). Why do personality traits predict divorce? Multiple pathways through satisfaction. *Journal of Personality and Social Psychology*, *106*(6), 978–996.

Sommer-Trembo, C., Santos, M. E., Clark, B., Werner, M., Fages, A., Matschiner, M., Hornung, S., Ronco, F., Oliver, C., Garcia, C., Tschopp, P., Malinski, M., & Salzburger, W. (2024). The genetics of niche-specific behavioral tendencies in an adaptive radiation of cichlid fishes. *Science*, *384*(6694), 470–475.

Soto, C. J. (2019). How replicable are links between personality traits and consequential life outcomes? The life outcomes of personality replication project. *Psychological Science*, *30*(5), 711–727.

Soto, C. J. (2021). Do links between personality and life outcomes generalize? Testing the robustness of trait–outcome associations across gender, age, ethnicity, and analytic approaches. *Social Psychological and Personality Science*, *12*(1), 118–130.

Soto, C. J., & John, O. P. (2017). The next Big Five Inventory (BFI-2): Developing and assessing a hierarchical model with 15 facets to enhance bandwidth, fidelity, and predictive power. *Journal of Personality and Social Psychology*, *113*(1), 117–143.

Srivastava, S. (2020). Personality structure: Who cares? *European Journal of Personality*, *34*(3), 550–551.

Stanek, K. C., & Ones, D. S. (2023). Meta-analytic relations between personality and cognitive ability. *Proceedings of the National Academy of Sciences*, *120*(23), e2212794120.

Steyn, R., & Ndofirepi, T. M. (2022). Structural validity and measurement invariance of the short version of the Big Five Inventory (BFI-10) in selected countries. *Cogent Psychology*, *9*(1), Article 2095035.

Stieger, M., Flückiger, C., Rüegger, D., Kowatsch, T., Roberts, B. W., & Allemand, M. (2021). Changing personality traits with the help of a digital personality change intervention. *Proceedings of the National Academy of Sciences of the United States of America*, *118*(8), Article e2017548118.

Suh, E. M. (2002). Culture, identity consistency, and subjective well-being. *Journal of Personality and Social Psychology*, *83*(6), 1378–1391.

Sun, J., & Goodwin, G. P. (2020). Do people want to be more moral?. *Psychological Science*, *31*(3), 243–257.

Szarota, P., Ashton, M. C., & Lee, K. (2007). Taxonomy and structure of the Polish personality lexicon. *European Journal of Personality*, *21*, 823–852.

Terracciano, A., McCrae, R. R., Hagemann, D., & Costa, P. T., Jr. (2003). Individual difference variables, affective differentiation, and the structures of affect. *Journal of Personality*, *71*(5), 669–704.

Thalmayer, A. G., Job, S., Shino, E. N., Robinson, S. L., & Saucier, G. (2021). Ūsigu: A mixed-method lexical study of character description in Khoekhoegowab. *Journal of Personality and Social Psychology*, *121*(6), 1258–1283.

Thalmayer, A. G., Mather, K. A., Saucier, G., Naudé, L., Florence, M., Adonis, T. A., Shino, E. N., Asatsa, S., Witzlack-Makarevich, A., Bächlin, L. Z. M., & Condon, D. M. (2024). The cross-cultural big two: A culturally decentered theoretical and measurement model for personality traits. *Journal of Personality and Social Psychology*, *128*, 1181–1208. https://doi.org/10.1037/pspp0000528

Thalmayer, A. G., & Saucier, G. (2014). The questionnaire big six in 26 nations: Developing cross-culturally applicable big six, big five and big two inventories. *European Journal of Personality*, *28*(5), 482–496.

Thalmayer, A. G., Saucier, G., & Eigenhuis, A. (2011). Comparative validity of Brief to Medium-Length Big Five and Big Six Personality Questionnaires. *Psychological Assessment*, *23*(4), 995–1009.

Thalmayer, A. G., Saucier, G., Flournoy, J. C., & Srivastava, S. (2019). Ethics-relevant values as antecedents of personality change: Longitudinal findings from the life and time study. *Collabra: Psychology*, *5*(1), Article 52.

Thalmayer, A. G., Saucier, G., Ole-Kotikash, L., & Payne, D. (2020). Personality structure in east and west Africa: Lexical studies of personality in Maa and Supyire-Senufo. *Journal of Personality and Social Psychology*, *119*(5), 1132–1152.

Thalmayer, A. G., Saucier, G., & Rotzinger, J. S. (2022).). Absolutism, relativism, and universalism in personality traits across cultures: The case of the big five. *Journal of Cross-Cultural Psychology*, *53*(7–8), 935–956.

Thielmann, I., Akrami, N., Babarović, T., Belloch, A., Bergh, R., Chirumbolo, A., Čolović, P., de Vries, R. E., Dostál, D., Egorova, M., Gnisci, A., Heydasch, T., Hilbig, B. E., Hsu, K. Y., Izdebski, P., Leone, L., Bernd, M., Međedović, J., Nagy, J., & Lee, K. (2020). The HEXACO–100 across 16 languages: A large-scale test of measurement invariance. *Journal of Personality Assessment*, *102*(5), 714–726.

Thielmann, I., & de Vries, R. E. (2021). Who wants to change and how? On the trait-specificity of personality change goals. *Journal of Personality and Social Psychology*, *121*(5), 1112–1139.

Torelli, C. J., & Rodas, M. A. (2017). Tightness–looseness: Implications for consumer and branding research. *Journal of Consumer Psychology*, *27*(3), 398–404.

Trapnell, P. D. (1994). Openness versus intellect: A lexical left turn. *European Journal of Personality*, *8*(4), 273–290.

Triandis, H. C. (1989). The self and social behavior in differing cultural contexts. *Psychological Review*, *96*(3), 506–520.

Triandis, H. C. (1997). Cross-cultural perspectives on personality. In R. Hogan, J. Johnson, & S. Briggs (Eds.), *Handbook of personality psychology* (pp. 439–464). Academic Press.

Triandis, H. C. (2001).). Individualism-collectivism and personality. *Journal of Personality*, *69*(6), 907–924.

Tupes, E. C., & Christal, R. E. (1961). Recurrent personality factors based on trait ratings. *Journal of Personality*, *60*, 225–251.

Turkheimer, E., Pettersson, E., & Horn, E. E. (2014). A phenotypic null hypothesis for the genetics of personality. *Annual Review of Psychology*, *65*(1), 515–540.

Vandello, J. A., & Cohen, D. (1999). Patterns of individualism and collectivism across the United States. *Journal of Personality and Social Psychology*, *77*(2), 279–292.

Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational Research Methods*, *3*(1), 4–70.

Vroman, K. G., Arthanat, S., & Lysack, C. (2015). "Who over 65 is online?" Older adults' dispositions toward information communication technology. *Computers in Human Behavior*, *43*, 156–166.

Vukasović, T., & Bratko, D. (2015). Heritability of personality: A meta-analysis of behavior genetic studies. *Psychological Bulletin*, *141*(4), 769–785.

Wang, X., Zhen, Z., Xu, S., Li, J., Song, Y., & Liu, J. (2022). Behavioral and neural correlates of social network size: The unique and common contributions of face recognition and extraversion. *Journal of Personality*, *90*(2), 294–305.

Watson, D., Klohnen, E. C., Casillas, A., Nus Simms, E., Haig, J., & Berry, D. S. (2004). Match makers and deal breakers: Analyses of assortative mating in newlywed couples. *Journal of Personality*, *72*(5), 1029–1068.

Watson, D., Stanton, K., Khoo, S., Ellickson-Larew, S., & Stasik-O'Brien, S. M. (2019). Extraversion and psychopathology: A multilevel hierarchical review. *Journal of Research in Personality*, *81*, 1–10.

Welzel, C., Brunkert, L., Kruse, S., & Inglehart, R. F. (2023). Non-invariance? An overstated problem with misconceived causes. *Sociological Methods & Research*, *52*(3), 1368–1400.

Widiger, T. A., & Crego, C. (2019). HiTOP thought disorder, DSM-5 psychoticism, and five factor model openness/intellect. *Journal of Research in Personality*, *80*, 72–77.

Wilson, D. S., Clark, A. B., Coleman, K., & Dearstyne, T. (1994). Shyness and boldness in humans and other animals. *Trends in Ecology & Evolution*, *9*(11), 442–446.

Wilt, J., & Revelle, W. (2015). Affect, behaviour, cognition and desire in the Big Five: An analysis of item content and structure. *European Journal of Personality*, *29*(4), 478–497.

Woo, S. E., Chernyshenko, O. S., Longley, A., Zhang, Z. X., Chiu, C. Y., & Stark, S. E. (2014). Openness to experience: Its lower level structure, measurement, and cross-cultural equivalence. *Journal of Personality Assessment*, *96*(1), 29–45.

Wright, A. J., & Jackson, J. J. (2023). Do changes in personality predict life outcomes? *Journal of Personality and Social Psychology*, *125*(6), 1495–1518.

Wrzus, C., & Roberts, B. W. (2017). Processes of personality development in adulthood: The TESSERA framework. *Personality and Social Psychology Review*, *21*(3), 253–277.

Xu, X., Soto, C. J., & Plaks, J. E. (2021). Beyond openness to experience and conscientiousness: Testing links between lower-level personality traits and American political orientation. *Journal of Personality*, *89*(4), 754–773.

Zeinoun, P., Daouk-Öyry, L., Choueiri, L., & van de Vijver, F. J. (2018). Arab-Levantine personality structure: A psycholexical study of modern standard Arabic in Lebanon, Syria, Jordan, and the West Bank. *Journal of Personality*, *86*(3), 397–421.

Zhou, X., Saucier, G., Gao, D., & Liu, J. (2009). The factor structure of Chinese personality terms. *Journal of Personality*, *77*(2), 363–400.

Ziegler, M., Schroeter, T. A., Lüdtke, O., & Roemer, L. (2018). The enriching interplay between openness and interest: A theoretical elaboration of the OFCI model and a first empirical test. *Journal of Intelligence*, *6*(3), Article 35.